IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

PERCEPTIVE AUTOMATA LLC,	§	
	§	
Plaintiff,	§	
	§	**JURY TRIAL DEMANDED**
v.	§	
	§	
TESLA, INC.,	§	**C.A. NO. 2:25-cv-742-JRG**
	§	
Defendant.	§	

PLAINTIFF'S FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Perceptive Automata LLC ("Perceptive" or "Plaintiff") files this First Amended Complaint against Defendant Tesla, Inc. ("Tesla" or "Defendant") for infringement of U.S. Patent No. 10,614,344 (the "'344 patent"), U.S. Patent No. 11,126,889 (the "'889 patent"), U.S. Patent No. 11,467,579 (the "'579 patent"), U.S. Patent No. 11,520,346 (the "'346 patent"), and 11,753,046 (the "'046 patent"), collectively, the "Asserted Patents."

THE PARTIES

1. Perceptive Automata LLC is a Texas limited liability company.

2. On information and belief, Tesla, Inc. is a corporation organized and existing under the laws of the State of Texas, having a principal place of business as its global headquarters at 1 Tesla Road, Austin, Texas 78725.

3. Tesla has numerous business locations throughout Texas, including businesses within this District located at 3408 S SW Loop 323, Tyler, TX 75701; 1805 Justin Rd, Flower Mound, TX 75028; 7500 Windrose Avenue Space B185, Plano, TX 75024; 5800 Democracy Drive, Plano, TX 75024; and 300 Lexington Dr, Plano, TX 75075.

4. The Tesla business locations within this District are vital to Tesla's presence and business in the state of Texas. *See, e.g.*, https://dentonrc.com/news/denton_county/flower-mound-greenlights-tesla-location-the-automaker-s-first-for-denton-county/article_41b4f605-86c8-53d6-8ae8-ea409f0f8b87.html ("Expanding and having this new center in Flower Mound is going to be vital to our presence in the state of Texas," Tesla design manager Dhwani Dave told the council members.").

5. Tesla's past and continuing making, using, selling, offering for sale, and/or importing, and/or inducing its subsidiaries, affiliates, retail partners, and customers in the making, using, selling, offering for sale, and/or importing the accused instrumentalities throughout the United States i) willfully infringe each of the Asserted Patents and ii) impermissibly take the significant benefits of Perceptive's patented technologies without fair compensation to Perceptive.

6. Tesla is engaged in making, using, selling, offering for sale, and/or importing, and/or induces its subsidiaries, affiliates, retail partners, and customers in the making, using, selling, offering for sale, and/or importing throughout the United States, including within this District, products and services accused of infringement.

JURISDICTION AND VENUE

7. This action arises under the patent laws of the United States, namely 35 U.S.C. §§ 271, 281, and 284-285, among others.

8. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

9. This Court has personal jurisdiction over Tesla in accordance with due process and/or the Texas Long Arm Statute because, among other things, Tesla does business in this State by, among other things, maintaining offices in this District, including maintaining its offices

located at 3408 S SW Loop 323, Tyler, TX 75701; 1805 Justin Rd, Flower Mound, TX 75028; 7500 Windrose Avenue Space B185, Plano, TX 75024; 5800 Democracy Drive, Plano, TX 75024; and 300 Lexington Dr, Plano, TX 75075.

10. Further, this Court has personal jurisdiction over Tesla because it has engaged, and continues to engage, in continuous, systematic, and substantial activities within this State, including the substantial marketing, making, using, and sale of products and services within this State and this District. Indeed, this Court has personal jurisdiction over Tesla because it has committed acts giving rise to Perceptive's claims for patent infringement within and directed to this District, has derived substantial revenue from its goods and services provided to individuals in this State and this District, and maintains regular and established places of business in this District, including its places of business at 3408 S SW Loop 323, Tyler, TX 75701; 1805 Justin Rd, Flower Mound, TX 75028; 7500 Windrose Avenue Space B185, Plano, TX 75024; 5800 Democracy Drive, Plano, TX 75024; and 300 Lexington Dr, Plano, TX 75075.

11. Relative to patent infringement, Tesla has committed and continues to commit acts in violation of 35 U.S.C. § 271, and has made, used, marketed, distributed, offered for sale, imported, and/or sold infringing products and services in this State, including in this District, and otherwise engaged in infringing conduct within and directed at, or from, this District. Such products and services have been and continue to be offered for sale, distributed to, sold, and used in this District, and the infringing conduct has caused, and continues to cause, injury to Perceptive, including injury suffered within this District. These are purposeful acts and transactions in this State and this District such that Tesla reasonably should know and expect that it could be haled into this Court because of such activities.

12. In addition, Tesla has knowingly induced and continues to knowingly induce infringement within this District by advertising, marketing, offering for sale and/or selling devices pre-loaded with infringing functionality within this District, to consumers, customers, manufacturers, distributors, resellers, partners, and/or end users, and providing instructions, user manuals, advertising, and/or marketing materials which facilitate, direct or encourage the use of infringing functionality with knowledge thereof.

13. Tesla re-incorporated from Delaware to Texas in 2024. In preparation for its Shareholder decision to re-incorporate in Texas, Tesla provided the following statements:

- "The Texas legal framework is strong and fair, and more appropriate to our mission;"
- "Our global headquarters, largest manufacturing facility and future are in Texas;"
- "We have thousands of [Texas] employees;" and
- "We respect Texas. Texas respects us."

https://ir.tesla.com/_flysystem/s3/sec/000110465924057076/tm2326076d23_defa14a-gen.pdf at 3. Moreover, Telsa considers Texas its "home." *Id.* at 47 (stating "Bring Tesla Home to Texas.").

14. Venue is proper in this District under 28 U.S.C. §§ 1391 and 1400(b) because Tesla has regular and established places of business in this District and has committed acts of infringement in this District. Tesla's regular and established places of business in this District include, at least, its facilities in 3408 S SW Loop 323, Tyler, TX 75701; 1805 Justin Rd, Flower Mound, TX 75028; 7500 Windrose Avenue Space B185, Plano, TX 75024; 5800 Democracy Drive, Plano, TX 75024; and 300 Lexington Dr, Plano, TX 75075. Such acts of infringement include the making, using, and/or selling of Tesla vehicles with Full Self-Driving (FSD) hardware and/or software that leverage and infringe the inventions of the Asserted Patents (as more

particularly identified and described throughout this First Amended Complaint, below) in this State and this District.

15. Tesla's "Gigafactory" and "Global Headquarters" are located in Austin, Texas. https://www.tesla.com/giga-texas. This factory has "over 10 million square feet of factory floor" and is a "manufacturing hub for Model Y and the home of Cybertruck." *Id*. The Model Y and the Cybertruck comprise the FSD hardware and/or software, and these autonomous vehicle models are Accused Products.

16. Tesla has built Cortex 1 ("Cortex") and is building Cortex 2 at its Gigafactory in Austin, Texas. Cortex is an infringing product and/or service that includes a supercluster datacenter that receives video clips from Tesla's large fleet of vehicles that Cortex uses to train Tesla's FSD product/service.

17. On information and belief, Tesla has a large number of employees in Texas working on the self-driving technology infringed by the Asserted Patents. For example, Tesla has an autonomous robotaxi service, which uses Tesla's FSD infringing technology, operating in Austin, Texas. https://www.shop4tesla.com/en/blogs/news/tesla-robotaxi-fsd-tests-austin-2025.

18. Tesla is currently advertising job positions in Texas related to the infringing products and services. *See, e.g.*, https://www.tesla.com/careers/search/job/staff-soc-rtl-design-engineer-self-driving-244821; https://www.tesla.com/careers/search/job/machine-learning-hardware-performance-engineer-self-driving-244822; https://www.tesla.com/careers/search/job/physical-design-engineer-self-driving-245760; https://www.tesla.com/careers/search/job/sr-product-test-engineer-self-driving-244818.

19. As further discussed, the Asserted Patents do not claim autonomous driving generally, but rather, are directed to concrete solutions for problems faced by autonomous vehicles,

such as how to predict the variable behavior and decision-making of humans. Training autonomous vehicle systems with a better understanding of such issues improves self-driving capabilities of vehicles and increases safety for drivers, pedestrians, and other vehicles.

COUNT I

(INFRINGEMENT OF U.S. PATENT NO. 10,614,344)

20. Plaintiff incorporates paragraphs 1 through 19 herein by reference.

21. Perceptive is the assignee of the '344 patent, entitled "System and Method of Predicting Human Interaction with Vehicles," with ownership of all substantial rights in the '344 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements. A copy of the '344 patent is attached hereto as Exhibit 1.

22. Tesla has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims including at least claims 1 and 19[1] of the '344 patent in this judicial district and elsewhere in Texas and the United States by making, using, testing, offering for sale, selling, and/or importing FSD software and hardware, Tesla vehicles with FSD software and hardware, and/or systems that support Tesla vehicles with FSD software and hardware (the '344 Accused Products). Such infringement includes, but is not limited to, the making, using, offering to sell, and/or selling of '344 Accused Products that leverage and infringe the inventions of the '344 patent. The infringement allegations of the asserted claims of the '344 patent, including claims 1 and 19, is also embodied in Plaintiff's preliminary infringement contentions, which are incorporated by reference. *See* Ex. 6.

[1] Throughout this Complaint, wherever Plaintiff identifies specific claims of the Asserted Patents infringed by Defendant, Plaintiff expressly reserves the right to identify additional claims and products in its infringement contentions in accordance with applicable local rules and the Court's case management order. Specifically identified claims throughout this Complaint are provided for notice pleading only.

23. On information and belief, Tesla directs and controls the '344 Accused Products to operate in an infringing manner by providing the components, including the FSD hardware and software instructions, that infringe the '344 patent. Furthermore, Tesla installs, services, and/or maintains the '344 Accused Products that it provided to its customers. Tesla owns and controls the FSD software which automatically runs on and directs and controls the '344 Accused Products. Through its provision of FSD software, Tesla causes the '344 Accused Products to perform the functionality recited by the asserted claims. Tesla further controls the performance of the claimed method steps by the '344 Accused Products by conditioning receipt of warranty benefits on the customer's agreement not to modify the '344 Accused Products. *See, e.g.,* https://digitalassets.tesla.com/tesla-contents/image/upload/tesla-new-vehicle-limited-warranty-en-us.pdf. Furthermore, Tesla owns vehicles and/or the training networks (*e.g.*, Dojo and/or Cortex) that infringe the asserted claims.

24. Each Tesla vehicle with FSD software and hardware infringes the method of at least claim 1 of the '344 patent in this judicial district and elsewhere in Texas and the United States. For example, Tesla performs each of the steps of claim 1 via Tesla FSD vehicles owned by Tesla and/or third parties that use FSD in this judicial district and elsewhere in Texas and the United States. Furthermore, Tesla infringes via Tesla owned FSD vehicles that are test driven, by Tesla employees and/or customers, using FSD at Tesla's regular and established places of business in this judicial district:

Schedule a Drive

Experience Full Self-Driving (Supervised)[1]
Let your vehicle drive you almost anywhere with your active supervision. Includes Auto Lane Changes, Actually Smart Summon, Autopark, and more.

Ownership Experience in App
Download the Tesla App to experience keyless driving, locating your vehicle, pre-cooling and heating, locking and unlocking, Sentry, and more.

Quick and Easy Check-in
Starting your drive is simple and low hassle, whether you're on a self-serve drive or visiting our advisors in store.

Select a Model

- **Cybertruck** — More utility than a truck with more performance than a sports car
- **Model S** — Luxury sedan for range, quick acceleration and comfort
- **Model X** — Luxury SUV for comfort, storage and maximum tech
- **Model 3** — Sports sedan for families, commuting and road trips
- **Model Y** — Midsize SUV for families, road trips and extra cargo space

Select Location and Time

Enter or edit your address as needed to find a demo drive location nearby and choose a time
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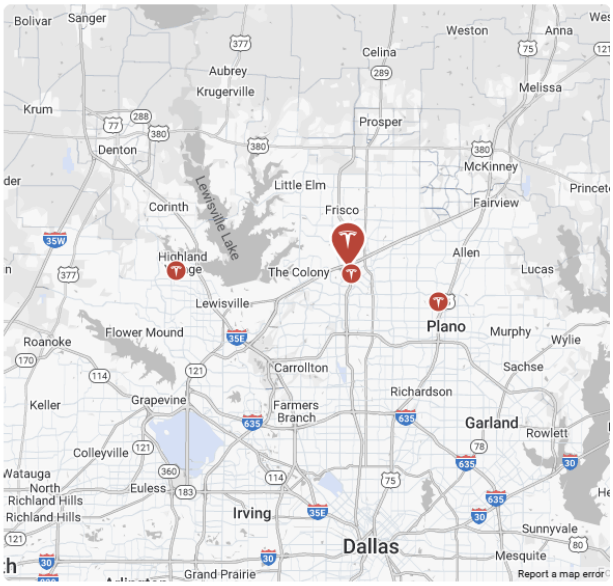
Drive Duration

Regular | 24 Hour | 48 Hour

Date: November 10, 2025

Time: 12:00 PM



What to expect
Tesla staff will answer all your questions. Learn what to expect, how to operate the vehicle and more.

Learn More

25. https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla FSD vehicles in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement of claim 1 of the '344 patent in this judicial district and elsewhere in Texas and the United States. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html. Each Tesla vehicle configured with FSD infringes at least claim 19 of the '344 patent. For example, Tesla offers to sell and/or sells infringing Tesla FSD vehicles in this judicial district and elsewhere in Texas and the United States. For example, Tesla employees offer to sell and/or sell Tesla FSD vehicles to a customer after the customer's demo drive at one of Tesla's regular and established places of business in this judicial district:

After Your Demo Drive

Return your Tesla vehicle and get your questions answered by a Tesla Advisor. If you are ready to order your Tesla vehicle, a Tesla Advisor can also walk you through how you can design and order your vehicle. You can also view and explore our existing inventory of Tesla vehicles online at any time.

https://www.tesla.com/support/demo-drive.

Schedule a Drive

Experience Full Self-Driving (Supervised)[1]
Let your vehicle drive you almost anywhere with your active supervision. Includes Auto Lane Changes, Actually Smart Summon, Autopark, and more.

Ownership Experience in App
Download the Tesla App to experience keyless driving, locating your vehicle, pre-cooling and heating, locking and unlocking, Sentry, and more.

Quick and Easy Check-in
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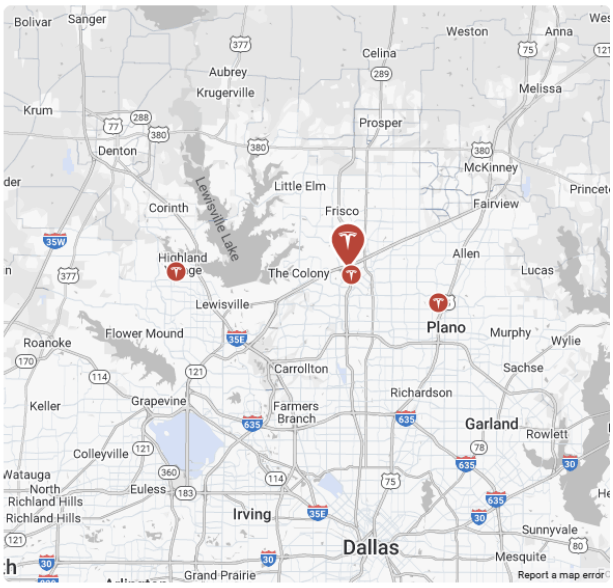

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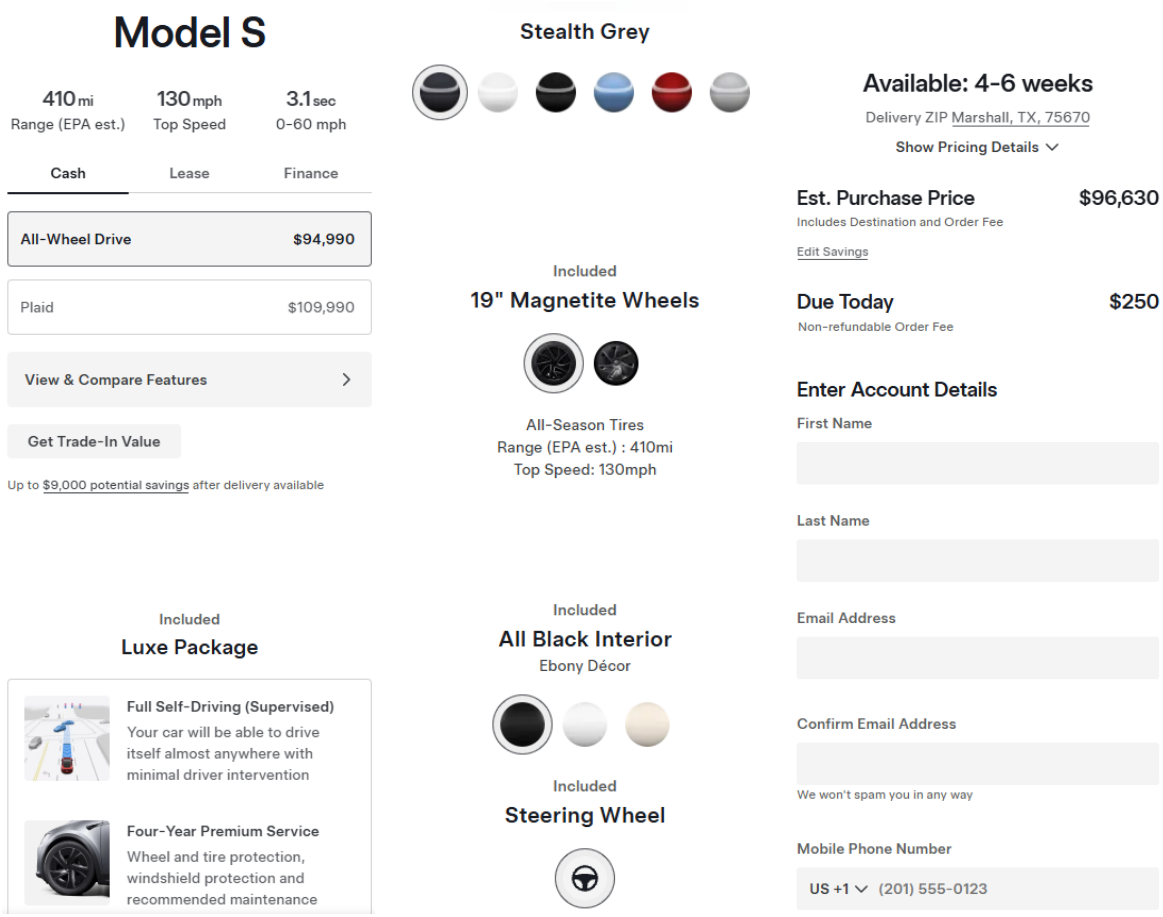
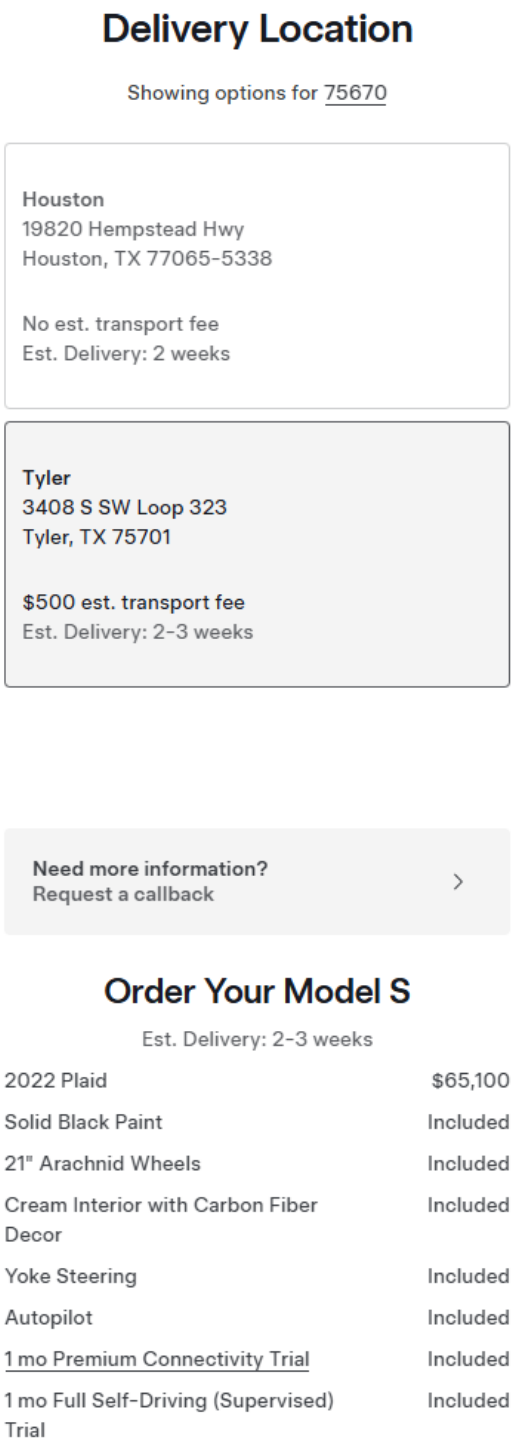
What to expect
Tesla staff will answer all your questions. Learn what to expect, how to operate the vehicle and more.

Learn More

https://www.tesla.com/drive. Furthermore, Tesla, via its website, offers to sell and/or sells Tesla vehicles, new or pre-owned, preloaded with infringing FSD functionality to customers located in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://www.tesla.com/inventory/new/ms?arrangeby=distance&zip=75670&range=25. On information and belief, Tesla's employees offer to sell and sell the FSD and/or direct the customer to Tesla's website and/or provide a device to the customer to complete the purchase of the vehicle at Tesla's regular and established places of business (e.g., showrooms) in this judicial district for the customer to purchase the infringing FSD vehicles from Tesla. Tesla's website is highly interactive allowing customers to design their vehicle, including the purchase of FSD:

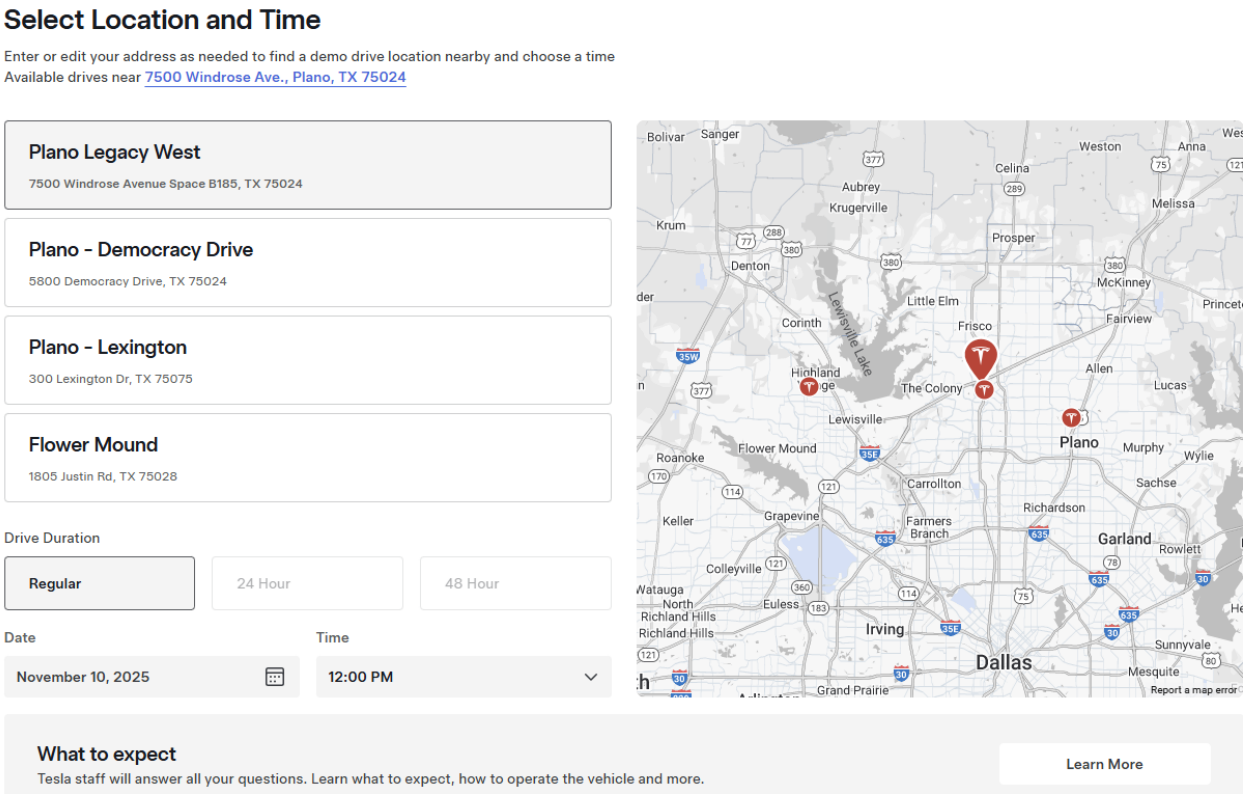


https://www.tesla.com/models/design#overview. Furthermore, Tesla delivers the infringing FSD vehicle to one of its established places of business in this judicial district and/or to the customer's location within this judicial district:



https://www.tesla.com/ms/order/.

26. Each Tesla vehicle configured with FSD infringes at least claim 19 of the '344 patent. Tesla infringes at least claim 19 of the '344 patent by making the Tesla vehicle configured with FSD. Tesla provides all of the necessary components of the infringing system, including providing over the air updates of the FSD software. The infringing system is made when the Tesla vehicle is configured with FSD software or an updated version of the FSD software. Tesla makes the infringing system of at least claim 19 of the '344 patent in this judicial district and elsewhere in Texas and the United States because it provides and/or installs the FSD software to FSD Tesla vehicles owned by customers and/or Tesla:



https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla owned FSD vehicles that receive FSD updates that make the claimed system in this judicial district and elsewhere in Texas and the United States. *See, e.g.*,

https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement of claim 19 of the '344 patent of making the claimed system in this judicial district and elsewhere in Texas and the United States. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html.

27. Each Tesla vehicle configured with FSD infringes at least claim 19 of the '344 patent. Tesla infringes at least claim 19 of the '344 patent by using the Tesla vehicle configured with FSD. Tesla provides all of the necessary components of the infringing system, including providing over the air updates of the FSD software. Furthermore, Tesla directs and controls the Tesla FSD vehicle and/or FSD system to automatically and autonomously control the vehicle by putting the claimed invention into service. Furthermore, Tesla uses the system of claim 19 of the '344 patent via Tesla owned FSD vehicles that are test driven, by Tesla employees and/or customers, using FSD at Tesla's regular and established places of business in this judicial district:

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Let your vehicle drive you almost anywhere with your active supervision. Includes Auto Lane Changes, Actually Smart Summon, Autopark, and more.

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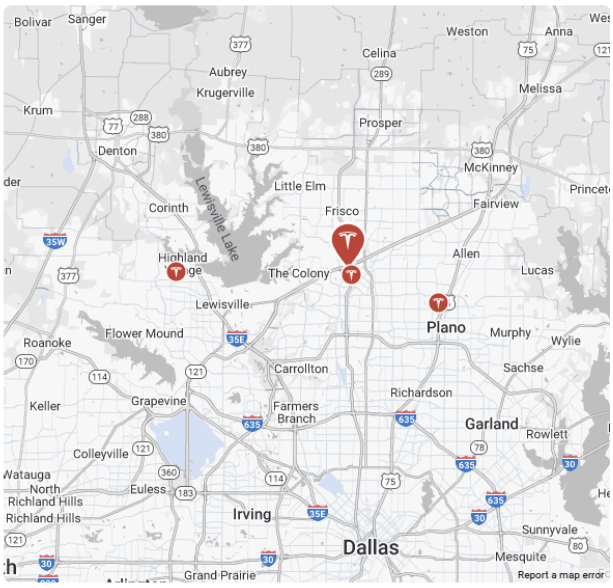

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https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla FSD vehicles in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement by using the system of claim 19 of the '344 patent in this judicial district and elsewhere in Texas and the United States. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html. In this judicial district and elsewhere in Texas and the United States, Tesla uses the entire claimed system by putting the system to use via Tesla's FSD system and receiving the benefit of that use, such as autonomously controlling a vehicle and/or collecting more data to better train its FSD software. On information and belief, Tesla also directs and/or controls its customers' actions in putting the entire claimed system to service in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html (Elon Musk wrote an email to Tesla employees stating that "Going forward, it is mandatory in North America to install and activate FSD V12.3.1 and take customers on a short test ride before handing over the car. … Almost no one actually realizes how well (supervised) FSD actually works. I know this will slow down the delivery process, but it is nonetheless a hard requirement.").

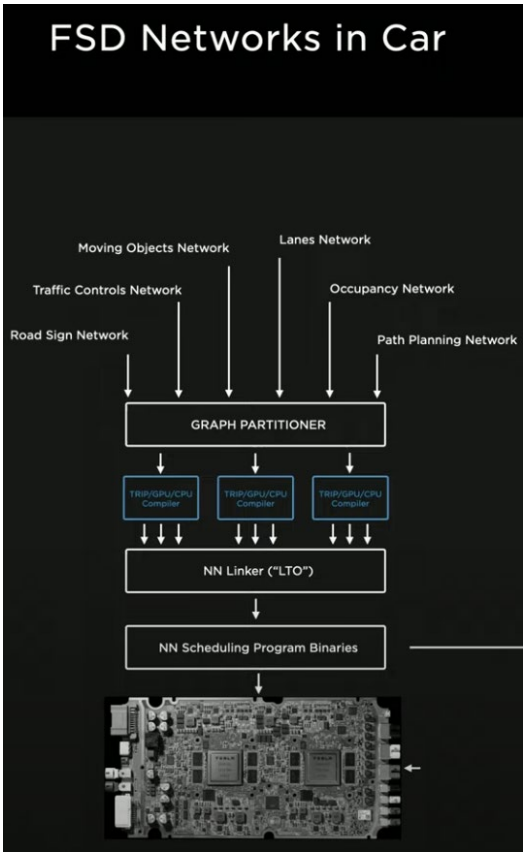
28. On information and belief, Tesla performs the computer-implemented method of claim 1 of the '344 patent that receives, by a computing device (e.g., FSD hardware/software) associated with an autonomous vehicle operating on a road, sensor data captured by a sensor

installed on the autonomous vehicle, the sensor data displaying an object on the road. For example, the '344 Accused Products include an internal computing device. This is evidenced by historic statements from Tesla's website referring to an "onboard computer":

Processing Power Increased 40x

To make sense of all of this information, our Hardware 3 onboard computer processes more than 40 times the data compared to our previous generation system. This computer runs the Tesla-developed neural net, which is the foundation for how we train and develop Autopilot. This system provides a view of the world that a driver alone cannot access, seeing in every direction simultaneously, and on wavelengths that go far beyond the human senses.

https://www.tesla.com/autopilot (as of January 1, 2025). And also evidenced by graphics shown in videos produced by Tesla:

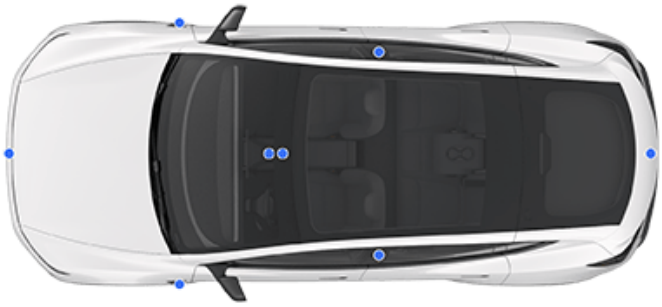


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). The onboard computer is associated with its host, which is an autonomous vehicle that operates on the road. *See*

https://www.tesla.com/fsd ("Watch the World's First Autonomous Car Delivery"). The '344 Accused Products comprise sensors, such as cameras, that actively monitor road conditions.

Cameras

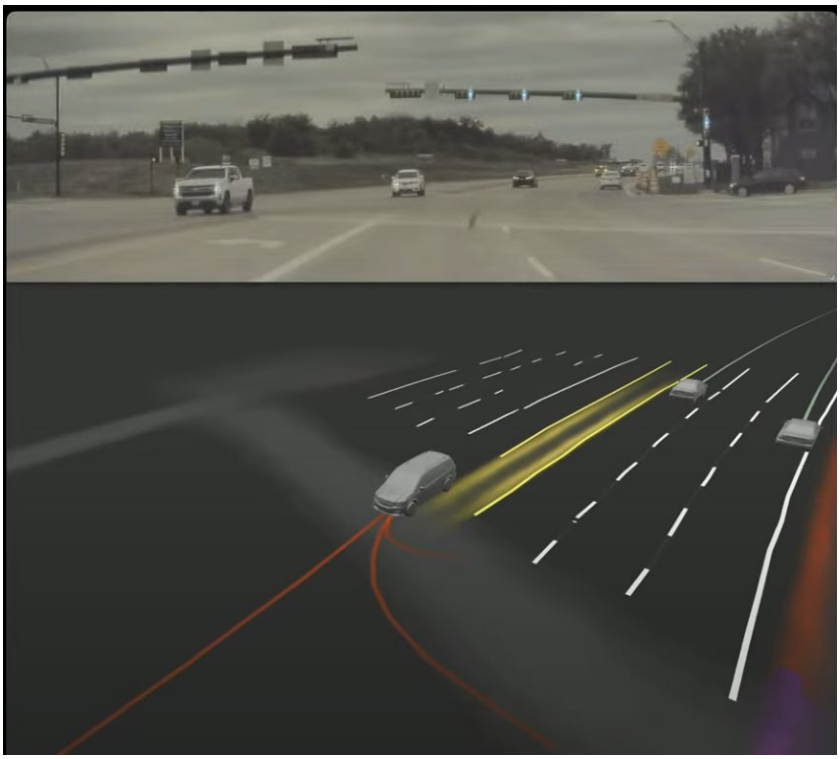
Your Model Y includes the following components that actively monitor the surrounding area:



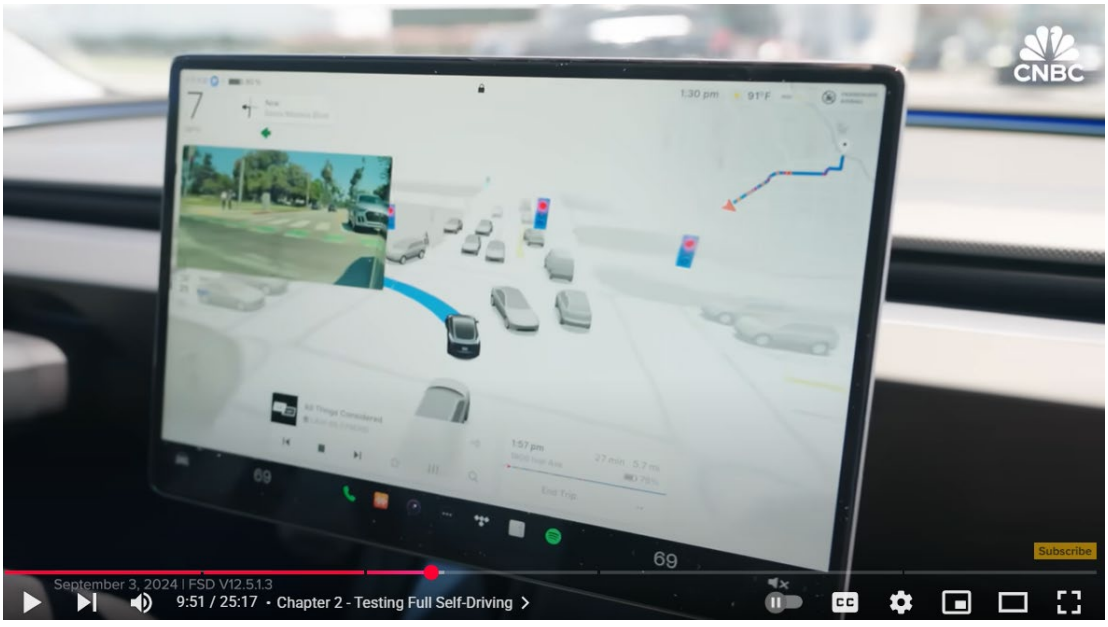
- A camera is mounted above the grille on the front bumper.
- A camera is mounted above the rear license plate.
- A camera is mounted in each door pillar.
- Two cameras are mounted to the windshield above the rear view mirror.
- A camera is mounted to each front fender.

Model Y is also equipped with high precision electronically-assisted braking and steering systems.

https://www.tesla.com/ownersmanual/modely/en_us/GUID-682FF4A7-D083-4C95-925A-5EE3752F4865.html. For example, the onboard computer in a Tesla vehicle receives sensor data captured by the sensors that displays an object on the road:

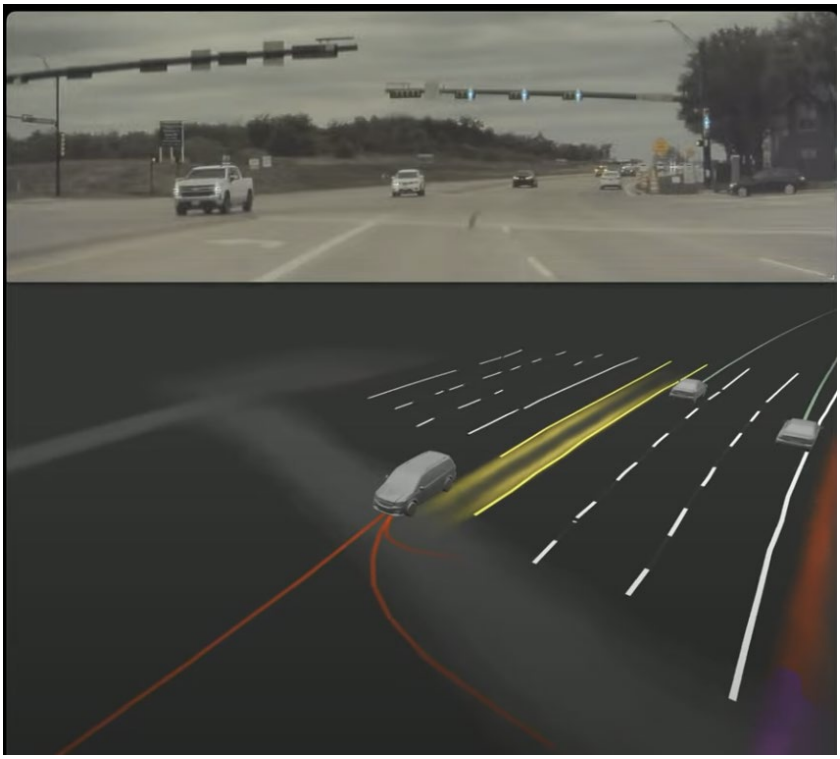


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).



https://www.youtube.com/watch?v=JuwK-vvvYgY.

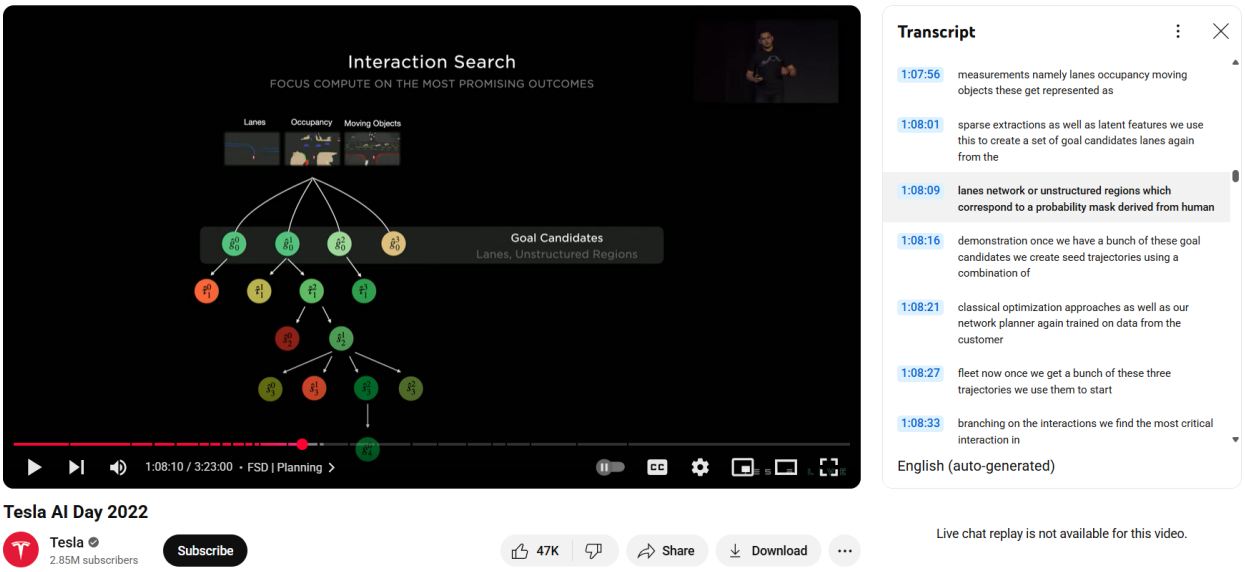
29. On information and belief, Tesla provides the sensor data as input to a supervised learning based model, the supervised learning based model configured to receive an input sensor data displaying a particular object on a road and predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object. The onboard computer within the '344 Accused Products includes the FSD software, which comprises a supervised learning based model that receives an input sensor data displaying a particular object on a road and predicts an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object. For example, the Accused Products provide the sensor data as input to the FSD onboard computer in the Tesla vehicle:



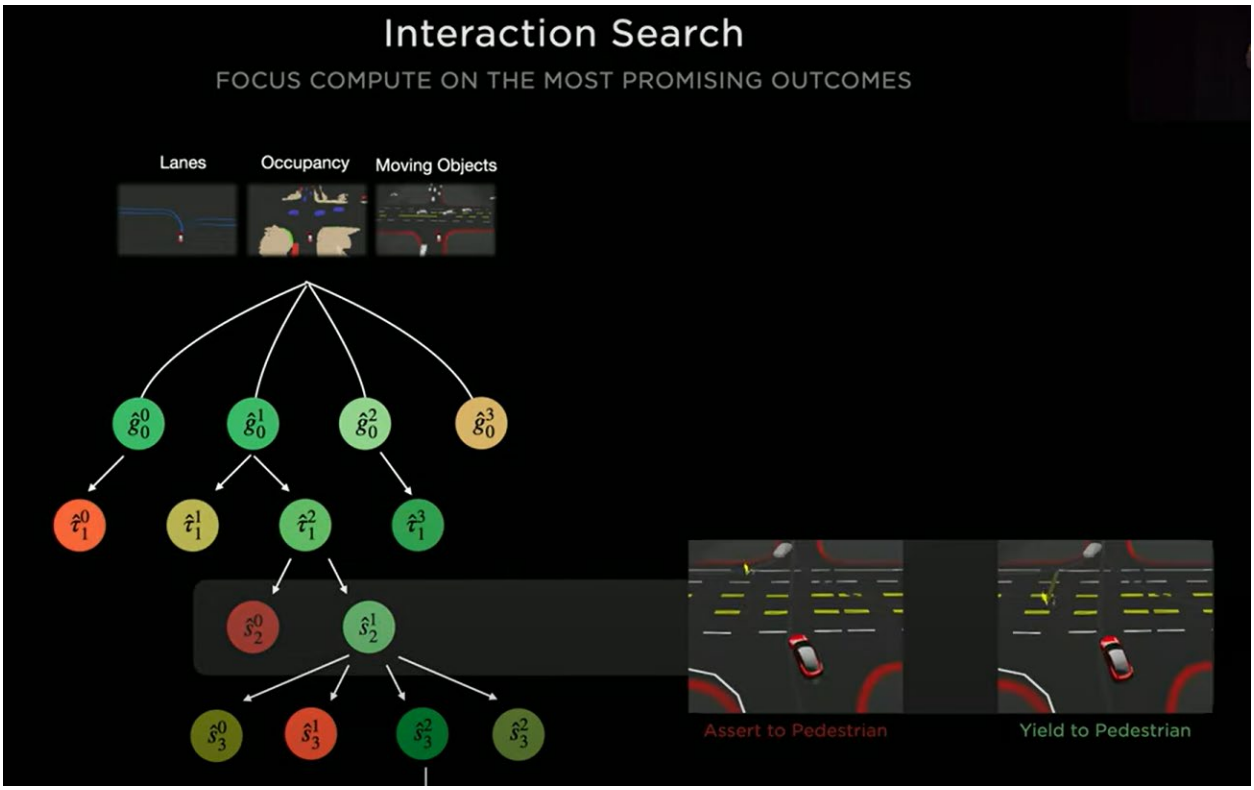
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). The FSD software is based on supervised learning. For example, Tesla's in-house team of over 1,000 people (e.g., users)

provided advanced labeling to particular objects (e.g., vehicle stopped at light in left hand lane) in a traffic scene. In the example illustrated below, a labeler is asked whether a stationary vehicle is one of six options: stopped_double_parked, stopped_traffic_controls, stopped_idle_in_lane, stopped_pulled_over, stopped_traffic, or parked.

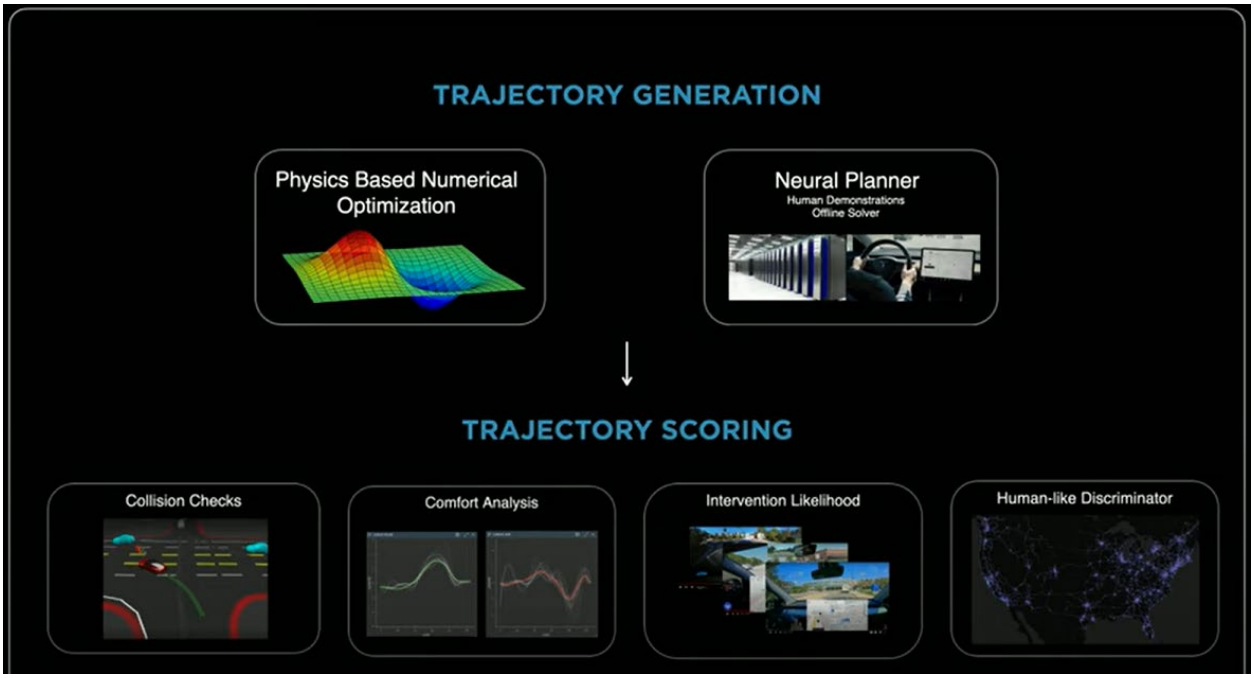
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). The FSD software in the Tesla vehicle is configured to receive and does receive the sensor data as an input. In response to receiving the sensor data as an input, the FSD software in the Tesla vehicle is configured to predict and does predict a statistical summary that characterizes a distribution of user responses expected to be received if presented with the sensor data. This is evidenced by the decision tree for the FSD software. In the below example, the FSD software is presented with sensor data corresponding to an object in the road and creates a set of "goal candidates" that "correspond to a probability mask derived from human demonstration."



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). The FSD software is also presented with further sensor data corresponding to an object in the road. For example, in the below excerpt, the FSD software is presented with sensor data corresponding to a pedestrian in the road:



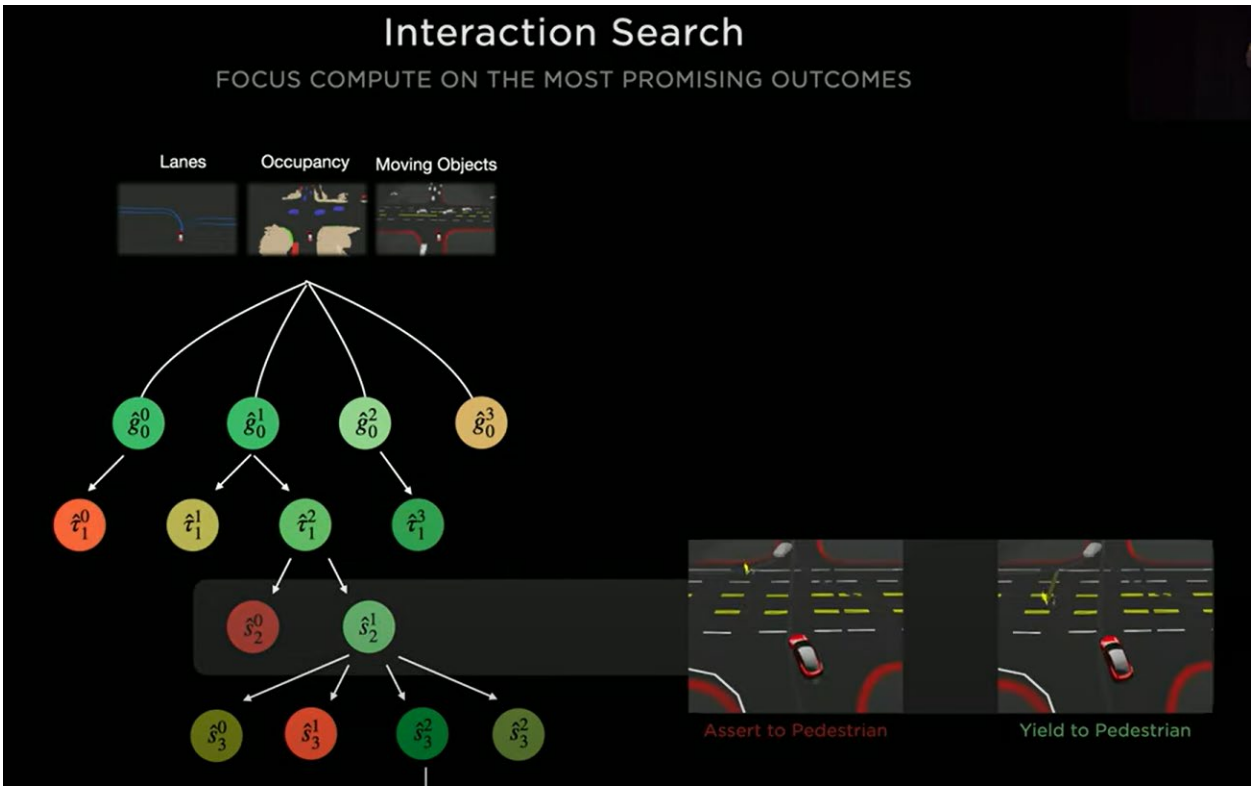
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). In response to this sensor data, the FSD software predicts a distribution of user responses expected to be received responsive to presenting the pedestrian in the road to a plurality of users. This is evidenced by the FSD software's assessment of the "Intervention Likelihood," as well as the "Human-like Discriminator" that the FSD software relies on. And further evidenced by the fact the Neural Planner within the FSD software was built on "Human Demonstrations":



30. https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).On information and belief, Tesla executes the trained supervised learning-based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users. For example, the '344 Accused Products execute the FSD software (the trained supervised learning based model), such as in the Tesla vehicle, to generate a summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users. *See*

https://www.cnbc.com/2023/09/09/ai-for-cars-walter-isaacson-biography-of-elon-musk-excerpt.html (quoting a member of Tesla's autopilot team as saying "Instead of determining the proper path of the car based on rules, we determine the car's proper path by relying on a neural network that learns from millions of examples of what humans have done."); *see also id.* (explaining "In other words, it's human imitation. Faced with a situation, the neural network chooses a path based on what humans have done in thousands of similar situations."). As detailed above, the statistical summary generated by the FSD software is evidenced by the assessment of the "Intervention Likelihood," as well as the "Human-like Discriminator" that the FSD software relies on.

31. On information and belief, Tesla controls the operation of the autonomous vehicle on the road based on the generated statistical summary data. For example, the FSD software, such as in the Tesla vehicle, uses the generated statistical summary data to determine actions for controlling the operation of the vehicle. For example, in the below excerpt, the FSD software relies on the statistical summary to determine whether to Assert or Yield to the pedestrian:



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

32. On information and belief, Tesla directs and controls the '344 Accused Products to operate in an infringing manner by providing the FSD hardware and software instructions that infringe the '344 patent. Furthermore, Tesla installs, services, and/or maintains the '344 Accused Products that it provided to its customers. Tesla owns and controls the FSD software which automatically runs on and controls the '344 Accused Products. Through its provision of FSD software, Tesla causes the '344 Accused Products to perform the functionality recited by the asserted claims. Tesla further controls the performance of the claimed method steps by the '344 Accused Products by conditioning receipt of warranty benefits on the customer's agreement not to modify the '344 Accused Products. *See, e.g.*, https://digitalassets.tesla.com/tesla-contents/image/upload/tesla-new-vehicle-limited-warranty-en-us.pdf. Furthermore, Tesla owns vehicles and the training networks (e.g., Dojo and/or Cortex) that infringe the asserted claims.

33. Each Tesla vehicle with FSD software and hardware infringes the method of at least claim 1 of the ’344 patent in this judicial district and elsewhere in Texas and the United States. For example, Tesla performs the steps of claim 1 via Tesla FSD vehicles owned by Tesla and/or third parties that use FSD in this judicial district and elsewhere in Texas and the United States. Furthermore, Tesla infringes via Tesla owned FSD vehicles that are test driven, by Tesla employees and/or customers, using FSD at Tesla’s regular and established places of business in this judicial district.

34. The specific ways in which the ’344 Accused Products are configured to support the aforementioned features are further detailed in proprietary documents and/or source code that evidence infringement by the ’344 Accused Products.

35. The technology discussion above and the exemplary ’344 Accused Products provide context for Plaintiff’s infringement allegations.

36. The ’344 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

37. The claims of the ’344 patent are patent eligible under 35 U.S.C. § 101.

38. The ’344 patent issued from U.S. Patent Application No. 16/512,560, filed on July 16, 2019. The ’344 patent is a continuation of U.S. Patent Application No. 15/830,549, filed on December 4, 2017. The ’344 patent also claims the benefit of U.S. Provisional Patent Application No. 62/528,771, filed on July 5, 2017.

39. The claims of the ’344 patent are entitled to a priority date at least as early as July 5, 2017, the filing date of U.S. Provisional Application No. 62/528,771.

40. The claims of the ’344 patent are not directed to any abstract idea.

41. The claims of the ’344 patent are not merely directed to using a machine learning model to drive a car. Instead, the claims of the ’344 patent are directed to specific technological improvements of autonomous vehicles for predicting the behavior of objects near the autonomous vehicle. The claims of the ’344 patent specifically claim improvements to the functionality of computer systems for autonomous vehicles. Also, the claims of the ’344 patent address problems specifically rooted in the field of computer systems for autonomous vehicles.

42. The claims of the ’344 patent recite inventive concepts.

43. Additionally, the claims of the ’344 patent do not recite subject matter that is well-understood, routine, or conventional as of July 5, 2017, the filing date of U.S. Provisional Application No. 62/528,771.

44. In its motion to dismiss (Dkt. 30), Tesla did not dispute that the claims of the ’344 patent are entitled to the priority date of U.S. Provisional Application No. 62/528,771.

45. The ’344 patent specifically describes and identifies certain problems with autonomously operating a car. As the ’344 patent states, “[t]he ability a driver of a car to look at a person—who is walking, driving another car, or riding a bike on or near a street—and predict what that person wants to do may be the single most important part of urban driving.” ’344 patent, 1:21-24. “For example, when a driver of a car sees people near the car, determining whether one person will cross the street, whether another person will remain standing on a street corner, and whether yet another person will change lanes on his or her bicycle is necessary to safely drive the car and avoid hitting the people.” *Id.* at 1:24-29. “This ability is so fundamental, that operating in cities without it would be nearly impossible.” *Id.* at 1:30-31.

46. As the ’344 patent indicates, “human drivers have such a natural ability to predict a person’s behavior. In fact, they can do it so effortlessly, that they often do not even notice that they are doing it.” *Id.* at 1:32-35.

47. The ’344 patent also describes the problems with such prediction in the context of autonomous driving, including that “computers and autonomous driving vehicles cannot adequately predict the behavior of people, especially in urban environments.” *Id.* at 1:35-37.

48. The ’344 patent describes certain pre-existing methods for addressing these then-existing shortcomings of autonomous vehicles, including that “autonomous driving vehicles may rely on methods that make decisions on how to control the vehicles by predicting ‘motion vectors’ of people near the vehicles.” *Id.* at 1:38-40. As the ’344 patent indicates, “[t]his is accomplished by collecting data of a person’s current and past movements, determining a motion vector of the person at a current time based on these movements, and extrapolating a future motion vector representing the person’s predicted motion at a future time based on the current motion vector.” *Id.* at 1:41-46. As the ’344 patent recognizes, “[h]owever, the methods do not predict a person's actions or movements based on other observations besides his or her current and past movements, which lead to inferior results in predicting the person's future behavior.” *Id.* at 1:46-49.

49. In addition, as of July 2017, there were numerous shortcomings in the field of autonomous vehicles that are addressed by the inventions of the claims of the ’344 patent.

50. For example, as of July 2017, Waymo’s fully self-driving vehicles were not yet on the road. Instead, until November 2017, Waymo was only operating vehicles on public roads with a test driver at the wheel. *See* https://waymo.com/blog/2017/11/waymos-fully-self-driving-vehicles-are (Ex. 11). Similarly, Tesla did not release a beta version of its FSD software until October 2020. *See* https://www.theverge.com/2020/10/21/21527577/tesla-full-self-driving-

autopilot-beta-software-update (Ex. 12). As part of that release, Tesla CEO Elon Musk indicates that "Tesla was approaching this software update 'very cautiously' because the 'world is a complex and messy place.'" *Id.* In addition, according to a warning message that Tesla drivers received when given the option to enable the FSD software in its beta, Tesla's FSD software "may do the wrong thing at the worst time." *See* https://dawnproject.com/wp-content/uploads/2022/09/FSD-Beta-warning.png (Ex. 13).

51. In addition, as of June 2017, researchers at the Australian Centre for Field Robotics (ACFR) at the University of Sydney (NSW, Australia) commented that:

> Advanced driver assistance systems (ADAS) are increasingly seen as a mechanism to improve the safety and efficiency of transportation by understanding and reacting to potential vehicle safety threats using state-of-the-art sensing and algorithms. A major component of these systems is the ability to infer the future intentions of drivers to predict the likelihood of potential collisions. This is a challenging task, particularly in intersections where complex traffic scenarios result in a proportionally high number of accidents. Human drivers are able to estimate the future trajectory of other vehicles from a combination of potentially subtle cues – the combination of the various kinematic properties - and the position of the vehicle on the road relative to the lane. Being able to reproduce this driver intuition in a computer model is still an open area of research.

Zyner et. al., "Long Short Term Memory for Driver Intent Prediction," 2017 IEEE Intelligent Vehicles Symposium (IV) June 11-14, 2017, Redondo Beach, CA, USA (Ex. 14).

52. Similarly, in 2017, researchers from the Institute for Intelligent Systems Research and Innovation at Deakin University in Australia noted that autonomous vehicles "still have some difficulties specially when it comes to driving in urban traffic environment such as the interaction with Vulnerable Road Users (VRUs) such as pedestrians. Intuitively, interactions take place nowadays between human drivers and pedestrians are based on implicit cues between the two parties." Saleh et al., "Intent Prediction of Vulnerable Road Users from Motion Trajectories Using

Stacked LSTM Network," 2017 IEEE 20th International Conference on Intelligent Transportation Systems (ITSC): Workshop (Ex. 15). *See also* Casas et al., "IntentNet: Learning to Predict Intention from Raw Sensor Data", 2nd Conference on Robot Learning , Zurich, Switzerland (2018) (Ex. 16) ("While a plethora of systems have been built in the past few decades, many challenges still remain. One of the fundamental difficulties is that self driving vehicles have to share the roads with human drivers, which can perform maneuvers that are difficult to predict."); Zyner et al., "Naturalistic Driver Intention and Path Prediction Using Recurrent Neural Networks", IEEE Transactions on Intelligent Transportation Systems, Vol. 21, No. 4 (April 2020) (Ex. 17) ("Driving vehicles is a highly skilled task that requires extensive understanding of the intentions of other road users. This knowledge allows drivers to safely navigate an area through other traffic. While this may become second nature to an experienced human driver, properly understanding the intentions of other drivers is still an unsolved problem for Advanced Driver Assistance Systems (ADAS), and by extension, autonomous vehicles."); Rasouli et al., "Are They Going to Cross? A Benchmark Dataset and Baseline for Pedestrian Crosswalk Behavior", 2017 IEEE International Conference on Computer Vision Workshops, Venice, Italy, 2017 (Ex. 18) ("Designing autonomous vehicles suitable for urban environments remains an unresolved problem. One of the major dilemmas faced by autonomous cars is how to understand the intention of other road users and communicate with them. The existing datasets do not provide the necessary means for such higher level analysis of traffic scenes").

53. In addition, the USPTO, in *Ex parte Desjardins*, recently rejected the Board's findings that a patent application directed to learning models and artificial intelligence was abstract stating: "Under a charitable view, the overbroad reasoning of the original panel below is perhaps understandable given the confusing nature of existing § 101 jurisprudence, but troubling, because

this case highlights what is at stake. Categorically excluding AI innovations from patent protection in the United States jeopardizes America's leadership in this critical emerging technology. Yet, under the panel's reasoning, many AI innovations are potentially unpatentable-even if they are adequately described and nonobvious-because the panel essentially equated any machine learning with an unpatentable "algorithm" and the remaining additional elements as "generic computer components," without adequate explanation. Dec. 24. Examiners and panels should not evaluate claims at such a high level of generality. However, it is with this view that the panel's *sua sponte* action is most troubling, as it eschewed the clear teachings of *Enfish*, and instead substituted only a cursory analysis that ignored this well-settled precedent. Panels should treat such precedent with more care, especially when acting *sua sponte*. At the same time, the claims at issue stand rejected under§ 103. This case demonstrates that§§ 102, 103 and 112 are the traditional and appropriate tools to limit patent protection to its proper scope. These statutory provisions should be the focus of examination. For these reasons, we determine that although independent claim 1 may recite an abstract idea, it is not directed to an abstract idea. Instead, we determine that independent claim 1, when considered as a whole, integrates an abstract idea into a practical application." *Ex parte Desjardins*, Appeal No. 2024-000567, Decision on Request for Rehearing (Sept. 26, 2025), *available at* https://www.uspto.gov/sites/default/files/documents/202400567-arp-rehearing-decision-20250926.pdf.

54. The '344 patent specifically describes and claims novels methods, non-transitory computer readable storage media, and systems which address these shortcomings of then-existing autonomous vehicle systems. The '344 patent also specifically describes and claims novels methods, non-transitory computer readable storage media, and systems which provide

improvements in the functionality of autonomous vehicle systems and addresses problems specifically rooted in the field of autonomous vehicle systems.

55. For example, claim 1 of the '344 patent recites "[a] computer-implemented method comprising" the steps of "receiving, by a computing device associated with an autonomous vehicle operating on a road, sensor data captured by a sensor installed on the autonomous vehicle, the sensor data displaying an object on the road," "providing the sensor data as input to a supervised learning based model, the supervised learning based model configured to receive an input sensor data displaying a particular object on a road and predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object," "executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users," and "controlling the operation of the autonomous vehicle on the road based on the generated statistical summary data."

56. Claim 1 improves the functionality of an autonomous vehicle by "providing the sensor data as input to a supervised learning based model," and more specifically by "the supervised learning based model . . . receiv[ing] an input sensor data displaying a particular object on a road and predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object." By "predicting an output statistical summary characterizing a distribution of user responses expected to be received" and "executing the trained supervised learning based model to generate a statistical summary data characterizing

a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users" the method of claim 1 allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "predicting an output statistical summary characterizing a distribution of user responses expected to be received" and "executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users" allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

57. Claim 10 of the '344 patent similarly recites "[a] non-transitory computer readable storage medium storing instructions that when executed by one or more processors, cause the one or more processors to perform the steps" comprising "receiving, by a computing device associated with an autonomous vehicle operating on a road, sensor data captured by a sensor installed on the autonomous vehicle, the sensor data displaying an object on the road;" "providing the sensor data as input to a supervised learning based model, the supervised learning based model configured to receive an input sensor data displaying a particular object on a road and predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object;" "executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle

to users;" and "controlling the operation of the autonomous vehicle on the road based on the generated statistical summary data."

58. Claim 10 improves the functionality of an autonomous vehicle by "providing the sensor data as input to a supervised learning based model," and more specifically by "the supervised learning based model . . . receiv[ing] an input sensor data displaying a particular object on a road and predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object." By "predicting an output statistical summary characterizing a distribution of user responses expected to be received" and "executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users" the non-transitory computer readable storage medium storing instructions of claim 10 allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "predicting an output statistical summary characterizing a distribution of user responses expected to be received" and "executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users" allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

59. Similarly, claim 19 of the '344 patent recites "a[] computing system" comprising "one or more processors" and "a non-transitory computer readable storage medium, storing instructions that when executed by the one or more processors, cause the one or more processors to perform steps" comprising "receiving, by a computing device associated with an autonomous vehicle operating on a road, sensor data captured by a sensor installed on the autonomous vehicle, the sensor data displaying an object on the road;" "providing the sensor data as input to a supervised learning based model, the supervised learning based model configured to receive an input sensor data displaying a particular object on a road and predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object;" executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users;" and "controlling the operation of the autonomous vehicle on the road based on the generated statistical summary data."

60. Claim 19 improves the functionality of an autonomous vehicle by "providing the sensor data as input to a supervised learning based model," and more specifically by "the supervised learning based model . . . receiv[ing] an input sensor data displaying a particular object on a road and predicting an output statistical summary characterizing a distribution of user responses expected to be received responsive to presenting the sensor data to a plurality of users, the user responses associated with the particular object." By "predicting an output statistical summary characterizing a distribution of user responses expected to be received" and "executing the trained supervised learning based model to generate a statistical summary data characterizing

a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users" the computer system of claim 19 allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "predicting an output statistical summary characterizing a distribution of user responses expected to be received" and "executing the trained supervised learning based model to generate a statistical summary data characterizing a distribution of user responses expected to be received responsive to presenting the sensor data captured by the sensor installed on the autonomous vehicle to users" allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

61. The dependent claims of the '344 patent provide additional improvements to the functionality of autonomous vehicles and the claimed methods, non-transitory computer readable storage media, and computer systems. For example, dependent claim 2 further improves on claim 1 by specifying that "the supervised learning based model is one of: a random forest regressor, a support vector regressor, a simple neural network, a deep convolutional neural network, a recurrent neural network, or a long short-term memory (LSTM) neural network." *See also* claim 11. Similarly, dependent claim 5 further improves on claim 1 by specifying that "the statistical data is associated with a parameter of the subset of the plurality of response data, the parameter including at least one of a content of a response, a time associated with entering a response, and a position of an eye of a human observer associated with the response, the position being measured with respect to a display associated with the user interface." *See also* claim 14. Dependent claim 6 further improves on claim 1 by specifying that "the parameter is further associated with at least

one of a central tendency, a variance, a skew, a kurtosis, a scale, and a histogram." *See also* claim 15. Dependent claim 7 further improves on claim 1 by specifying that "the supervised learning based model is configured to predict user responses describing a state of mind of a road user associated with the object." *See also* claims 16, 20. Dependent claim 8 further improves on claim 1 by specifying that "the object is associated with a road user and the supervised learning based model is configured to predict user responses describing an intention of the road user to move into the path of the autonomous vehicle." *See also* claims 17, 21. Dependent claim 9 further improves on claim 1 by specifying that "the object is associated with a road user and the supervised learning based model is configured to predict user responses describing awareness of the road user of the autonomous vehicle." *See also* claims 18, 22.

62. These and other processes and their benefits are described in the '344 patent specification as well. For example, Figure 2A of the '344 patent is "a flow chart showing the process of predicting human behavior, according to some embodiments of the present disclosure." '344 patent at 3:8-10. Figure 2A is reproduced below:

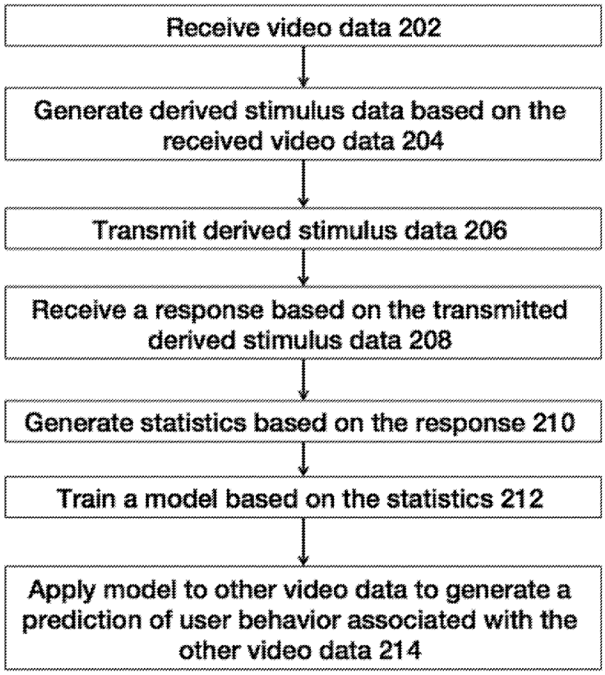


FIG. 2A

63. As the ’344 patent specification states, “[i]n step 202, this video or other data captured by the camera or other sensor is transmitted from the vehicle 102, over the network 104, and to the server 106 where it is stored.” ’344 patent, 5:4-7. “Then, in step 204, video frames or segments are extracted from the stored video or other data and are used to create stimulus data including derived stimulus (or stimuli). In one implementation, the derived stimulus corresponds to a scene in which one or more humans are conducting activities (e.g., standing, walking, driving, riding a bicycle, etc.) beside or on a street and/or near a vehicle.” *Id.* at 5:8-15. “In step 206, the derived stimulus is transmitted from the server 106 and displayed to a large number of users (or human observers) on the user terminal 108 (or multiple terminals 108). The terminal(s) 108 prompt the human observers to predict how the people shown in the derived stimulus will act, and upon viewing the displayed stimulus, the observers input their responses corresponding to their predictions.” *Id.* at 5:39-46. “In step 208, the derived stimulus and associated human observer

responses are transmitted from the terminal(s) 108 to the server 106 and recorded in the user response database 110." *Id.*at 5:64-67.

64. As the '344 patent describes, "[i]n step 210, summary statistics are generated based on the user responses." *Id.*at 6:1-2. The '344 patent describes that "the statistics may characterize the aggregate responses of multiple human observers to a particular derived stimulus. For instance, if the derived stimulus shows a pedestrian walking on a sidewalk towards an intersection, the response can be categorized in terms of how many human observers believe that the pedestrian will stop upon reaching the intersection, continue walking straight across the intersection, turn a corner and continue walking along the sidewalk without crossing the intersection, etc." *Id.*at 6:2-11.

65. The '344 patent also describes an example of how "the stored statistics and corresponding images . . . are sent over the network 104 to the model training system 112 and used to train a prediction algorithm":

> For example, the collection of images and statistics can be used to train a supervised learning algorithm, which can comprise a random forest regressor, a support vector regressor, a simple neural network, a deep convolutional neural network, a recurrent neural network, a long-short-term memory (LSTM) neural network with linear or nonlinear kernels that are two dimensional or three dimensional, or any other supervised learning algorithm which is able to take a collection of data labeled with continuous values and adapt its architecture in terms of weights, structure or other characteristics to minimize the deviation between its predicted label on a novel stimulus and the actual label collected on that stimulus using the same method as was used on the set of stimuli used to train that network. The model is given data which comprises some subset of the pixel data from the video frames that the summary statistics were generated from. In one implementation, this subset includes the pixel data contained in a box (such as the box 221 shown in FIG. 2B) drawn to contain the boundaries of the person, cyclist, motorist and vehicle, or other road user, including their mode of conveyance. In some other implementations, it also includes the entire pixel data from the rest of the image. In one of those implementations, that

> pixel data is selected according to criteria such as the salience of those features in terms of contrast, lighting, presence of edges, or color. In an additional implementation, the features can include descriptive meta-data about the images such as the dimensions and location of the bounding box, the shape of the bounding box or the change in size or position of the bounding box from one frame to the next.

Id. at 6:42-7:4.

66. The '344 patent further states that, "[i]n step 214, the prediction engine 114 uses the trained model from the model training system 112 to predict the actual, 'real-world' or 'live data' behavior of people on or near a road." *Id.* at 7:5-8. The '344 patent further explains this prediction process:

> The trained model or algorithm makes a prediction of what a pedestrian or other person shown in the "live data" would do based on the summary statistics and/or training labels of one or more derived stimulus. The accuracy of the model is determined by having it make predictions of novel derived stimuli that were not part of the training images previously mentioned but which do have human ratings attached to them, such that the summary statistics on the novel images can be generated using the same method as was used to generate the summary statistics for the training data, but where the correlation between summary statistics and image data was not part of the model training process. The predictions produced by the trained model comprise a set of predictions of the state of mind of road users that can then be used to improve the performance of autonomous vehicles, robots, virtual agents, trucks, bicycles, or other systems that operate on roadways by allowing them to make judgments about the future behavior of road users based on their state of mind.

Id. at 7:20-39.

67. The '344 patent also provides additional descriptions of these processes through its figures and their accompanying descriptions. *See* '344 patent, Fig. 4 (which "shows a process of generating derived stimuli from raw camera or sensor data in the vehicle, according to some embodiments of the present disclosure"), Fig. 5 (which "is a flowchart showing a process of

collecting predictions and other information from human observers based on derived stimuli, according to some embodiments of the present disclosure"), Fig. 6 (which "shows a data structure associated with tracking video frame data, according to some embodiments of the present disclosure"), Fig. 7 (which "is a flowchart showing a process for producing summary statistics of a video frame or derived stimulus according to some embodiments of the present disclosure"), Fig. 8 (which "is a flowchart showing a process of training a learning algorithm using summary statistics, according to some embodiments of the present disclosure"), Fig. 9 (which "is a flowchart showing a process of predicting the state of mind of road users using a trained learning algorithm, according to some embodiments of the present disclosure"), Fig. 10 (which "is a diagram showing an example of an application of a context user prediction process in an automobile context, according to some embodiments of the present disclosure") and their accompanying descriptions.

68. Any functional language in the claims of the '344 patent is not determinative of those such claims being abstract, especially when the claims provide a technical improvement to a computer system, as discussed above. *See, e.g.*, *Evolved Wireless, LLC v. Apple Inc.*, 221 F. Supp. 3d 485, 491 (D. Del. 2016) ("Applying these guidelines in the relevant field of technology can be somewhat difficult, because '[t]he essence of software is manipulating existing data and generating additional data through algorithms.' *Cal. Inst. of Tech. v. Hughes Commc'ns Inc.*, 59 F. Supp. 3d 974, 987 (C.D. Cal. 2014); *Oplus Techs. Ltd. v. Sears Holding Corp.*, 2013 U.S. Dist. LEXIS 35474, 2013 WL 1003632, at *12 (C.D. Cal. Mar. 4, 2013) ('All software only receives data, applies algorithms, and ends with decisions.'). Ultimately, the Federal Circuit instructs that not all 'claims directed to software ... are inherently abstract.' *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016). Claims 'improv[ing] the functioning of [a] computer' or 'improving an existing technological process' are patent-eligible even if they rely on a

mathematical algorithm. *Id.* at 1336; *see also Hughes*, 59 F. Supp. 3d at 993 ('When claims provide a specific computing solution for a computing problem, these claims should generally be patentable, even if their novel elements are mathematical algorithms.')).").

69. The claims of the '344 patent cover patent eligible improvements to autonomous vehicles that were more than well-understood, routine, or conventional activity. The inventions in the '344 patent were years ahead of the release of the accused products and functionalities. Taken alone and together, the limitations of the asserted claims involve an inventive concept. For example, the claim limitations identified above as not being directed to abstract ideas are also claim elements that contain inventive concepts. As discussed above, those claim elements provide an improvement over existing autonomous vehicle systems, methods, and software.

70. Tesla has filed its own patent applications for alleged inventions related to autonomous vehicle technology. Tesla's own patent applications demonstrate that, even after July 2017, autonomous vehicle technology (including prediction of human behavior) was still in its early stages and that improvements to autonomous vehicle technology (including prediction of human behavior) were still needed. Further, in filing those patents application, Tesla represented to the USPTO that, as of the time of each filing, the alleged inventions in those patent applications were directed to patent eligible subject matter and that, even after July 2017, a need existed for such inventions in the market. This further demonstrates that the inventions claimed in the '344 patent were not well-understood, routine, and conventional in the July 2017 time period but are instead directed to patent eligible subject matter. *See, e.g.*, U.S. Patent Application Publication Nos. 2021/0271259, 2020/0348909, 2023/0176593, 2022/0284712; U.S. Patent Nos. 11,748,620, 11,816,585, 11,537,811, 11,215,999, 11,150,664, 11,636,333, 10,678,244.

71. As discussed above, as of July 2017, Waymo's fully self-driving vehicles were not yet on the road without safety drivers. Instead, until November 2017, Waymo was only operating vehicles on public roads with a test driver at the wheel. *See* https://waymo.com/blog/2017/11/waymos-fully-self-driving-vehicles-are (Ex. 11). Similarly, Tesla did not release a beta version of its FSD software until October 2020. *See* https://www.theverge.com/2020/10/21/21527577/tesla-full-self-driving-autopilot-beta-software-update (Ex. 12). As part of that release, Tesla CEO Elon Musk indicates that "Tesla was approaching this software update 'very cautiously' because the 'world is a complex and messy place.'" *Id.* In addition, according to a warning message that Tesla drivers received when given the option to enable the FSD software in its beta, Tesla's FSD software "may do the wrong thing at the worst time." *See* https://dawnproject.com/wp-content/uploads/2022/09/FSD-Beta-warning.png (Ex. 13). These facts also demonstrate that operating autonomous vehicles was not a well-understood, routine, or conventional activity as of July 2017.

72. In addition, other researchers in the field of autonomous vehicles confirmed that the subject matter of the claims of the '344 patent was not well-understood, routine, or conventional in July 2017. For example, in June 2017, researchers at the Australian Centre for Field Robotics (ACFR) at the University of Sydney (NSW, Australia) commented that:

> Advanced driver assistance systems (ADAS) are increasingly seen as a mechanism to improve the safety and efficiency of transportation by understanding and reacting to potential vehicle safety threats using state-of-the-art sensing and algorithms. A major component of these systems is the ability to infer the future intentions of drivers to predict the likelihood of potential collisions. This is a challenging task, particularly in intersections where complex traffic scenarios result in a proportionally high number of accidents. Human drivers are able to estimate the future trajectory of other vehicles from a combination of potentially subtle cues – the combination of the various kinematic properties - and the position of the vehicle on the road relative to the lane. Being able to

> reproduce this driver intuition in a computer model is still an open area of research.

Zyner et. al., "Long Short Term Memory for Driver Intent Prediction," 2017 IEEE Intelligent Vehicles Symposium (IV) June 11-14, 2017, Redondo Beach, CA, USA (Ex. 14).

73. Similarly, in 2017, researchers from the Institute for Intelligent Systems Research and Innovation at Deakin University in Australia noted that autonomous vehicles "still have some difficulties specially when it comes to driving in urban traffic environment such as the interaction with Vulnerable Road Users (VRUs) such as pedestrians. Intuitively, interactions take place nowadays between human drivers and pedestrians are based on implicit cues between the two parties." Saleh et al., "Intent Prediction of Vulnerable Road Users from Motion Trajectories Using Stacked LSTM Network," 2017 IEEE 20th International Conference on Intelligent Transportation Systems (ITSC): Workshop (Ex. 15). *See also* Casas et al., "IntentNet: Learning to Predict Intention from Raw Sensor Data", 2nd Conference on Robot Learning , Zurich, Switzerland (2018) (Ex. 16) ("While a plethora of systems have been built in the past few decades, many challenges still remain. One of the fundamental difficulties is that self driving vehicles have to share the roads with human drivers, which can perform maneuvers that are difficult to predict."); Zyner et al., "Naturalistic Driver Intention and Path Prediction Using Recurrent Neural Networks", IEEE Transactions on Intelligent Transportation Systems, Vol. 21, No. 4 (April 2020) (Ex. 17) ("Driving vehicles is a highly skilled task that requires extensive understanding of the intentions of other road users. This knowledge allows drivers to safely navigate an area through other traffic. While this may become second nature to an experienced human driver, properly understanding the intentions of other drivers is still an unsolved problem for Advanced Driver Assistance Systems (ADAS), and by extension, autonomous vehicles."); Rasouli et al., "Are They Going to Cross? A Benchmark Dataset and Baseline for Pedestrian Crosswalk Behavior", 2017 IEEE International

Conference on Computer Vision Workshops, Venice, Italy, 2017 (Ex. 18) ("Designing autonomous vehicles suitable for urban environments remains an unresolved problem. One of the major dilemmas faced by autonomous cars is how to understand the intention of other road users and communicate with them. The existing datasets do not provide the necessary means for such higher level analysis of traffic scenes"). That these problems existed in the art demonstrates that the subject matter of the claims of the '344 patent was not well-understood, routine, or conventional as of July 2017.

74. In addition, numerous accidents have been reported since 2017 involving shortcomings of Tesla's autonomous driving systems, its prior Autopilot systems, and other autonomous or semi-autonomous driving systems. *See, e.g.*, https://www.craftlawfirm.com/autonomous-vehicle-accidents-2019-2024-crash-data/ (Ex. 19); https://www.cbsnews.com/news/waymo-car-recall-software-crash-self-driving/ (Ex. 20); https://www.msn.com/en-us/news/us/waymo-is-being-investigated-by-the-feds-for-a-robotaxi-illegally-passing-a-school-bus/ar-AA1OQeGB (Ex. 21); https://www.msn.com/en-us/autos/news/driver-fell-asleep-at-wheel-of-autopilot-driven-tesla-before-it-hit-police-car/ar-AA1Px1Ku (Ex. 22); https://ktar.com/arizona-news/self-driving-uber-car-fatally-runs-over-pedestrian-in-tempe/1994638/ (Ex. 23); https://www.msn.com/en-us/autos/news/waymo-autonomous-vehicle-involved-in-multicar-crash-apd-says/ar-AA1Prszz (Ex. 24); https://www.msn.com/en-us/pets-and-animals/pets/a-week-after-a-waymo-self-driving-car-killed-a-beloved-cat-san-francisco-still-mourns/ar-AA1PFvoq (Ex. 25); https://www.latimes.com/business/story/2025-08-01/tesla-must-pay-243-million-over-fatal-autopilot-crash (Ex. 26); https://www.techspot.com/news/110085-tesla-robotaxis-already-crashing-austin-data-points-gaps.html (Ex. 27); https://electrek.co/2018/06/07/tesla-fatal-crash-

autopilot-ntsb-releases-preliminary-report (Ex. 28); https://www.theguardian.com/technology/2024/apr/26/tesla-autopilot-fatal-crash (Ex. 29); https://techcrunch.com/2024/02/13/waymo-recall-crash-software-self-driving-cars (Ex. 30); https://www.upi.com/Top_News/US/2024/06/13/waymo-recall-robotaxi-crash/2251718311972 (Ex. 31); https://abcnews.go.com/Business/tesla-autopilot-steered-driver-barrier-fatal-crash-ntsb/story?id=68936725 (Ex. 32); https://www.reuters.com/business/autos-transportation/nhtsa-opens-probe-into-24-mln-tesla-vehicles-over-full-self-driving-collisions-2024-10-18/ (Ex. 33); https://www.cnn.com/2021/08/27/cars/toyota-self-driving-vehicle-paralympics-accident (Ex. 34). These incidents likewise demonstrate that operating autonomous vehicles was not a well-understood, routine, or conventional activity as of July 2017.

75. At a minimum, Tesla has known about the ’344 patent and its infringement of the ’344 patent at least as early as the filing date of the Original Complaint. Further, on information and belief, Tesla’s conduct before the USPTO provides that Tesla was aware of the ’344 patent and its infringement prior to the filing of the Original Complaint. For example, in prosecuting U.S. Patent No. 11,403,069, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,409,692, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,487,288, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,537,811, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,561,791, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,562,231, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,567,514, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,610,117, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,636,333, Tesla has known of

the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,665,108, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,681,649, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,734,562, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,748,620, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,790,664, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,816,585, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,841,434, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,893,774, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 11,893,393, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 12,014,553, Tesla has known of the ’344 patent. In another example, in prosecuting U.S. Patent No. 12,307,350, Tesla has known of the ’344 patent. In addition, on information and belief, Tesla was aware of Perceptive’s patent portfolio, monitored Perceptive’s patent portfolio, and it and/or its agents substantially cited to Perceptive’s patents in connection with prosecuting Tesla patents, all prior to the filing of the Original Complaint.

76. On information and belief, since at least the above-mentioned dates when Tesla was on notice of its infringement, Defendant has indirectly infringed the ’344 patent in violation of 35 U.S.C. § 271(b) at least by inducing customers to purchase the Accused Products and/or by instructing customers how to use and/or make the Accused Products in a way that directly infringes the asserted claims of the ’344 Patent. *See, e.g.,* infringement allegations in this Count and Ex. 6.

77. On information and belief, Defendant’s actions represented a specific intent to induce infringement of the asserted claims, including at least claims 1 and 19 of the ’344 patent. In this judicial district and elsewhere in Texas and the United States, Defendant has offered its

customers and prospective customers extensive customer support and instructions that instruct and encourage its customers to infringe the '344 patent via at least the making and/or use of the Accused Products in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, materials cited in Ex. 6; https://www.tesla.com/drive (advertisement for Tesla demo drives using FSD in this judicial district and elsewhere in Texas and the United States); https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html (Elon Musk wrote an email to Tesla employees requiring them to encourage and instruct customer to install and use the accused FSD functionality in Tesla vehicles); https://www.tesla.com/ms/order/ (delivery of Tesla vehicle occurs at customer location and/or at a Tesla regular and established place of business in this judicial district and elsewhere in Texas and the United States); https://www.tesla.com/fsd (Tesla encouraging and instructing customers to demo drive a Tesla car with FSD and install/activate FSD in their Tesla vehicles to drive for the customer avoiding bikes, motorcycles, and other cars); https://www.tesla.com/ownersmanual/modely/en_us/GUID-2CB60804-9CEA-4F4B-8B04-09B991368DC5.html. In addition, Tesla's website is accessible in this judicial district and, as discussed and cited herein, is further evidence of Tesla's acts of indirect infringement in this judicial district. In this judicial district and elsewhere in Texas and the United States, Tesla induces its customers and prospective customers to perform each of the steps of claim 1 by driving Tesla FSD vehicles that use FSD in this judicial district and elsewhere in Texas and the United States. In this judicial district and elsewhere in Texas and the United States, Tesla induces its customers and prospective customers to use the entire claimed system of claim 19 by putting the system to use via Tesla's FSD system and receiving the benefit of that use, such as autonomously controlling

a vehicle. In this judicial district and elsewhere in Texas and the United States, Tesla induces its customers to make the system of claim 19 by installing the FSD software via over the air updates.

78. In addition, by receiving notice of the ’344 patent and Defendant’s infringement thereof, Defendant obtained a subjective belief that there is a high probability that the Accused Products infringe the ’344 patent. Despite being put on notice of infringement, on information and belief Defendant has not taken actions to avoid the conduct alleged to infringe, has not offered any reasons as to why Defendant does not infringe the ’344 patent, and has not sought to remedy its infringements by offering to take a license. Defendant’s failure to act reflects deliberate actions to avoid learning that the Accused Products infringe the ’344 patent and, more generally, a policy of not earnestly reviewing and respecting the intellectual property of others.

79. Since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the ’344 patent. Tesla intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the ’344 Accused Products, creating and/or maintaining established distribution channels for the ’344 Accused Products into and within the United States, manufacturing the ’344 Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the ’344 Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States. *See, e.g.*, https://www.tesla.com/fsd.

80. On information and belief, despite having knowledge of the '344 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '344 patent, Tesla has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. Tesla's infringing activities relative to the '344 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

81. Perceptive has been damaged as a result of Tesla's infringing conduct described in this Count. Tesla is, thus, liable to Perceptive in an amount that adequately compensates Perceptive for Tesla's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT II

(INFRINGEMENT OF U.S. PATENT NO. 11,126,889)

82. Plaintiff incorporates paragraphs 1 through 81 herein by reference.

83. Perceptive is the assignee of the '889 patent, entitled "Machine Learning Based Prediction of Human Interactions with Autonomous Vehicles," with ownership of all substantial rights in the '889 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements. A copy of the '889 patent is attached hereto as Exhibit 2.

84. Tesla has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims including at least claims 1 and 2 of the '889 patent in this judicial district and elsewhere in Texas and the United States by making, using, testing, offering for sale, selling, and/or importing systems that comprise Tesla vehicles with FSD software and hardware

and/or Tesla systems that support Tesla vehicles with FSD software and hardware (the '889 Accused Products). Such infringement includes, but is not limited to, the making, using, offering to sell, and/or selling of '889 Accused Products that leverage and infringe the inventions of the '889 patent. The infringement allegations of the asserted claims of the '889 patent, including claims 1 and 2 of the '889 patent, is also embodied in Plaintiff's preliminary infringement contentions, which are incorporated by reference. *See* Ex. 7.

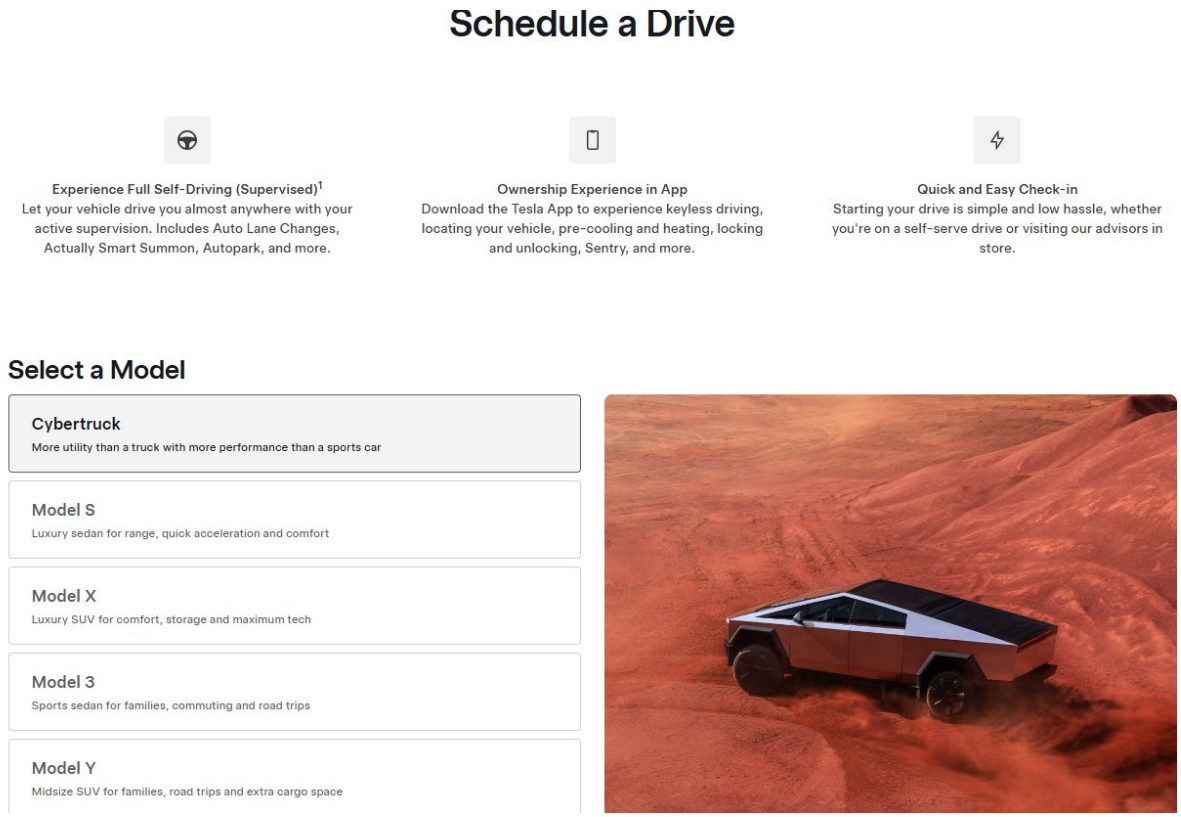
85. On information and belief, Tesla directs and controls the '889 Accused Products to operate in an infringing manner by providing the components, including the FSD hardware and software instructions, that infringe the '889 patent. Furthermore, Tesla installs, services, and/or maintains the '889 Accused Products that it provided to its customers. Tesla owns and controls the FSD software which automatically runs on and directs and controls the '889 Accused Products. Through its provision of the FSD software, Tesla causes the '889 Accused Products to perform the functionality recited by the asserted claims. Tesla further controls the performance of the claimed method steps of the '889 Accused Products by conditioning receipt of warranty benefits on the customer's agreement not to modify the '889 Accused Products. *See, e.g.,* https://digitalassets.tesla.com/tesla-contents/image/upload/tesla-new-vehicle-limited-warranty-en-us.pdf. Furthermore, Tesla owns vehicles and the training networks (*e.g.*, Dojo and/or Cortex) that infringe the asserted claims.

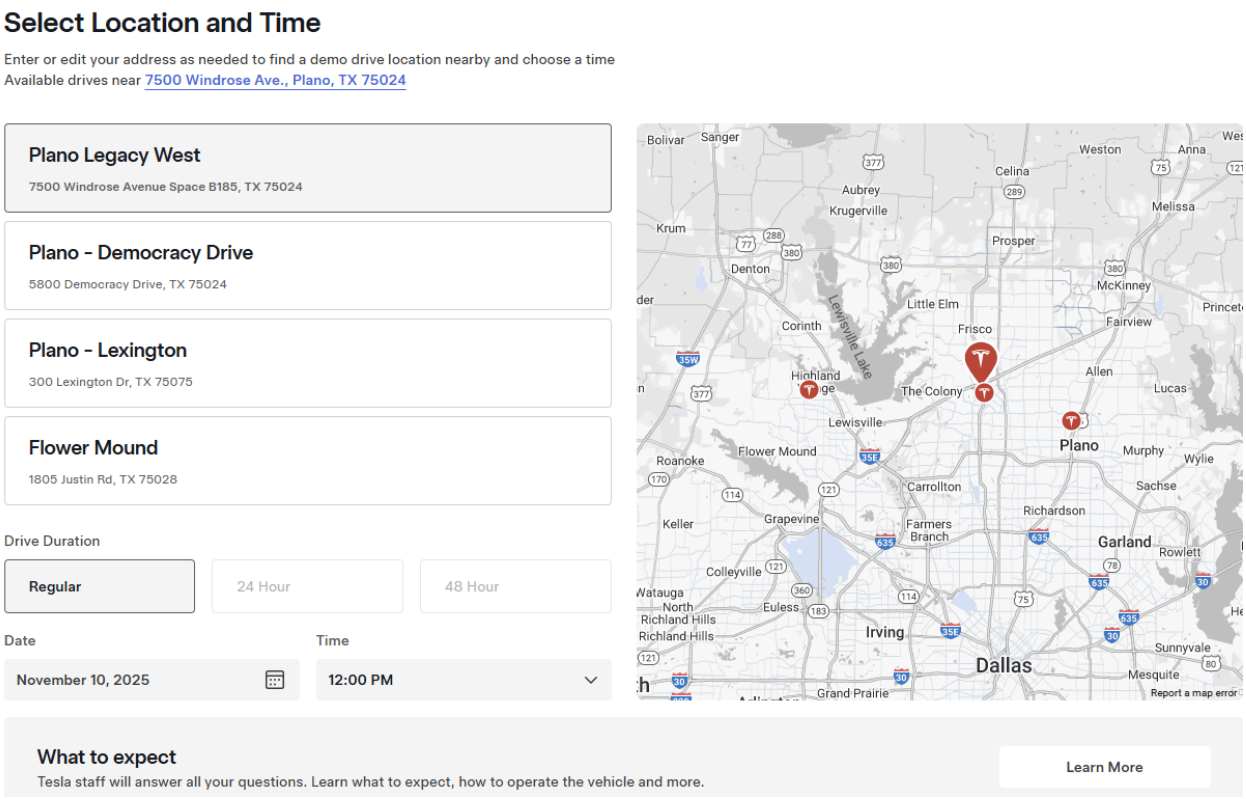
86. Tesla performs all of the steps of claim 2 of the '899 patent in Texas and elsewhere in the United States. Tesla performs at least the following steps of claim 2 of the '889 patent via Tesla FSD vehicles owned by Tesla and/or third parties that use FSD in this judicial district:

- "receiving a plurality of images displaying road scenes captured by one or more vehicles";

- "receiving, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user";
- "predicting, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image"; and
- "controlling the autonomous vehicle based on the prediction of the supervised learning based model."

Furthermore, Tesla infringes these steps via Tesla owned FSD vehicles that are test driven, by Tesla employees and/or customers, using FSD at Tesla's regular and established places of business in this judicial district:

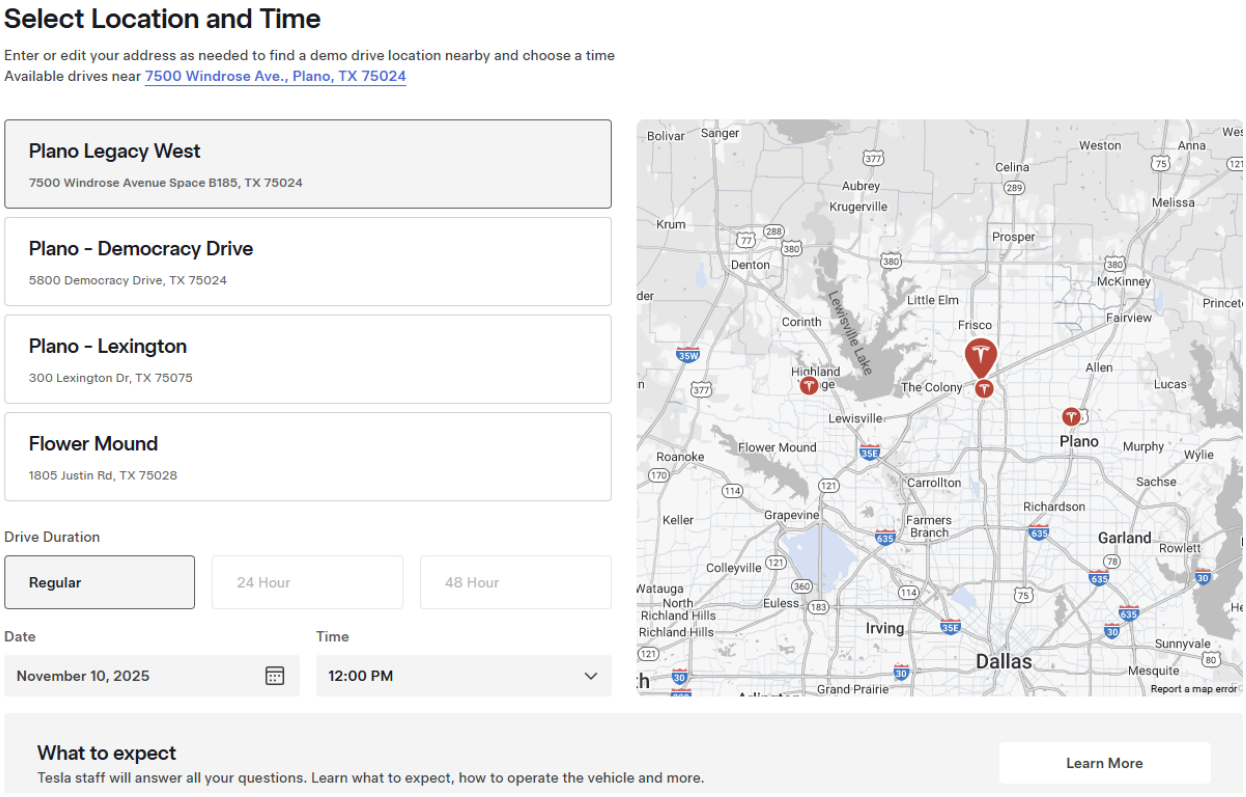




https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla FSD vehicles and performing the aforementioned steps of claim 2 of the '889 patent in this judicial district. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement of the aforementioned steps of claim 2 of the '889 patent in this judicial district. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html.

87. Tesla also infringes at least claim 1 of the '889 patent by making the system of at least claim 1 of the '889 patent in this judicial district and elsewhere in Texas and the United

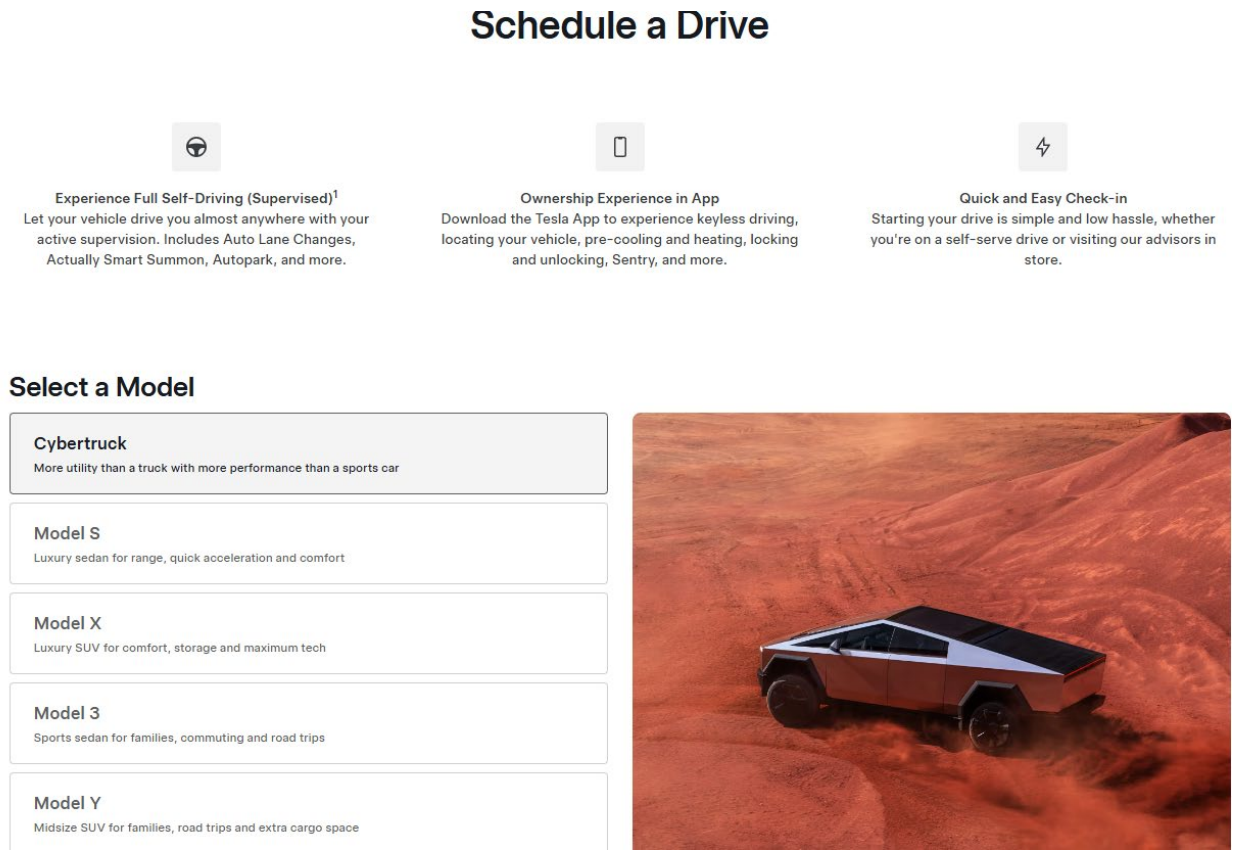
States. Tesla provides all of the necessary components of the infringing system, including providing over-the-air updates of the FSD software. The infringing system is made at least when a Tesla vehicle is configured with FSD software or an updated version of the FSD software. Tesla makes the infringing system of at least claim 1 of the '889 patent in this judicial district and elsewhere in Texas and the United States because it provides and/or installs the FSD software to FSD Tesla vehicles owned by customers and/or Tesla:

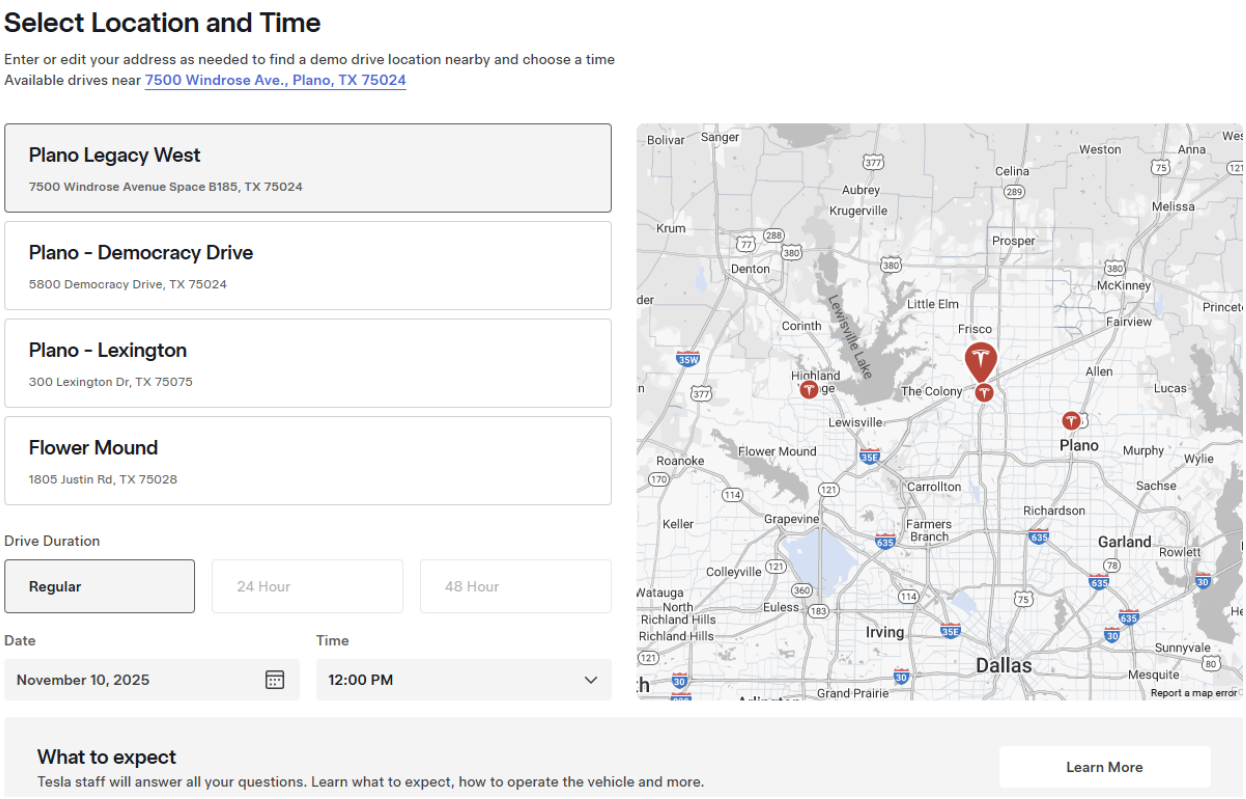


https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla owned FSD vehicles that receive FSD updates that make the claimed system in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a

short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement of claim 1 of the '889 patent of making the claimed system in this judicial district and elsewhere in Texas and the United States. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html.

88. Tesla infringes at least claim 1 of the '889 patent by using the claimed system as a whole. Tesla provides all of the necessary components of the infringing system, including providing over-the-air updates of the FSD software. Furthermore, Tesla directs and controls the system to automatically and autonomously control the vehicle by putting the claimed invention into service. Furthermore, Tesla uses the system of claim 1 of the '889 patent via its Tesla owned FSD vehicles that are test driven, by Tesla employees and/or customers, using FSD at Tesla's regular and established places of business in this judicial district:

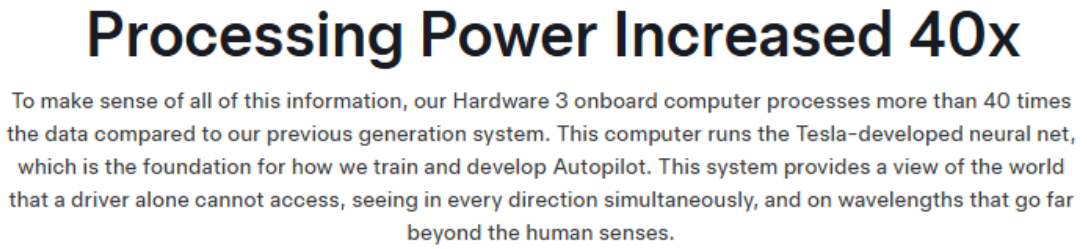




https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla FSD vehicles in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement by using the system of claim 1 of the '889 patent in this judicial district and elsewhere in Texas and the United States. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html. In this judicial district and elsewhere in Texas and the United States, Tesla uses the entire claimed system by putting the system to use via Tesla's FSD system and receiving the benefit of that use, such as autonomously controlling a vehicle and/or collecting more data to better train its FSD software. On information and belief,

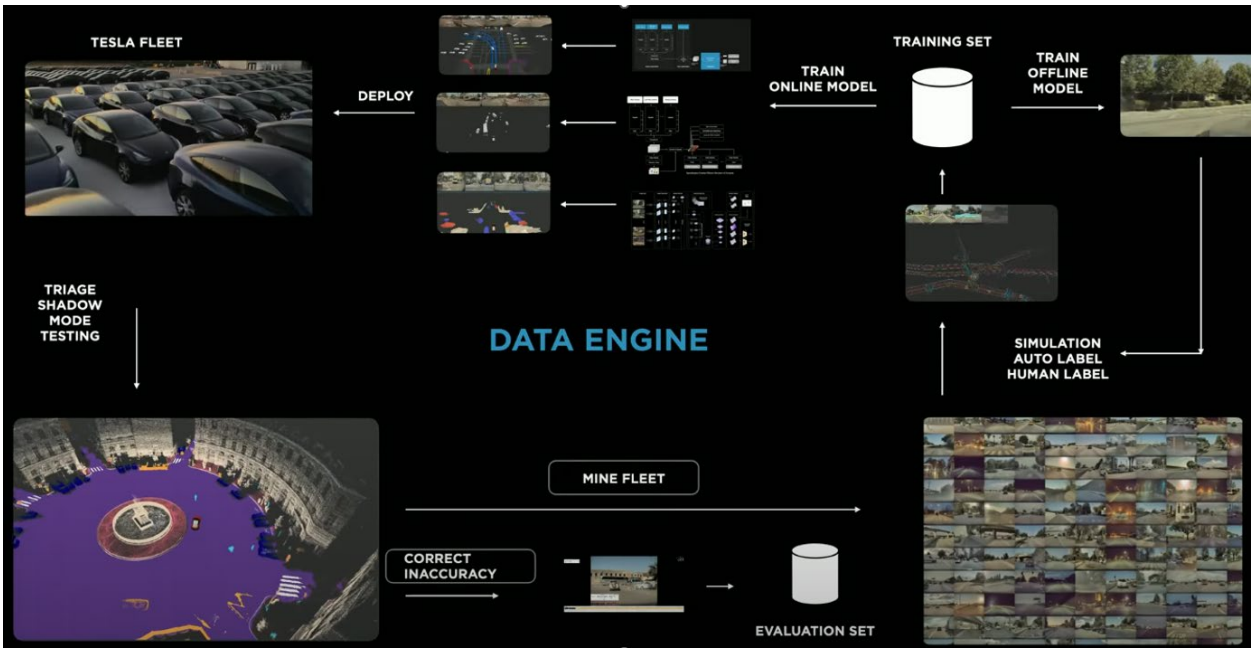
Tesla also directs and/or controls its customers' actions in putting the entire claimed system to service in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html (Elon Musk wrote an email to Tesla employees stating that "Going forward, it is mandatory in North America to install and activate FSD V12.3.1 and take customers on a short test ride before handing over the car. … Almost no one actually realizes how well (supervised) FSD actually works. I know this will slow down the delivery process, but it is nonetheless a hard requirement.").

89. On information and belief, Tesla performs the computer-implemented method of claim 2 of the '889 patent for controlling an autonomous vehicle based on a predicted state of mind of road users in a scene captured by a camera of the autonomous vehicle as described in the steps below. The '889 Accused Products comprise a computer that provides autonomous operation:



https://www.tesla.com/autopilot (as of January 1, 2025); See https://www.tesla.com/fsd ("Watch the World's First Autonomous Car Delivery").

90. On information and belief, Tesla receives a plurality of images displaying road scenes captured by one or more vehicles. For example, Tesla receives, at one or more of its datacenters (e.g., Dojo, Cortex), a plurality of images displaying road scenes captured by one or more Tesla vehicles.



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). Similarly, the '889 Accused Products are part of the Tesla fleet. *See* https://www.tesla.com/fleet. The Tesla fleet transmits the sensor data to Tesla's servers. *See* https://electrek.co/2020/10/24/tesla-collecting-insane-amount-data-full-self-driving-test-fleet/ ("Tesla asked owners for the authorization to collect videos from the Autopilot cameras. After that, Tesla opened the floodgates of Autopilot data gathering."); https://electrek.co/2017/05/06/tesla-data-sharing-policy-collecting-video-self-driving/ (quoting Tesla as saying "We are working hard to improve autonomous safety features and make self-driving a reality for you as soon as possible. In order to do so, we need to collect short video clips using the car's external cameras to learn how to recognize things like lane lines, street signs, and traffic light positions. The more fleet learning of road conditions we are able to do, the better your Tesla's self-driving ability will become.").

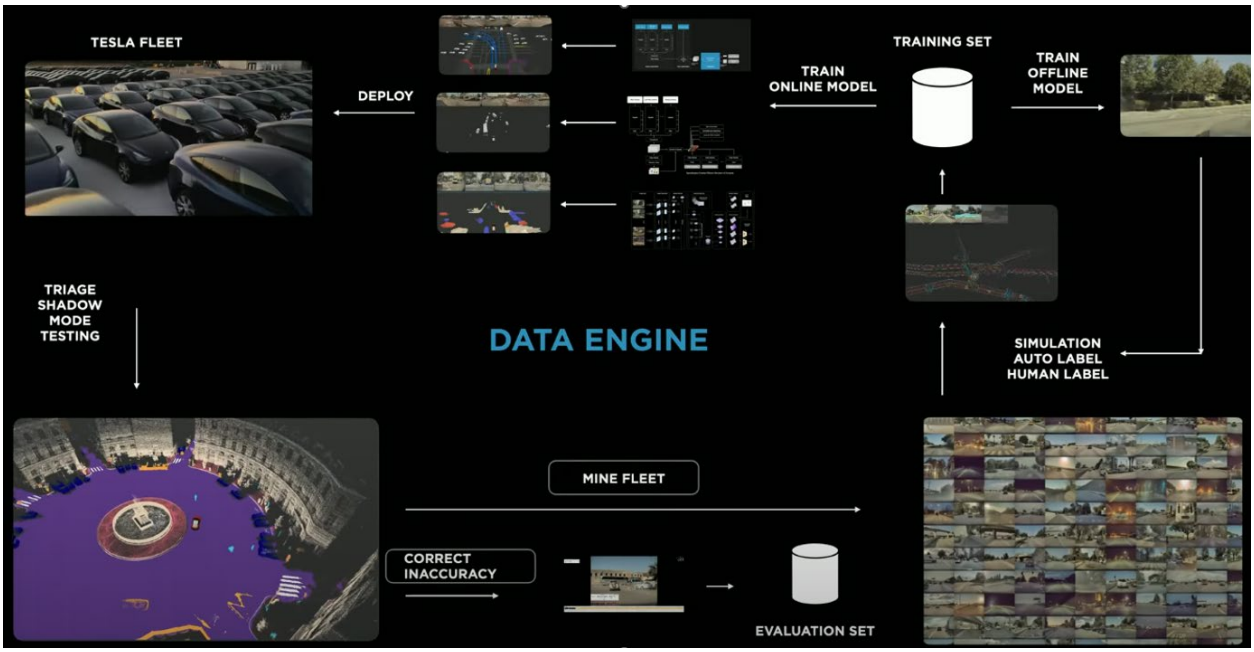
91. On information and belief, Tesla receives a plurality of user responses, each user response describing a state of mind of a road user displayed in one or more images. For example, Tesla receives, at one or more of its datacenters (e.g., Dojo, Cortex), the user responses to plurality of images. This is evidenced by the fact that Tesla received millions of video clips "collected from

the cars of Tesla customers." *See* https://www.cnbc.com/2023/09/09/ai-for-cars-walter-isaacson-biography-of-elon-musk-excerpt.html. These clips convey the state of mind of road users, which is evidenced by Tesla's selection of scenarios "from humans when they handled a situation well," and corresponded to things "a five-star Uber driver would do." *Id.* Further, the videos received by Tesla at its datacenters were labeled based on the road users state of mind. *Id.* (explaining that "Human labelers, many of them based in Buffalo, New York, assessed the videos" that Tesla received at its datacenters.). Tesla employed an in-house team of over 1,000 data labelers that provide advanced labeling that describes a state of mind of a road user displayed in one or more images. In the example illustrated below, a labeler is asked whether a stationary vehicle is one of six options: stopped_double_parked, stopped_traffic_controls, stopped_idle_in_lane, stopped_pulled_over, stopped_traffic, or parked.

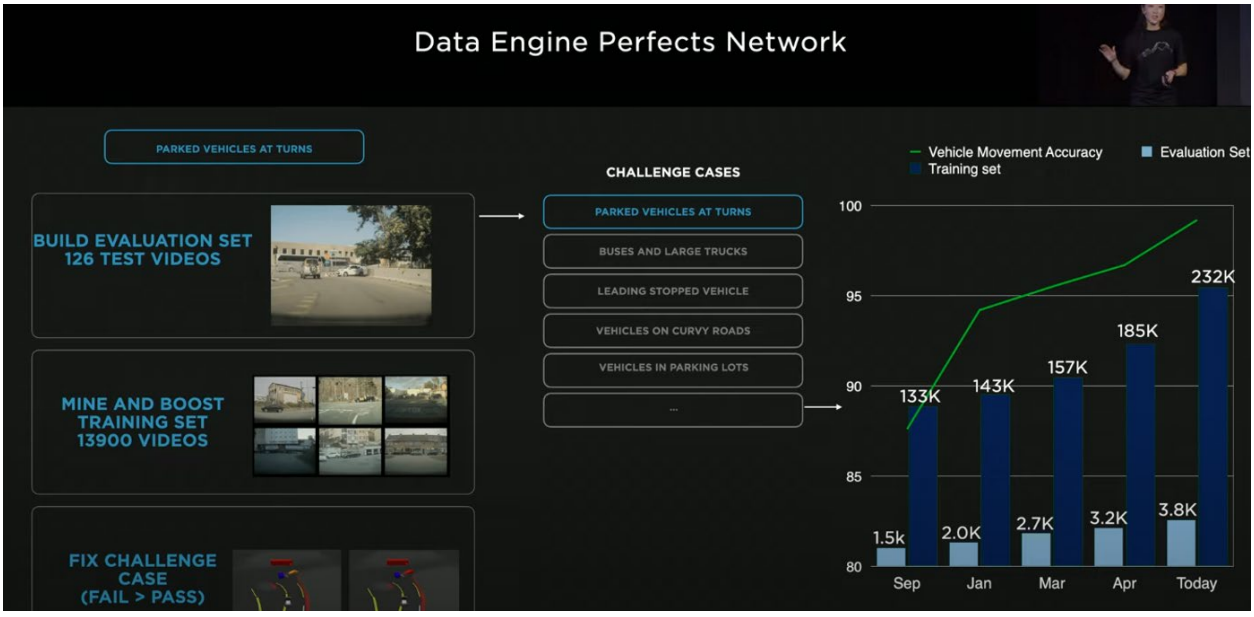
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). The resulting label describes the state of mind of road users displayed in the plurality of images.

92. On information and belief, Tesla generates a training dataset comprising summary statistics of user responses describing the state of minds of road users displayed in the plurality of images. At its datacenters (e.g., Dojo and/or Cortex), Tesla generates a training dataset comprising summary statistics of user responses describing the state of minds of road users displayed in the

plurality of images. With each new user response, the weight of the statistical summary describing the state of minds of road users in the plurality of images is modified, such that the accuracy of the movement by the autonomous vehicle movement improves with more responses and updated statistical summaries.

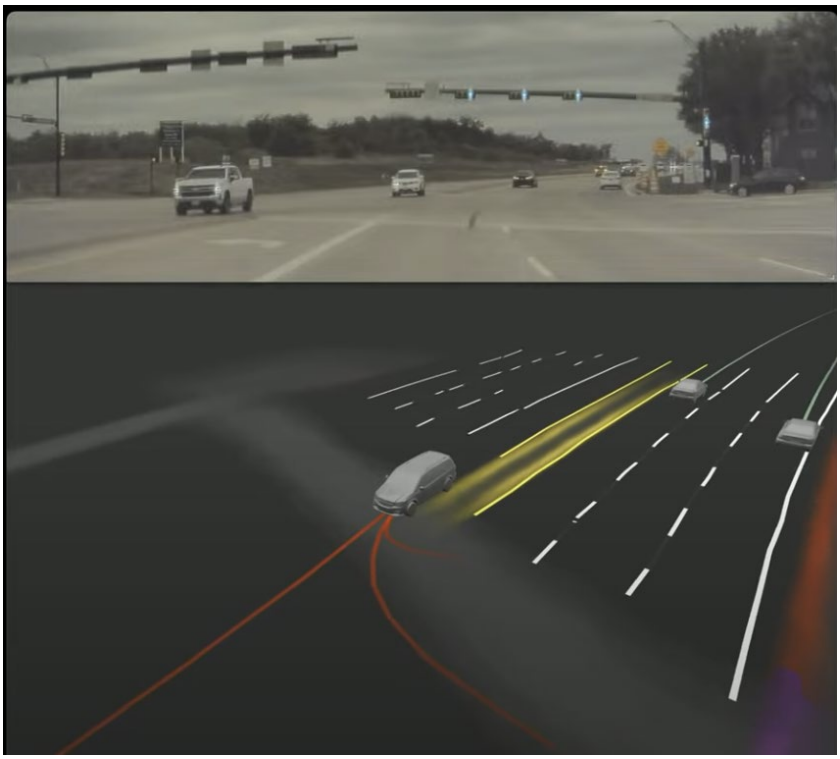


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

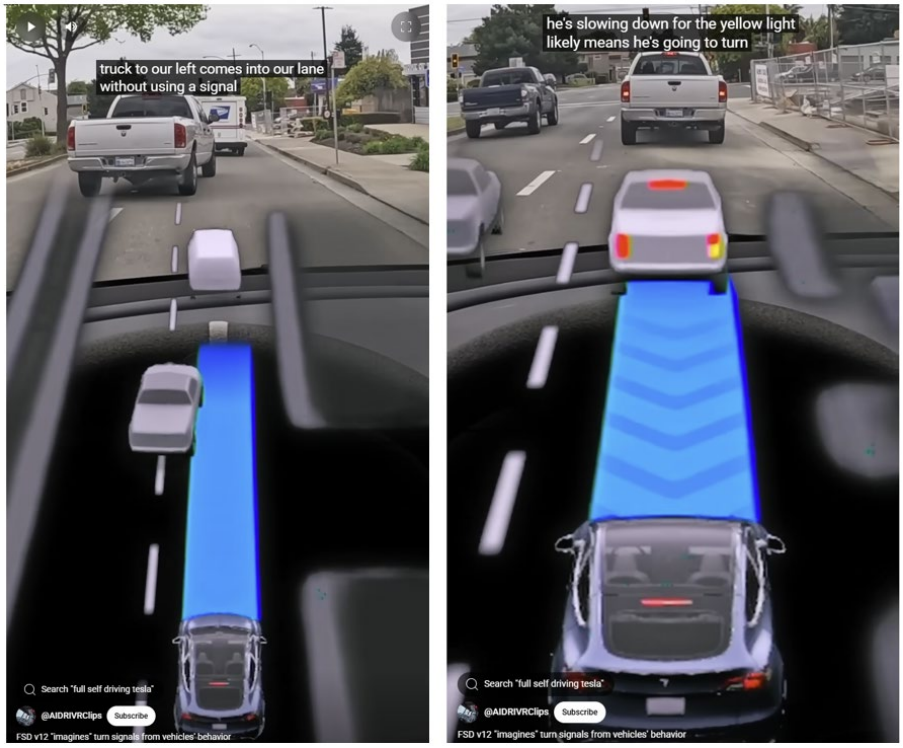


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

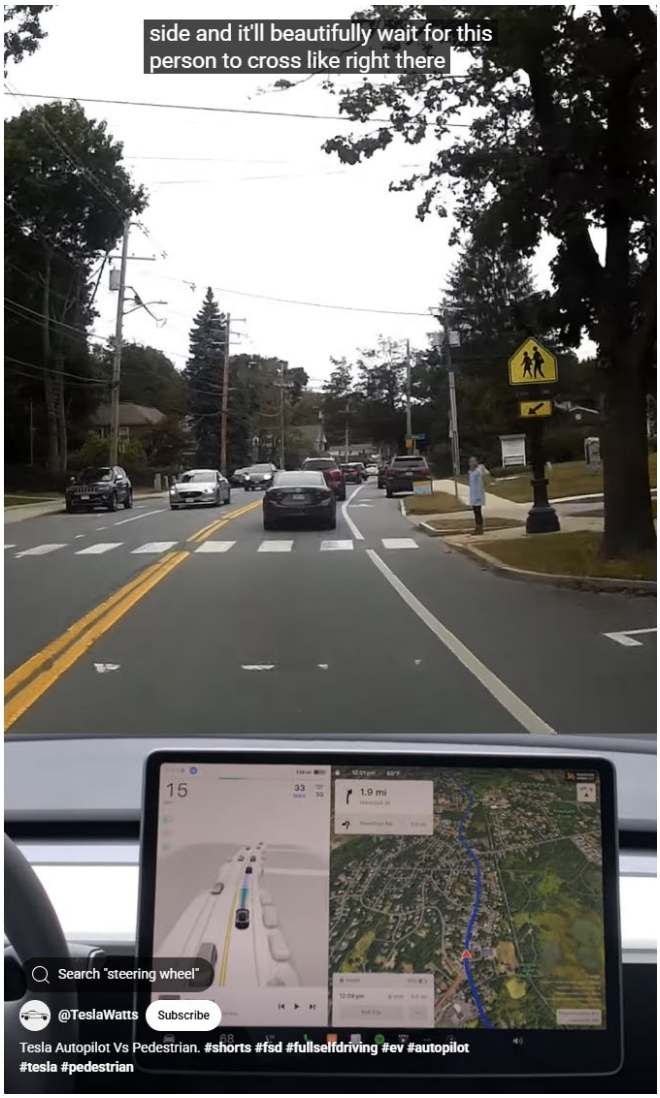
93. On information and belief, Tesla trains, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image. Tesla uses the training data set to train the FSD software, which comprises a supervised learning based model. This is evidenced by the fact that the FSD software predicts actions based on the possible state of mind of road users.



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (predicting whether the road user will continue forward, make a left turn, or a u-turn).

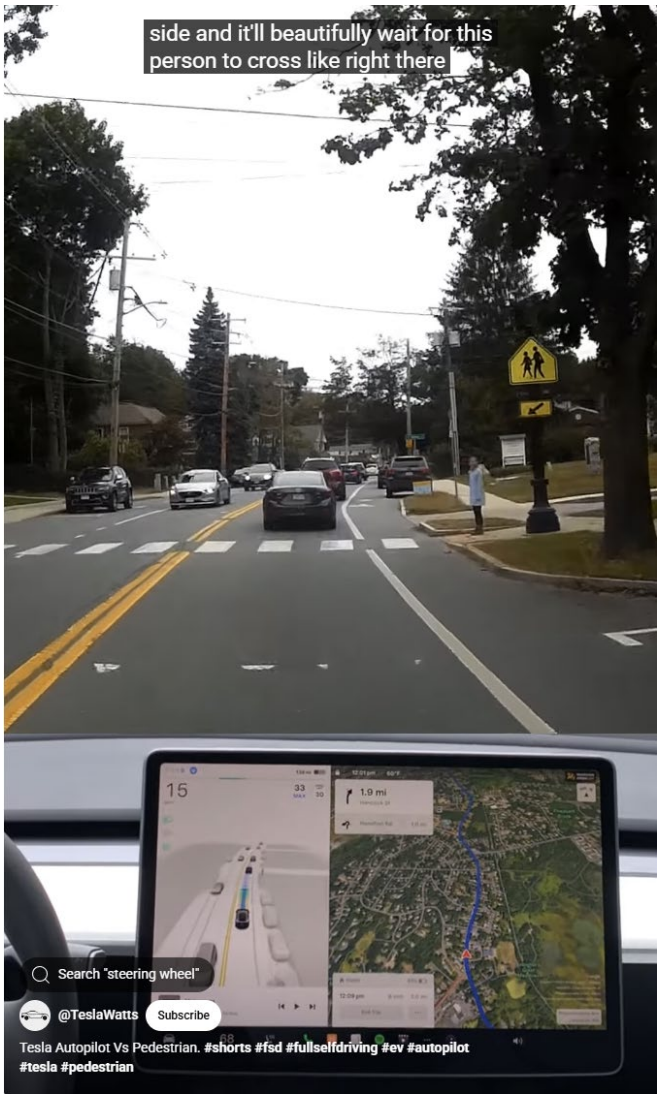


https://www.youtube.com/shorts/KVa4GWepX74 (ultimately predicting that the road user will make a right hand turn, rather than continue straight, as illustrated by the predicted right-hand turn blinker that is not actually used by the actual road user).



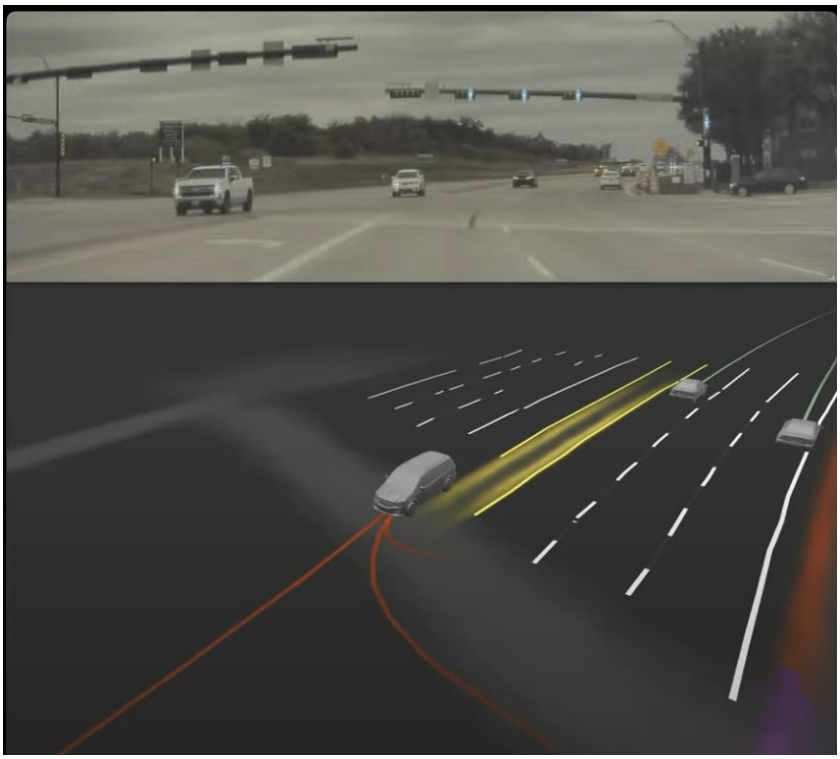
https://www.youtube.com/shorts/-fJzjyi6HkI (predicting that the pedestrian road user is likely to cross the road, rather than continue to stand).

94. On information and belief, Tesla receives, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user. For example, the '889 Accused Products receives an image from its camera of a pedestrian on the side of the road.

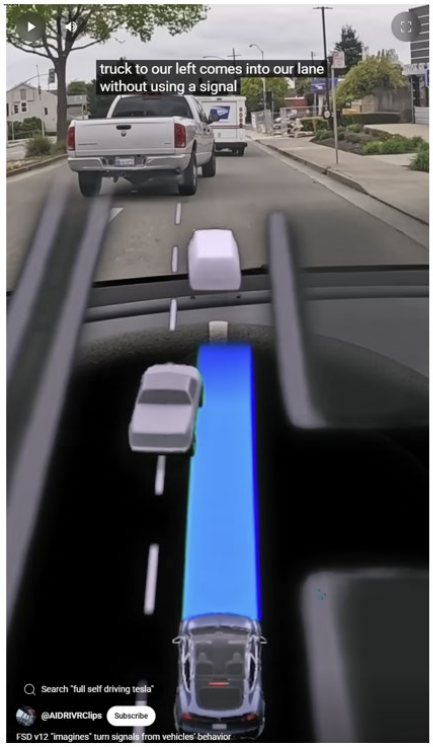


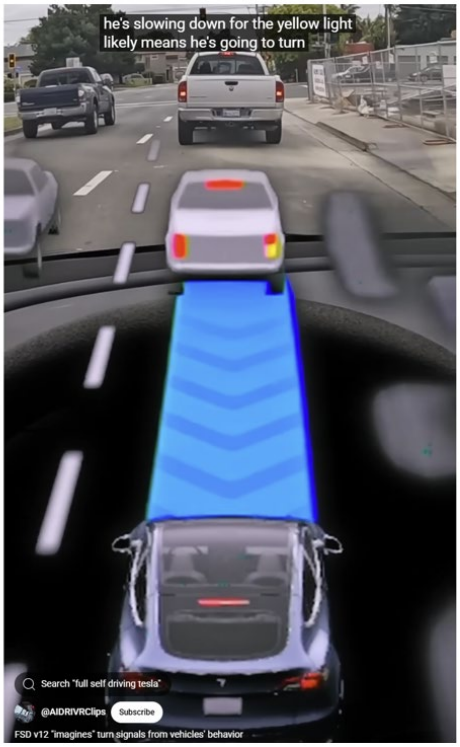
https://www.youtube.com/shorts/-fJzjyi6HkI.

95. On information and belief, Tesla predicts, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image. For example, Tesla, via its FSD software makes statistical predictions describing a state of mind of the road user in the new image. This is evidenced by the fact that the FSD software predicts actions based on the possible state of mind of road users:

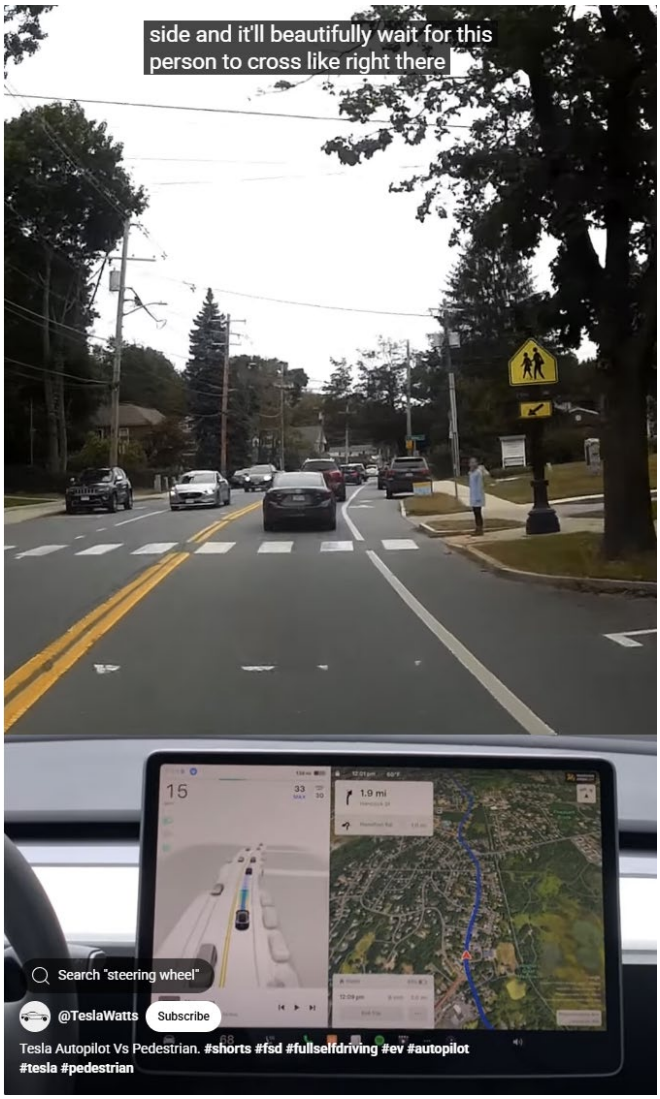


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (predicting whether the road user will continue forward, make a left turn, or a u-turn).





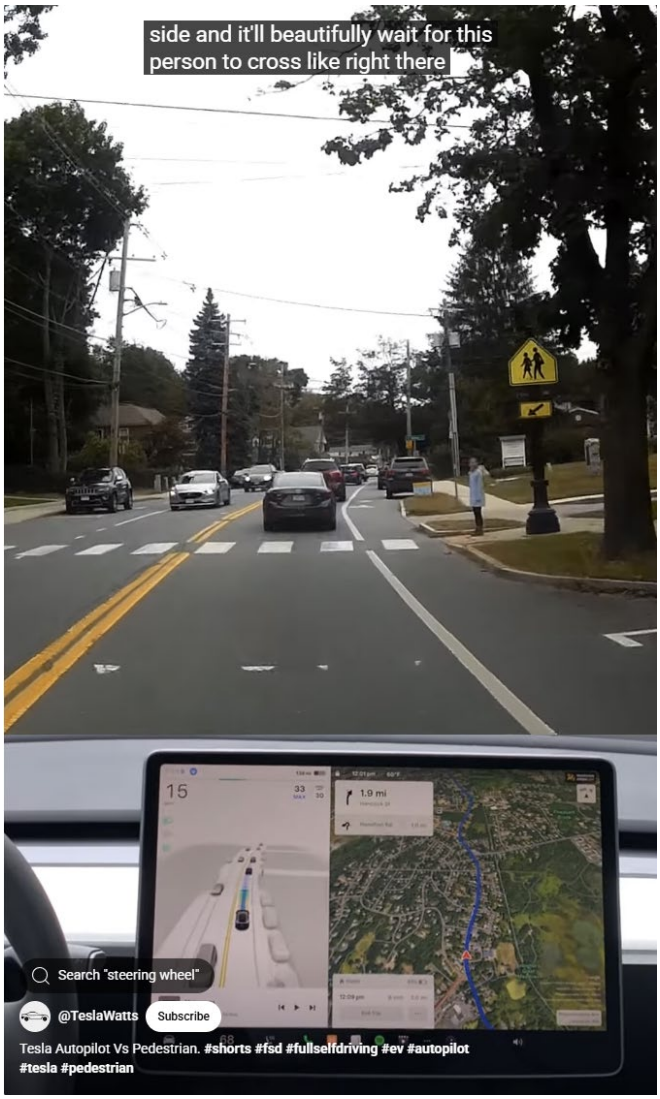
https://www.youtube.com/shorts/KVa4GWepX74 (ultimately predicting that the road user will make a right hand turn, rather than continue straight, as illustrated by the predicted right-hand turn blinker that is not actually used by the actual road user).



https://www.youtube.com/shorts/-fJzjyi6HkI (predicting that the pedestrian road user is likely to cross the road, rather than continue to still).

96. On information and belief, Tesla controls the autonomous vehicle based on the prediction of the supervised learning based model. For example, the operation of the Tesla autonomous vehicle is controlled by Tesla's FSD software based on the prediction of the

supervised learning-based model. This is evidenced by the fact that the autonomous vehicle performs actions, such as stopping to allow a pedestrian to cross the road without human interaction.



https://www.youtube.com/shorts/-fJzjyi6HkI.

97. The specific ways in which the '889 Accused Products are configured to support the aforementioned features are further detailed in proprietary documents and/or source code that evidence infringement by the '889 Accused Products.

98. The technology discussion above and the exemplary '889 Accused Products provide context for Plaintiff's infringement allegations.

99. The '889 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

100. The claims of the '889 patent are patent eligible under 35 U.S.C. § 101.

101. The '889 patent issued from U.S. Patent Application No. 16/828,823, filed on Mach 24, 2020. The '889 patent is a continuation of U.S. Patent Application No. 16/512, 560, filed on July 16, 2019, which issued as the '344 patent, and is also a continuation of U.S. Patent Application No. 15/830,549, filed on December 4, 2017. The '889 patent also claims the benefit of U.S. Provisional Patent Application No. 62/528,771, filed on July 5, 2017.

102. The claims of the '889 patent are entitled to a priority date at least as early as July 5, 2017, the filing date of U.S. Provisional Application No. 62/528,771.

103. The claims of the '889 patent are not directed to any abstract idea.

104. The claims of the '889 patent are not merely directed to using a machine learning model to drive a car. Instead, the claims of the '889 patent are directed to specific technological improvements of autonomous vehicles for predicting the behavior of objects near the autonomous vehicle. The claims of the '889 patent specifically claim improvements to the functionality of computer systems for autonomous vehicles. Also, the claims of the '889 patent address problems specifically rooted in the field of computer systems for autonomous vehicles.

105. The claims of the '889 patent recite inventive concepts.

106. Additionally, the claims of the '889 patent do not recite subject matter that is well-understood, routine, or conventional as of July 5, 2017, the filing date of U.S. Provisional Application No. 62/528,771.

107. In its motion to dismiss (Dkt. 30), Tesla did not dispute that the claims of the '889 patent are entitled to the priority date of U.S. Provisional Application No. 62/528,771.

108. The '889 patent specifically describes and identifies certain problems with autonomously operating a car. As the '889 patent states, "[t]he ability a driver of a car to look at a person—who is walking, driving another car, or riding a bike on or near a street—and predict what that person wants to do may be the single most important part of urban driving." '889 patent, 1:25-28. "For example, when a driver of a car sees people near the car, determining whether one person will cross the street, whether another person will remain standing on a street corner, and whether yet another person will change lanes on his or her bicycle is necessary to safely drive the car and avoid hitting the people." *Id.* at 1:28-33. "This ability is so fundamental, that operating in cities without it would be nearly impossible." *Id.* at 1:34-35.

109. As the '889 patent indicates, "human drivers have such a natural ability to predict a person's behavior. In fact, they can do it so effortlessly, that they often do not even notice that they are doing it." *Id.* at 1:36-39.

110. The '889 patent also describes the problems with such prediction in the context of autonomous driving, including that "computers and autonomous driving vehicles cannot adequately predict the behavior of people, especially in urban environments." *Id.* at 1:39-41.

111. The '889 patent describes certain pre-existing methods for addressing these then-existing shortcomings of autonomous vehicles, including that "autonomous driving vehicles may rely on methods that make decisions on how to control the vehicles by predicting 'motion vectors' of people near the vehicles." *Id.* at 1:42-44. As the '889 patent indicates, "[t]his is accomplished by collecting data of a person's current and past movements, determining a motion vector of the person at a current time based on these movements, and extrapolating a future motion vector

representing the person's predicted motion at a future time based on the current motion vector." *Id.* at 1:45-50. As the '889 patent recognizes, "[h]owever, the methods do not predict a person's actions or movements based on other observations besides his or her current and past movements, which lead to inferior results in predicting the person's future behavior." *Id.* at 1:50-53.

112. In addition, as of July 2017, there were numerous shortcomings in the field of autonomous vehicles that are addressed by the inventions of the claims of the '889 patent.

113. For example, as of July 2017, Waymo's fully self-driving vehicles were not yet on the road. Instead, until November 2017, Waymo was only operating vehicles on public roads with a test driver at the wheel. *See* https://waymo.com/blog/2017/11/waymos-fully-self-driving-vehicles-are (Ex. 11). Similarly, Tesla did not release a beta version of its FSD software until October 2020. *See* https://www.theverge.com/2020/10/21/21527577/tesla-full-self-driving-autopilot-beta-software-update (Ex. 12). As part of that release, Tesla CEO Elon Musk indicates that "Tesla was approaching this software update 'very cautiously' because the 'world is a complex and messy place.'" *Id.* In addition, according to a warning message that Tesla drivers received when given the option to enable the FSD software in its beta, Tesla's FSD software "may do the wrong thing at the worst time." *See* https://dawnproject.com/wp-content/uploads/2022/09/FSD-Beta-warning.png (Ex. 13).

114. In addition, as of June 2017, researchers at the Australian Centre for Field Robotics (ACFR) at the University of Sydney (NSW, Australia) commented that:

> Advanced driver assistance systems (ADAS) are increasingly seen as a mechanism to improve the safety and efficiency of transportation by understanding and reacting to potential vehicle safety threats using state-of-the-art sensing and algorithms. A major component of these systems is the ability to infer the future intentions of drivers to predict the likelihood of potential collisions. This is a challenging task, particularly in intersections where complex traffic scenarios result in a proportionally high number of

> accidents. Human drivers are able to estimate the future trajectory of other vehicles from a combination of potentially subtle cues – the combination of the various kinematic properties - and the position of the vehicle on the road relative to the lane. Being able to reproduce this driver intuition in a computer model is still an open area of research.

Zyner et. al., "Long Short Term Memory for Driver Intent Prediction," 2017 IEEE Intelligent Vehicles Symposium (IV) June 11-14, 2017, Redondo Beach, CA, USA (Ex. 14).

115. Similarly, in 2017, researchers from the Institute for Intelligent Systems Research and Innovation at Deakin University in Australia noted that autonomous vehicles "still have some difficulties specially when it comes to driving in urban traffic environment such as the interaction with Vulnerable Road Users (VRUs) such as pedestrians. Intuitively, interactions take place nowadays between human drivers and pedestrians are based on implicit cues between the two parties." Saleh et al., "Intent Prediction of Vulnerable Road Users from Motion Trajectories Using Stacked LSTM Network," 2017 IEEE 20th International Conference on Intelligent Transportation Systems (ITSC): Workshop (Ex. 15). *See also* Casas et al., "IntentNet: Learning to Predict Intention from Raw Sensor Data", 2nd Conference on Robot Learning , Zurich, Switzerland (2018) (Ex. 16) ("While a plethora of systems have been built in the past few decades, many challenges still remain. One of the fundamental difficulties is that self driving vehicles have to share the roads with human drivers, which can perform maneuvers that are difficult to predict."); Zyner et al., "Naturalistic Driver Intention and Path Prediction Using Recurrent Neural Networks", IEEE Transactions on Intelligent Transportation Systems, Vol. 21, No. 4 (April 2020) (Ex. 17) ("Driving vehicles is a highly skilled task that requires extensive understanding of the intentions of other road users. This knowledge allows drivers to safely navigate an area through other traffic. While this may become second nature to an experienced human driver, properly understanding the intentions of other drivers is still an unsolved problem for Advanced Driver Assistance Systems

(ADAS), and by extension, autonomous vehicles."); Rasouli et al., "Are They Going to Cross? A Benchmark Dataset and Baseline for Pedestrian Crosswalk Behavior", 2017 IEEE International Conference on Computer Vision Workshops, Venice, Italy, 2017 (Ex. 18) ("Designing autonomous vehicles suitable for urban environments remains an unresolved problem. One of the major dilemmas faced by autonomous cars is how to understand the intention of other road users and communicate with them. The existing datasets do not provide the necessary means for such higher level analysis of traffic scenes").

116. In addition, the USPTO, in *Ex parte Desjardins*, recently rejected the Board's findings that a patent application directed to learning models and artificial intelligence was abstract stating: "Under a charitable view, the overbroad reasoning of the original panel below is perhaps understandable given the confusing nature of existing § 101 jurisprudence, but troubling, because this case highlights what is at stake. Categorically excluding AI innovations from patent protection in the United States jeopardizes America's leadership in this critical emerging technology. Yet, under the panel's reasoning, many AI innovations are potentially unpatentable-even if they are adequately described and nonobvious-because the panel essentially equated any machine learning with an unpatentable "algorithm" and the remaining additional elements as "generic computer components," without adequate explanation. Dec. 24. Examiners and panels should not evaluate claims at such a high level of generality. However, it is with this view that the panel's *sua sponte* action is most troubling, as it eschewed the clear teachings of *Enfish*, and instead substituted only a cursory analysis that ignored this well-settled precedent. Panels should treat such precedent with more care, especially when acting *sua sponte*. At the same time, the claims at issue stand rejected under§ 103. This case demonstrates that §§ 102, 103 and 112 are the traditional and appropriate tools to limit patent protection to its proper scope. These statutory provisions should be the focus

of examination. For these reasons, we determine that although independent claim 1 may recite an abstract idea, it is not directed to an abstract idea. Instead, we determine that independent claim 1, when considered as a whole, integrates an abstract idea into a practical application." *Ex parte Desjardins*, Appeal No. 2024-000567, Decision on Request for Rehearing (Sept. 26, 2025), *available at* https://www.uspto.gov/sites/default/files/documents/202400567-arp-rehearing-decision-20250926.pdf.

117. The '889 patent specifically describes and claims novels methods, non-transitory computer readable storage media, and systems which address these shortcomings of then-existing autonomous vehicle systems. The '889 patent also specifically describes and claims novels methods, non-transitory computer readable storage media, and systems which provide improvements in the functionality of autonomous vehicle systems and addresses problems specifically rooted in the field of autonomous vehicle systems.

118. For example, claim 1 of the '889 patent recites "[a] computer system comprising" "a computer processor" and "a non-transitory computer readable storage medium storing instructions that when executed by the computer processor cause the computer processor to perform steps of a computer-implemented method for controlling an autonomous vehicle based on a predicted state of mind of road users in a scene captured by a camera of the autonomous vehicle," the steps comprising "receiving a plurality of images displaying road scenes captured by one or more vehicles;" "receiving a plurality of user responses, each user response describing a state of mind of a road user displayed in one or more images;" "generating a training dataset comprising summary statistics of uses responses describing the state of minds of road users displayed in the plurality of images;" "training, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an

input image;" "receiving, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user;" "predicting, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image;" and "controlling the autonomous vehicle based on the prediction of the supervised learning based model."

119. Claim 1 improves the functionality of an autonomous vehicle by "receiving a plurality of images displaying road scenes captured by one or more vehicles;" "receiving a plurality of user responses, each user response describing a state of mind of a road user displayed in one or more images;" "generating a training dataset comprising summary statistics of uses responses describing the state of minds of road users displayed in the plurality of images;" "training, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image;" "receiving, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user;" "predicting, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image;" and "controlling the autonomous vehicle based on the prediction of the supervised learning based model."

120. By "generating a training dataset comprising summary statistics of uses responses describing the state of minds of road users displayed in the plurality of images;" "training, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image;" "receiving, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user;" "predicting, by the autonomous vehicle, using the supervised

learning based model, summary statistics describing a state of mind of the road user in the new image;" the system of claim 1 allows an autonomous vehicle to consider summary statistics describing a state of mind of the road user, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "generating a training dataset comprising summary statistics of uses responses describing the state of minds of road users displayed in the plurality of images;" "training, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image;" "receiving, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user;" "predicting, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image;" allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

121. Claim 2 of the '889 patent recites "[a] computer-implemented method for controlling an autonomous vehicle based on a predicted state of mind of road users in a scene captured by a camera of the autonomous vehicle," the method comprising: "receiving a plurality of images displaying road scenes captured by one or more vehicles;" "receiving a plurality of user responses, each user response describing a state of mind of a road user displayed in one or more images;" "generating a training dataset comprising summary statistics of user responses describing the state of minds of road users displayed in the plurality of images;" "training, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image;" "receiving, by an autonomous vehicle,

a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user;" "predicting, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image;" and "controlling the autonomous vehicle based on the prediction of the supervised learning based model."

122. Claim 2 of the '889 patent improves the functionality of an autonomous vehicle by "receiving a plurality of images displaying road scenes captured by one or more vehicles;" "receiving a plurality of user responses, each user response describing a state of mind of a road user displayed in one or more images;" "generating a training dataset comprising summary statistics of user responses describing the state of minds of road users displayed in the plurality of images;" "training, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image;" "receiving, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user;" "predicting, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image;" and "controlling the autonomous vehicle based on the prediction of the supervised learning based model." By "receiving a plurality of user responses, each user response describing a state of mind of a road user displayed in one or more images;" "generating a training dataset comprising summary statistics of user responses describing the state of minds of road users displayed in the plurality of images;" "training, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image;" "receiving, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user;" "predicting, by the autonomous vehicle, using the supervised learning based model, summary

statistics describing a state of mind of the road user in the new image;" and "controlling the autonomous vehicle based on the prediction of the supervised learning based model," the method of claim 2 allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "receiving a plurality of user responses, each user response describing a state of mind of a road user displayed in one or more images;" "generating a training dataset comprising summary statistics of user responses describing the state of minds of road users displayed in the plurality of images;" "training, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image;" "receiving, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user;" "predicting, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image;" and "controlling the autonomous vehicle based on the prediction of the supervised learning based model," allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

123. Claim 12 of the '889 patent similarly recites "[a] non-transitory computer readable storage medium storing instructions that when executed by a computer processor cause the computer processor to perform steps of a computer-implemented method for controlling an autonomous vehicle based on a predicted state of mind of road users in a scene captured by a camera of the autonomous vehicle," the steps comprising "receiving a plurality of images displaying road scenes captured by one or more vehicles;" "receiving a plurality of user responses,

each user response describing a state of mind of a road user displayed in one or more images;" "generating a training dataset comprising summary statistics of uses responses describing the state of minds of road users displayed in the plurality of images;" "training, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image;" "receiving, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user;" "predicting, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image;" and "controlling the autonomous vehicle based on the prediction of the supervised learning based model."

124. Claim 12 improves the functionality of an autonomous vehicle by "receiving a plurality of images displaying road scenes captured by one or more vehicles;" "receiving a plurality of user responses, each user response describing a state of mind of a road user displayed in one or more images;" "generating a training dataset comprising summary statistics of uses responses describing the state of minds of road users displayed in the plurality of images;" "training, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image;" "receiving, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user;" "predicting, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image;" and "controlling the autonomous vehicle based on the prediction of the supervised learning based model." By ""receiving a plurality of images displaying road scenes captured by one or more vehicles;" "receiving a plurality of user responses, each user response describing a state of mind of a road user displayed in one or more images;" "generating a training dataset

comprising summary statistics of uses responses describing the state of minds of road users displayed in the plurality of images;" "training, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image;" "receiving, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user;" "predicting, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image;" and "controlling the autonomous vehicle based on the prediction of the supervised learning based model" the non-transitory computer readable storage medium storing instructions of claim 12 allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such ""receiving a plurality of images displaying road scenes captured by one or more vehicles;" "receiving a plurality of user responses, each user response describing a state of mind of a road user displayed in one or more images;" "generating a training dataset comprising summary statistics of uses responses describing the state of minds of road users displayed in the plurality of images;" "training, using the training dataset, a supervised learning based model configured to predict summary statistics describing a state of mind of a road user displayed in an input image;" "receiving, by an autonomous vehicle, a new image captured by a camera of the autonomous vehicle, the new image of a scene including a road user;" "predicting, by the autonomous vehicle, using the supervised learning based model, summary statistics describing a state of mind of the road user in the new image;" and "controlling the autonomous vehicle based on the prediction of the supervised learning based model" allows an autonomous vehicle to

consider a distribution of user responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

125. The dependent claims of the '889 patent provide additional improvements to the functionality of autonomous vehicles and the claimed methods, non-transitory computer readable storage media, and computer systems. For example, dependent claim 5 further improves on claim 2 by specifying that "the summary statistics comprises one or more of: a central tendency, a variance, a skew, a kurtosis, a scale, or a histogram." *See also* claim 15. Similarly, dependent claim 6 further improves on claim 2 by specifying that "receiving a user response comprises sending one or more images for display to a viewer via a user interface, the one or more images including a road user, wherein the user interface is configured to prompt the viewer to describe how the road user will act." *See also* claim 16. Dependent claim 7 further improves on claim 2 by specifying that "receiving a user response comprises generating a stimulus comprising a set of images; sending the generated stimulus for display via a user interface; and receiving, via the user interface, a user response describing the stimulus." *See also* claim 17. Dependent claim 8 further improves on claim 2 by specifying that "modifying an image to generate a stimulus, the modifying comprising extracting a subset of the image contained in a bounding box around the road user displayed in the image." *See also* claim 18. Dependent claim 9 further improves on claim 2 by specifying that "the supervised learning based model uses one or more features comprising dimensions of the bounding box; location of the bounding box; shape of the bounding box; or a change in size or position of the bounding box across two images representing video frames." *See also* claim 19. Dependent claim 10 further improves on claim 2 by specifying that "the user response is determined based on: an explicit response to a question asked via a user interface; and an implicit data representing one or more of: time taken to respond; whether user deleted

keystrokes; or whether user moved a mouse anywhere other than a location corresponding to a selected response." *See also* claim 20. Dependent claim 11 further improves on claim 2 by specifying that "the supervised learning based model is one of: a random forest regressor, a support vector regressor, a simple neural network, a deep convolutional neural network, a recurrent neural network, or a long short-term memory (LSTM) neural network."

126. These and other processes and their benefits are described in the '889 patent specification as well. For example, Figure 2A of the '889 patent is "a flow chart showing the process of predicting human behavior, according to some embodiments of the present disclosure." '889 patent, 3:16-18. Figure 2A is reproduced below:

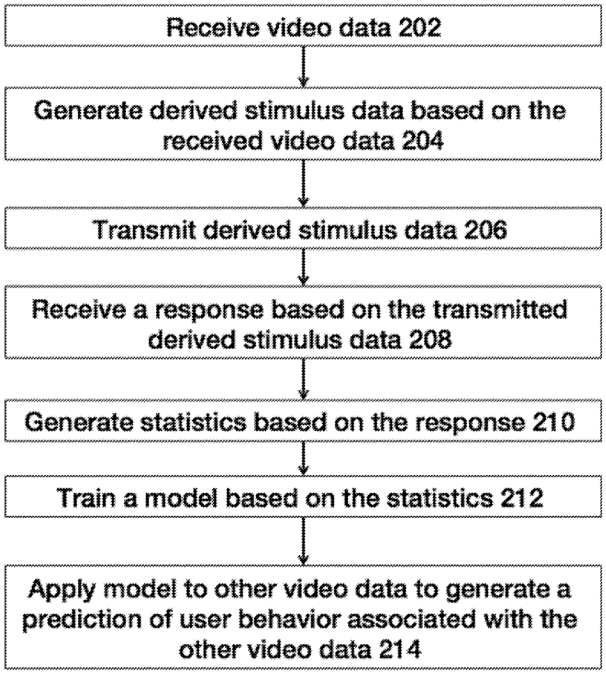


FIG. 2A

127. As the '889 patent specification states, "[i]n step 202, this video or other data captured by the camera or other sensor is transmitted from the vehicle 102, over the network 104, and to the server 106 where it is stored." *Id.* at 5:12-15. "Then, in step 204, video frames or

segments are extracted from the stored video or other data and are used to create stimulus data including derived stimulus (or stimuli). In one implementation, the derived stimulus corresponds to a scene in which one or more humans are conducting activities (e.g., standing, walking, driving, riding a bicycle, etc.) beside or on a street and/or near a vehicle." *Id.* at 5:16-22. "In step 206, the derived stimulus is transmitted from the server 106 and displayed to a large number of users (or human observers) on the user terminal 108 (or multiple terminals 108). The terminal(s) 108 prompt the human observers to predict how the people shown in the derived stimulus will act, and upon viewing the displayed stimulus, the observers input their responses corresponding to their predictions." *Id.* at 5:46-53. "In step 208, the derived stimulus and associated human observer responses are transmitted from the terminal(s) 108 to the server 106 and recorded in the user response database 110." *Id.* at 6:4-7.

128. As the '889 patent describes, "[i]n step 210, summary statistics are generated based on the user responses." *Id.* at 6:8-9. The '889 patent describes that "the statistics may characterize the aggregate responses of multiple human observers to a particular derived stimulus. For instance, if the derived stimulus shows a pedestrian walking on a sidewalk towards an intersection, the response can be categorized in terms of how many human observers believe that the pedestrian will stop upon reaching the intersection, continue walking straight across the intersection, turn a corner and continue walking along the sidewalk without crossing the intersection, etc." *Id.* at 6:9-18.

129. The '889 patent also describes an example of how "the stored statistics and corresponding images . . . are sent over the network 104 to the model training system 112 and used to train a prediction algorithm":

> For example, the collection of images and statistics can be used to train a supervised learning algorithm, which can comprise a random

> forest regressor, a support vector regressor, a simple neural network, a deep convolutional neural network, a recurrent neural network, a long-short-term memory (LSTM) neural network with linear or nonlinear kernels that are two dimensional or three dimensional, or any other supervised learning algorithm which is able to take a collection of data labeled with continuous values and adapt its architecture in terms of weights, structure or other characteristics to minimize the deviation between its predicted label on a novel stimulus and the actual label collected on that stimulus using the same method as was used on the set of stimuli used to train that network. The model is given data which comprises some subset of the pixel data from the video frames that the summary statistics were generated from. In one implementation, this subset includes the pixel data contained in a box (such as the box 221 shown in FIG. 2B) drawn to contain the boundaries of the person, cyclist, motorist and vehicle, or other road user, including their mode of conveyance. In some other implementations, it also includes the entire pixel data from the rest of the image. In one of those implementations, that pixel data is selected according to criteria such as the salience of those features in terms of contrast, lighting, presence of edges, or color. In an additional implementation, the features can include descriptive meta-data about the images such as the dimensions and location of the bounding box, the shape of the bounding box or the change in size or position of the bounding box from one frame to the next.

Id. at 6:44-7:11.

130. The ’889 patent further states that, “[i]n step 214, the prediction engine 114 uses the trained model from the model training system 112 to predict the actual, ‘real-world’ or ‘live data’ behavior of people on or near a road.” *Id.* at 7:12-15. The ’889 patent further explains this prediction process:

> The trained model or algorithm makes a prediction of what a pedestrian or other person shown in the “live data” would do based on the summary statistics and/or training labels of one or more derived stimulus. The accuracy of the model is determined by having it make predictions of novel derived stimuli that were not part of the training images previously mentioned but which do have human ratings attached to them, such that the summary statistics on the novel images can be generated using the same method as was used to generate the summary statistics for the training data, but where the correlation between summary statistics and image data

> was not part of the model training process. The predictions produced by the trained model comprise a set of predictions of the state of mind of road users that can then be used to improve the performance of autonomous vehicles, robots, virtual agents, trucks, bicycles, or other systems that operate on roadways by allowing them to make judgments about the future behavior of road users based on their state of mind.

Id. at 7:26-44.

131. The '889 patent also provides additional descriptions of these processes through its figures and their accompanying descriptions. *See* '889 patent, Fig. 4 (which "shows a process of generating derived stimuli from raw camera or sensor data in the vehicle, according to some embodiments of the present disclosure"), Fig. 5 (which "is a flowchart showing a process of collecting predictions and other information from human observers based on derived stimuli, according to some embodiments of the present disclosure"), Fig. 6 (which "shows a data structure associated with tracking video frame data, according to some embodiments of the present disclosure"), Fig. 7 (which "is a flowchart showing a process for producing summary statistics of a video frame or derived stimulus according to some embodiments of the present disclosure"), Fig. 8 (which "is a flowchart showing a process of training a learning algorithm using summary statistics, according to some embodiments of the present disclosure"), Fig. 9 (which "is a flowchart showing a process of predicting the state of mind of road users using a trained learning algorithm, according to some embodiments of the present disclosure"), Fig. 10 (which "is a diagram showing an example of an application of a context user prediction process in an automobile context, according to some embodiments of the present disclosure") and their accompanying descriptions.

132. Any functional language in the claims of the '889 patent is not determinative of those such claims being abstract, especially when the claims provide a technical improvement to a computer system, as discussed above. *See, e.g.*, *Evolved Wireless, LLC v. Apple Inc.*, 221 F.

Supp. 3d 485, 491 (D. Del. 2016) ("Applying these guidelines in the relevant field of technology can be somewhat difficult, because '[t]he essence of software is manipulating existing data and generating additional data through algorithms.' *Cal. Inst. of Tech. v. Hughes Commc'ns Inc.*, 59 F. Supp. 3d 974, 987 (C.D. Cal. 2014); *Oplus Techs. Ltd. v. Sears Holding Corp.*, 2013 U.S. Dist. LEXIS 35474, 2013 WL 1003632, at *12 (C.D. Cal. Mar. 4, 2013) ('All software only receives data, applies algorithms, and ends with decisions.'). Ultimately, the Federal Circuit instructs that not all 'claims directed to software ... are inherently abstract.' *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016). Claims 'improv[ing] the functioning of [a] computer' or 'improving an existing technological process' are patent-eligible even if they rely on a mathematical algorithm. *Id.* at 1336; *see also Hughes*, 59 F. Supp. 3d at 993 ('When claims provide a specific computing solution for a computing problem, these claims should generally be patentable, even if their novel elements are mathematical algorithms.').").

133. The claims of the '889 patent cover patent eligible improvements to autonomous vehicles that were more than well-understood, routine, or conventional activity. The inventions in the '889 patent were years ahead of the release of the accused products and functionalities. Taken alone and together, the limitations of the asserted claims involve an inventive concept. For example, the claim limitations identified above as not being directed to abstract ideas are also claim elements that contain inventive concepts. As discussed above, those claim elements provide an improvement over existing autonomous vehicle systems, methods, and software.

134. Tesla has filed its own patent applications for alleged inventions related to autonomous vehicle technology. Tesla's own patent applications demonstrate that, even after July 2017, autonomous vehicle technology (including prediction of human behavior) was still in its early stages and that improvements to autonomous vehicle technology (including prediction of

human behavior) were still needed. Further, in filing those patents application, Tesla represented to the USPTO that, as of the time of each filing, the alleged inventions in those patent applications were directed to patent eligible subject matter and that, even after July 2017, a need existed for such inventions in the market. This further demonstrates that the inventions claimed in the '889 patent were not well-understood, routine, and conventional in the July 2017 time period but are instead directed to patent eligible subject matter. *See, e.g.*, U.S. Patent Application Publication Nos. 2021/0271259, 2020/0348909, 2023/0176593, 2022/0284712; U.S. Patent Nos. 11,748,620, 11,816,585, 11,537,811, 11,215,999, 11,150,664, 11,636,333, 10,678,244.

135. As discussed above, as of July 2017, Waymo's fully self-driving vehicles were not yet on the road without safety drivers. Instead, until November 2017, Waymo was only operating vehicles on public roads with a test driver at the wheel. *See* https://waymo.com/blog/2017/11/waymos-fully-self-driving-vehicles-are (Ex. 11). Similarly, Tesla did not release a beta version of its FSD software until October 2020. *See* https://www.theverge.com/2020/10/21/21527577/tesla-full-self-driving-autopilot-beta-software-update (Ex. 12). As part of that release, Tesla CEO Elon Musk indicates that "Tesla was approaching this software update 'very cautiously' because the 'world is a complex and messy place.'" *Id.* In addition, according to a warning message that Tesla drivers received when given the option to enable the FSD software in its beta, Tesla's FSD software "may do the wrong thing at the worst time." *See* https://dawnproject.com/wp-content/uploads/2022/09/FSD-Beta-warning.png (Ex. 13). These facts also demonstrate that operating autonomous vehicles was not a well-understood, routine, or conventional activity as of July 2017.

136. In addition, other researchers in the field of autonomous vehicles confirmed that the subject matter of the claims of the '889 patent was not well-understood, routine, or

conventional in July 2017. For example, in June 2017, researchers at the Australian Centre for Field Robotics (ACFR) at the University of Sydney (NSW, Australia) commented that:

> Advanced driver assistance systems (ADAS) are increasingly seen as a mechanism to improve the safety and efficiency of transportation by understanding and reacting to potential vehicle safety threats using state-of-the-art sensing and algorithms. A major component of these systems is the ability to infer the future intentions of drivers to predict the likelihood of potential collisions. This is a challenging task, particularly in intersections where complex traffic scenarios result in a proportionally high number of accidents. Human drivers are able to estimate the future trajectory of other vehicles from a combination of potentially subtle cues – the combination of the various kinematic properties - and the position of the vehicle on the road relative to the lane. Being able to reproduce this driver intuition in a computer model is still an open area of research.

Zyner et. al., "Long Short Term Memory for Driver Intent Prediction," 2017 IEEE Intelligent Vehicles Symposium (IV) June 11-14, 2017, Redondo Beach, CA, USA (Ex. 14).

137. Similarly, in 2017, researchers from the Institute for Intelligent Systems Research and Innovation at Deakin University in Australia noted that autonomous vehicles "still have some difficulties specially when it comes to driving in urban traffic environment such as the interaction with Vulnerable Road Users (VRUs) such as pedestrians. Intuitively, interactions take place nowadays between human drivers and pedestrians are based on implicit cues between the two parties." Saleh et al., "Intent Prediction of Vulnerable Road Users from Motion Trajectories Using Stacked LSTM Network," 2017 IEEE 20th International Conference on Intelligent Transportation Systems (ITSC): Workshop (Ex. 15). *See also* Casas et al., "IntentNet: Learning to Predict Intention from Raw Sensor Data", 2nd Conference on Robot Learning , Zurich, Switzerland (2018) (Ex. 16) ("While a plethora of systems have been built in the past few decades, many challenges still remain. One of the fundamental difficulties is that self driving vehicles have to share the roads with human drivers, which can perform maneuvers that are difficult to predict."); Zyner et al.,

"Naturalistic Driver Intention and Path Prediction Using Recurrent Neural Networks", IEEE Transactions on Intelligent Transportation Systems, Vol. 21, No. 4 (April 2020) (Ex. 17) ("Driving vehicles is a highly skilled task that requires extensive understanding of the intentions of other road users. This knowledge allows drivers to safely navigate an area through other traffic. While this may become second nature to an experienced human driver, properly understanding the intentions of other drivers is still an unsolved problem for Advanced Driver Assistance Systems (ADAS), and by extension, autonomous vehicles."); Rasouli et al., "Are They Going to Cross? A Benchmark Dataset and Baseline for Pedestrian Crosswalk Behavior", 2017 IEEE International Conference on Computer Vision Workshops, Venice, Italy, 2017 (Ex. 18) ("Designing autonomous vehicles suitable for urban environments remains an unresolved problem. One of the major dilemmas faced by autonomous cars is how to understand the intention of other road users and communicate with them. The existing datasets do not provide the necessary means for such higher level analysis of traffic scenes"). That these problems existed in the art demonstrates that the subject matter of the claims of the '889 patent was not well-understood, routine, or conventional as of July 2017.

138. In addition, numerous accidents have been reported since 2017 involving shortcomings of Tesla's autonomous driving systems, its prior Autopilot systems, and other autonomous or semi-autonomous driving systems. *See, e.g.*, https://www.craftlawfirm.com/autonomous-vehicle-accidents-2019-2024-crash-data/ (Ex. 19); https://www.cbsnews.com/news/waymo-car-recall-software-crash-self-driving/ (Ex. 20); https://www.msn.com/en-us/news/us/waymo-is-being-investigated-by-the-feds-for-a-robotaxi-illegally-passing-a-school-bus/ar-AA1OQeGB (Ex. 21); https://www.msn.com/en-us/autos/news/driver-fell-asleep-at-wheel-of-autopilot-driven-tesla-before-it-hit-police-car/ar-

AA1Px1Ku (Ex. 22); https://ktar.com/arizona-news/self-driving-uber-car-fatally-runs-over-pedestrian-in-tempe/1994638/ (Ex. 23); https://www.msn.com/en-us/autos/news/waymo-autonomous-vehicle-involved-in-multicar-crash-apd-says/ar-AA1Prszz (Ex. 24); https://www.msn.com/en-us/pets-and-animals/pets/a-week-after-a-waymo-self-driving-car-killed-a-beloved-cat-san-francisco-still-mourns/ar-AA1PFvoq (Ex. 25); https://www.latimes.com/business/story/2025-08-01/tesla-must-pay-243-million-over-fatal-autopilot-crash (Ex. 26); https://www.techspot.com/news/110085-tesla-robotaxis-already-crashing-austin-data-points-gaps.html (Ex. 27); https://electrek.co/2018/06/07/tesla-fatal-crash-autopilot-ntsb-releases-preliminary-report (Ex. 28); https://www.theguardian.com/technology/2024/apr/26/tesla-autopilot-fatal-crash (Ex. 29); https://techcrunch.com/2024/02/13/waymo-recall-crash-software-self-driving-cars (Ex. 30); https://www.upi.com/Top_News/US/2024/06/13/waymo-recall-robotaxi-crash/2251718311972 (Ex. 31); https://abcnews.go.com/Business/tesla-autopilot-steered-driver-barrier-fatal-crash-ntsb/story?id=68936725 (Ex. 32); https://www.reuters.com/business/autos-transportation/nhtsa-opens-probe-into-24-mln-tesla-vehicles-over-full-self-driving-collisions-2024-10-18/ (Ex. 33); https://www.cnn.com/2021/08/27/cars/toyota-self-driving-vehicle-paralympics-accident (Ex. 34). These incidents likewise demonstrate that operating autonomous vehicles was not a well-understood, routine, or conventional activity as of July 2017.

139. At a minimum, Tesla has known about the ’889 patent and its infringement of the ’889 patent at least as early as the filing date of the Original Complaint. Further, on information and belief, Tesla’s conduct before the USPTO provides that Tesla was aware of the ’889 patent and its infringement prior to the filing of the Original Complaint. For example, in prosecuting U.S. Patent No. 11,157,441, Tesla has known of the ’889 patent. In another example, in prosecuting

U.S. Patent No. 11,409,692, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 10,671,349, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,893,393, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 12,307,350, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,561,791, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,215,999, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,361,457, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,636,333, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,562,231, Tesla has known of the ’889 patent. In another example, in prosecuting European Patent Application Publication No. 3864573, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,196,678, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,816,585, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,537,811, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,610,117, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 10,997,461, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,150,664, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 11,567,514, Tesla has known of the ’889 patent. In another example, in prosecuting U.S. Patent No. 10,956,755, Tesla has known of the ’889 patent. In addition, on information and belief, Tesla was aware of Perceptive’s patent portfolio, monitored Perceptive’s patent portfolio, and it and/or its agents substantially cited to Perceptive’s patents in connection with prosecuting Tesla patents, all prior to the filing of the Original Complaint.

140. On information and belief, since at least the above-mentioned dates when Tesla was on notice of its infringement, Defendant has indirectly infringed the '889 patent in violation of 35 U.S.C. § 271(b) at least by inducing customers to purchase the Accused Products and/or by instructing customers how to use and/or make the Accused Products in a way that directly infringes the asserted claims of the '889 Patent. *See, e.g.,* infringement allegations in this Count and Ex. 7.

141. On information and belief, Defendant's actions represented a specific intent to induce infringement of the asserted claims, including at least claims 1 and 2 of the '889 patent. In this judicial district and elsewhere in Texas and the United States, Defendant has offered its customers and prospective customers extensive customer support and instructions that instruct and encourage its customers to infringe the '889 patent via at least the making and/or use of the Accused Products in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, materials cited in Ex. 7; https://www.tesla.com/drive (advertisement for Tesla demo drives using FSD in this judicial district and elsewhere in Texas and the United States); https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html (Elon Musk wrote an email to Tesla employees requiring them to encourage and instruct customer to install and use the accused FSD functionality in Tesla vehicles); https://www.tesla.com/ms/order/ (delivery of Tesla vehicle occurs at customer location and/or at a Tesla regular and established place of business in this judicial district and elsewhere in Texas and the United States); https://www.tesla.com/fsd (Tesla encouraging and instructing customers to demo drive a Tesla car with FSD and install/activate FSD in their Tesla vehicles to drive for the customer avoiding bikes, motorcycles, and other cars); https://www.tesla.com/ownersmanual/modely/en_us/GUID-2CB60804-9CEA-4F4B-8B04-09B991368DC5.html. In addition, Tesla's website is accessible in this judicial district and, as

discussed and cited herein, is further evidence of Tesla's acts of indirect infringement in this judicial district. In this judicial district and elsewhere in Texas and the United States, Tesla induces its customers and prospective customers to use the entire claimed system of claim 1 by putting the system to use via Tesla's FSD system and receiving the benefit of that use, such as autonomously controlling a vehicle. In this judicial district and elsewhere in Texas and the United States, Tesla induces its customers to make the system of claim 1 by installing the FSD software via over the air updates.

142. In addition, by receiving notice of the '889 patent and Defendant's infringement thereof, Defendant obtained a subjective belief that there is a high probability that the Accused Products infringe the '889 patent. Despite being put on notice of infringement, on information and belief Defendant has not taken actions to avoid the conduct alleged to infringe, has not offered any reasons as to why Defendant does not infringe the '889 patent, and has not sought to remedy its infringements by offering to take a license. Defendant's failure to act reflects deliberate actions to avoid learning that the Accused Products infringe the '889 patent and, more generally, a policy of not earnestly reviewing and respecting the intellectual property of others.

143. Since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the '889 patent. Tesla intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the '889 Accused Products, creating and/or maintaining established distribution channels for the '889 Accused Products into and within the United States, manufacturing the '889 Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or

manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the '889 Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States. *See, e.g.*, https://www.tesla.com/fsd.

144. On information and belief, despite having knowledge of the '889 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '889 patent, Tesla has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. Tesla's infringing activities relative to the '889 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

145. Perceptive has been damaged as a result of Tesla's infringing conduct described in this Count. Tesla is, thus, liable to Perceptive in an amount that adequately compensates Perceptive for Tesla's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT III

(INFRINGEMENT OF U.S. PATENT NO. 11,467,579)

146. Plaintiff incorporates paragraphs 1 through 145 herein by reference.

147. Perceptive is the assignee of the '579 patent, entitled "Probabilistic Neural Network for Predicting Hidden Context of Traffic Entities for Autonomous Vehicles," with ownership of all substantial rights in the '579 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements. A copy of the '579 patent is attached hereto as Exhibit 3.

148. Tesla has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims including at least claims 1 and 20 of the '579 patent in this judicial district and elsewhere in Texas and the United States by making, using, testing, offering for sale, selling, and/or importing systems that comprise Tesla vehicles with FSD software and hardware and/or Tesla systems that support Tesla vehicles with FSD software and hardware (the '579 Accused Products). Such infringement includes, but is not limited to, the making, using, offering to sell, and/or selling of '579 Accused Products that leverage and infringe the inventions of the '579 patent. The infringement allegations of the asserted claims of the '579 patent, including claims 1 and 20 of the '579 patent, is also embodied in Plaintiff's preliminary infringement contentions, which are incorporated by reference. *See* Ex. 8.

149. On information and belief, Tesla directs and controls the '579 Accused Products to operate in an infringing manner by providing the components, including the requisite FSD hardware and software instructions, that infringe the '579 patent. Furthermore, Tesla installs, services, and/or maintains the '579 Accused Products provided to its customers. Tesla owns and controls the FSD software that automatically runs and directs and controls the Tesla vehicles it provides to its customers. Tesla provides the FSD software, such that Tesla causes the '579 Accused Products. Through its provision of the FSD software, Tesla causes the '579 Accused Products to perform the functionality recited by the asserted claims. Tesla further controls the performance of the claimed method steps of the '579 Accused Products by conditioning receipt of warranty benefits on the customer's agreement not to modify the '579 Accused Products. *See, e.g.,* https://digitalassets.tesla.com/tesla-contents/image/upload/tesla-new-vehicle-limited-warranty-en-us.pdf. Furthermore, Tesla owns vehicles and the training networks (*e.g.*, Dojo and/or Cortex) that infringe the asserted claims.

150. Tesla performs all of the steps of claim 1 of the '579 patent in Texas and elsewhere in the United States. In this judicial district, Tesla performs at least the following steps of claim 1 of the '579 patent via at least Tesla FSD vehicles owned by Tesla and/or third parties that use FSD:

- "receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic";
- "executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image";
- "determining a measure of uncertainty for each of the plurality of values"; and
- "navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network."

Furthermore, Tesla infringes these steps via Tesla owned FSD vehicles that are test driven, by Tesla employees and/or customers, using FSD at Tesla's regular and established places of business in this judicial district:

Schedule a Drive

Experience Full Self-Driving (Supervised)[1]
Let your vehicle drive you almost anywhere with your active supervision. Includes Auto Lane Changes, Actually Smart Summon, Autopark, and more.

Ownership Experience in App
Download the Tesla App to experience keyless driving, locating your vehicle, pre-cooling and heating, locking and unlocking, Sentry, and more.

Quick and Easy Check-in
Starting your drive is simple and low hassle, whether you're on a self-serve drive or visiting our advisors in store.

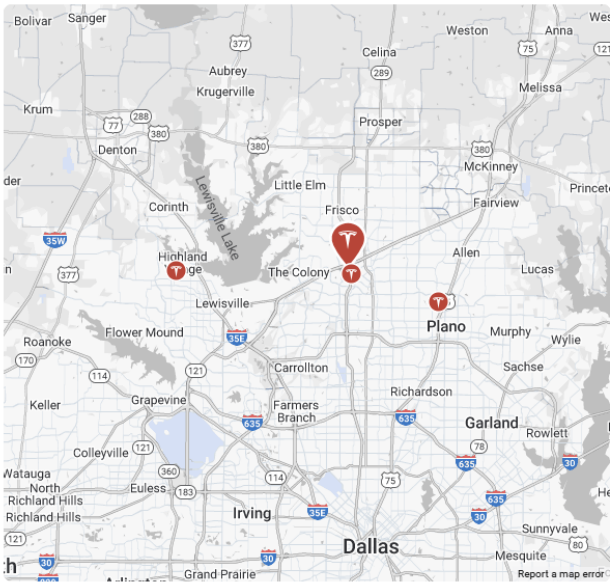
Select a Model

- **Cybertruck** — More utility than a truck with more performance than a sports car
- **Model S** — Luxury sedan for range, quick acceleration and comfort
- **Model X** — Luxury SUV for comfort, storage and maximum tech
- **Model 3** — Sports sedan for families, commuting and road trips
- **Model Y** — Midsize SUV for families, road trips and extra cargo space

Select Location and Time

Enter or edit your address as needed to find a demo drive location nearby and choose a time
Available drives near 7500 Windrose Ave., Plano, TX 75024

- **Plano Legacy West** — 7500 Windrose Avenue Space B185, TX 75024
- **Plano - Democracy Drive** — 5800 Democracy Drive, TX 75024
- **Plano - Lexington** — 300 Lexington Dr, TX 75075
- **Flower Mound** — 1805 Justin Rd, TX 75028



Drive Duration

Regular | 24 Hour | 48 Hour

Date: November 10, 2025

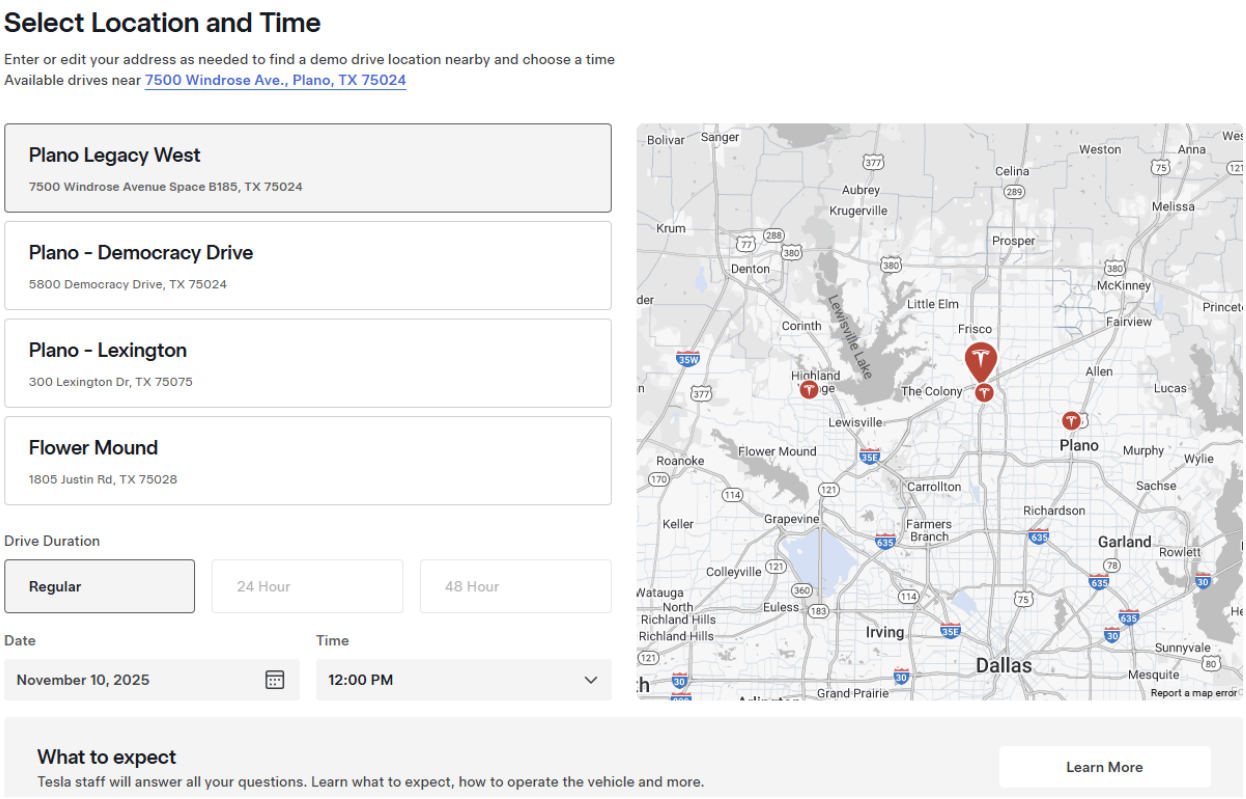
Time: 12:00 PM

What to expect
Tesla staff will answer all your questions. Learn what to expect, how to operate the vehicle and more.

Learn More

https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla FSD vehicles and performing the aforementioned steps of claim 1 of the '579 patent in this judicial district. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement of the aforementioned steps of claim 1 of the '579 patent in this judicial district. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html.

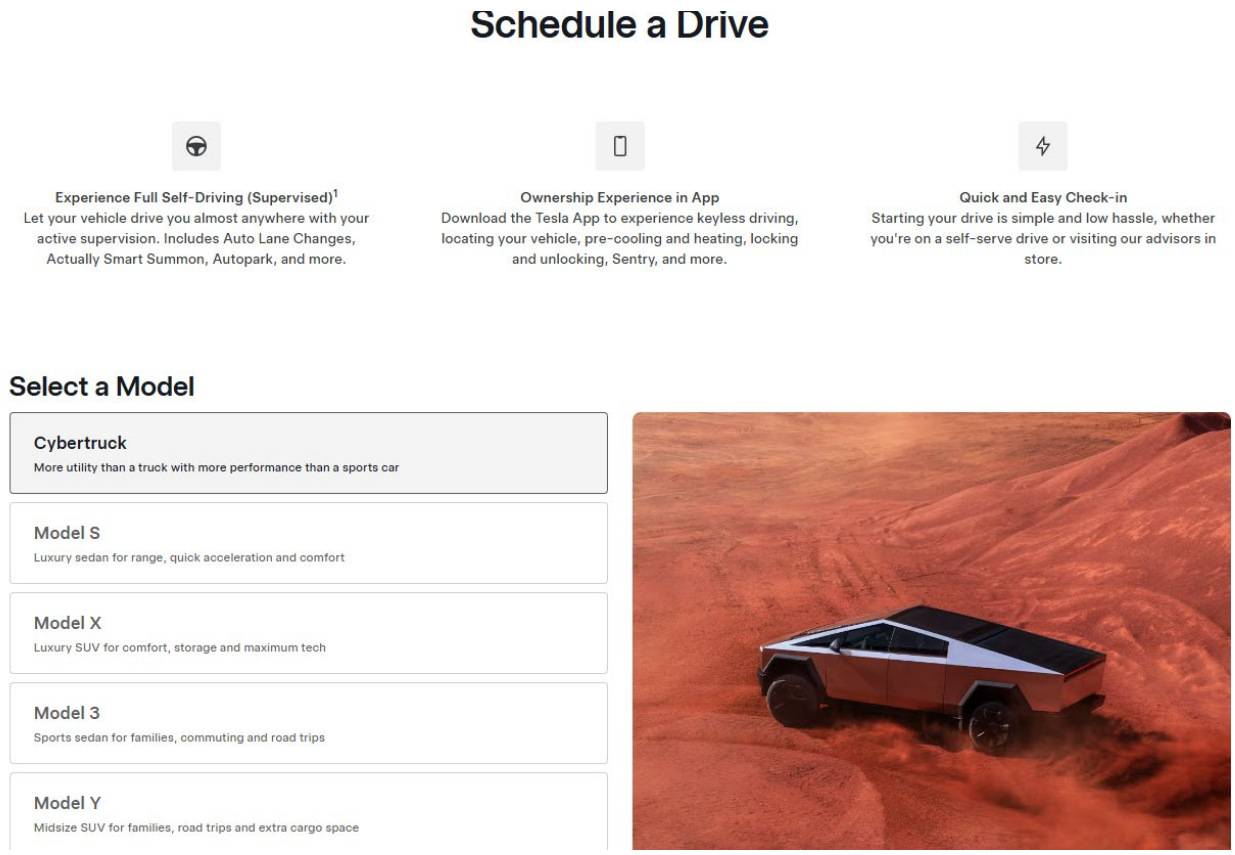
151. Tesla also infringes at least claim 20 of the '579 patent by making the system of at least claim 20 of the '579 patent in this judicial district and elsewhere in Texas and the United States. Tesla provides all of the necessary components of the infringing system, including providing over the air updates of the FSD software. The infringing system is made at least when a Tesla vehicle is configured with FSD software or an updated version of the FSD software. Tesla makes the infringing system of at least claim 20 of the '579 patent in this judicial district and elsewhere in Texas and the United States because it provides and/or installs the FSD software to FSD Tesla vehicles owned by customers and/or Tesla:

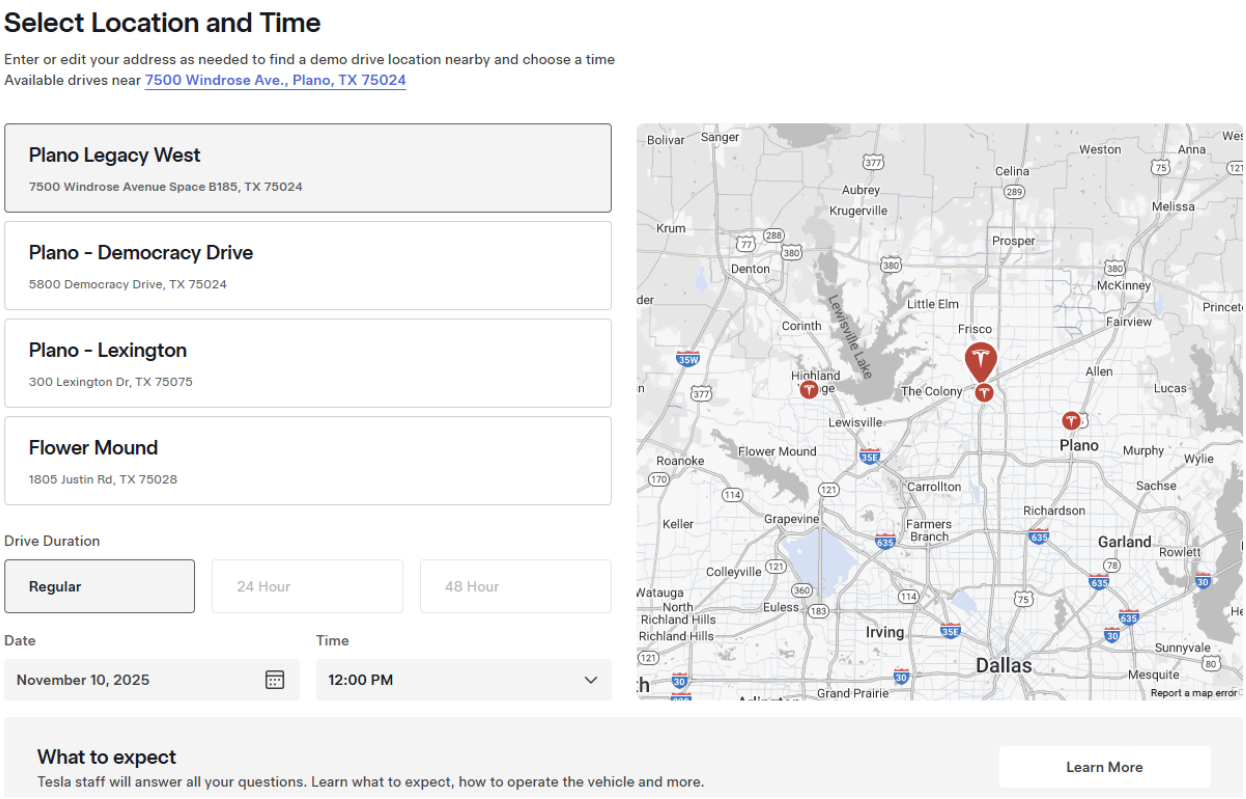


https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla owned FSD vehicles that receive FSD updates that make the claimed system in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement of claim 20 of the '579 patent of making the claimed system in this judicial district and elsewhere in Texas and the United States. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html.

152. Tesla infringes at least claim 20 of the '579 patent by using the claimed system as a whole. Tesla provides all of the necessary components of the infringing system, including

providing over-the-air updates of the FSD software. Furthermore, Tesla directs and controls the system to automatically and autonomously control the vehicle by putting the claimed invention into service. Furthermore, Tesla uses the system of claim 20 of the ’579 patent via its Tesla owned FSD vehicles that are test driven, by Tesla employees and/or customers, using FSD at Tesla’s regular and established places of business in this judicial district:



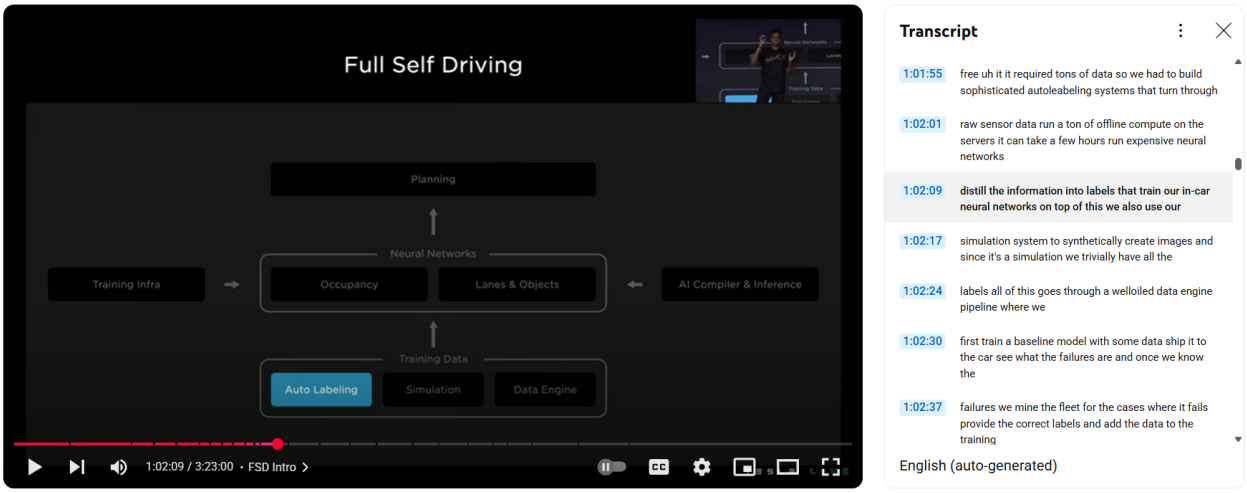


https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla FSD vehicles in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement by using the system of claim 20 of the '579 patent in this judicial district and elsewhere in Texas and the United States. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html. In this judicial district and elsewhere in Texas and the United States, Tesla uses the entire claimed system by putting the system to use via Tesla's FSD system and receiving the benefit of that use, such as autonomously controlling a vehicle and/or collecting more data to better train its FSD software. On information

and belief, Tesla also directs and/or controls its customers' actions in putting the entire claimed system to service in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html (Elon Musk wrote an email to Tesla employees stating that "Going forward, it is mandatory in North America to install and activate FSD V12.3.1 and take customers on a short test ride before handing over the car. … Almost no one actually realizes how well (supervised) FSD actually works. I know this will slow down the delivery process, but it is nonetheless a hard requirement.").

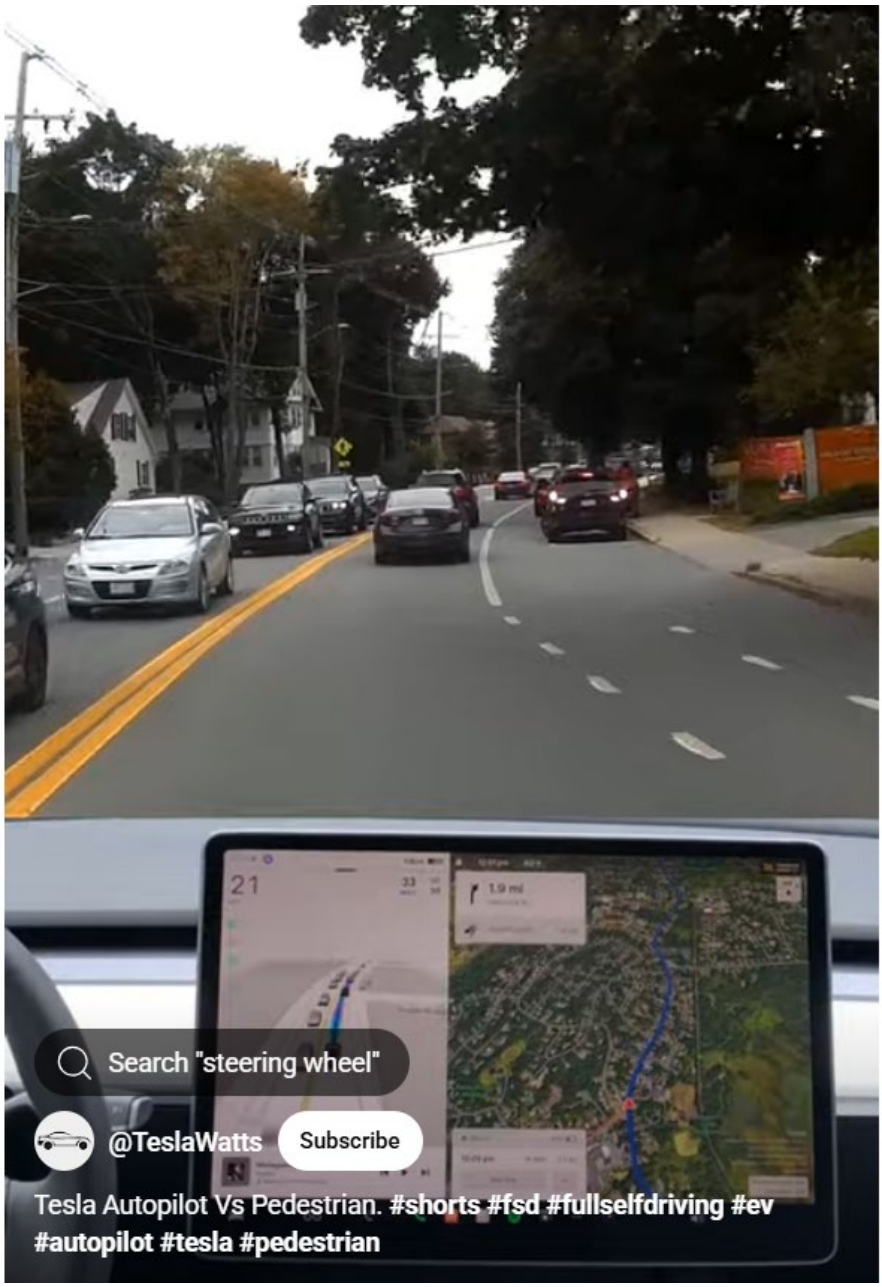
153. On information and belief, Tesla performs a method for navigating autonomous vehicles of claim 1 of the '579 patent as described below. *See* https://www.tesla.com/fsd ("Watch the World's First Autonomous Car Delivery").

154. On information and belief, Tesla trains a probabilistic neural network. For example, Tesla datacenters (e.g., Dojo and/or Cortex) receive videos from the Tesla fleet that are used to train the FSD software. *See* https://electrek.co/2020/10/24/tesla-collecting-insane-amount-data-full-self-driving-test-fleet/ ("Tesla asked owners for the authorization to collect videos from the Autopilot cameras. After that, Tesla opened the floodgates of Autopilot data gathering."). The FSD software is a probabilistic neural network:



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (describing Tesla's datacenters as being used to "train [Tesla's] in-car neural networks").

155. On information and belief, the probabilistic neural network is configured to receive as input, an image of traffic, the image displaying a traffic entity belonging to the traffic. For example, the FSD software is configured to receive images from the camera sensors on the Tesla vehicle. Such images correspond to a traffic entity, such as the vehicles in the oncoming lane. This is evidenced by the fact that the Tesla displays representations of such traffic entities on the display screen:

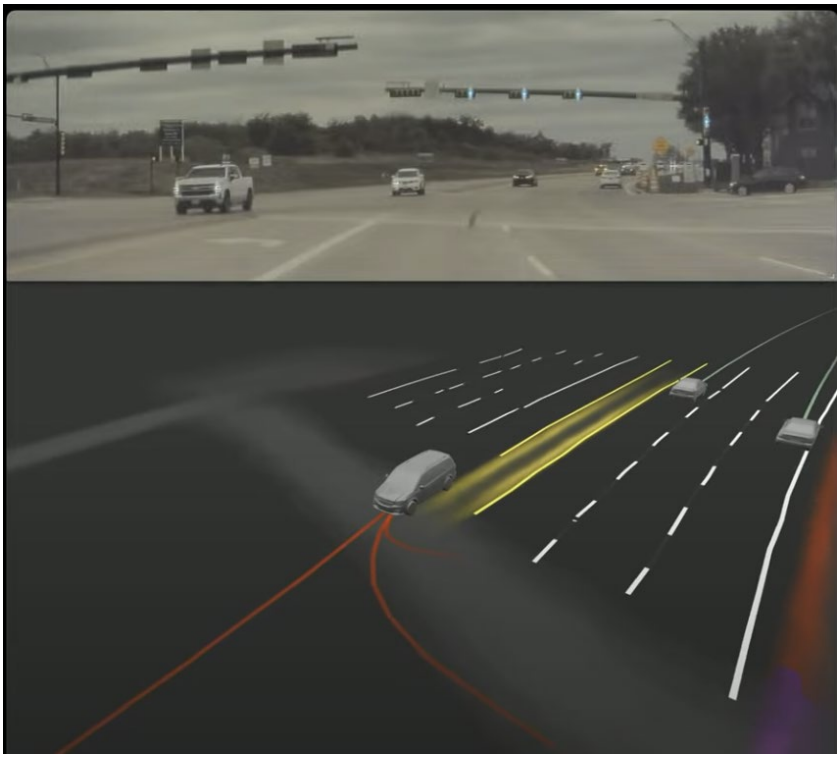


https://www.youtube.com/shorts/-fJzjyi6HkI.

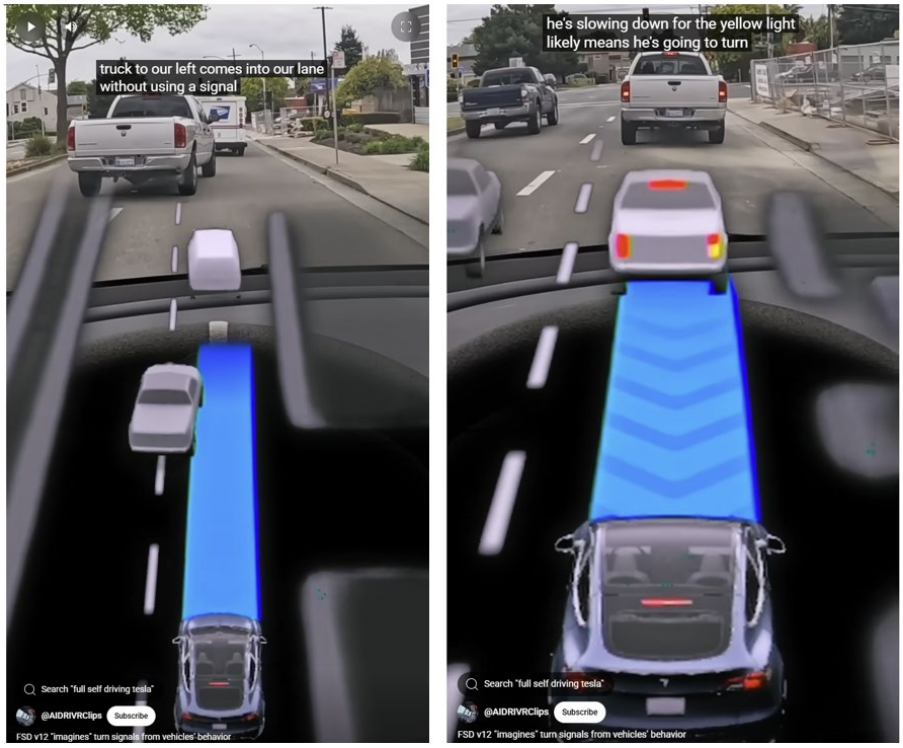
156. On information and belief, the probabilistic neural network is configured to generate a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature. For example, the FSD software is configured to produce a vector space. *See* https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (explaining that "across the full FSD platform all of these neural networks running in the car

together produce the vector space which is again the model of the world around the robot or car."). The FSD software uses the feature vector to provide a numerical representation of the vehicle's surroundings, such as road edges.

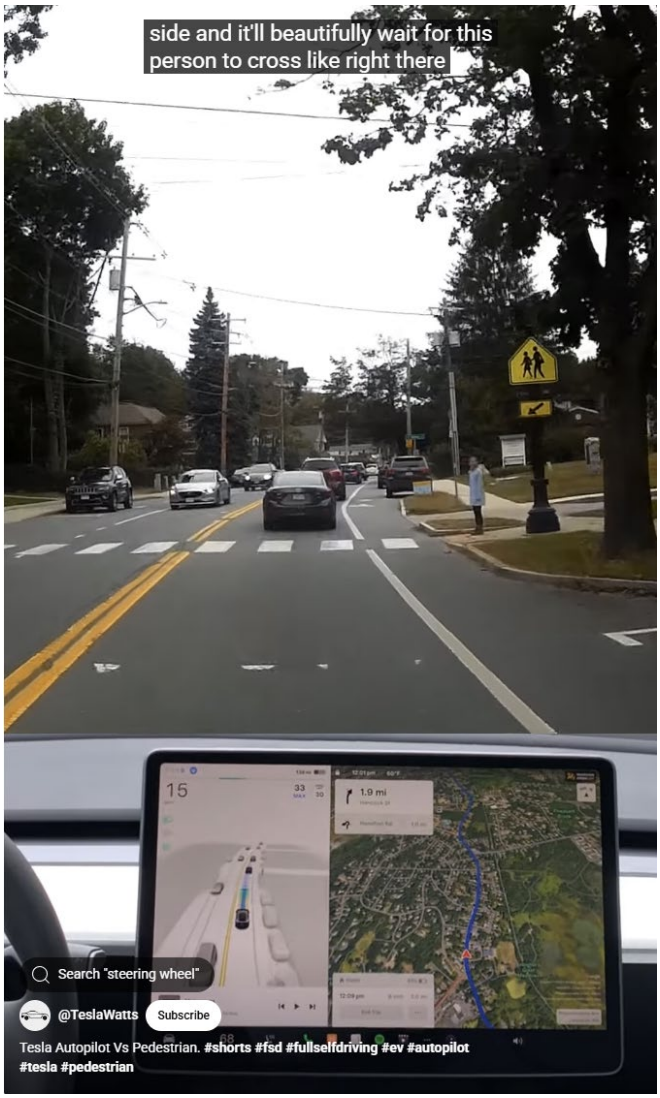
157. On information and belief, the probabilistic neural network is configured to generate output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image. For example, the FSD software is configured to generate output representing hidden context for the traffic entity. This is evidenced by the fact that the Tesla displays evidence of such hidden context and reacts to traffic entities, such as pedestrians on the side of the road:



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (predicting whether the road user will continue forward, make a left turn, or a u-turn).

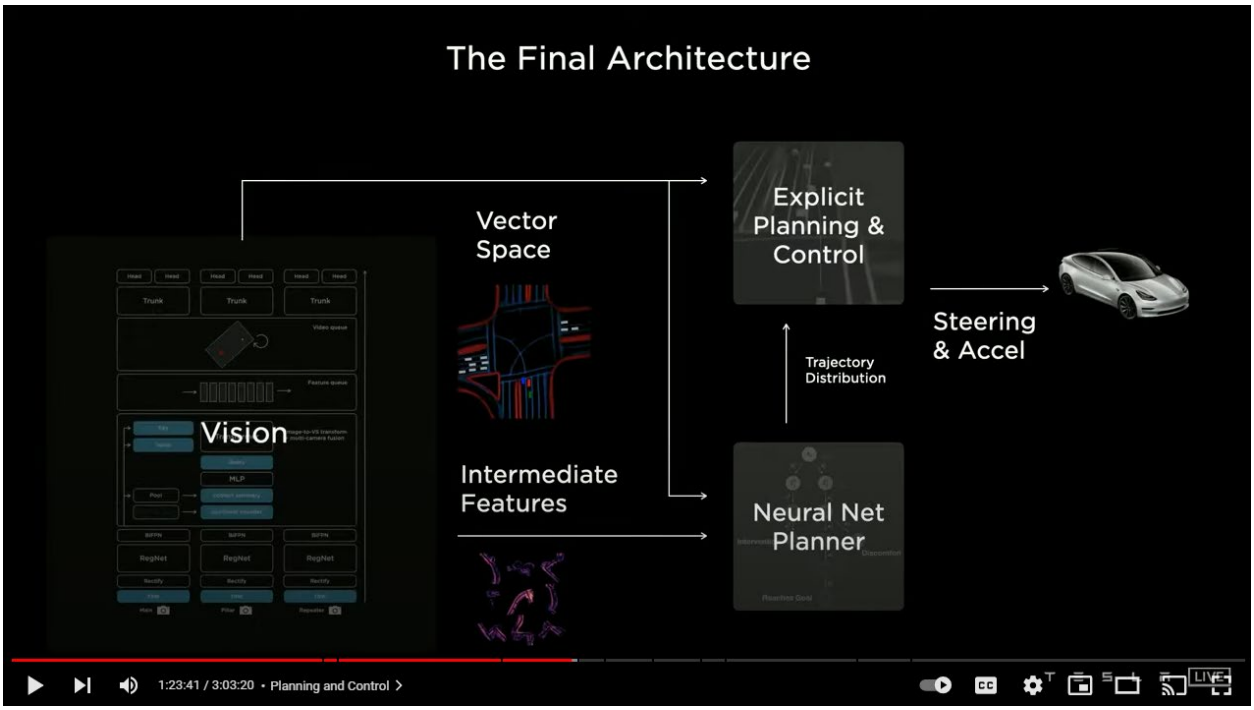


https://www.youtube.com/shorts/KVa4GWepX74 (ultimately predicting that the road user will make a right hand turn, rather than continue straight, as illustrated by the predicted right-hand turn blinker that is not actually used by the actual road user).



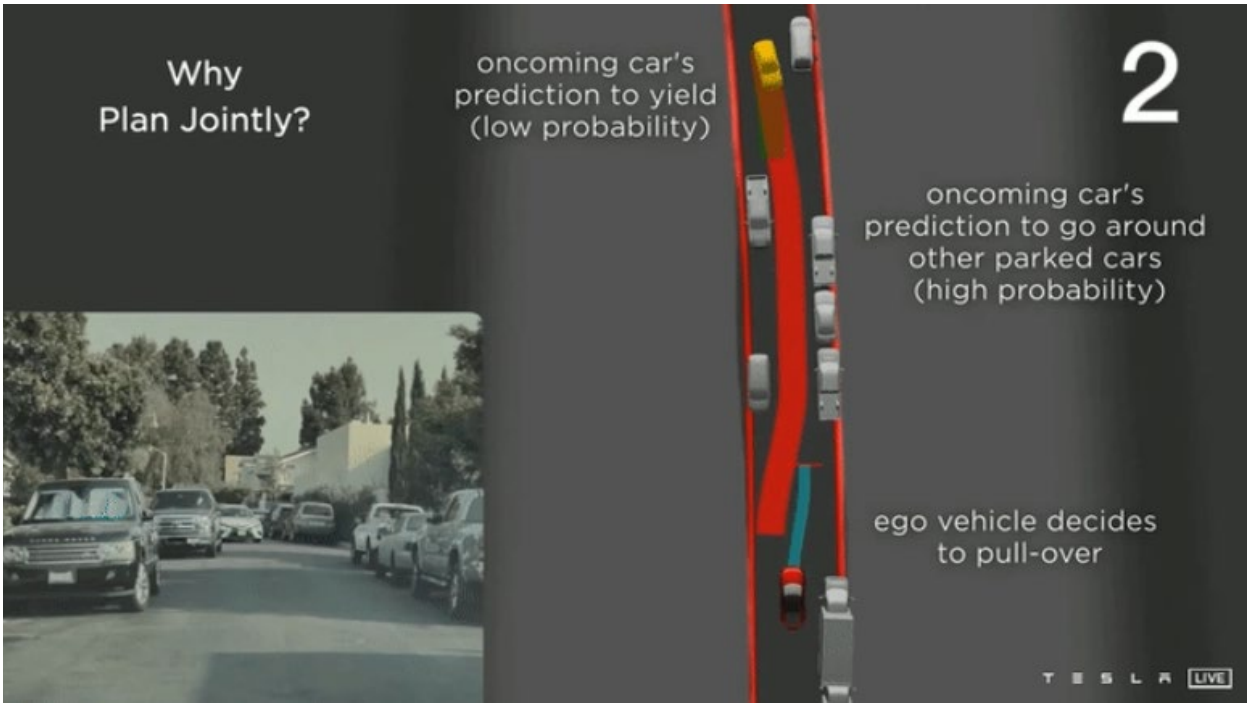
https://www.youtube.com/shorts/-fJzjyi6HkI (predicting that the pedestrian road user is likely to cross the road, rather than continue to stand). The generated output comprises values, such as probabilities, corresponding to how a user might react to such hidden context. This is evidenced in part by the fact that Tesla trained the FSD using driving videos "from humans when they handled a situation well," and corresponded to things "a five-star Uber driver would do." https://www.cnbc.com/2023/09/09/ai-for-cars-walter-isaacson-biography-of-elon-musk-excerpt.html.

158. Further, on information and belief, Tesla, at its datacenters (e.g., Dojo and/or Cortex), train the FSD software, which is a probabilistic neural network, that is configured to generate a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature.



See, e.g., www.youtube.com/watch?v=j0z4FweCy4M (Tesla AI Day 2021) (stating "So this is what a final architecture is going to look like. The vision system is going to crush down the dense video data into a vector space. It's going to be consumed by both an explicit planner and a neural network planner. In addition to this, the network planner can also consume intermediate features of the network. Together, this produces a trajectory distribution and it can be optimized end to end both with explicit cost functions and human intervention and other imitation data."). The generated feature vector is associated with at least one traffic entity (*e.g.*, the oncoming car in the image below) for a plurality of features (*e.g.*, first feature = probability that the oncoming car will yield;

and second feature = probability that the oncoming vehicle go around the other parked cars), such as for the oncoming vehicle illustrated in the picture below:



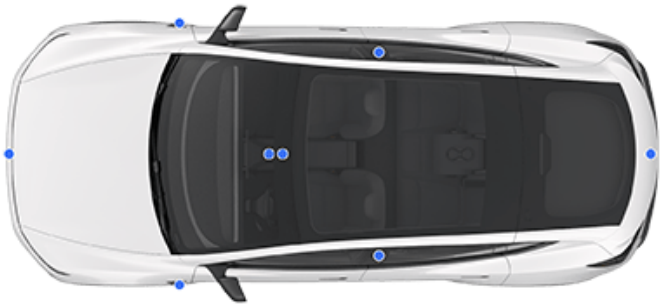
https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021). Continuing with this example, the feature vector comprises values describing statistical distribution for each feature. On information and belief, the first value may be a low number indicating a low statistical chance that the first feature as to whether the oncoming car will yield, and the second value may be a high number indicating a high statistical chance that the second feature as to whether the oncoming car will go around other parked cars. These values correspond to the statistical distribution received by user responses from one or more users (e.g., Tesla labelers) presented with this image and indicating their prediction as to hidden context regarding the state of mind of the driver of the oncoming car to predict whether that driver will yield or go around other parked cars (or some other action). The FSD software then generates output representing these values as

illustrated in the image above showing a low likelihood green path of the oncoming car yielding and a high likelihood red path of the oncoming car going around other parked cars.

159. On information and belief, Tesla receives a new image captured by a camera mounted on an autonomous vehicle navigating through traffic. For example, while in operation the FSD software receives a new image from one of the cameras on the vehicle:

Cameras

Your Model Y includes the following components that actively monitor the surrounding area:



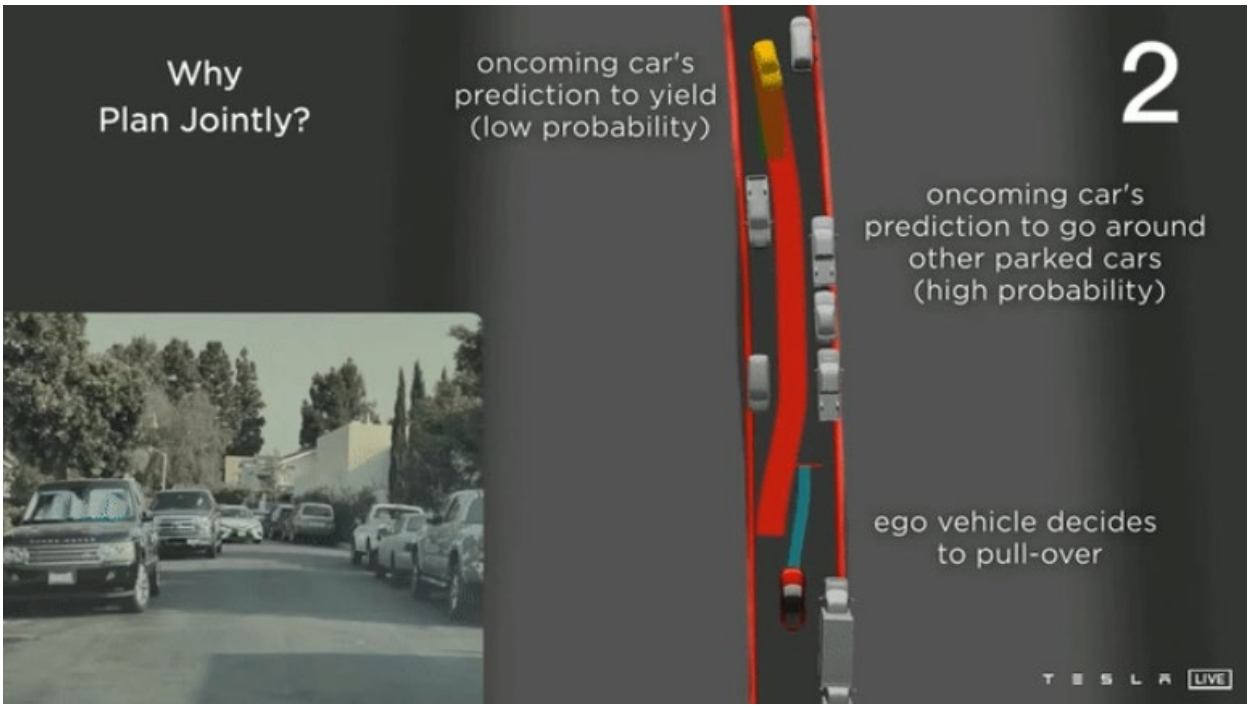
- A camera is mounted above the grille on the front bumper.
- A camera is mounted above the rear license plate.
- A camera is mounted in each door pillar.
- Two cameras are mounted to the windshield above the rear view mirror.
- A camera is mounted to each front fender.

Model Y is also equipped with high precision electronically-assisted braking and steering systems.

https://www.tesla.com/ownersmanual/modely/en_us/GUID-682FF4A7-D083-4C95-925A-5EE3752F4865.html. This is further evidenced by the Tesla display which displays such images:

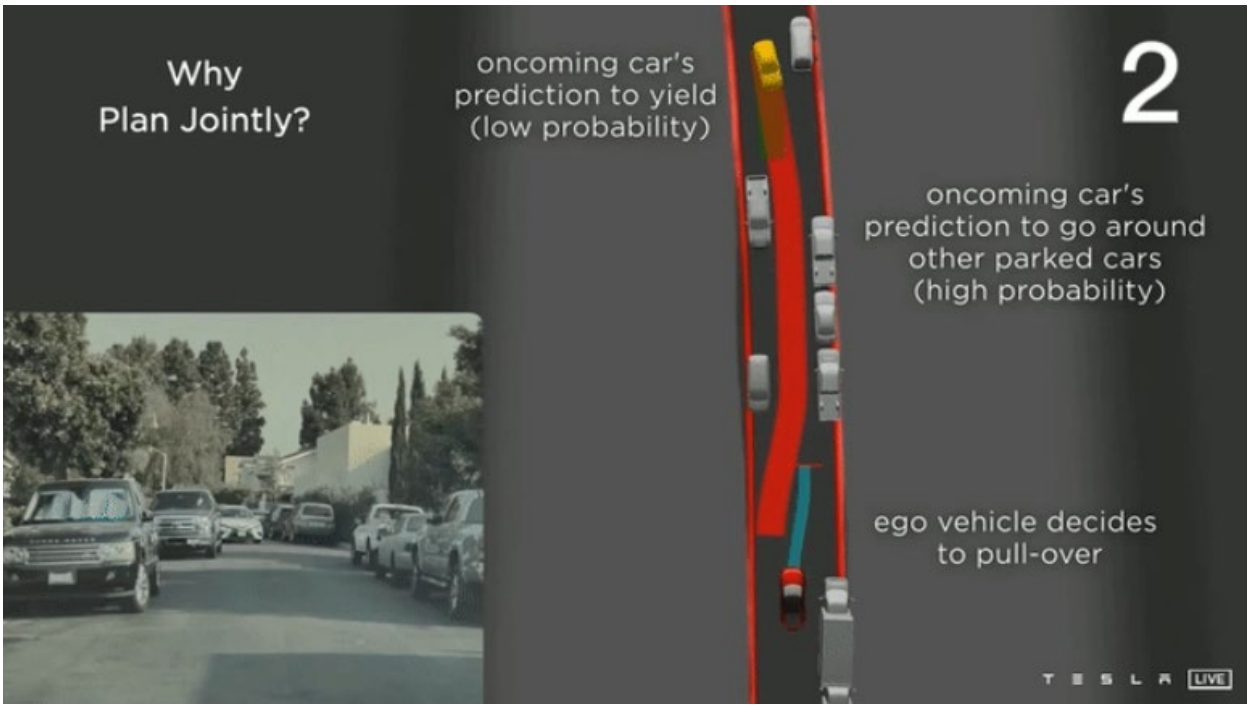
https://www.youtube.com/watch?v=JuwK-vvvYgY.

160. On information and belief, Tesla executes the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image. For example, the probabilistic network of the FSD software is executed to generate output representing hidden context for at least a traffic entity displayed in the new image:



https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

161. On information and belief, Tesla determines a measure of uncertainty for each of the plurality of values and navigates the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network. For example, the FSD software determines a high measure of uncertainty for the first value indicating a low probability that the oncoming car will yield and a low measure of uncertainty for the second value indicating a high probability that the oncoming car will go around other parked cars. Thus, the FSD software navigates the vehicle to pull-over as illustrated below:



https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

162. The specific ways in which the '579 Accused Products are configured to support the aforementioned features are further detailed in proprietary documents and/or source code that evidence infringement by the '579 Accused Products.

163. The technology discussion above and the exemplary '579 Accused Products provide context for Plaintiff's infringement allegations.

164. The '579 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

165. The claims of the '579 patent are patent eligible under 35 U.S.C. § 101.

166. The '579 patent issued from U.S. Patent Application No. 16/783,845, filed on February 6, 2020. The '579 patent claims the benefit of U.S. Provisional Patent Application Nos. 62/822,269, filed March 22, 2019, and 62/802,151, filed February 6, 2019.

167. The claims of the ’579 patent are entitled to a priority date at least as early as February 6, 2019, the filing date of U.S. Provisional Application No. 62/802,151.

168. The claims of the ’579 patent are not directed to any abstract idea.

169. The claims of the ’579 patent are not merely directed to using a machine learning model to drive a car. Instead, the claims of the ’579 patent are directed to specific technological improvements of autonomous vehicles for predicting the behavior of objects near the autonomous vehicle. The claims of the ’579 patent specifically claim improvements to the functionality of computer systems for autonomous vehicles. Also, the claims of the ’579 patent address problems specifically rooted in the field of computer systems for autonomous vehicles.

170. The claims of the ’579 patent recite inventive concepts.

171. Additionally, the claims of the ’579 patent do not recite subject matter that is well-understood, routine, or conventional as of February 6, 2019, the filing date of U.S. Provisional Application No. 62/802,151.

172. In its motion to dismiss (Dkt. 30), Tesla did not dispute that the claims of the ’579 patent are entitled to the priority date of U.S. Provisional Application No. 62/802,151.

173. The ’579 patent specifically describes and identifies certain problems with autonomously operating a car. As the ’579 patent states:

> Conventional systems predict motion of non-stationary objects using kinematics. For example, autonomous vehicles may rely on methods that make decisions on how to control the vehicles by predicting motion vectors of objects near the vehicles. This is accomplished by collecting data of an objects current and past movements, determining a motion vector of the object at a current time based on these movements, and extrapolating a future motion vector representing the object's predicted motion at a future time based on the current motion vector. However, these techniques fail to predict motion of certain non-stationary objects for example, pedestrians, bicyclists, and so on. For example, if the autonomous vehicle detects a pedestrian standing in a street corner, the motion

> of the pedestrian does not help predict whether the pedestrian will cross the street or whether the pedestrian will remain standing on a street corner. Similarly, if the autonomous vehicle detects a bicyclist in a lane, the current motion of the bicycle does not help the autonomous vehicle predict whether the bicycle will change lanes. Failure of autonomous vehicles fail to accurately predict motion of non-stationary traffic objects results in unnatural movement of the autonomous vehicle, for example, as a result of the autonomous vehicle suddenly stopping due to a pedestrian moving in the road or the autonomous vehicle continuing to wait for a person to cross a street even if the person never intends to cross the street.

'579 patent, 1:38-62.

174. In addition, as of February 2019, there were numerous shortcomings in the field of autonomous vehicles that are addressed by the inventions of the claims of the '579 patent.

175. For example, Tesla did not release a beta version of its FSD software until October 2020. *See* https://www.theverge.com/2020/10/21/21527577/tesla-full-self-driving-autopilot-beta-software-update (Ex. 12). As part of that release, Tesla CEO Elon Musk indicates that "Tesla was approaching this software update 'very cautiously' because the 'world is a complex and messy place.'" *Id.* In addition, according to a warning message that Tesla drivers received when given the option to enable the FSD software in its beta, Tesla's FSD software "may do the wrong thing at the worst time." *See* https://dawnproject.com/wp-content/uploads/2022/09/FSD-Beta-warning.png (Ex. 13).

176. In addition, as of June 2017, researchers at the Australian Centre for Field Robotics (ACFR) at the University of Sydney (NSW, Australia) commented that:

> Advanced driver assistance systems (ADAS) are increasingly seen as a mechanism to improve the safety and efficiency of transportation by understanding and reacting to potential vehicle safety threats using state-of-the-art sensing and algorithms. A major component of these systems is the ability to infer the future intentions of drivers to predict the likelihood of potential collisions. This is a challenging task, particularly in intersections where complex traffic scenarios result in a proportionally high number of

> accidents. Human drivers are able to estimate the future trajectory of other vehicles from a combination of potentially subtle cues – the combination of the various kinematic properties - and the position of the vehicle on the road relative to the lane. Being able to reproduce this driver intuition in a computer model is still an open area of research.

Zyner et. al., "Long Short Term Memory for Driver Intent Prediction," 2017 IEEE Intelligent Vehicles Symposium (IV) June 11-14, 2017, Redondo Beach, CA, USA (Ex. 14).

177. Similarly, in 2017, researchers from the Institute for Intelligent Systems Research and Innovation at Deakin University in Australia noted that autonomous vehicles "still have some difficulties specially when it comes to driving in urban traffic environment such as the interaction with Vulnerable Road Users (VRUs) such as pedestrians. Intuitively, interactions take place nowadays between human drivers and pedestrians are based on implicit cues between the two parties." Saleh et al., "Intent Prediction of Vulnerable Road Users from Motion Trajectories Using Stacked LSTM Network," 2017 IEEE 20th International Conference on Intelligent Transportation Systems (ITSC): Workshop (Ex. 15). *See also* Casas et al., "IntentNet: Learning to Predict Intention from Raw Sensor Data", 2nd Conference on Robot Learning , Zurich, Switzerland (2018) (Ex. 16) ("While a plethora of systems have been built in the past few decades, many challenges still remain. One of the fundamental difficulties is that self driving vehicles have to share the roads with human drivers, which can perform maneuvers that are difficult to predict."); Zyner et al., "Naturalistic Driver Intention and Path Prediction Using Recurrent Neural Networks", IEEE Transactions on Intelligent Transportation Systems, Vol. 21, No. 4 (April 2020) (Ex. 17) ("Driving vehicles is a highly skilled task that requires extensive understanding of the intentions of other road users. This knowledge allows drivers to safely navigate an area through other traffic. While this may become second nature to an experienced human driver, properly understanding the intentions of other drivers is still an unsolved problem for Advanced Driver Assistance Systems

(ADAS), and by extension, autonomous vehicles."); Rasouli et al., "Are They Going to Cross? A Benchmark Dataset and Baseline for Pedestrian Crosswalk Behavior", 2017 IEEE International Conference on Computer Vision Workshops, Venice, Italy, 2017 (Ex. 18) ("Designing autonomous vehicles suitable for urban environments remains an unresolved problem. One of the major dilemmas faced by autonomous cars is how to understand the intention of other road users and communicate with them. The existing datasets do not provide the necessary means for such higher level analysis of traffic scenes").

178. In addition, the USPTO, in *Ex parte Desjardins*, recently rejected the Board's findings that a patent application directed to learning models and artificial intelligence was abstract stating: "Under a charitable view, the overbroad reasoning of the original panel below is perhaps understandable given the confusing nature of existing § 101 jurisprudence, but troubling, because this case highlights what is at stake. Categorically excluding AI innovations from patent protection in the United States jeopardizes America's leadership in this critical emerging technology. Yet, under the panel's reasoning, many AI innovations are potentially unpatentable-even if they are adequately described and nonobvious-because the panel essentially equated any machine learning with an unpatentable "algorithm" and the remaining additional elements as "generic computer components," without adequate explanation. Dec. 24. Examiners and panels should not evaluate claims at such a high level of generality. However, it is with this view that the panel's *sua sponte* action is most troubling, as it eschewed the clear teachings of *Enfish*, and instead substituted only a cursory analysis that ignored this well-settled precedent. Panels should treat such precedent with more care, especially when acting *sua sponte*. At the same time, the claims at issue stand rejected under§ 103. This case demonstrates that§§ 102, 103 and 112 are the traditional and appropriate tools to limit patent protection to its proper scope. These statutory provisions should be the focus

of examination. For these reasons, we determine that although independent claim 1 may recite an abstract idea, it is not directed to an abstract idea. Instead, we determine that independent claim 1, when considered as a whole, integrates an abstract idea into a practical application." *Ex parte Desjardins*, Appeal No. 2024-000567, Decision on Request for Rehearing (Sept. 26, 2025), *available at* https://www.uspto.gov/sites/default/files/documents/202400567-arp-rehearing-decision-20250926.pdf.

179. The '579 patent specifically describes and claims novels methods, non-transitory computer readable storage media, and systems which address these shortcomings of then-existing autonomous vehicle systems. The '579 patent also specifically describes and claims novels methods, non-transitory computer readable storage media, and systems which provide improvements in the functionality of autonomous vehicle systems and addresses problems specifically rooted in the field of autonomous vehicle systems.

180. For example, claim 1 of the '579 patent recites "[a] method for navigating autonomous vehicles" comprising "training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:" "receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic," "generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature," "generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;" "receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;" "executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;" "determining a measure of uncertainty for each of the plurality of values;" and

"navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network."

181. Claim 1 improves the functionality of an autonomous vehicle by "training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:" "receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic," "generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature," "generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;" "receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;" "executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;" "determining a measure of uncertainty for each of the plurality of values;" and "navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network." By "training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:" "receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic," "generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature," "generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;" "receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;"

"executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;" "determining a measure of uncertainty for each of the plurality of values;" and "navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network," the method of claim 1 allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:" "receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic," "generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature," "generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;" "receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;" "executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;" "determining a measure of uncertainty for each of the plurality of values;" and "navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network," allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

182. Claim 13 of the '579 patent similarly recites "[a] non-transitory computer readable storage medium storing instructions, that when executed by a processor, cause the processor to perform steps" comprising "training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:" "receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic," "generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature, and" "generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;" "receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;" "executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;" "determining a measure of uncertainty for each of the plurality of values;" and "navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network."

183. Claim 13 improves the functionality of an autonomous vehicle by "training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:" "receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic," "generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature, and" "generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;" "receiving a new image captured by a camera mounted on an autonomous vehicle

navigating through traffic;" "executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;" "determining a measure of uncertainty for each of the plurality of values;" and "navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network." By "training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:" "receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic," "generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature, and" "generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;" "receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;" "executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;" "determining a measure of uncertainty for each of the plurality of values;" and "navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network," the non-transitory computer readable storage medium storing instructions of claim 13 allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:" "receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic," "generating a feature vector for a plurality of features, the feature vector comprising values

describing statistical distribution for each feature, and" "generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;" "receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;" "executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;" "determining a measure of uncertainty for each of the plurality of values;" and "navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network," allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

184. Similarly, claim 20 of the '579 patent recites "[a] computer system" comprising "a processor" and "a non-transitory computer readable storage medium storing instructions that when executed by the processor, cause the processor to perform steps" comprising "training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:" "receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic," "generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature," and "generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;" "receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;" "executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;" "determining

a measure of uncertainty for each of the plurality of values;" and "navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network."

185. Claim 20 improves the functionality of an autonomous vehicle by "training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:" "receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic," "generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature," and "generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;" "receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;" "executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;" "determining a measure of uncertainty for each of the plurality of values;" and "navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network." By "training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:" "receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic," "generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature," and "generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;" "receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;"

"executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;" "determining a measure of uncertainty for each of the plurality of values;" and "navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network," the computer system of claim 20 allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "training a probabilistic neural network, the probabilistic neural network configured to perform steps comprising:" "receiving as input, an image of traffic, the image displaying a traffic entity belonging to the traffic," "generating a feature vector for a plurality of features, the feature vector comprising values describing statistical distribution for each feature," and "generating output representing hidden context for the traffic entity, the output comprising a plurality of values, each value representing a likelihood of receiving a particular user response from a user presented with the image;" "receiving a new image captured by a camera mounted on an autonomous vehicle navigating through traffic;" "executing the probabilistic neural network to generate output representing hidden context for at least a traffic entity displayed in the new image;" "determining a measure of uncertainty for each of the plurality of values;" and "navigating the autonomous vehicle to avoid the traffic entity displayed in the new image, the navigation based on at least the measure of uncertainty generated by the probabilistic neural network," allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

186. The dependent claims of the '579 patent provide additional improvements to the functionality of autonomous vehicles and the claimed methods, non-transitory computer readable storage media, and computer systems. For example, dependent claim 2 further improves on claim 1 by specifying that "the values describing statistical distribution for each feature comprise a mean value and a standard deviation for the feature." *See also* claim 14. Dependent claim 3 further improves on claim 1 by specifying that "training the probabilistic neural network comprises determining evidence lower bound between the plurality of values predicted and a plurality of values determined from user responses obtained from users presented with images from a training dataset." *See also* claim 15. Dependent claim 4 further improves on claim 1 by specifying that "determining the measure of uncertainty for each of the plurality of values comprises: generating a plurality of samples for the input image using the probabilistic neural network; and determining a confidence interval for each of the plurality of values using the plurality of samples." *See also* claim 16. Dependent claim 5 further improves on claim 1 by specifying that "navigating the autonomous vehicle comprises ensuring that the autonomous vehicle stays at least a threshold distance away from the traffic entity displayed in the new image, the threshold distance determined based on the measure of uncertainty generated by the probabilistic neural network." *See also* claim 17. Dependent claim 6 further improves on claim 1 by specifying that "the threshold distance is determined to be a value directly related to the measure of uncertainty generated by the probabilistic neural network." *See also* claim 18. Dependent claim 7 further improves on claim 1 by specifying that "the hidden context represents a state of mind of a user represented by the traffic entity." Dependent claim 8 further improves on claim 1 by specifying that "the hidden context represents a task that a user represented by the traffic entity is planning on accomplishing." Dependent claim 9 further improves on claim 1 by specifying that "the hidden context represents

a degree of awareness of the autonomous vehicle by a user represented by the traffic entity." Dependent claim 10 further improves on claim 1 by specifying that "the hidden context represents a goal of a user represented by the traffic entity, wherein the user expects to achieve the goal within a threshold time interval." Dependent claim 11 further improves on claim 1 by specifying that "navigating the autonomous vehicle comprises: generating signals for controlling the autonomous vehicle based on motion parameters and the hidden context of the traffic entity; and sending the generated signals to controls of the autonomous vehicle." *See also* claim 19. Dependent claim 12 further improves on claim 1 by specifying that "the probabilistic neural network is a probabilistic convolutional neural network."

187. These and other processes and their benefits are described in the '579 patent specification as well. For example, Figure 4 of the '579 patent is "a flowchart showing a process of training a machine learning based model to predict hidden context information describing traffic entities, according to some embodiments of the invention." '579 patent, 3:45-48. Figure 4 is reproduced below:

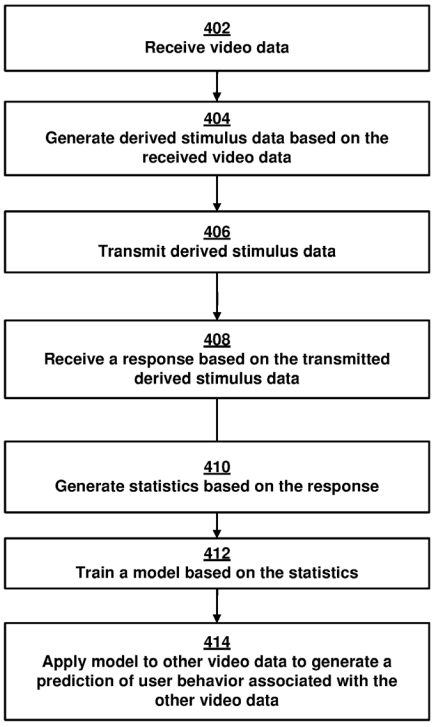


FIG. 4

188. As the '579 patent specification states, "[i]n step 402, this video or other data captured by the camera or other sensor is transmitted from the vehicle 102, over the network 104, and to the server 106 where it is stored." *Id.* at 8:29-32. "Then, in step 404, video frames or segments are extracted from the stored video or other data and are used to create stimulus data including derived stimulus (or stimuli). In one implementation, the derived stimulus corresponds to a scene in which one or more humans are conducting activities (e.g., standing, walking, driving, riding a bicycle, etc.) beside or on a street and/or near a vehicle." *Id.* at 8:33-39. "In step 406, the derived stimulus is transmitted from the server 106 and displayed to a large number of users (or human observers) on the client device 108 (or multiple client devices 108). The client devices(s) 108 prompt the human observers to predict how the people shown in the derived stimulus will act, and upon viewing the displayed stimulus, the observers input their responses corresponding to their predictions. For example, the human observers may predict that a bicyclist will continue

riding, whether a first person in the stimulus will cross the street, whether another person will remain standing on a street corner, and yet another person will change lanes on his or her bicycle. In an illustrative embodiment, the human observers may make a continuous or ordinal judgment about the state of mind or the predicted behavior of the people shown in the derived stimulus and record that judgment. For example, the human observers may select an appropriate icon displayed on the client devices(s) 108 by clicking a mouse or by pressing a key to indicate their judgment or prediction. The judgment or prediction may correspond to the human observers' assessment of the state of mind of the person in the derived stimulus or other awareness or intention that would be relevant to a hypothetical driver who sees the person in the derived stimulus while driving." *Id.* at 8:51-9:7. "In step 408, the derived stimulus and associated human observer responses are transmitted from the client device(s) 108 to the server 106 and recorded in the user response database 110." *Id.* at 9:7-10.

189. As the '579 patent specification describes, "[i]n step 410, summary statistics are generated based on the user responses." *Id.* at 9:11-12. The '579 patent describes that "the statistics may characterize the aggregate responses of multiple human observers to a particular derived stimulus. For instance, if the derived stimulus shows a pedestrian walking on a sidewalk towards an intersection, the response can be categorized in terms of how many human observers believe that the pedestrian will stop upon reaching the intersection, continue walking straight across the intersection, turn a corner and continue walking along the sidewalk without crossing the intersection, etc." *Id.* at 9:12-21.

190. The '579 patent also describes an example of how "the stored statistics and corresponding images . . . are sent over the network 104 to the model training system 112 and used to train a prediction algorithm":

> For example, the collection of images and statistics can be used to train a supervised learning algorithm, which can comprise a random forest regressor, a support vector regressor, a simple neural network, a deep convolutional neural network, a recurrent neural network, a long-short-term memory (LSTM) neural network with linear or nonlinear kernels that are two dimensional or three dimensional, or any other supervised learning algorithm which is able to take a collection of data labeled with continuous values and adapt its architecture in terms of weights, structure or other characteristics to minimize the deviation between its predicted label on a novel stimulus and the actual label collected on that stimulus using the same method as was used on the set of stimuli used to train that network. The model is given data which comprises some subset of the pixel data from the video frames that the summary statistics were generated from. In one implementation, this subset includes the pixel data contained in a bounding box drawn to contain the boundaries of the person, cyclist, motorist and vehicle, or other road user, including their mode of conveyance. In some other implementations, it also includes the entire pixel data from the rest of the image. In one of those implementations, that pixel data is selected according to criteria such as the salience of those features in terms of contrast, lighting, presence of edges, or color. In an additional implementation, the features can include descriptive meta-data about the images such as the dimensions and location of the bounding box, the shape of the bounding box or the change in size or position of the bounding box from one frame to the next.

Id. at 9:47-10:14.

191. The ’579 patent further states that, “[i]n step 414, the prediction engine 114 uses the trained model from the model training system 112 to predict the actual, ‘real-world’ or ‘live data’ behavior of people on or near a road.” *Id.* at 10:15-18. The ’579 patent further explains this prediction process:

> The trained model or algorithm makes a prediction of what a pedestrian or other person shown in the “live data” would do based on the summary statistics and/or training labels of one or more derived stimulus. The accuracy of the model is determined by having it make predictions of novel derived stimuli that were not part of the training images previously mentioned but which do have human ratings attached to them, such that the summary statistics on the novel images can be generated using the same method as was used to generate the summary statistics for the training data, but

> where the correlation between summary statistics and image data was not part of the model training process. The predictions produced by the trained model comprise a set of predictions of the state of mind of road users that can then be used to improve the performance of autonomous vehicles, robots, virtual agents, trucks, bicycles, or other systems that operate on roadways by allowing them to make judgments about the future behavior of road users based on their state of mind.

Id. at 10:29-47.

192. The '579 patent also provides additional descriptions of these processes through its figures and their accompanying descriptions. *See* '579 patent Fig. 5 (which "is a flowchart showing a process of predicting the state of mind of road users using a trained learning algorithm, according to some embodiments of the invention"), Fig. 6(which "is a diagram showing an example of an application of a context user prediction process in an automobile context, according to some embodiments of the invention"), Fig. 7 (which "represents a flowchart illustrating the process of navigating the autonomous vehicle based on hidden context, according to an embodiment," Fig. 8 (which "represents a flowchart illustrating the process of generating training dataset for training of neural network"), Fig. 9 (which "represents a flowchart illustrating the process of training of neural network"), Fig. 10 (which "represents a flowchart illustrating the process of generating training dataset for training of neural network"), Fig. 11 (which ""is a block diagram illustrating components of an example machine able to read instructions from a machine-readable medium and execute them in a processor (or controller)") and their accompanying descriptions.

193. Any functional language in the claims of the '579 patent is not determinative of those such claims being abstract, especially when the claims provide a technical improvement to a computer system, as discussed above. *See, e.g.*, *Evolved Wireless, LLC v. Apple Inc.*, 221 F. Supp. 3d 485, 491 (D. Del. 2016) ("Applying these guidelines in the relevant field of technology

can be somewhat difficult, because '[t]he essence of software is manipulating existing data and generating additional data through algorithms.' *Cal. Inst. of Tech. v. Hughes Commc'ns Inc.*, 59 F. Supp. 3d 974, 987 (C.D. Cal. 2014); *Oplus Techs. Ltd. v. Sears Holding Corp.*, 2013 U.S. Dist. LEXIS 35474, 2013 WL 1003632, at *12 (C.D. Cal. Mar. 4, 2013) ('All software only receives data, applies algorithms, and ends with decisions.'). Ultimately, the Federal Circuit instructs that not all 'claims directed to software ... are inherently abstract.' *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016). Claims 'improv[ing] the functioning of [a] computer' or 'improving an existing technological process' are patent-eligible even if they rely on a mathematical algorithm. *Id.* at 1336; *see also Hughes*, 59 F. Supp. 3d at 993 ('When claims provide a specific computing solution for a computing problem, these claims should generally be patentable, even if their novel elements are mathematical algorithms.')."").

194. The claims of the '579 patent cover patent eligible improvements to autonomous vehicles that were more than well-understood, routine, or conventional activity. The inventions in the '579 patent were years ahead of the release of the accused products and functionalities. Taken alone and together, the limitations of the asserted claims involve an inventive concept. For example, the claim limitations identified above as not being directed to abstract ideas are also claim elements that contain inventive concepts. As discussed above, those claim elements provide an improvement over existing autonomous vehicle systems, methods, and software.

195. Tesla has filed its own patent applications for alleged inventions related to autonomous vehicle technology. Tesla's own patent applications demonstrate that, even after February 2019, autonomous vehicle technology (including prediction of human behavior) was still in its early stages and that improvements to autonomous vehicle technology (including prediction of human behavior) were still needed. Further, in filing those patents application, Tesla

represented to the USPTO that, as of the time of each filing, the alleged inventions in those patent applications were directed to patent eligible subject matter and that, even after February 2019, a need existed for such inventions in the market. This further demonstrates that the inventions claimed in the '579 patent were not well-understood, routine, and conventional in the February 2019 time period but are instead directed to patent eligible subject matter. *See, e.g.*, U.S. Patent Application Publication Nos. 2021/0271259, 2020/0348909, 2023/0176593, 2022/0284712; U.S. Patent Nos. 11,748,620, 11,816,585, 11,537,811, 11,215,999, 11,150,664, 11,636,333, 10,678,244.

196. As discussed above, Tesla did not release a beta version of its FSD software until October 2020. *See* https://www.theverge.com/2020/10/21/21527577/tesla-full-self-driving-autopilot-beta-software-update (Ex. 12). As part of that release, Tesla CEO Elon Musk indicates that "Tesla was approaching this software update 'very cautiously' because the 'world is a complex and messy place.'" *Id.* In addition, according to a warning message that Tesla drivers received when given the option to enable the FSD software in its beta, Tesla's FSD software "may do the wrong thing at the worst time." *See* https://dawnproject.com/wp-content/uploads/2022/09/FSD-Beta-warning.png (Ex. 13). These facts also demonstrate that operating autonomous vehicles was not a well-understood, routine, or conventional activity as of February 2019.

197. In addition, other researchers in the field of autonomous vehicles confirmed that the subject matter of the claims of the '579 patent was not well-understood, routine, or conventional in February 2019. For example, in June 2017, researchers at the Australian Centre for Field Robotics (ACFR) at the University of Sydney (NSW, Australia) commented that:

> Advanced driver assistance systems (ADAS) are increasingly seen as a mechanism to improve the safety and efficiency of transportation by understanding and reacting to potential vehicle safety threats using state-of-the-art sensing and algorithms. A major

> component of these systems is the ability to infer the future intentions of drivers to predict the likelihood of potential collisions. This is a challenging task, particularly in intersections where complex traffic scenarios result in a proportionally high number of accidents. Human drivers are able to estimate the future trajectory of other vehicles from a combination of potentially subtle cues – the combination of the various kinematic properties - and the position of the vehicle on the road relative to the lane. Being able to reproduce this driver intuition in a computer model is still an open area of research.

Zyner et. al., "Long Short Term Memory for Driver Intent Prediction," 2017 IEEE Intelligent Vehicles Symposium (IV) June 11-14, 2017, Redondo Beach, CA, USA (Ex. 14).

198. Similarly, in 2017, researchers from the Institute for Intelligent Systems Research and Innovation at Deakin University in Australia noted that autonomous vehicles "still have some difficulties specially when it comes to driving in urban traffic environment such as the interaction with Vulnerable Road Users (VRUs) such as pedestrians. Intuitively, interactions take place nowadays between human drivers and pedestrians are based on implicit cues between the two parties." Saleh et al., "Intent Prediction of Vulnerable Road Users from Motion Trajectories Using Stacked LSTM Network," 2017 IEEE 20th International Conference on Intelligent Transportation Systems (ITSC): Workshop (Ex. 15). *See also* Casas et al., "IntentNet: Learning to Predict Intention from Raw Sensor Data", 2nd Conference on Robot Learning , Zurich, Switzerland (2018) (Ex. 16) ("While a plethora of systems have been built in the past few decades, many challenges still remain. One of the fundamental difficulties is that self driving vehicles have to share the roads with human drivers, which can perform maneuvers that are difficult to predict."); Zyner et al., "Naturalistic Driver Intention and Path Prediction Using Recurrent Neural Networks", IEEE Transactions on Intelligent Transportation Systems, Vol. 21, No. 4 (April 2020) (Ex. 17) ("Driving vehicles is a highly skilled task that requires extensive understanding of the intentions of other road users. This knowledge allows drivers to safely navigate an area through other traffic. While

this may become second nature to an experienced human driver, properly understanding the intentions of other drivers is still an unsolved problem for Advanced Driver Assistance Systems (ADAS), and by extension, autonomous vehicles."); Rasouli et al., "Are They Going to Cross? A Benchmark Dataset and Baseline for Pedestrian Crosswalk Behavior", 2017 IEEE International Conference on Computer Vision Workshops, Venice, Italy, 2017 (Ex. 18) ("Designing autonomous vehicles suitable for urban environments remains an unresolved problem. One of the major dilemmas faced by autonomous cars is how to understand the intention of other road users and communicate with them. The existing datasets do not provide the necessary means for such higher level analysis of traffic scenes"). That these problems existed in the art demonstrates that the subject matter of the claims of the '579 patent was not well-understood, routine, or conventional as of February 2019.

199. In addition, numerous accidents have been reported since 2019 involving shortcomings of Tesla's autonomous driving systems, its prior Autopilot systems, and other autonomous or semi-autonomous driving systems. *See, e.g.*, https://www.craftlawfirm.com/autonomous-vehicle-accidents-2019-2024-crash-data/ (Ex. 19); https://www.cbsnews.com/news/waymo-car-recall-software-crash-self-driving/ (Ex. 20); https://www.msn.com/en-us/news/us/waymo-is-being-investigated-by-the-feds-for-a-robotaxi-illegally-passing-a-school-bus/ar-AA1OQeGB (Ex. 21); https://www.msn.com/en-us/autos/news/driver-fell-asleep-at-wheel-of-autopilot-driven-tesla-before-it-hit-police-car/ar-AA1Px1Ku (Ex. 22); https://ktar.com/arizona-news/self-driving-uber-car-fatally-runs-over-pedestrian-in-tempe/1994638/ (Ex. 23); https://www.msn.com/en-us/autos/news/waymo-autonomous-vehicle-involved-in-multicar-crash-apd-says/ar-AA1Prszz (Ex. 24); https://www.msn.com/en-us/pets-and-animals/pets/a-week-after-a-waymo-self-driving-car-

killed-a-beloved-cat-san-francisco-still-mourns/ar-AA1PFvoq (Ex. 25); https://www.latimes.com/business/story/2025-08-01/tesla-must-pay-243-million-over-fatal-autopilot-crash (Ex. 26); https://www.techspot.com/news/110085-tesla-robotaxis-already-crashing-austin-data-points-gaps.html (Ex. 27); https://electrek.co/2018/06/07/tesla-fatal-crash-autopilot-ntsb-releases-preliminary-report (Ex. 28); https://www.theguardian.com/technology/2024/apr/26/tesla-autopilot-fatal-crash (Ex. 29); https://techcrunch.com/2024/02/13/waymo-recall-crash-software-self-driving-cars (Ex. 30); https://www.upi.com/Top_News/US/2024/06/13/waymo-recall-robotaxi-crash/2251718311972 (Ex. 31); https://abcnews.go.com/Business/tesla-autopilot-steered-driver-barrier-fatal-crash-ntsb/story?id=68936725 (Ex. 32); https://www.reuters.com/business/autos-transportation/nhtsa-opens-probe-into-24-mln-tesla-vehicles-over-full-self-driving-collisions-2024-10-18/ (Ex. 33); https://www.cnn.com/2021/08/27/cars/toyota-self-driving-vehicle-paralympics-accident (Ex. 34). These incidents likewise demonstrate that operating autonomous vehicles was not a well-understood, routine, or conventional activity as of February 2019.

200. At a minimum, Tesla has known about the ’579 patent and its infringement of the ’579 patent at least as early as the filing date of the Original Complaint. In addition, on information and belief, Tesla was aware of Perceptive’s patent portfolio, monitored Perceptive’s patent portfolio, and it and/or its agents substantially cited to Perceptive’s patents in connection with prosecuting Tesla patents, all prior to the filing of the Original Complaint.

201. On information and belief, since at least the above-mentioned dates when Tesla was on notice of its infringement, Defendant has indirectly infringed the ’579 patent in violation of 35 U.S.C. § 271(b) at least by inducing customers to purchase the Accused Products and/or by

instructing customers how to use and/or make the Accused Products in a way that directly infringes the asserted claims of the '579 Patent. *See, e.g.,* infringement allegations in this Count and Ex. 8.

202. On information and belief, Defendant's actions represented a specific intent to induce infringement of the asserted claims, including at least claims 1 and 20 of the '579 patent. In this judicial district and elsewhere in Texas and the United States, Defendant has offered its customers and prospective customers extensive customer support and instructions that instruct and encourage its customers to infringe the '579 patent via at least the making and/or use of the Accused Products in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, materials cited in Ex. 8; https://www.tesla.com/drive (advertisement for Tesla demo drives using FSD in this judicial district and elsewhere in Texas and the United States); https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html (Elon Musk wrote an email to Tesla employees requiring them to encourage and instruct customer to install and use the accused FSD functionality in Tesla vehicles); https://www.tesla.com/ms/order/ (delivery of Tesla vehicle occurs at customer location and/or at a Tesla regular and established place of business in this judicial district and elsewhere in Texas and the United States); https://www.tesla.com/fsd (Tesla encouraging and instructing customers to demo drive a Tesla car with FSD and install/activate FSD in their Tesla vehicles to drive for the customer avoiding bikes, motorcycles, and other cars); https://www.tesla.com/ownersmanual/modely/en_us/GUID-2CB60804-9CEA-4F4B-8B04-09B991368DC5.html. In addition, Tesla's website is accessible in this judicial district and, as discussed and cited herein, is further evidence of Tesla's acts of indirect infringement in this judicial district. In this judicial district and elsewhere in Texas and the United States, Tesla induces its customers and prospective customers to use the entire claimed system of claim 20 by putting

the system to use via Tesla's FSD system and receiving the benefit of that use, such as autonomously controlling a vehicle. In this judicial district and elsewhere in Texas and the United States, Tesla induces its customers to make the system of claim 20 by installing the FSD software via over the air updates.

203. In addition, by receiving notice of the '579 patent and Defendant's infringement thereof, Defendant obtained a subjective belief that there is a high probability that the Accused Products infringe the '579patent. Despite being put on notice of infringement, on information and belief Defendant has not taken actions to avoid the conduct alleged to infringe, has not offered any reasons as to why Defendant does not infringe the '579 patent, and has not sought to remedy its infringements by offering to take a license. Defendant's failure to act reflects deliberate actions to avoid learning that the Accused Products infringe the '579 patent and, more generally, a policy of not earnestly reviewing and respecting the intellectual property of others.

204. Since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the '579 patent. Tesla intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the '579 Accused Products, creating and/or maintaining established distribution channels for the '579 Accused Products into and within the United States, manufacturing the '579 Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the '579 Accused Products, and/or providing technical support,

replacement parts, or services for these products to these purchasers in the United States. *See, e.g.*, https://www.tesla.com/fsd.

205. On information and belief, despite having knowledge of the '579 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '579 patent, Tesla has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. Tesla's infringing activities relative to the '579 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

206. Perceptive has been damaged as a result of Tesla's infringing conduct described in this Count. Tesla is, thus, liable to Perceptive in an amount that adequately compensates Perceptive for Tesla's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT IV

(INFRINGEMENT OF U.S. PATENT NO. 11,520,346)

207. Plaintiff incorporates paragraphs 1 through 206 herein by reference.

208. Perceptive is the assignee of the '346 patent, entitled "Navigating Autonomous Vehicles Based on Modulation of a World Model Representing Traffic Entities," with ownership of all substantial rights in the '346 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements. A copy of the '346 patent is attached hereto as Exhibit 4.

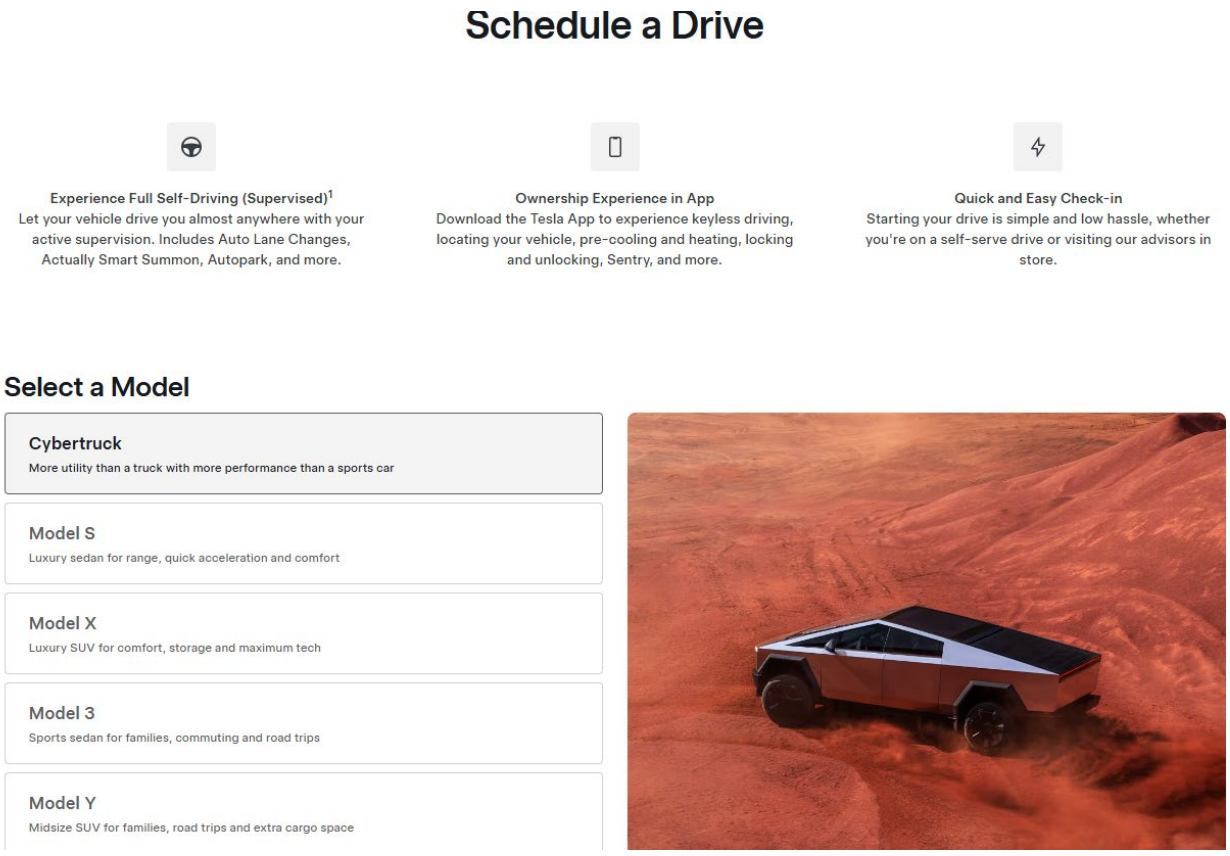
209. Tesla has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims including at least claims 1 and 19 of the '346 patent in this

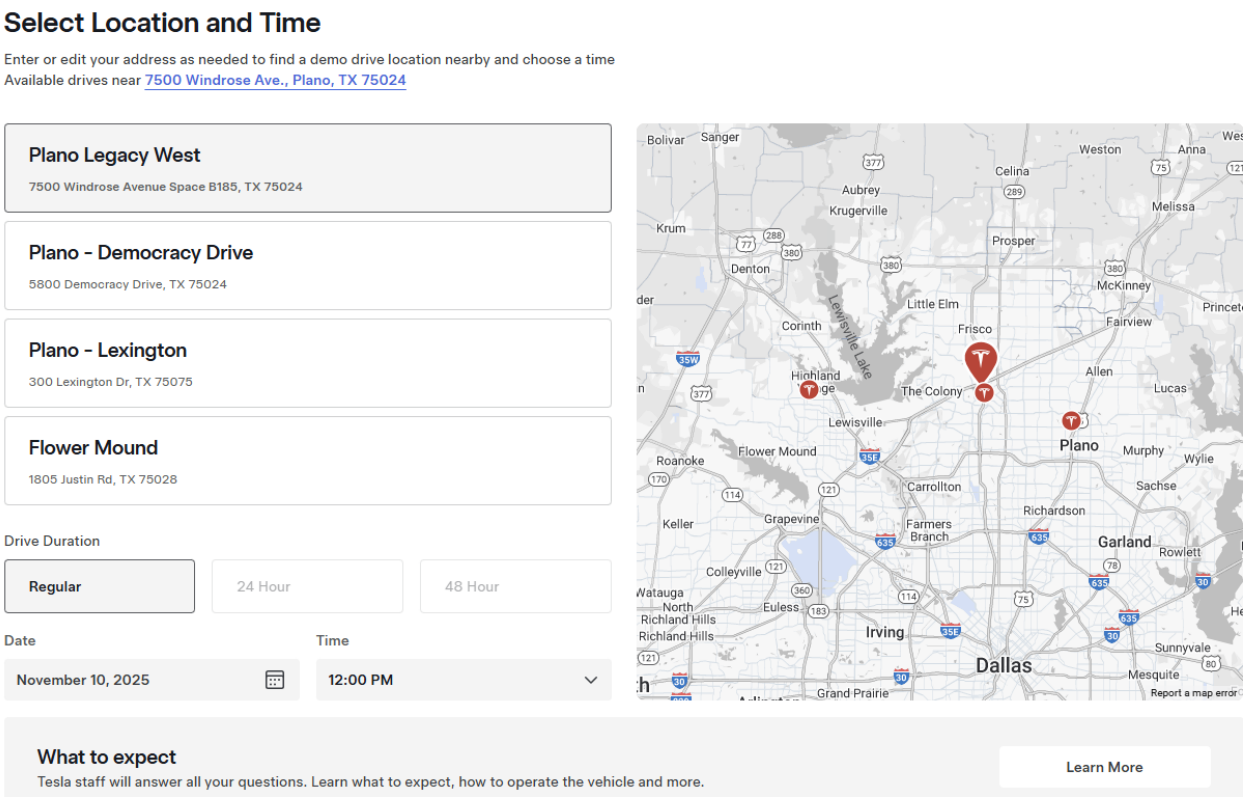
judicial district and elsewhere in Texas and the United States by making, using, testing, offering for sale, selling, and/or importing systems that comprise Tesla vehicles with FSD software and hardware and/or Tesla systems that support Tesla vehicles with FSD software and hardware (the '346 Accused Products). Such infringement includes, but is not limited to, the making, using, offering for sale, and/or selling of '346 Accused Products that leverage and infringe the inventions of the '346 patent. The infringement allegations of the asserted claims of the '346 patent, including claims 1 and 19 of the '346 patent, is also embodied in Plaintiff's preliminary infringement contentions, which are incorporated by reference. *See* Ex. 9.

210. On information and belief, Tesla directs and controls the '346 Accused Products to operate in an infringing manner by providing the components, including the requisite FSD hardware and software instructions, that infringe the '346 patent. Furthermore, Tesla installs, services, and/or maintains the '346 Accused Products that it provided to its customers. Tesla owns and controls the FSD software that automatically runs on and directs and controls the '346 Accused Products. Through its provision of the FSD software, Tesla causes the '346 Accused Products to perform the functionality recited by the asserted claims. Tesla further controls the performance of the claimed method steps of the '346 Accused Products by conditioning receipt of warranty benefits on the customer's agreement not to modify the '346 Accused Products. *See, e.g.,* https://digitalassets.tesla.com/tesla-contents/image/upload/tesla-new-vehicle-limited-warranty-en-us.pdf. Furthermore, Tesla owns vehicles and the training networks (*e.g.*, Dojo and/or Cortex) that infringe the asserted claims.

211. Each Tesla vehicle with FSD software and hardware infringes the method of at least claim 1 of the '346 patent in this judicial district and elsewhere in Texas and the United States. For example, Tesla performs each of the steps of claim 1 via Tesla FSD vehicles owned by Tesla

and/or third parties that use FSD in this judicial district and elsewhere in Texas and the United States. Furthermore, Tesla infringes via Tesla owned FSD vehicles that are test driven, by Tesla employees and/or customers, using FSD at Tesla's regular and established places of business in this judicial district:





https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla FSD vehicles in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement of claim 1 of the '346 patent in this judicial district and elsewhere in Texas and the United States. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html.

212. Each Tesla vehicle configured with FSD infringes at least claim 19 of the '346 patent. For example, Tesla offers to sell and/or sells infringing Tesla FSD vehicles in this judicial district and elsewhere in Texas and the United States. For example, Tesla employees offer to sell

and/or sell Tesla FSD vehicles to a customer after the customer's demo drive at one of Tesla's regular and established places of business in this judicial district:

After Your Demo Drive

Return your Tesla vehicle and get your questions answered by a Tesla Advisor. If you are ready to order your Tesla vehicle, a Tesla Advisor can also walk you through how you can design and order your vehicle. You can also view and explore our existing inventory of Tesla vehicles online at any time.

https://www.tesla.com/support/demo-drive.

Schedule a Drive

Experience Full Self-Driving (Supervised)[1]
Let your vehicle drive you almost anywhere with your active supervision. Includes Auto Lane Changes, Actually Smart Summon, Autopark, and more.

Ownership Experience in App
Download the Tesla App to experience keyless driving, locating your vehicle, pre-cooling and heating, locking and unlocking, Sentry, and more.

Quick and Easy Check-in
Starting your drive is simple and low hassle, whether you're on a self-serve drive or visiting our advisors in store.

Select a Model

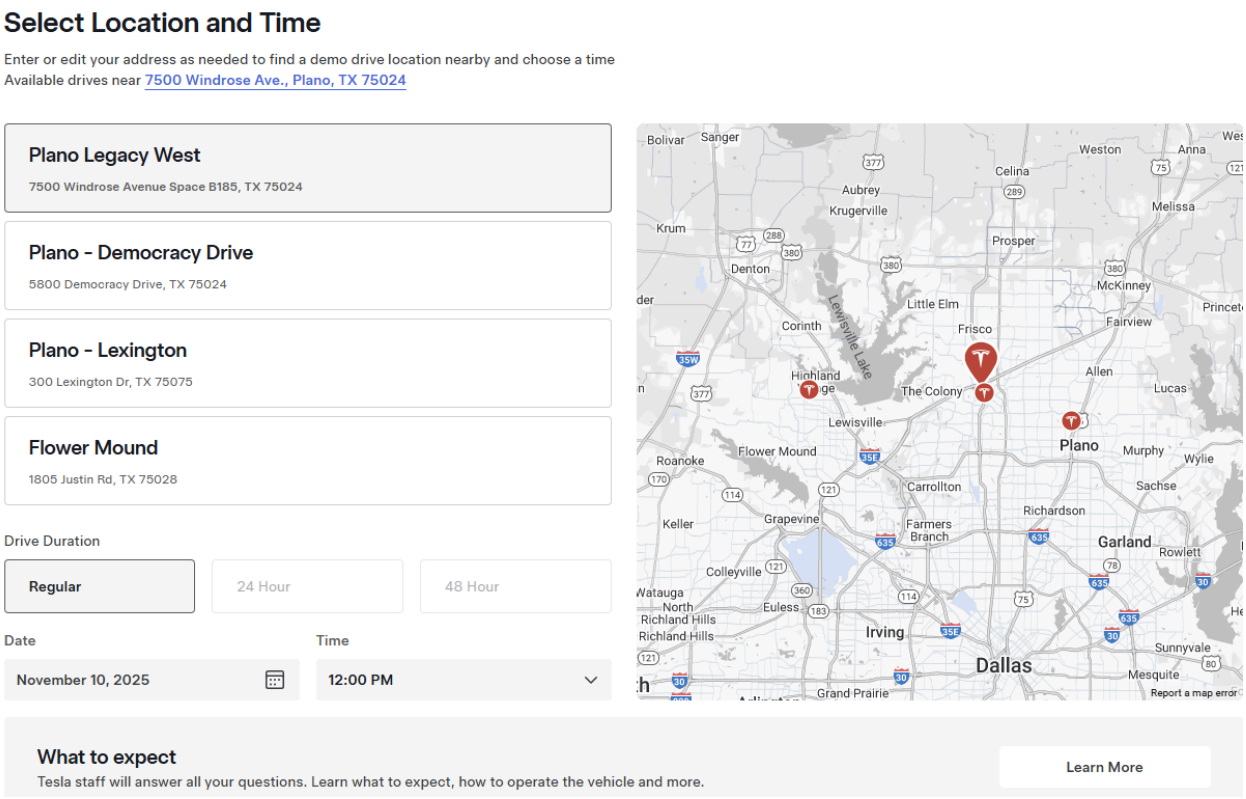
Cybertruck
More utility than a truck with more performance than a sports car

Model S
Luxury sedan for range, quick acceleration and comfort

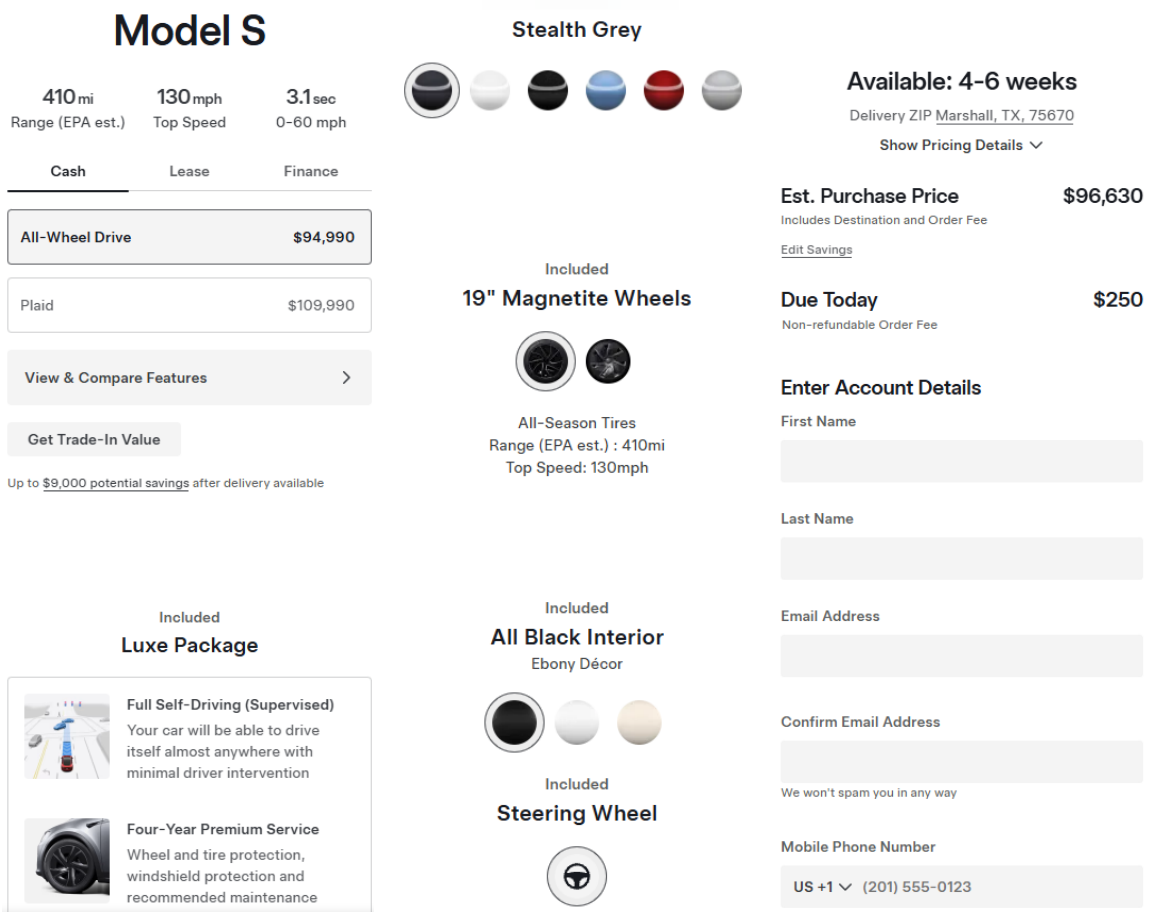
Model X
Luxury SUV for comfort, storage and maximum tech

Model 3
Sports sedan for families, commuting and road trips

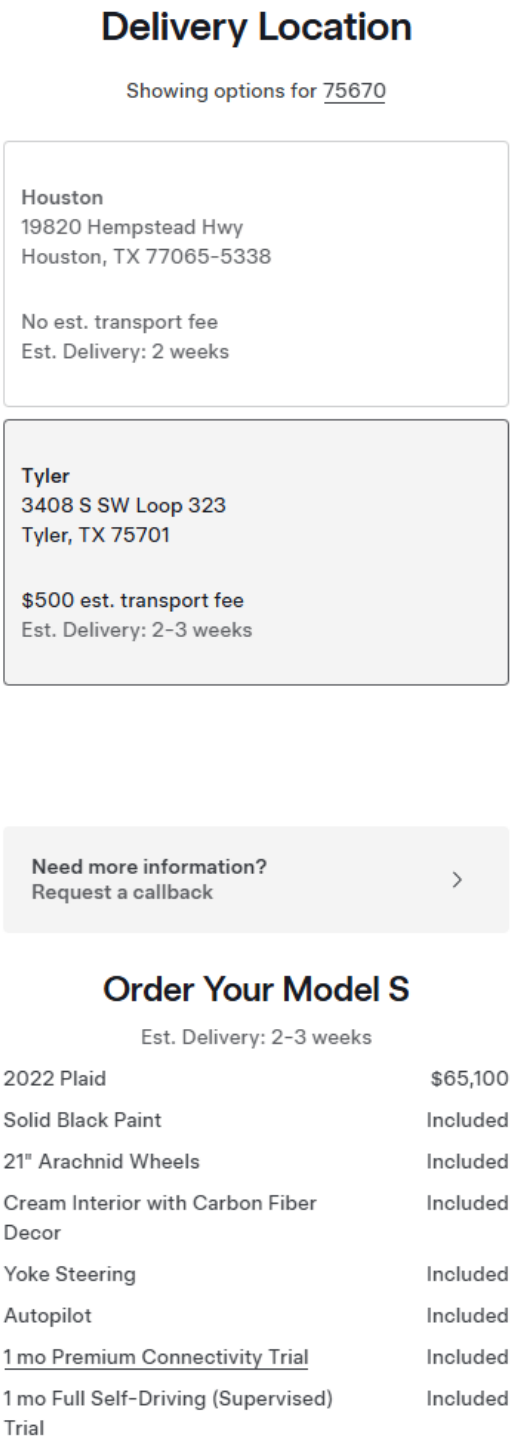
Model Y
Midsize SUV for families, road trips and extra cargo space



https://www.tesla.com/drive. Furthermore, Tesla, via its website, offers to sell and/or sells Tesla vehicles, new or pre-owned, preloaded with infringing FSD functionality to customers located in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://www.tesla.com/inventory/new/ms?arrangeby=distance&zip=75670&range=25. On information and belief, Tesla's employees offer to sell and sell the FSD and/or direct the customer to Tesla's website and/or provide a device to the customer to complete the purchase of the vehicle at Tesla's regular and established places of business (e.g., showrooms) in this judicial district for the customer to purchase the infringing FSD vehicles from Tesla. Tesla's website is highly interactive allowing customers to design their vehicle, including the purchase of FSD:



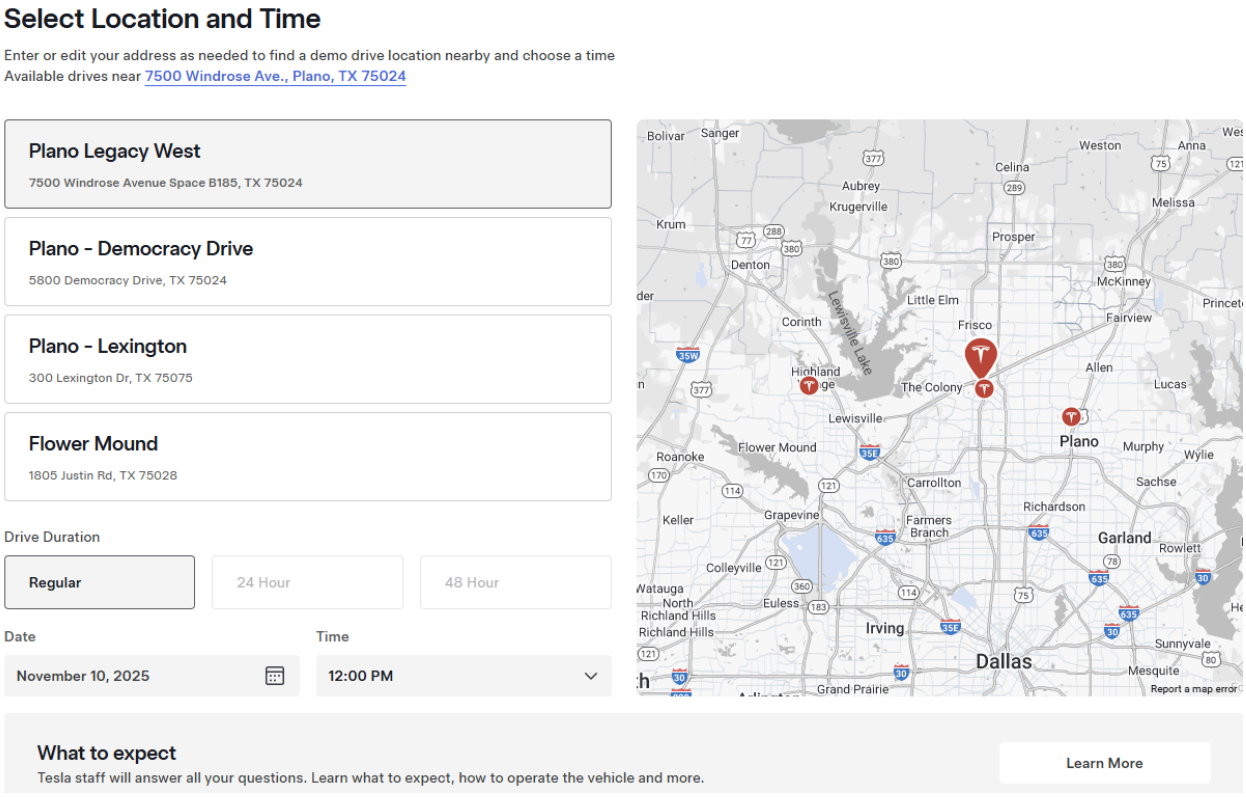
https://www.tesla.com/models/design#overview. Furthermore, Tesla delivers the infringing FSD vehicle to one of its established places of business in this judicial district and/or to the customer's location within this judicial district:



https://www.tesla.com/ms/order/.

213. Each Tesla vehicle configured with FSD infringes at least claim 19 of the ’346 patent. Tesla infringes at least claim 19 of the ’346 patent by making the Tesla vehicle configured with FSD. Tesla provides all of the necessary components of the infringing system, including

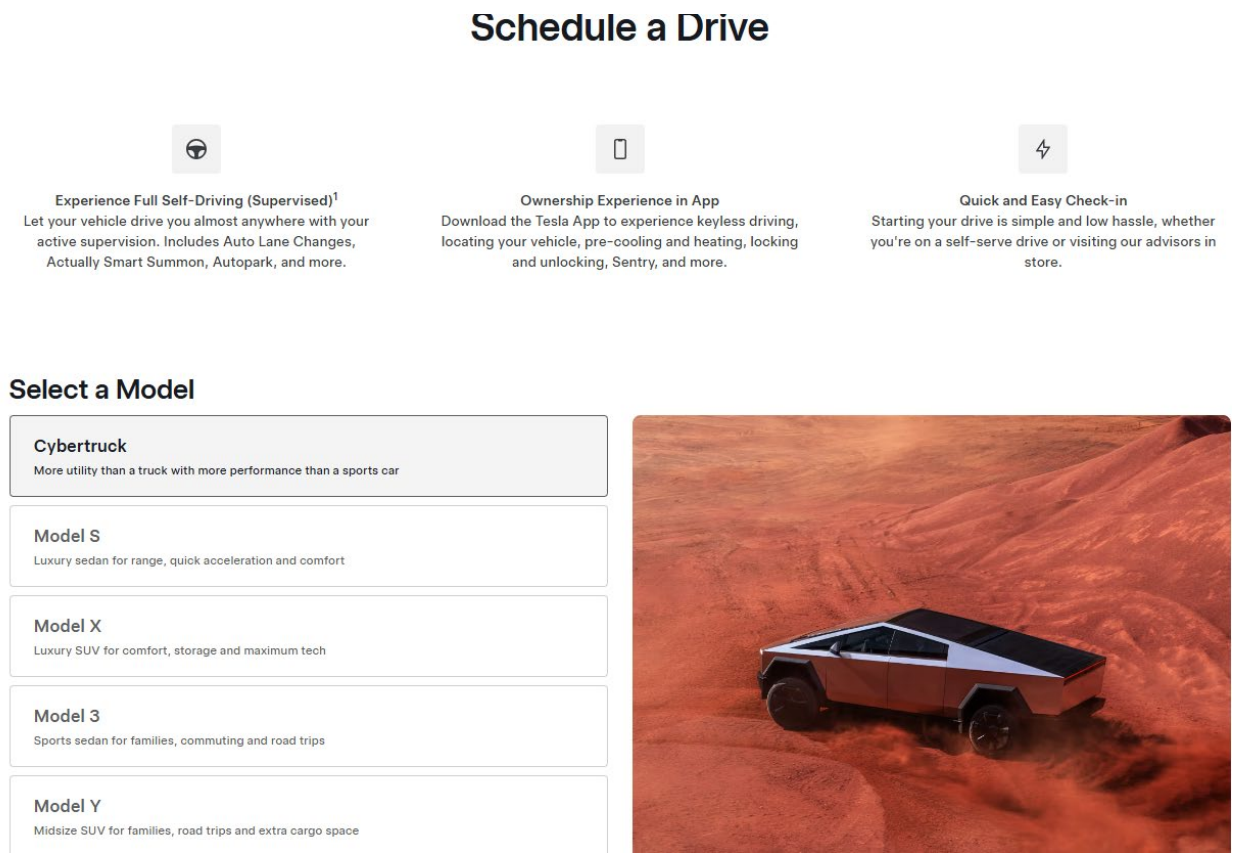
providing over the air updates of the FSD software. The infringing system is made when the Tesla vehicle is configured with FSD software or an updated version of the FSD software. Tesla makes the infringing system of at least claim 19 of the ’346 patent in this judicial district and elsewhere in Texas and the United States because it provides and/or installs the FSD software to FSD Tesla vehicles owned by customers and/or Tesla:

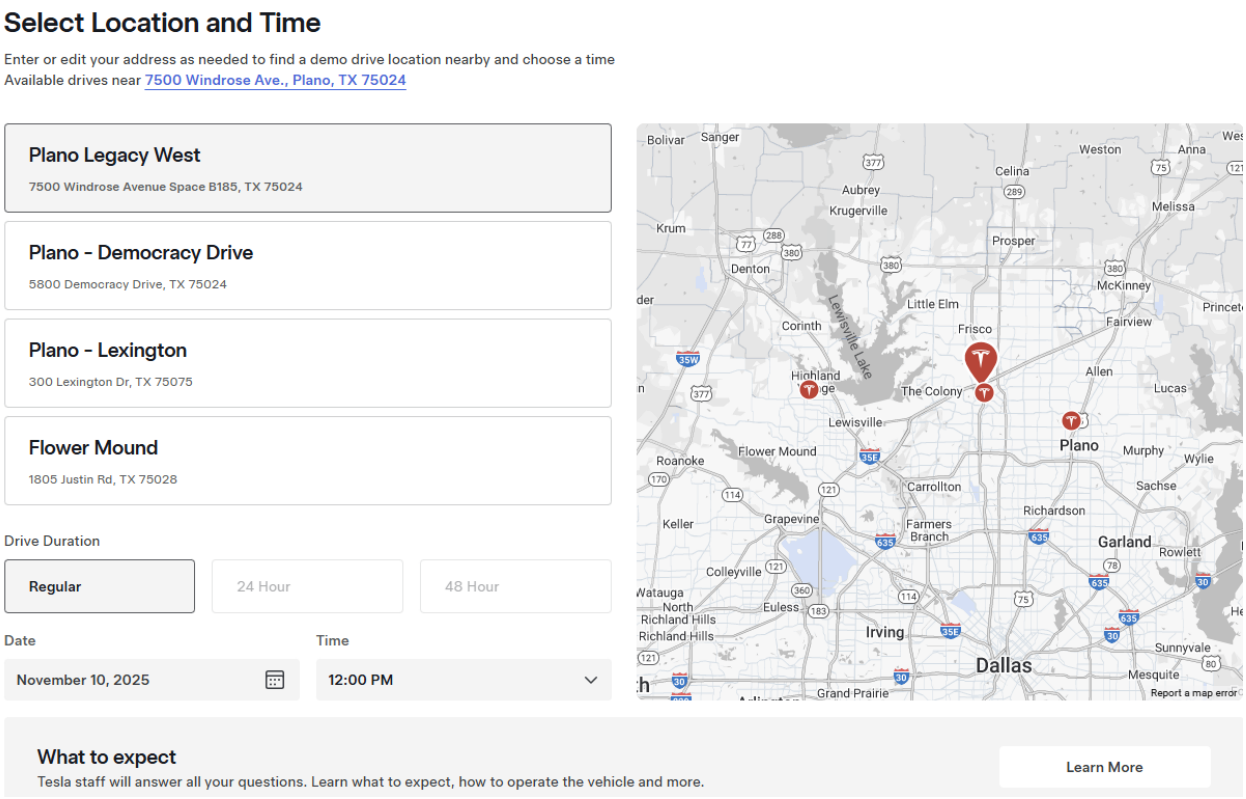


https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla owned FSD vehicles that receive FSD updates that make the claimed system in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla’s infringement of claim 19 of the ’346 patent of making the claimed system in this judicial district

and elsewhere in Texas and the United States. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html.

214. Each Tesla vehicle configured with FSD infringes at least claim 19 of the ’346 patent. Tesla infringes at least claim 19 of the ’346 patent by using the Tesla vehicle configured with FSD. Tesla provides all of the necessary components of the infringing system, including providing over the air updates of the FSD software. Furthermore, Tesla directs and controls the Tesla FSD vehicle and/or FSD system to automatically and autonomously control the vehicle by putting the claimed invention into service. Furthermore, Tesla uses the system of claim 19 of the ’346 patent via Tesla owned FSD vehicles that are test driven, by Tesla employees and/or customers, using FSD at Tesla’s regular and established places of business in this judicial district:





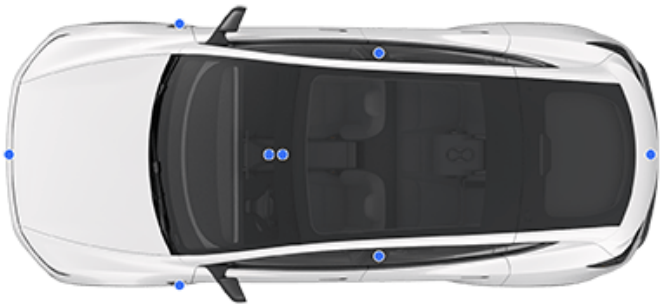
https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla FSD vehicles in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement by using the system of claim 19 of the '346 patent in this judicial district and elsewhere in Texas and the United States. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html. In this judicial district and elsewhere in Texas and the United States, Tesla uses the entire claimed system by putting the system to use via Tesla's FSD system and receiving the benefit of that use, such as autonomously controlling a vehicle and/or collecting more data to better train its FSD software. On information

and belief, Tesla also directs and/or controls its customers' actions in putting the entire claimed system to service in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html (Elon Musk wrote an email to Tesla employees stating that "Going forward, it is mandatory in North America to install and activate FSD V12.3.1 and take customers on a short test ride before handing over the car. … Almost no one actually realizes how well (supervised) FSD actually works. I know this will slow down the delivery process, but it is nonetheless a hard requirement.").

215. On information and belief, Tesla performs the method of claim 1 of the '346 patent comprising receiving, by an autonomous vehicle, sensor data from sensors mounted on the autonomous vehicle, the sensor data comprising one or more images. For example, the '346 Accused Products comprise an autonomous vehicle. *See* https://www.tesla.com/fsd ("Watch the World's First Autonomous Car Delivery"). The '346 Accused Products comprise sensors mounted on the autonomous vehicle:

Cameras

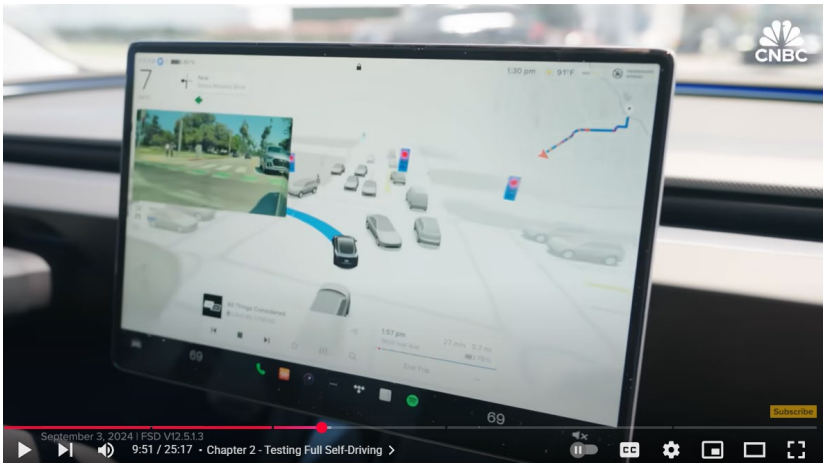
Your Model Y includes the following components that actively monitor the surrounding area:



- A camera is mounted above the grille on the front bumper.
- A camera is mounted above the rear license plate.
- A camera is mounted in each door pillar.
- Two cameras are mounted to the windshield above the rear view mirror.
- A camera is mounted to each front fender.

Model Y is also equipped with high precision electronically-assisted braking and steering systems.

https://www.tesla.com/ownersmanual/modely/en_us/GUID-682FF4A7-D083-4C95-925A-5EE3752F4865.html. The sensors provide the FSD software sensor data corresponding to images of the driving environment:



https://www.youtube.com/watch?v=JuwK-vvvYgY.

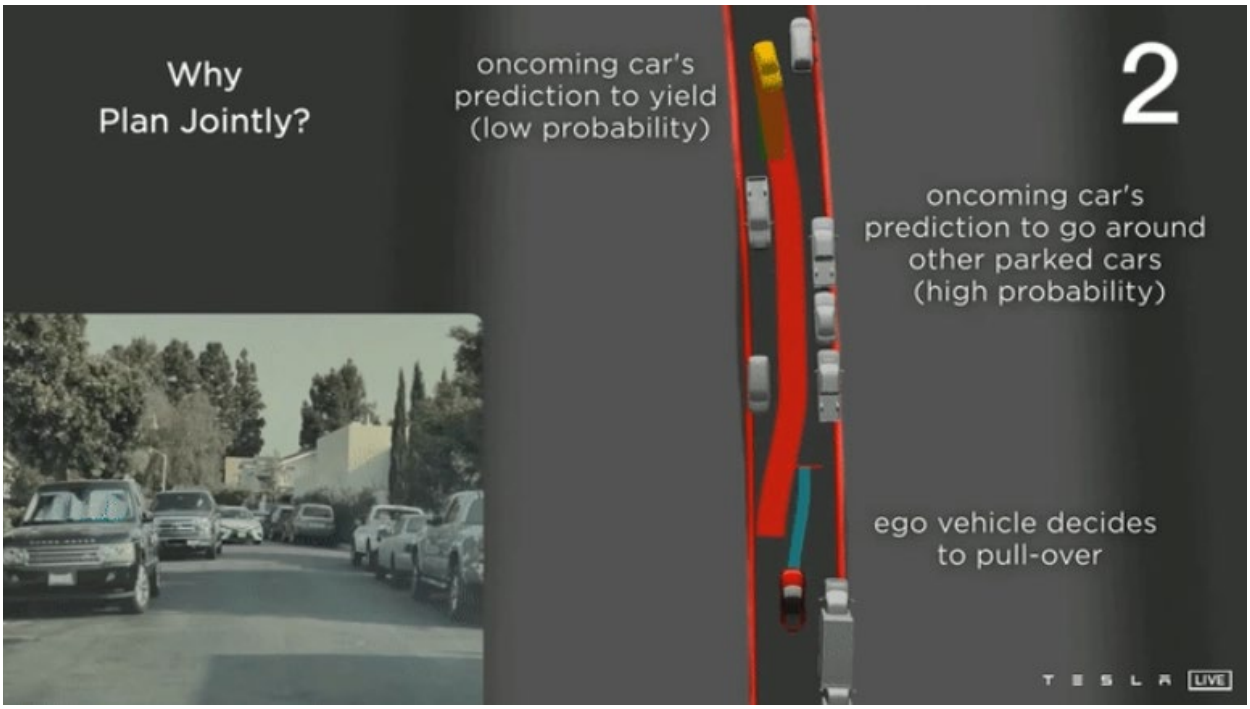
216. On information and belief, Tesla generates a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data. For example, Tesla uses the on vehicle cameras to create a 3D rendering of the vehicle's surroundings.

https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

217. On information and belief, Tesla identifies one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving. For example, the FSD software identifies various moving vehicles (represented as a collection of dark blue cubes).

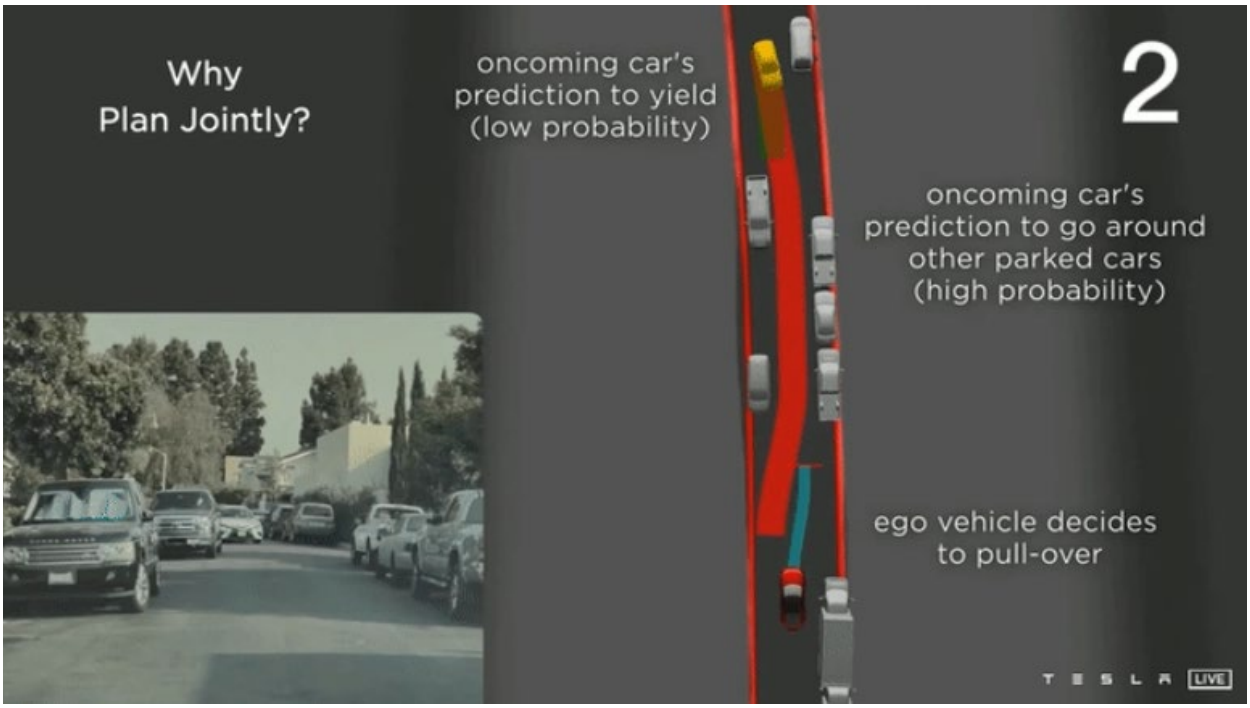
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

218. On information and belief, for each of the one or more traffic entities, Tesla determines one or more motion parameters describing movement of the traffic entity. For example, the FSD software identifies an oncoming vehicle and determines a projected path:



https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

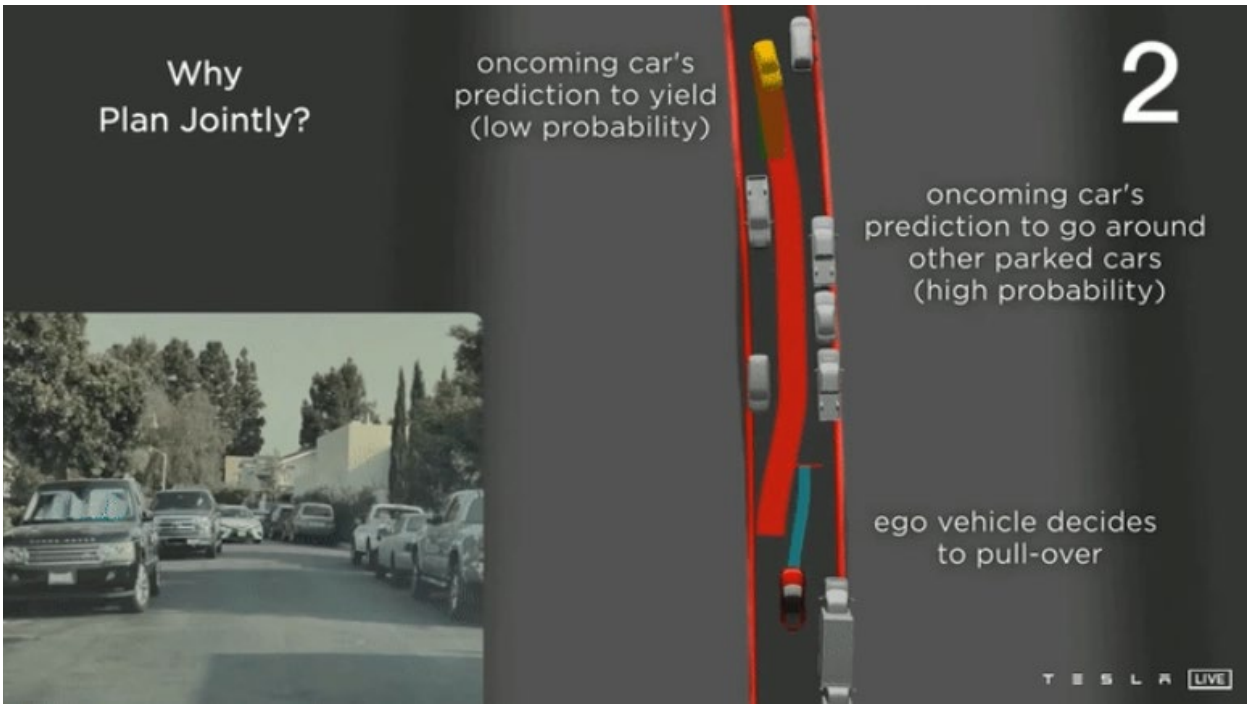
219. On information and belief, for each of the one or more traffic entities, Tesla provides an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image. For example, an image showing the oncoming car is input into the FSD software (a machine learning model) which outputs summary statistics (e.g., low or high probability) of expected human responses describing a hidden context of the oncoming car (e.g., will the oncoming car yield, will the oncoming car go around other parked cars):



https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

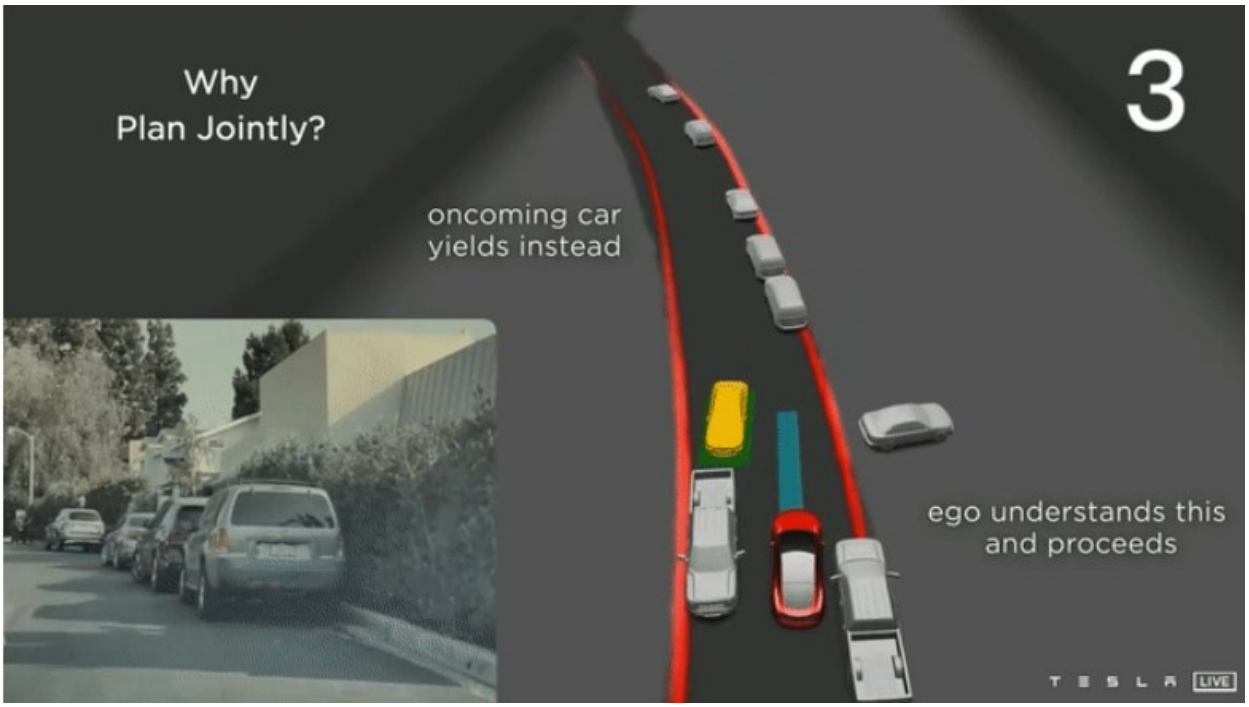
220. On information and belief, for each of the one or more traffic entities, Tesla determines the hidden context of the traffic entity based on the output of the machine learning based model. As described in the previous paragraph, the FSD software determines the hidden context of the traffic entity based on the summary statistics it outputs.

221. On information and belief, for each of the one or more traffic entities, Tesla determines a region of the point cloud where the traffic entity is expected to reach within a threshold time interval. For example, in the below video the FSD software determines that the oncoming vehicle is expected to occupy the space shown by the red path within the decision time window for the vehicle on which the FSD software operates:



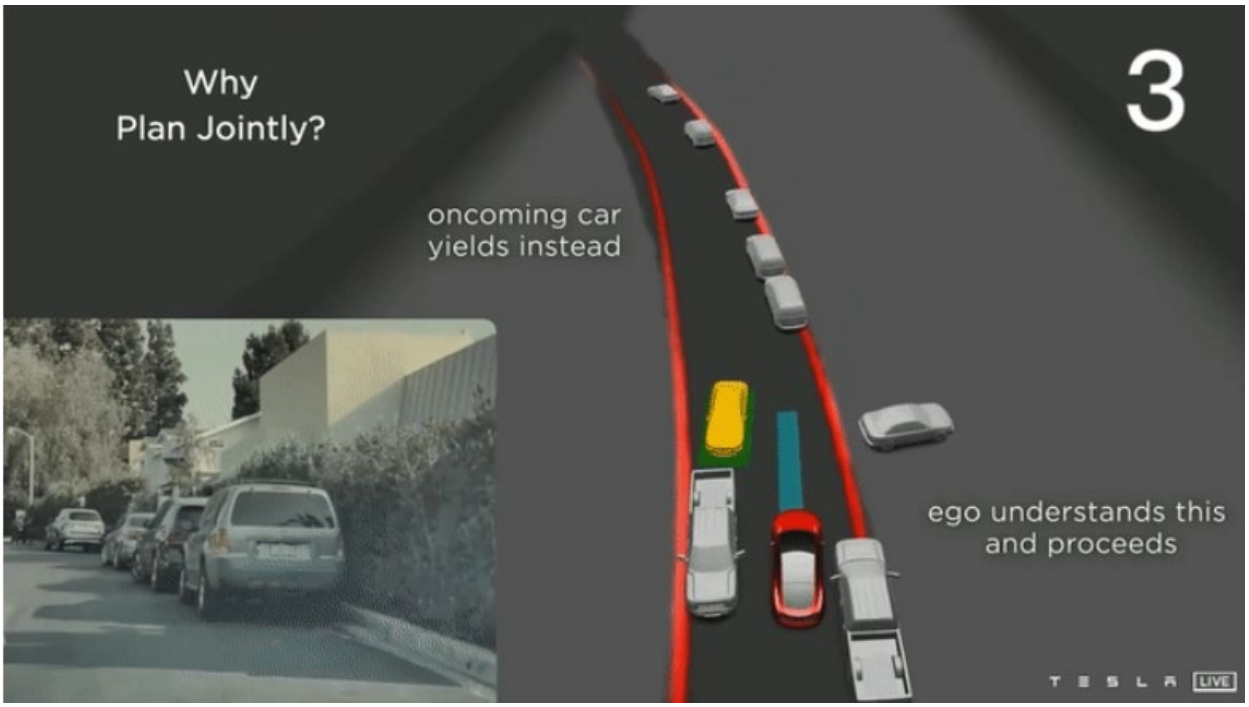
https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

222. On information and belief, for each of the one or more traffic entities, Tesla modifies the region based on the hidden context of the traffic entity. As depicted in the image and illustration below, the FSD software modifies the region based on the hidden context of a high probability that the oncoming car will now yield and a low probability that the oncoming car will continue to go around other parked cars:



https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

223. On information and belief, Tesla navigates the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities. For example, the FSD software maintains a minimum distance from the modified region to avoid collisions:



https://www.youtube.com/watch?v=j0z4FweCy4M&t=3s (Tesla AI Day 2021).

224. The specific ways in which the ’346 Accused Products are configured to support the aforementioned features are further detailed in proprietary documents and/or source code that evidence infringement by the ’346 Accused Products.

225. The technology discussion above and the exemplary ’346 Accused Products provide context for Plaintiff’s infringement allegations.

226. The ’346 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

227. The claims of the ’346 patent are patent eligible under 35 U.S.C. § 101.

228. The ’346 patent issued from U.S. Patent Application No. 16/777,673, filed on January 30, 2020. The ’346 patent claims the benefit of U.S. Provisional Patent Application Nos. 62/822,269, filed March 22, 2019, 62/800,416, filed February 1, 2019, and 62/798,978, filed January 30, 2019.

229. The claims of the ’346 patent are entitled to a priority date at least as early as January 30, 2019, the filing date of U.S. Provisional Application No. 62/798,978.

230. The claims of the ’346 patent are not directed to any abstract idea.

231. The claims of the ’346 patent are not merely directed to using a machine learning model to drive a car. Instead, the claims of the ’346 patent are directed to specific technological improvements of autonomous vehicles for predicting the behavior of objects near the autonomous vehicle. The claims of the ’346 patent specifically claim improvements to the functionality of computer systems for autonomous vehicles. Also, the claims of the ’346 patent address problems specifically rooted in the field of computer systems for autonomous vehicles.

232. The claims of the ’346 patent recite inventive concepts.

233. Additionally, the claims of the ’346 patent do not recite subject matter that is well-understood, routine, or conventional as of January 30, 2019, the filing date of U.S. Provisional Application No. 62/798,978.

234. In its motion to dismiss (Dkt. 30), Tesla did not dispute that the claims of the ’346 patent are entitled to the priority date of U.S. Provisional Application No. 62/798,978.

235. The ’346 patent specifically describes and identifies certain problems with autonomously operating a car. As the ’346 patent states:

> An autonomous vehicle uses different types of sensors to receive input describing the surroundings (or environment) of the autonomous vehicle while driving through traffic. For example, an autonomous vehicle may perceive the surroundings using camera images and lidar scans. The autonomous vehicle determines whether an object in the surroundings is stationary, for example, buildings or trees or the object is non-stationary, for example, a pedestrian, a vehicle, and so on. The autonomous vehicle system predicts the motion of non-stationary objects to make sure that the autonomous vehicle is able to navigate through non-stationary obstacles in the traffic.

> Conventional systems predict motion of pedestrians and other vehicles to determine whether they are likely to come in the path of the autonomous vehicle. The autonomous vehicle navigates through traffic so as to avoid collisions with any pedestrians or other vehicles. However, conventional techniques fail to accurately predict motion of certain non-stationary objects for example, pedestrians, bicyclists, and so on. For example, if the autonomous vehicle detects a pedestrian standing in a street corner, the motion of the pedestrian does not help predict whether the pedestrian will cross the street or whether the pedestrian will remain standing on a street corner. Similarly, if the autonomous vehicle detects a bicyclist in a lane, the current motion of the bicycle does not help the autonomous vehicle predict whether the bicycle will change lanes.
>
> Failure of autonomous vehicles to accurately predict motion of non-stationary traffic objects results in unnatural movement of the autonomous vehicle, for example, as a result of the autonomous vehicle suddenly stopping due to a pedestrian moving in the road or the autonomous vehicle continuing to wait for a person to cross a street even if the person never intends to cross the street.

'346 patent, 1:34-67.

236. In addition, as of January 2019, there were numerous shortcomings in the field of autonomous vehicles that are addressed by the inventions of the claims of the '346 patent.

237. For example, Tesla did not release a beta version of its FSD software until October 2020. *See* https://www.theverge.com/2020/10/21/21527577/tesla-full-self-driving-autopilot-beta-software-update (Ex. 12). As part of that release, Tesla CEO Elon Musk indicates that "Tesla was approaching this software update 'very cautiously' because the 'world is a complex and messy place.'" *Id.* In addition, according to a warning message that Tesla drivers received when given the option to enable the FSD software in its beta, Tesla's FSD software "may do the wrong thing at the worst time." *See* https://dawnproject.com/wp-content/uploads/2022/09/FSD-Beta-warning.png (Ex. 13).

238. In addition, as of June 2017, researchers at the Australian Centre for Field Robotics (ACFR) at the University of Sydney (NSW, Australia) commented that:

> Advanced driver assistance systems (ADAS) are increasingly seen as a mechanism to improve the safety and efficiency of transportation by understanding and reacting to potential vehicle safety threats using state-of-the-art sensing and algorithms. A major component of these systems is the ability to infer the future intentions of drivers to predict the likelihood of potential collisions. This is a challenging task, particularly in intersections where complex traffic scenarios result in a proportionally high number of accidents. Human drivers are able to estimate the future trajectory of other vehicles from a combination of potentially subtle cues – the combination of the various kinematic properties - and the position of the vehicle on the road relative to the lane. Being able to reproduce this driver intuition in a computer model is still an open area of research.

Zyner et. al., "Long Short Term Memory for Driver Intent Prediction," 2017 IEEE Intelligent Vehicles Symposium (IV) June 11-14, 2017, Redondo Beach, CA, USA (Ex. 14).

239. Similarly, in 2017, researchers from the Institute for Intelligent Systems Research and Innovation at Deakin University in Australia noted that autonomous vehicles "still have some difficulties specially when it comes to driving in urban traffic environment such as the interaction with Vulnerable Road Users (VRUs) such as pedestrians. Intuitively, interactions take place nowadays between human drivers and pedestrians are based on implicit cues between the two parties." Saleh et al., "Intent Prediction of Vulnerable Road Users from Motion Trajectories Using Stacked LSTM Network," 2017 IEEE 20th International Conference on Intelligent Transportation Systems (ITSC): Workshop (Ex. 15). *See also* Casas et al., "IntentNet: Learning to Predict Intention from Raw Sensor Data", 2nd Conference on Robot Learning , Zurich, Switzerland (2018) (Ex. 16) ("While a plethora of systems have been built in the past few decades, many challenges still remain. One of the fundamental difficulties is that self driving vehicles have to share the roads with human drivers, which can perform maneuvers that are difficult to predict."); Zyner et al., "Naturalistic Driver Intention and Path Prediction Using Recurrent Neural Networks", IEEE Transactions on Intelligent Transportation Systems, Vol. 21, No. 4 (April 2020) (Ex. 17) ("Driving

vehicles is a highly skilled task that requires extensive understanding of the intentions of other road users. This knowledge allows drivers to safely navigate an area through other traffic. While this may become second nature to an experienced human driver, properly understanding the intentions of other drivers is still an unsolved problem for Advanced Driver Assistance Systems (ADAS), and by extension, autonomous vehicles."); Rasouli et al., "Are They Going to Cross? A Benchmark Dataset and Baseline for Pedestrian Crosswalk Behavior", 2017 IEEE International Conference on Computer Vision Workshops, Venice, Italy, 2017 (Ex. 18) ("Designing autonomous vehicles suitable for urban environments remains an unresolved problem. One of the major dilemmas faced by autonomous cars is how to understand the intention of other road users and communicate with them. The existing datasets do not provide the necessary means for such higher level analysis of traffic scenes").

240. In addition, the USPTO, in *Ex parte Desjardins*, recently rejected the Board's findings that a patent application directed to learning models and artificial intelligence was abstract stating: "Under a charitable view, the overbroad reasoning of the original panel below is perhaps understandable given the confusing nature of existing § 101 jurisprudence, but troubling, because this case highlights what is at stake. Categorically excluding AI innovations from patent protection in the United States jeopardizes America's leadership in this critical emerging technology. Yet, under the panel's reasoning, many AI innovations are potentially unpatentable-even if they are adequately described and nonobvious-because the panel essentially equated any machine learning with an unpatentable "algorithm" and the remaining additional elements as "generic computer components," without adequate explanation. Dec. 24. Examiners and panels should not evaluate claims at such a high level of generality. However, it is with this view that the panel's *sua sponte* action is most troubling, as it eschewed the clear teachings of *Enfish*, and instead substituted only

a cursory analysis that ignored this well-settled precedent. Panels should treat such precedent with more care, especially when acting *sua sponte*. At the same time, the claims at issue stand rejected under§ 103. This case demonstrates that§§ 102, 103 and 112 are the traditional and appropriate tools to limit patent protection to its proper scope. These statutory provisions should be the focus of examination. For these reasons, we determine that although independent claim 1 may recite an abstract idea, it is not directed to an abstract idea. Instead, we determine that independent claim 1, when considered as a whole, integrates an abstract idea into a practical application." *Ex parte Desjardins*, Appeal No. 2024-000567, Decision on Request for Rehearing (Sept. 26, 2025), *available at* https://www.uspto.gov/sites/default/files/documents/202400567-arp-rehearing-decision-20250926.pdf.

241. The '346 patent specifically describes and claims novels methods, non-transitory computer readable storage media, and systems which address these shortcomings of then-existing autonomous vehicle systems. The '346 patent also specifically describes and claims novels methods, non-transitory computer readable storage media, and systems which provide improvements in the functionality of autonomous vehicle systems and addresses problems specifically rooted in the field of autonomous vehicle systems.

242. For example, claim 1 of the '346 patent recites "[a] method" comprising "receiving, by an autonomous vehicle, sensor data from sensors mounted on the autonomous vehicle, the sensor data comprising one or more images;" "generating a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data;" "identifying, one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving;" "for each of the one or more traffic entities: determining one or more motion parameters describing movement of the traffic entity;" "providing

an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image;" "determining the hidden context of the traffic entity based on the output of the machine learning based model;" "determining a region of the point cloud where the traffic entity is expected to reach within a threshold time interval;" and "modifying the region based on the hidden context of the traffic entity;" and "navigating the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities."

243. Claim 1 improves the functionality of an autonomous vehicle "receiving, by an autonomous vehicle, sensor data from sensors mounted on the autonomous vehicle, the sensor data comprising one or more images;" "generating a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data;" "identifying, one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving;" "for each of the one or more traffic entities: determining one or more motion parameters describing movement of the traffic entity;" "providing an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image;" "determining the hidden context of the traffic entity based on the output of the machine learning based model;" "determining a region of the point cloud where the traffic entity is expected to reach within a threshold time interval;" and "modifying the region based on the hidden context of the traffic entity;" and "navigating the autonomous vehicle so that the

autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities." By "receiving, by an autonomous vehicle, sensor data from sensors mounted on the autonomous vehicle, the sensor data comprising one or more images;" "generating a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data;" "identifying, one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving;" "for each of the one or more traffic entities: determining one or more motion parameters describing movement of the traffic entity;" "providing an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image;" "determining the hidden context of the traffic entity based on the output of the machine learning based model;" "determining a region of the point cloud where the traffic entity is expected to reach within a threshold time interval;" and "modifying the region based on the hidden context of the traffic entity;" and "navigating the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities," the method of claim 1 allows an autonomous vehicle to consider a distribution of expected human responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "receiving, by an autonomous vehicle, sensor data from sensors mounted on the autonomous vehicle, the sensor data comprising one or more images;" "generating a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data;" "identifying, one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which

the autonomous vehicle is driving;" "for each of the one or more traffic entities: determining one or more motion parameters describing movement of the traffic entity;" "providing an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image;" "determining the hidden context of the traffic entity based on the output of the machine learning based model;" "determining a region of the point cloud where the traffic entity is expected to reach within a threshold time interval;" and "modifying the region based on the hidden context of the traffic entity;" and "navigating the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities," allows an autonomous vehicle to consider a distribution of expected human responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

244. Claim 10 of the '346 patent similarly recites "[a] non-transitory computer readable storage medium storing instructions, that when executed by a processor, cause the processor to perform steps" comprising "receiving, by an autonomous vehicle, sensor data from sensors mounted on the autonomous vehicle, the sensor data comprising one or more images;" "generating a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data;" "identifying, one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving;" "for each of the one or more traffic entities: determining one or more motion parameters describing movement of the traffic entity;" "providing an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image

showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image;" "determining the hidden context of the traffic entity based on the output of the machine learning based model;" "determining a region of the point cloud where the traffic entity is expected to reach within a threshold time interval;" and modifying the region based on the hidden context of the traffic entity;" and "navigating the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities."

245. Claim 10 improves the functionality of an autonomous vehicle by "receiving, by an autonomous vehicle, sensor data from sensors mounted on the autonomous vehicle, the sensor data comprising one or more images;" "generating a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data;" "identifying, one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving;" "for each of the one or more traffic entities: determining one or more motion parameters describing movement of the traffic entity;" "providing an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image;" "determining the hidden context of the traffic entity based on the output of the machine learning based model;" "determining a region of the point cloud where the traffic entity is expected to reach within a threshold time interval;" and modifying the region based on the hidden context of the traffic entity;" and "navigating the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities." By "receiving, by an autonomous vehicle, sensor data from

sensors mounted on the autonomous vehicle, the sensor data comprising one or more images;" "generating a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data;" "identifying, one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving;" "for each of the one or more traffic entities: determining one or more motion parameters describing movement of the traffic entity;" "providing an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image;" "determining the hidden context of the traffic entity based on the output of the machine learning based model;" "determining a region of the point cloud where the traffic entity is expected to reach within a threshold time interval;" and modifying the region based on the hidden context of the traffic entity;" and "navigating the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities," the non-transitory computer readable storage medium storing instructions of claim 10 allows an autonomous vehicle to consider a distribution of expected human responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "receiving, by an autonomous vehicle, sensor data from sensors mounted on the autonomous vehicle, the sensor data comprising one or more images;" "generating a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data;" "identifying, one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving;" "for each of the one or more traffic entities: determining one or more motion

parameters describing movement of the traffic entity;" "providing an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image;" "determining the hidden context of the traffic entity based on the output of the machine learning based model;" "determining a region of the point cloud where the traffic entity is expected to reach within a threshold time interval;" and modifying the region based on the hidden context of the traffic entity;" and "navigating the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities," allows an autonomous vehicle to consider a distribution of expected human responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

246. Similarly, claim 19 of the '346 patent recites "[a] computer system" comprising "a processor" and "a non-transitory computer readable storage medium storing instructions that when executed by the processor, cause the processor to perform steps" comprising "receiving, by an autonomous vehicle, sensor data from sensors mounted on the autonomous vehicle, the sensor data comprising one or more images;" "generating a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data;" "identifying, one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving;" "for each of the one or more traffic entities: determining one or more motion parameters describing movement of the traffic entity;" "providing an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics

of expected human responses describing a hidden context of the input traffic entity shown in the input image;" "determining the hidden context of the traffic entity based on the output of the machine learning based model;" "determining a region of the point cloud where the traffic entity is expected to reach within a threshold time interval;" "modifying the region based on the hidden context of the traffic entity;" and "navigating the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities."

247. Claim 19 improves the functionality of an autonomous vehicle by "receiving, by an autonomous vehicle, sensor data from sensors mounted on the autonomous vehicle, the sensor data comprising one or more images;" "generating a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data;" "identifying, one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving;" "for each of the one or more traffic entities: determining one or more motion parameters describing movement of the traffic entity;" "providing an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image;" "determining the hidden context of the traffic entity based on the output of the machine learning based model;" "determining a region of the point cloud where the traffic entity is expected to reach within a threshold time interval;" "modifying the region based on the hidden context of the traffic entity;" and "navigating the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities." By "receiving, by an autonomous vehicle, sensor data from sensors mounted

on the autonomous vehicle, the sensor data comprising one or more images;" "generating a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data;" "identifying, one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving;" "for each of the one or more traffic entities: determining one or more motion parameters describing movement of the traffic entity;" "providing an image of the one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image;" "determining the hidden context of the traffic entity based on the output of the machine learning based model;" "determining a region of the point cloud where the traffic entity is expected to reach within a threshold time interval;" "modifying the region based on the hidden context of the traffic entity;" and "navigating the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities," the computer system of claim 19 allows an autonomous vehicle to consider a distribution of expected human responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "receiving, by an autonomous vehicle, sensor data from sensors mounted on the autonomous vehicle, the sensor data comprising one or more images;" "generating a point cloud representation of the surroundings of the autonomous vehicle based on the sensor data;" "identifying, one or more traffic entities based on the sensor data, the traffic entities representing non-stationary objects in traffic in which the autonomous vehicle is driving;" "for each of the one or more traffic entities: determining one or more motion parameters describing movement of the traffic entity;" "providing an image of the

one or more images, the image showing the traffic entity as input to a machine learning model configured to receive an input image showing an input traffic entity and output summary statistics of expected human responses describing a hidden context of the input traffic entity shown in the input image;" "determining the hidden context of the traffic entity based on the output of the machine learning based model;" "determining a region of the point cloud where the traffic entity is expected to reach within a threshold time interval;" "modifying the region based on the hidden context of the traffic entity;" and "navigating the autonomous vehicle so that the autonomous vehicle stays at least a threshold distance away from the modified region of each of the one or more traffic entities," allows an autonomous vehicle to consider a distribution of expected human responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

248. The dependent claims of the '346 patent provide additional improvements to the functionality of autonomous vehicles and the claimed methods, non-transitory computer readable storage media, and computer systems. For example, dependent claim 2 further improves on claim 1 by specifying that "the region is in a direction determined based on a motion vector of the traffic entity, wherein the traffic entity represents a user, wherein modifying the region based on the hidden context comprises responsive to determining based on the hidden context that the user represented by the traffic entity is likely to move in the direction having a component along the motion vector, extending the region along the direction of the motion vector." *See also* claims 11, 20. Dependent claim 3 further improves on claim 1 by specifying that "the region is in a direction determined based on a motion vector of the traffic entity, wherein the traffic entity represents a user, wherein modifying the region based on the hidden context comprises responsive to determining based on the hidden context that the user represented by the traffic entity is likely to

move in a direction having a component opposite to direction of the motion vector, decreasing a size of the region along the direction of the motion vector." *See also* claim 12, 21. Dependent claim 4 further improves on claim 1 by specifying that "the hidden context represents a state of mind of a user represented by the traffic entity." *See also* claims 13, 22. Dependent claim 5 further improves on claim 1 by specifying that "the hidden context represents a task that a user represented by the traffic entity is planning on accomplishing." *See also* claim 14. Dependent claim 6 further improves on claim 1 by specifying that "he hidden context represents a degree of awareness of the autonomous vehicle by a user represented by the traffic entity." *See also* claim 15, 23. Dependent claim 7 further improves on claim 1 by specifying that "the hidden context represents a goal of a user represented by the traffic entity, wherein the user expects to achieve the goal within a threshold time interval." *See also* claim 16. Dependent claim 8 further improves on claim 1 by specifying that "navigating the autonomous vehicle comprises generating signals for controlling the autonomous vehicle based on the one or more motion parameters and the hidden context of each of the one or more traffic entities; and sending the generated signals to controls of the autonomous vehicle." *See also* claim 17. Dependent claim 9 further improves on claim 1 by specifying that "the sensor data represents one or more images captured by a camera mounted on the autonomous vehicle or a lidar scan captured by a lidar mounted on the autonomous vehicle." *See also* claim 18.

249. These and other processes and their benefits are described in the '346 patent specification as well. For example, Figure 4 of the '346 patent is "a flowchart showing a process of training a machine learning based model to predict hidden context information describing traffic entities, according to some embodiments of the invention." '346 patent, 4:8-11. Figure 4 is reproduced below:

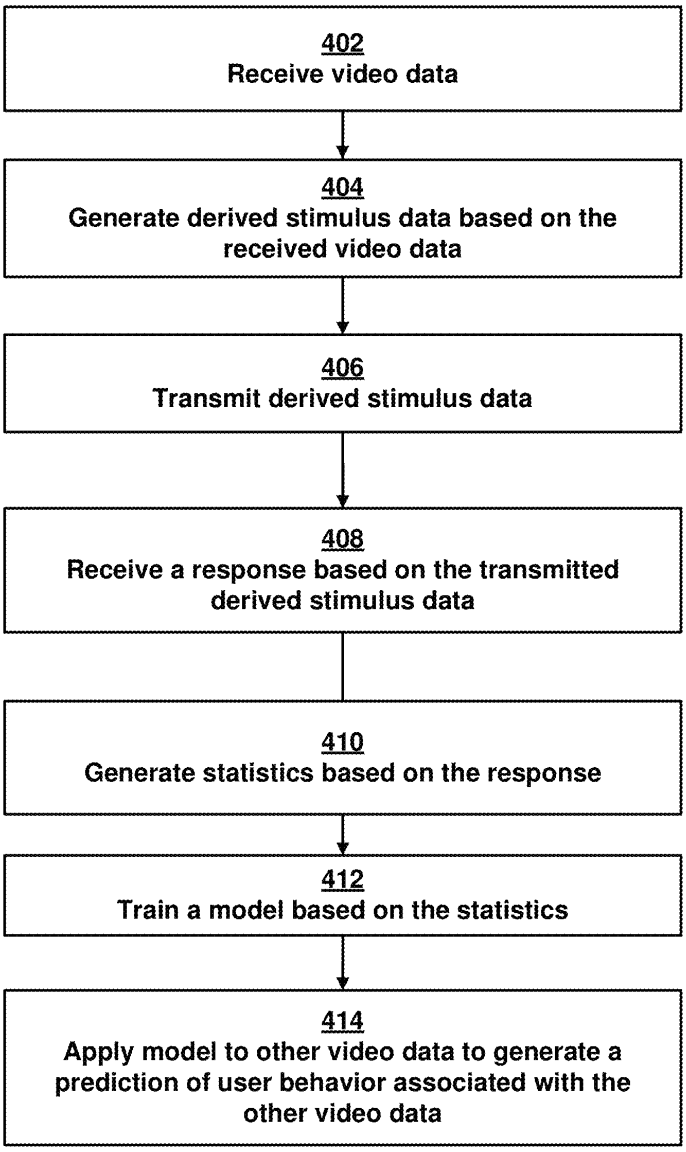


FIG. 4

250. As the '346 patent specification states, "[i]n step 402, this video or other data captured by the camera or other sensor is transmitted from the vehicle 102, over the network 104, and to the server 106 where it is stored." *Id.* at 8:19-22. "Then, in step 404, video frames or segments are extracted from the stored video or other data and are used to create stimulus data including derived stimulus (or stimuli). In one implementation, the derived stimulus corresponds

to a scene in which one or more humans are conducting activities (e.g., standing, walking, driving, riding a bicycle, etc.) beside or on a street and/or near a vehicle." *Id.* at 8:23-29. "In step 406, the derived stimulus is transmitted from the server 106 and displayed to a large number of users (or human observers) on the client device 108 (or multiple client devices 108). The client devices(s) 108 prompt the human observers to predict how the people shown in the derived stimulus will act, and upon viewing the displayed stimulus, the observers input their responses corresponding to their predictions. For example, the human observers may predict that a bicyclist will continue riding, whether a first person in the stimulus will cross the street, whether another person will remain standing on a street corner, and yet another person will change lanes on his or her bicycle. In an illustrative embodiment, the human observers may make a continuous or ordinal judgment about the state of mind or the predicted behavior of the people shown in the derived stimulus and record that judgment. For example, the human observers may select an appropriate icon displayed on the client devices(s) 108 by clicking a mouse or by pressing a key to indicate their judgment or prediction. The judgment or prediction may correspond to the human observers' assessment of the state of mind of the person in the derived stimulus or other awareness or intention that would be relevant to a hypothetical driver who sees the person in the derived stimulus while driving." *Id.*at 8:41-64. "In step 408, the derived stimulus and associated human observer responses are transmitted from the client device(s) 108 to the server 106 and recorded in the user response database 110." *Id.* at 8:64-67.

251. As the '346 patent specification describes, "[i]n step 410, summary statistics are generated based on the user responses. For example, the statistics may characterize the aggregate responses of multiple human observers to a particular derived stimulus. For instance, if the derived stimulus shows a pedestrian walking on a sidewalk towards an intersection, the response can be

categorized in terms of how many human observers believe that the pedestrian will stop upon reaching the intersection, continue walking straight across the intersection, turn a corner and continue walking along the sidewalk without crossing the intersection, etc." *Id.* at 9:1-11.

252. The '346 patent also describes an example of how "the stored statistics and corresponding images . . . are sent over the network 104 to the model training system 112 and used to train a prediction algorithm":

> For example, the collection of images and statistics can be used to train a supervised learning algorithm, which can comprise a random forest regressor, a support vector regressor, a simple neural network, a deep convolutional neural network, a recurrent neural network, a long-short-term memory (LSTM) neural network with linear or nonlinear kernels that are two dimensional or three dimensional, or any other supervised learning algorithm which is able to take a collection of data labeled with continuous values and adapt its architecture in terms of weights, structure or other characteristics to minimize the deviation between its predicted label on a novel stimulus and the actual label collected on that stimulus using the same method as was used on the set of stimuli used to train that network. The model is given data which comprises some subset of the pixel data from the video frames that the summary statistics were generated from. In one implementation, this subset includes the pixel data contained in a bounding box drawn to contain the boundaries of the person, cyclist, motorist and vehicle, or other road user, including their mode of conveyance. In some other implementations, it also includes the entire pixel data from the rest of the image. In one of those implementations, that pixel data is selected according to criteria such as the salience of those features in terms of contrast, lighting, presence of edges, or color. In an additional implementation, the features can include descriptive meta-data about the images such as the dimensions and location of the bounding box, the shape of the bounding box or the change in size or position of the bounding box from one frame to the next.

Id. at 9:37-10:4.

253. The '346 patent further states that, "[i]n step 414, the prediction engine 114 uses the trained model from the model training system 112 to predict the actual, 'real-world' or 'live

data' behavior of people on or near a road." *Id.* at 10:5-10. The '346 patent further explains this prediction process:

> The trained model or algorithm makes a prediction of what a pedestrian or other person shown in the "live data" would do based on the summary statistics and/or training labels of one or more derived stimulus. The accuracy of the model is determined by having it make predictions of novel derived stimuli that were not part of the training images previously mentioned but which do have human ratings attached to them, such that the summary statistics on the novel images can be generated using the same method as was used to generate the summary statistics for the training data, but where the correlation between summary statistics and image data was not part of the model training process. The predictions produced by the trained model comprise a set of predictions of the state of mind of road users that can then be used to improve the performance of autonomous vehicles, robots, virtual agents, trucks, bicycles, or other systems that operate on roadways by allowing them to make judgments about the future behavior of road users based on their state of mind.

Id. at 10:19-37.

254. The '346 patent also provides additional descriptions of these processes through its figures and their accompanying descriptions. *See* '346 patent Fig. 5 (which "is a flowchart showing a process of predicting the state of mind of road users using a trained learning algorithm, according to some embodiments of the invention"), Fig. 6 (which "is a diagram showing an example of an application of a context user prediction process in an automobile context, according to some embodiments of the invention"), Fig. 7 (which "represents a flowchart illustrating the process of navigating the autonomous vehicle based on hidden context, according to an embodiment"), Fig. 8 (which "represents a flowchart illustrating the process of modulating the world model for navigating the autonomous vehicle, according to an embodiment"), Fig. 9 (which "represents a flowchart illustrating the process of using the modulatory signals to reduce false positives while navigating the autonomous vehicle, according to an embodiment"), Fig. 10 (which

"illustrates sensor data captured by the autonomous vehicle illustrating traffic entities, according to an embodiment"), Fig. 11 (which "illustrates various objects surrounding the autonomous vehicle, according to an embodiment"), Fig. 12 (which "illustrates an occupancy grid representation of objects surrounding the autonomous vehicle, according to an embodiment"), Fig. 13 (which "illustrates segmentation of various traffic entities in the occupancy grid representation of the surroundings of the autonomous vehicle, according to an embodiment"), Fig. 14 (which "illustrates determination of safe distance from traffic entities while navigating through the traffic by the autonomous vehicle, according to an embodiment"), Fig. 15 ("illustrates determination of safe distance based on trajectory of traffic entities, according to an embodiment"), Fig. 16 (which "illustrates modulation of safe distance based on predicted hidden context associated with traffic entities, according to an embodiment"), Fig. 17 (which "is a block diagram illustrating components of an example machine able to read instructions from a machine-readable medium and execute them in a processor (or controller)") and their accompanying descriptions.

255. Any functional language in the claims of the '346 patent is not determinative of those such claims being abstract, especially when the claims provide a technical improvement to a computer system, as discussed above. *See, e.g.*, *Evolved Wireless, LLC v. Apple Inc.*, 221 F. Supp. 3d 485, 491 (D. Del. 2016) ("Applying these guidelines in the relevant field of technology can be somewhat difficult, because '[t]he essence of software is manipulating existing data and generating additional data through algorithms.' *Cal. Inst. of Tech. v. Hughes Commc'ns Inc.*, 59 F. Supp. 3d 974, 987 (C.D. Cal. 2014); *Oplus Techs. Ltd. v. Sears Holding Corp.*, 2013 U.S. Dist. LEXIS 35474, 2013 WL 1003632, at *12 (C.D. Cal. Mar. 4, 2013) ('All software only receives data, applies algorithms, and ends with decisions.'). Ultimately, the Federal Circuit instructs that not all 'claims directed to software ... are inherently abstract.' *Enfish, LLC v. Microsoft Corp.*, 822

F.3d 1327, 1335 (Fed. Cir. 2016). Claims 'improv[ing] the functioning of [a] computer' or 'improving an existing technological process' are patent-eligible even if they rely on a mathematical algorithm. *Id.* at 1336; *see also Hughes*, 59 F. Supp. 3d at 993 ('When claims provide a specific computing solution for a computing problem, these claims should generally be patentable, even if their novel elements are mathematical algorithms.').").

256. The claims of the '346 patent cover patent eligible improvements to autonomous vehicles that were more than well-understood, routine, or conventional activity. The inventions in the '346 patent were years ahead of the release of the accused products and functionalities. Taken alone and together, the limitations of the asserted claims involve an inventive concept. For example, the claim limitations identified above as not being directed to abstract ideas are also claim elements that contain inventive concepts. As discussed above, those claim elements provide an improvement over existing autonomous vehicle systems, methods, and software.

257. Tesla has filed its own patent applications for alleged inventions related to autonomous vehicle technology. Tesla's own patent applications demonstrate that, even after January 2019, autonomous vehicle technology (including prediction of human behavior) was still in its early stages and that improvements to autonomous vehicle technology (including prediction of human behavior) were still needed. Further, in filing those patents application, Tesla represented to the USPTO that, as of the time of each filing, the alleged inventions in those patent applications were directed to patent eligible subject matter and that, even after January 2019, a need existed for such inventions in the market. This further demonstrates that the inventions claimed in the '346 patent were not well-understood, routine, and conventional in the January 2019 time period but are instead directed to patent eligible subject matter. *See, e.g.*, U.S. Patent Application Publication Nos. 2021/0271259, 2020/0348909, 2023/0176593, 2022/0284712; U.S.

Patent Nos. 11,748,620, 11,816,585, 11,537,811, 11,215,999, 11,150,664, 11,636,333, 10,678,244.

258. As discussed above, Tesla did not release a beta version of its FSD software until October 2020. *See* https://www.theverge.com/2020/10/21/21527577/tesla-full-self-driving-autopilot-beta-software-update (Ex. 12). As part of that release, Tesla CEO Elon Musk indicates that "Tesla was approaching this software update 'very cautiously' because the 'world is a complex and messy place.'" *Id.* In addition, according to a warning message that Tesla drivers received when given the option to enable the FSD software in its beta, Tesla's FSD software "may do the wrong thing at the worst time." *See* https://dawnproject.com/wp-content/uploads/2022/09/FSD-Beta-warning.png (Ex. 13). These facts also demonstrate that operating autonomous vehicles was not a well-understood, routine, or conventional activity as of January 2019.

259. In addition, other researchers in the field of autonomous vehicles confirmed that the subject matter of the claims of the '346 patent was not well-understood, routine, or conventional in January 2019. For example, in June 2017, researchers at the Australian Centre for Field Robotics (ACFR) at the University of Sydney (NSW, Australia) commented that:

> Advanced driver assistance systems (ADAS) are increasingly seen as a mechanism to improve the safety and efficiency of transportation by understanding and reacting to potential vehicle safety threats using state-of-the-art sensing and algorithms. A major component of these systems is the ability to infer the future intentions of drivers to predict the likelihood of potential collisions. This is a challenging task, particularly in intersections where complex traffic scenarios result in a proportionally high number of accidents. Human drivers are able to estimate the future trajectory of other vehicles from a combination of potentially subtle cues – the combination of the various kinematic properties - and the position of the vehicle on the road relative to the lane. Being able to reproduce this driver intuition in a computer model is still an open area of research.

Zyner et. al., "Long Short Term Memory for Driver Intent Prediction," 2017 IEEE Intelligent Vehicles Symposium (IV) June 11-14, 2017, Redondo Beach, CA, USA (Ex. 14).

260. Similarly, in 2017, researchers from the Institute for Intelligent Systems Research and Innovation at Deakin University in Australia noted that autonomous vehicles "still have some difficulties specially when it comes to driving in urban traffic environment such as the interaction with Vulnerable Road Users (VRUs) such as pedestrians. Intuitively, interactions take place nowadays between human drivers and pedestrians are based on implicit cues between the two parties." Saleh et al., "Intent Prediction of Vulnerable Road Users from Motion Trajectories Using Stacked LSTM Network," 2017 IEEE 20th International Conference on Intelligent Transportation Systems (ITSC): Workshop (Ex. 15). *See also* Casas et al., "IntentNet: Learning to Predict Intention from Raw Sensor Data", 2nd Conference on Robot Learning , Zurich, Switzerland (2018) (Ex. 16) ("While a plethora of systems have been built in the past few decades, many challenges still remain. One of the fundamental difficulties is that self driving vehicles have to share the roads with human drivers, which can perform maneuvers that are difficult to predict."); Zyner et al., "Naturalistic Driver Intention and Path Prediction Using Recurrent Neural Networks", IEEE Transactions on Intelligent Transportation Systems, Vol. 21, No. 4 (April 2020) (Ex. 17) ("Driving vehicles is a highly skilled task that requires extensive understanding of the intentions of other road users. This knowledge allows drivers to safely navigate an area through other traffic. While this may become second nature to an experienced human driver, properly understanding the intentions of other drivers is still an unsolved problem for Advanced Driver Assistance Systems (ADAS), and by extension, autonomous vehicles."); Rasouli et al., "Are They Going to Cross? A Benchmark Dataset and Baseline for Pedestrian Crosswalk Behavior", 2017 IEEE International Conference on Computer Vision Workshops, Venice, Italy, 2017 (Ex. 18) ("Designing

autonomous vehicles suitable for urban environments remains an unresolved problem. One of the major dilemmas faced by autonomous cars is how to understand the intention of other road users and communicate with them. The existing datasets do not provide the necessary means for such higher level analysis of traffic scenes"). That these problems existed in the art demonstrates that the subject matter of the claims of the '346 patent was not well-understood, routine, or conventional as of January 2019.

261. In addition, numerous accidents have been reported since 2019 involving shortcomings of Tesla's autonomous driving systems, its prior Autopilot systems, and other autonomous or semi-autonomous driving systems. *See, e.g.*, https://www.craftlawfirm.com/autonomous-vehicle-accidents-2019-2024-crash-data/ (Ex. 19); https://www.cbsnews.com/news/waymo-car-recall-software-crash-self-driving/ (Ex. 20); https://www.msn.com/en-us/news/us/waymo-is-being-investigated-by-the-feds-for-a-robotaxi-illegally-passing-a-school-bus/ar-AA1OQeGB (Ex. 21); https://www.msn.com/en-us/autos/news/driver-fell-asleep-at-wheel-of-autopilot-driven-tesla-before-it-hit-police-car/ar-AA1Px1Ku (Ex. 22); https://ktar.com/arizona-news/self-driving-uber-car-fatally-runs-over-pedestrian-in-tempe/1994638/ (Ex. 23); https://www.msn.com/en-us/autos/news/waymo-autonomous-vehicle-involved-in-multicar-crash-apd-says/ar-AA1Prszz (Ex. 24); https://www.msn.com/en-us/pets-and-animals/pets/a-week-after-a-waymo-self-driving-car-killed-a-beloved-cat-san-francisco-still-mourns/ar-AA1PFvoq (Ex. 25); https://www.latimes.com/business/story/2025-08-01/tesla-must-pay-243-million-over-fatal-autopilot-crash (Ex. 26); https://www.techspot.com/news/110085-tesla-robotaxis-already-crashing-austin-data-points-gaps.html (Ex. 27); https://electrek.co/2018/06/07/tesla-fatal-crash-autopilot-ntsb-releases-preliminary-report (Ex. 28);

https://www.theguardian.com/technology/2024/apr/26/tesla-autopilot-fatal-crash (Ex. 29); https://techcrunch.com/2024/02/13/waymo-recall-crash-software-self-driving-cars (Ex. 30); https://www.upi.com/Top_News/US/2024/06/13/waymo-recall-robotaxi-crash/2251718311972 (Ex. 31); https://abcnews.go.com/Business/tesla-autopilot-steered-driver-barrier-fatal-crash-ntsb/story?id=68936725 (Ex. 32); https://www.reuters.com/business/autos-transportation/nhtsa-opens-probe-into-24-mln-tesla-vehicles-over-full-self-driving-collisions-2024-10-18/ (Ex. 33); https://www.cnn.com/2021/08/27/cars/toyota-self-driving-vehicle-paralympics-accident (Ex. 34). These incidents likewise demonstrate that operating autonomous vehicles was not a well-understood, routine, or conventional activity as of February 2019.

262. At a minimum, Tesla has known about the ’346 patent and its infringement of the ’346 patent at least as early as the filing date of the Original Complaint. In addition, on information and belief, Tesla was aware of Perceptive’s patent portfolio, monitored Perceptive’s patent portfolio, and it and/or its agents substantially cited to Perceptive’s patents in connection with prosecuting Tesla patents, all prior to the filing of the Original Complaint.

263. On information and belief, since at least the above-mentioned dates when Tesla was on notice of its infringement, Defendant has indirectly infringed the ’346 patent in violation of 35 U.S.C. § 271(b) at least by inducing customers to purchase the Accused Products and/or by instructing customers how to use and/or make the Accused Products in a way that directly infringes the asserted claims of the ’346 Patent. *See, e.g.,* infringement allegations in this Count and Ex. 9.

264. On information and belief, Defendant’s actions represented a specific intent to induce infringement of the asserted claims, including at least claims 1 and 19 of the ’346 patent. In this judicial district and elsewhere in Texas and the United States, Defendant has offered its customers and prospective customers extensive customer support and instructions that instruct and

encourage its customers to infringe the '346 patent via at least the making and/or use of the Accused Products in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, materials cited in Ex. 9; https://www.tesla.com/drive (advertisement for Tesla demo drives using FSD in this judicial district and elsewhere in Texas and the United States); https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html (Elon Musk wrote an email to Tesla employees requiring them to encourage and instruct customer to install and use the accused FSD functionality in Tesla vehicles); https://www.tesla.com/ms/order/ (delivery of Tesla vehicle occurs at customer location and/or at a Tesla regular and established place of business in this judicial district and elsewhere in Texas and the United States); https://www.tesla.com/fsd (Tesla encouraging and instructing customers to demo drive a Tesla car with FSD and install/activate FSD in their Tesla vehicles to drive for the customer avoiding bikes, motorcycles, and other cars); https://www.tesla.com/ownersmanual/modely/en_us/GUID-2CB60804-9CEA-4F4B-8B04-09B991368DC5.html. In addition, Tesla's website is accessible in this judicial district and, as discussed and cited herein, is further evidence of Tesla's acts of indirect infringement in this judicial district. In this judicial district and elsewhere in Texas and the United States, Tesla induces its customers and prospective customers to perform each of the steps of claim 1 by driving Tesla FSD vehicles that use FSD in this judicial district and elsewhere in Texas and the United States. In this judicial district and elsewhere in Texas and the United States, Tesla induces its customers and prospective customers to use the entire claimed system of claim 19 by putting the system to use via Tesla's FSD system and receiving the benefit of that use, such as autonomously controlling a vehicle. In this judicial district and elsewhere in Texas and the United States, Tesla induces its customers to make the system of claim 19 by installing the FSD software via over the air updates.

265. In addition, by receiving notice of the '346 patent and Defendant's infringement thereof, Defendant obtained a subjective belief that there is a high probability that the Accused Products infringe the '346 patent. Despite being put on notice of infringement, on information and belief Defendant has not taken actions to avoid the conduct alleged to infringe, has not offered any reasons as to why Defendant does not infringe the '346 patent, and has not sought to remedy its infringements by offering to take a license. Defendant's failure to act reflects deliberate actions to avoid learning that the Accused Products infringe the '346 patent and, more generally, a policy of not earnestly reviewing and respecting the intellectual property of others.

266. Since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the '346 patent. Tesla intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the '346 Accused Products, creating and/or maintaining established distribution channels for the '346 Accused Products into and within the United States, manufacturing the '346 Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the '346 Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States. *See, e.g.*, https://www.tesla.com/fsd.

267. On information and belief, despite having knowledge of the '346 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '346 patent, Tesla has nevertheless continued its infringing conduct and disregarded an objectively high

likelihood of infringement. Tesla's infringing activities relative to the '346 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

268. Perceptive has been damaged as a result of Tesla's infringing conduct described in this Count. Tesla is, thus, liable to Perceptive in an amount that adequately compensates Perceptive for Tesla's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT V

(INFRINGEMENT OF U.S. PATENT NO. 11,753,046)

269. Plaintiff incorporates paragraphs 1 through 268 herein by reference.

270. Perceptive is the assignee of the '046 patent, entitled "System and Method of Predicting Human Interaction with Vehicles," with ownership of all substantial rights in the '046 patent, including the right to exclude others and to enforce, sue, and recover damages for past and future infringements. A copy of the '046 patent is attached hereto as Exhibit 5.

271. Tesla has and continues to directly and/or indirectly infringe (by inducing infringement) one or more claims including at least claims 1 and 15 of the '046 patent in this judicial district and elsewhere in Texas and the United States by making, using, testing, offering for sale, selling, and/or importing FSD software and hardware, Tesla vehicles with FSD software and hardware, and/or systems that comprise Tesla vehicles with FSD software and hardware and/or Tesla systems that support Tesla vehicles with FSD software and hardware (the '046 Accused Products). Such infringement includes, but is not limited to, the making, using, and/or selling of '046 Accused Products that leverage and infringe the inventions of the '046 patent. The

infringement allegations of the asserted claims of the ’046 patent, including claims 1 and 15 of the ’046 patent, is also embodied in Plaintiff’s preliminary infringement contentions, which are incorporated by reference. *See* Ex. 10.

272. On information and belief, Tesla directs and controls the ’046 Accused Products to operate in an infringing manner by providing the components, including the FSD hardware and software instructions, that infringe the ’046 patent. Furthermore, Tesla installs, services, and/or maintains the ’046 Accused Products that it provided to its customers. Tesla owns and controls the FSD software which automatically runs on and directs and controls the ’046 Accused Products. Through its provision of the FSD software, Tesla causes the ’046 Accused Products to perform the functionality recited by the asserted claims. Tesla further controls the performance of the claimed method steps of the ’046 Accused Products by conditioning receipt of warranty benefits on the customer’s agreement not to modify the ’046 Accused Products. *See, e.g.,* https://digitalassets.tesla.com/tesla-contents/image/upload/tesla-new-vehicle-limited-warranty-en-us.pdf. Furthermore, Tesla owns vehicles and the training networks (*e.g.*, Dojo and/or Cortex) that infringe the asserted claims.

273. Tesla performs all of the steps of claim 1 of the ’046 patent in Texas and elsewhere in the United States. Tesla performs at least the step of “executing the trained model to predict a state of mind of a user in a new image” of claim 1 of the ’046 patent via Tesla FSD vehicles owned by Tesla and/or third parties that use FSD in this judicial district. Furthermore, Tesla infringes this step via Tesla owned FSD vehicles that are test driven, by Tesla employees and/or customers, using FSD at Tesla’s regular and established places of business in this judicial district:

Schedule a Drive

Experience Full Self-Driving (Supervised)[1]
Let your vehicle drive you almost anywhere with your active supervision. Includes Auto Lane Changes, Actually Smart Summon, Autopark, and more.

Ownership Experience in App
Download the Tesla App to experience keyless driving, locating your vehicle, pre-cooling and heating, locking and unlocking, Sentry, and more.

Quick and Easy Check-in
Starting your drive is simple and low hassle, whether you're on a self-serve drive or visiting our advisors in store.

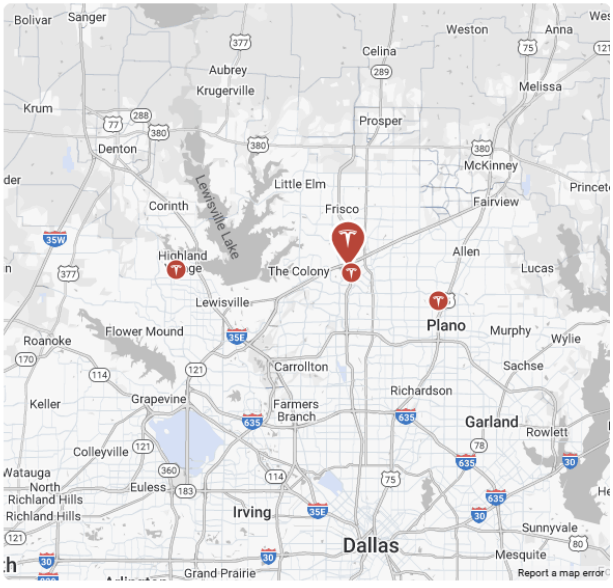
Select a Model

- **Cybertruck** — More utility than a truck with more performance than a sports car
- **Model S** — Luxury sedan for range, quick acceleration and comfort
- **Model X** — Luxury SUV for comfort, storage and maximum tech
- **Model 3** — Sports sedan for families, commuting and road trips
- **Model Y** — Midsize SUV for families, road trips and extra cargo space

Select Location and Time

Enter or edit your address as needed to find a demo drive location nearby and choose a time
Available drives near 7500 Windrose Ave., Plano, TX 75024

- **Plano Legacy West** — 7500 Windrose Avenue Space B185, TX 75024
- **Plano - Democracy Drive** — 5800 Democracy Drive, TX 75024
- **Plano - Lexington** — 300 Lexington Dr, TX 75075
- **Flower Mound** — 1805 Justin Rd, TX 75028



Drive Duration

Regular | 24 Hour | 48 Hour

Date: November 10, 2025

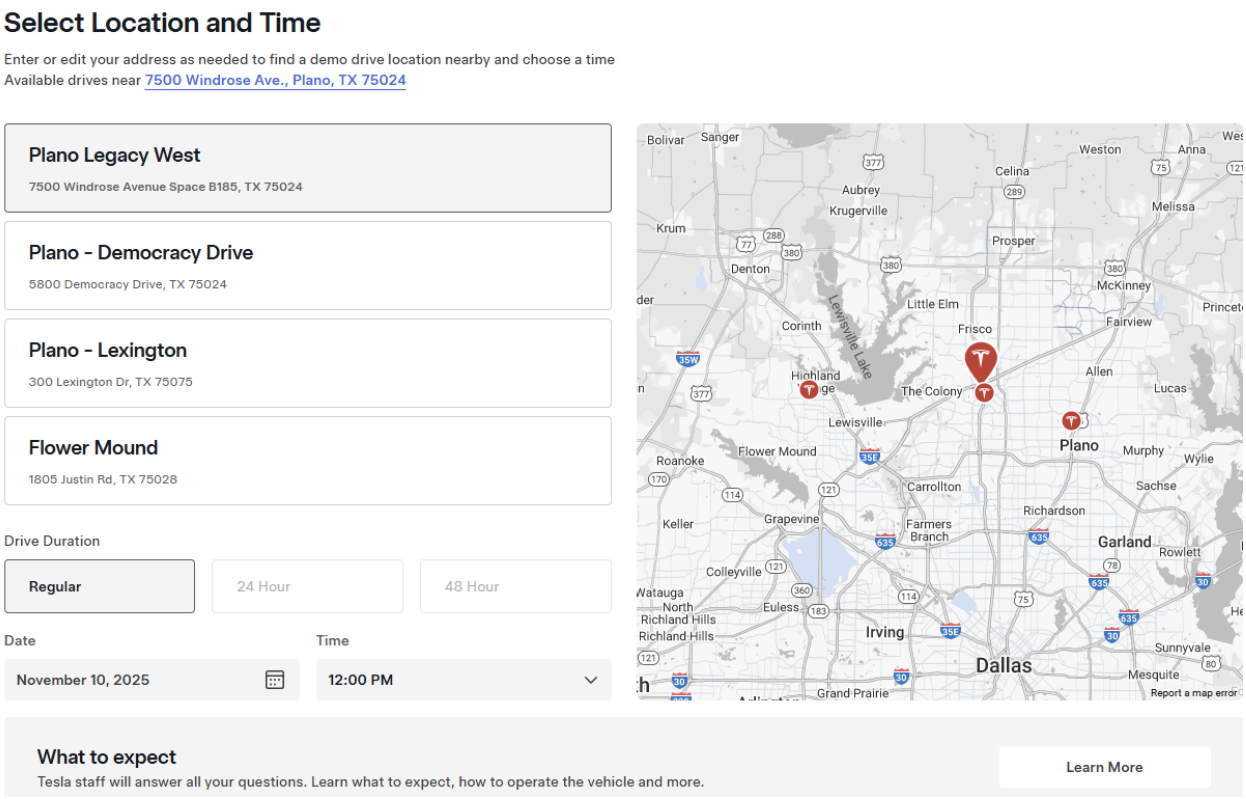
Time: 12:00 PM

What to expect
Tesla staff will answer all your questions. Learn what to expect, how to operate the vehicle and more.

Learn More

https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla FSD vehicles and performing the aforementioned step of claim 1 of the '046 patent in this judicial district. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement of the aforementioned step of claim 1 of the '046 patent in this judicial district. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html.

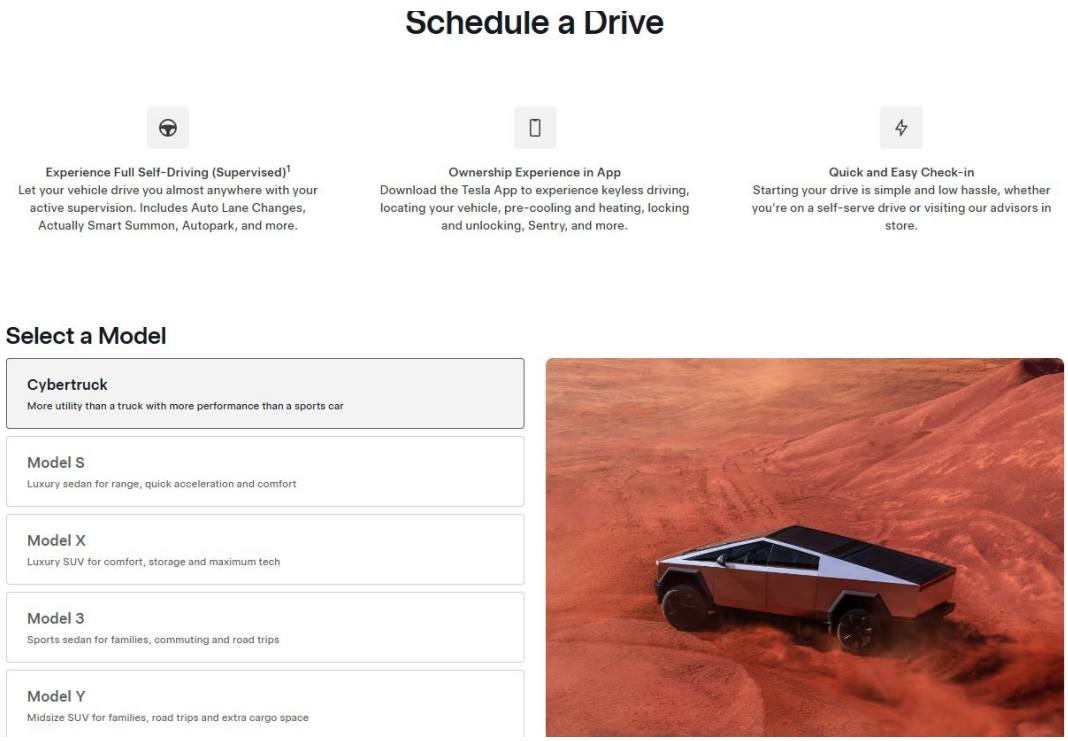
274. Tesla also infringes at least claim 15 of the '046 patent by making the system of at least claim 15 of the '046 patent in this judicial district and elsewhere in Texas and the United States. Tesla provides all of the necessary components of the infringing system, including providing over the air updates of the FSD software. The infringing system is made at least when a Tesla vehicle is configured with FSD software or an updated version of the FSD software. Tesla makes the infringing system of at least claim 15 of the '046 patent in this judicial district and elsewhere in Texas and the United States because it provides and/or installs the FSD software to FSD Tesla vehicles owned by customers and/or Tesla:

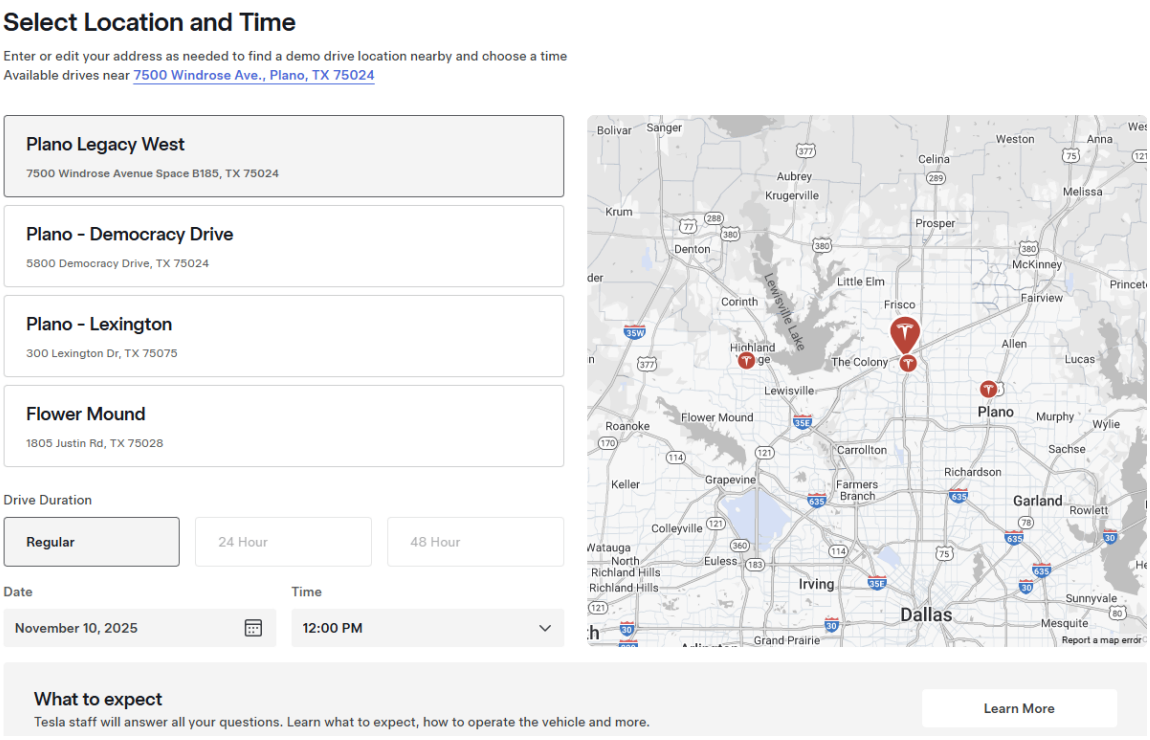


https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla owned FSD vehicles that receive FSD updates that make the claimed system in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement of claim 15 of the '046 patent of making the claimed system in this judicial district and elsewhere in Texas and the United States. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html.

275. Tesla infringes at least claim 15 of the '046 patent by using the claimed system as a whole. Tesla provides all of the necessary components of the infringing system, including

providing over the air updates of the FSD software. Furthermore, Tesla directs and controls the system to automatically and autonomously control the vehicle by putting the claimed invention into service. Furthermore, Tesla uses the system of claim 15 of the ’046 patent via its Tesla owned FSD vehicles that are test driven, by Tesla employees and/or customers, using FSD at Tesla’s regular and established places of business in this judicial district:

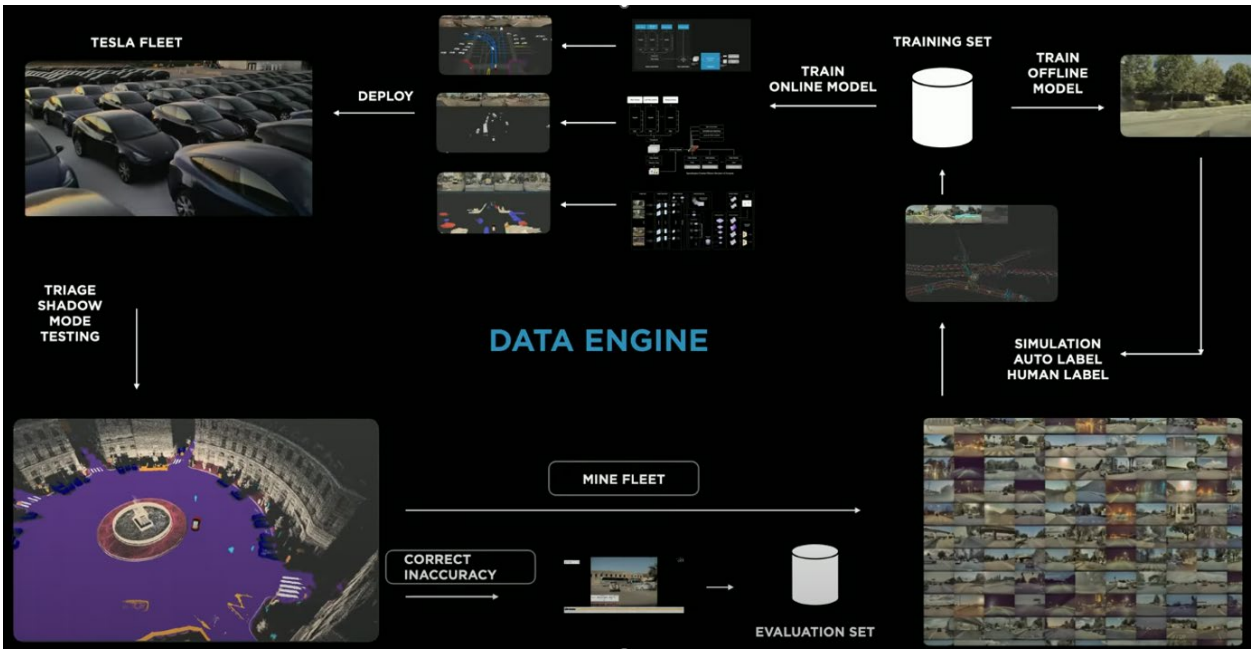




https://www.tesla.com/drive. Furthermore, Tesla has been operating its infringing robotaxis and/or other Tesla FSD vehicles in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://x.com/InnovatingCoin/status/1970618062932967669?s=20; https://eletric-vehicles.com/tesla/tesla-spotted-testing-robotaxis-in-plano-texas-as-expansion-continues/. Tesla requires and/or has required its employees to install and activate FSD and take customers on a short test ride using FSD before handing over a purchased vehicle, which further evidences Tesla's infringement by using the system of claim 15 of the '046 patent in this judicial district and elsewhere in Texas and the United States. https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html. In this judicial district and elsewhere in Texas and the United States, Tesla uses the entire claimed system by putting the system to use via Tesla's FSD system and receiving the benefit of that use, such as autonomously controlling a vehicle and/or collecting more data to better train its FSD software. On information and belief, Tesla also directs and/or controls its customers' actions in putting the entire claimed

system to service in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html (Elon Musk wrote an email to Tesla employees stating that "Going forward, it is mandatory in North America to install and activate FSD V12.3.1 and take customers on a short test ride before handing over the car. … Almost no one actually realizes how well (supervised) FSD actually works. I know this will slow down the delivery process, but it is nonetheless a hard requirement.").

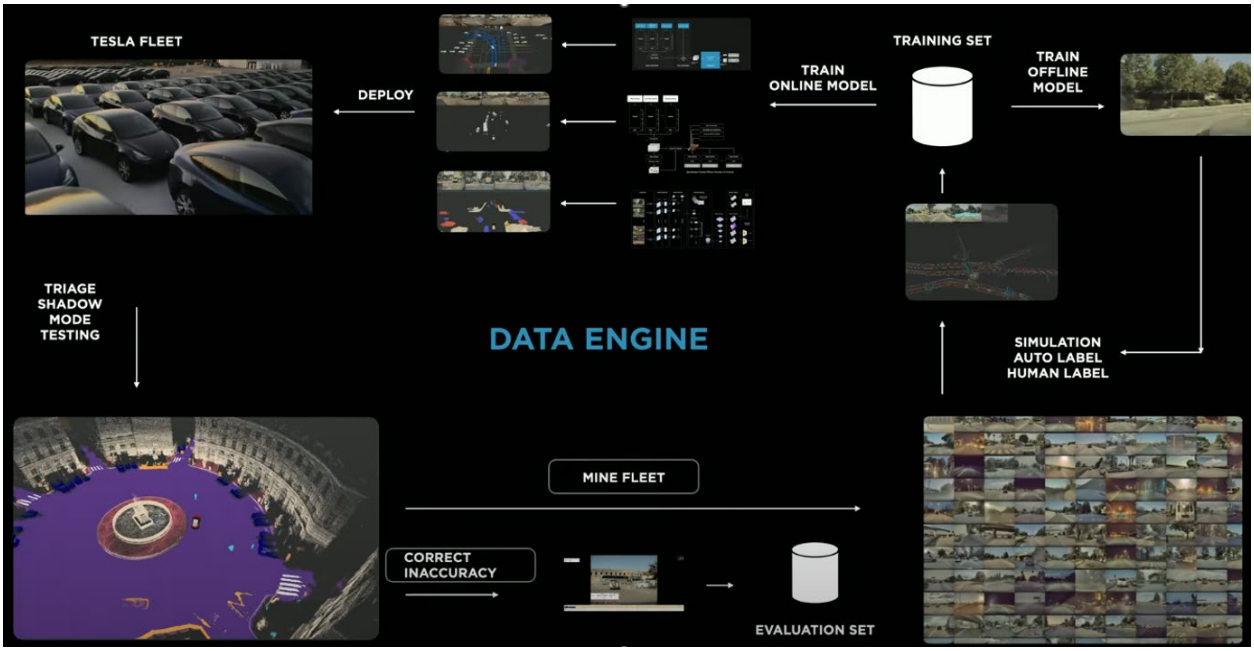
276. On information and belief, Tesla performs the computer-implemented method of claim 1 of the '046 patent comprising storing a plurality of images, each image displaying one or more users. For example, Tesla stores, at one or more of its datacenters (e.g., Dojo, Cortex), a plurality of images displaying one or more users (e.g., vehicle, pedestrian).



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

277. On information and belief, Tesla generates training data from the plurality of images, the generating comprising sending the image to a plurality of human observers, each

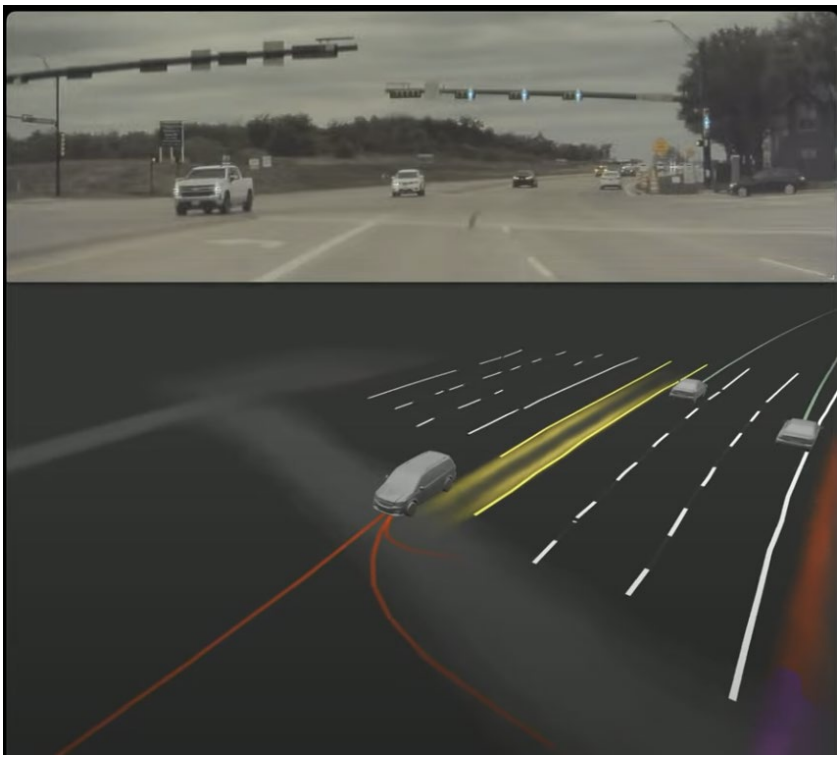
human observer presented with a request to answer a question about a state of mind of a user in the image.



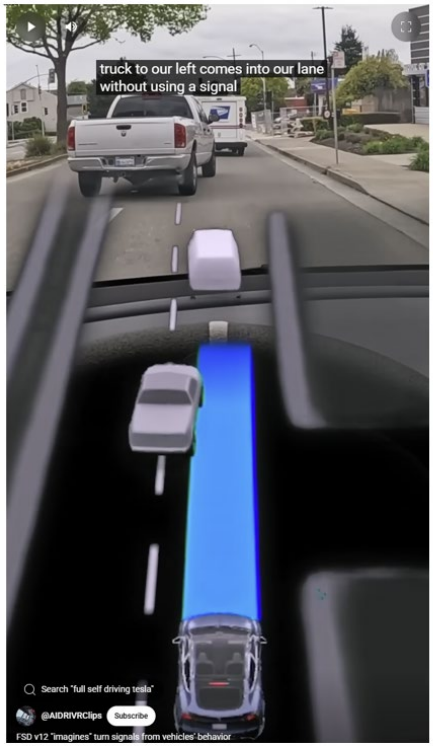
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

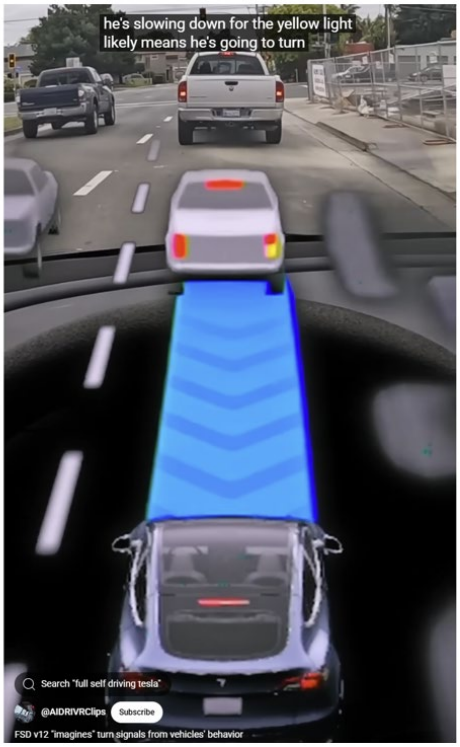
For example, Tesla's in-house team of over 1,000 data labelers provide advanced labeling that describe a state of mind of a road user displayed in one or more images. In the example illustrated below, a labeler is asked six questions about the state of mind of a road in the image: stopped_double_parked, stopped_traffic_controls, stopped_idle_in_lane, stopped_pulled_over, stopped_traffic, or parked.

https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022). Another Tesla labeler reviewing this video makes a new prediction that the car is parked and not stopped because of traffic, which adds a new weight to the prediction of the statistical summary. On information and belief, Tesla uses similar tooling mechanisms to collect multiple answers to questions from many different labelers regarding the state of mind of a road user in thousands for certain images/videos showing a user in an image. Tesla gathers a statistical summary of answers that describe a state of mind of a road user (e.g., will the road user in a stopped vehicle in the left hand lane perform a u-turn, left turn, or continue forward; will a pedestrian road user cross the road or not; will a road user of a vehicle in the right hand lane continue forward or make a right hand turn if it just merged into the lane of the autonomous vehicle). The examples below illustrate that the answers provided by human observers are collected as to the state of mind of road users in the scenarios where the state of mind of road users is considered in the scenarios depicted below.

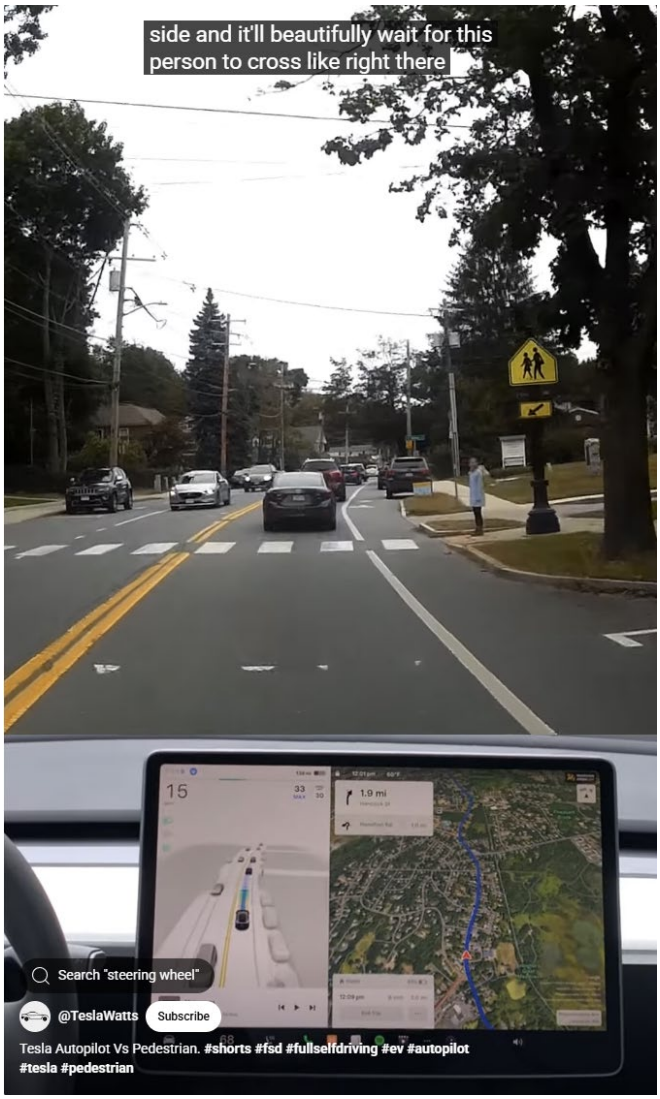


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (predicting whether the road user will make a left turn, u-turn, or continue forward).





https://www.youtube.com/shorts/KVa4GWepX74 (ultimately predicting that the road user will make a right hand turn, rather than continue straight, as illustrated by the predicted right-hand turn blinker that is not actually used by the actual road user).

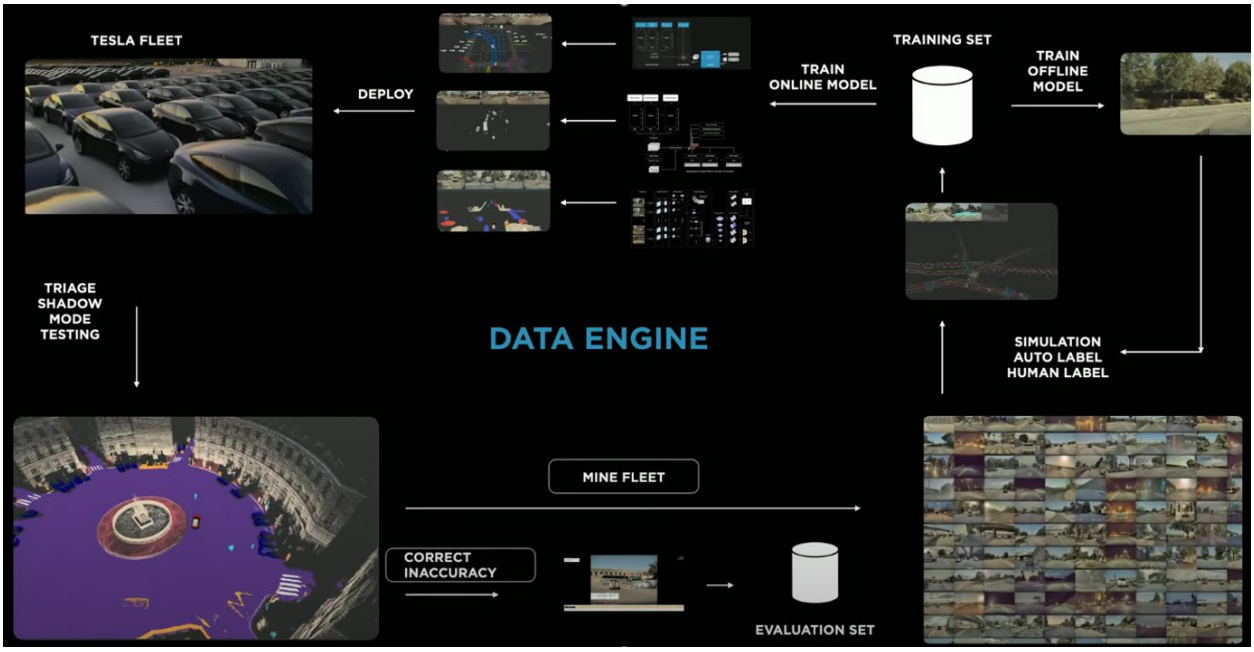


https://www.youtube.com/shorts/-fJzjyi6HkI (predicting that the pedestrian road user is likely to cross the road, rather than continue to stand still).

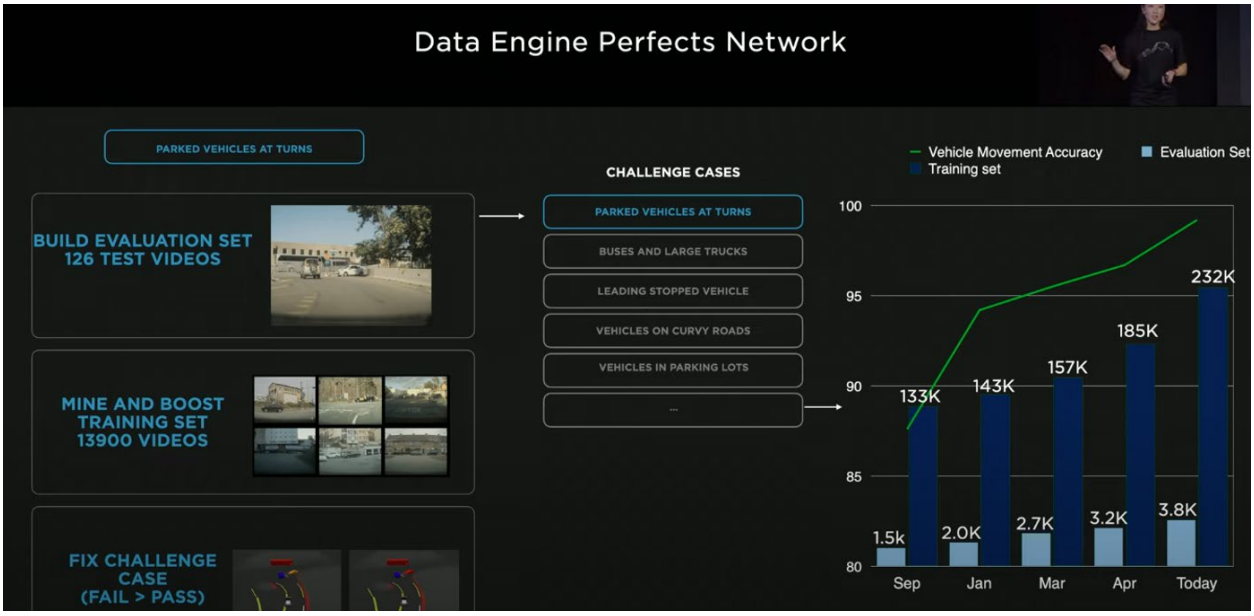
278. On information and belief, Tesla generates training data from the plurality of images, the generating comprising receiving, from each of the plurality of human observers, a

response representing a judgment by the human observer of the state of mind of the user in the image. Tesla performs this step as described in the paragraph above.

279. On information and belief, Tesla generates training data from the plurality of images, the generating comprising generating summary statistics describing the state of mind of the user in the image based on the received responses from the plurality of human observers. At its datacenters (e.g., Dojo and/or Cortex), Tesla generates a training dataset comprising summary statistics of user responses describing the state of minds of road users displayed in the plurality of images. With each new user response, the weight of the statistical summary describing the state of minds of road users in the plurality of images is modified, such that the accuracy of the movement by the autonomous vehicle improves with more responses and updated statistical summaries.



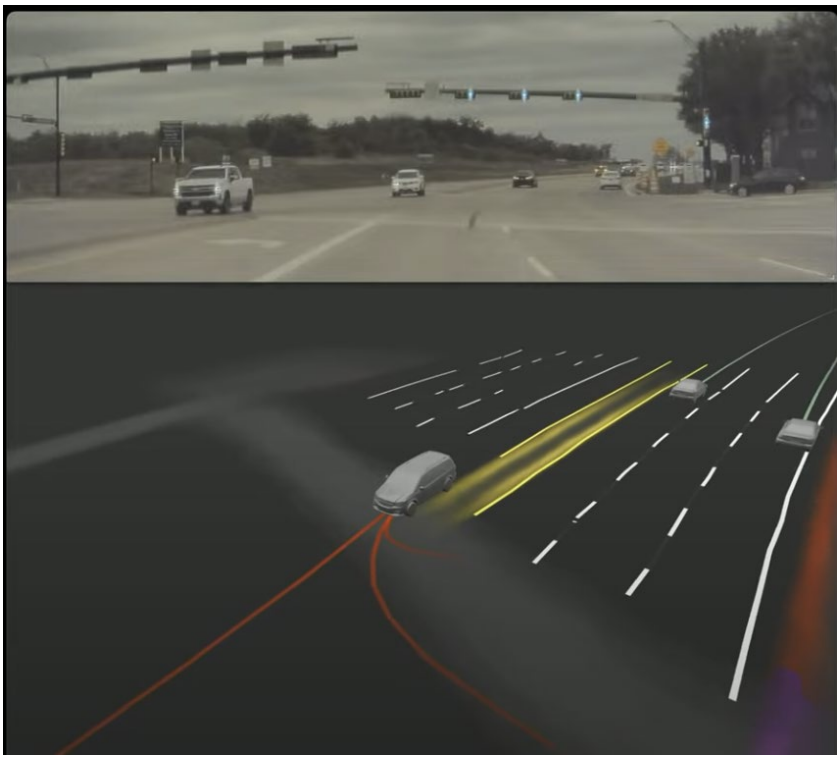
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).



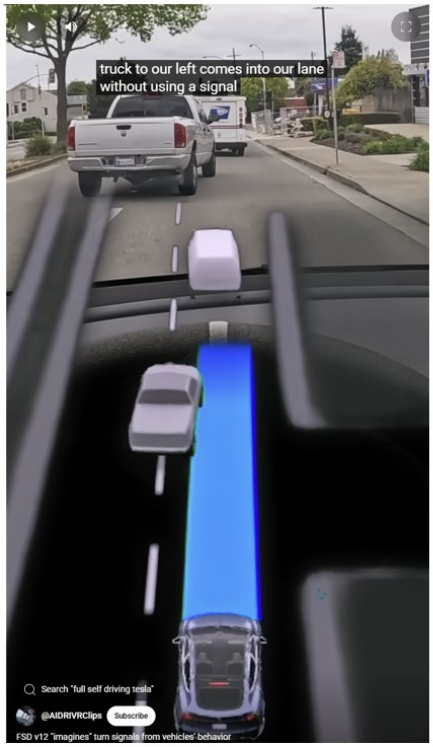
https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

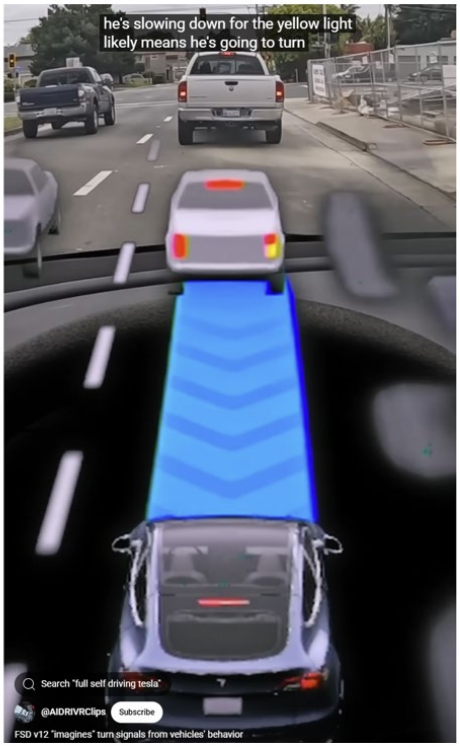
280. On information and belief, Tesla generates training data from the plurality of images, the generating comprising storing the summary statistics in association with the image as part of the training data. Tesla performs this step at its AI data centers, where the summary statistics associated with the image (or video compromising the image(s)) are stored with the image (or with a video comprising the image(s)) as part of the training data.

281. On information and belief, Tesla trains a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image. Tesla uses the training data set to train the FSD software. This is evidenced by the fact that the FSD software predicts actions based on the possible state of mind of road users.

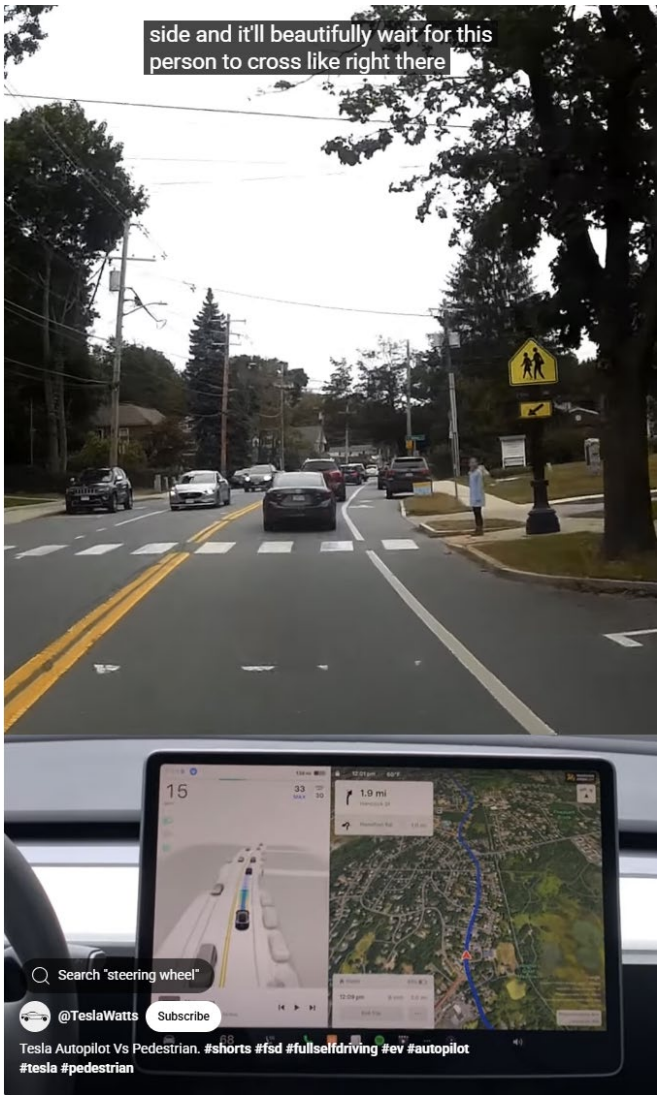


https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022) (predicting whether the road user will continue forward, make a left turn, or a u-turn).

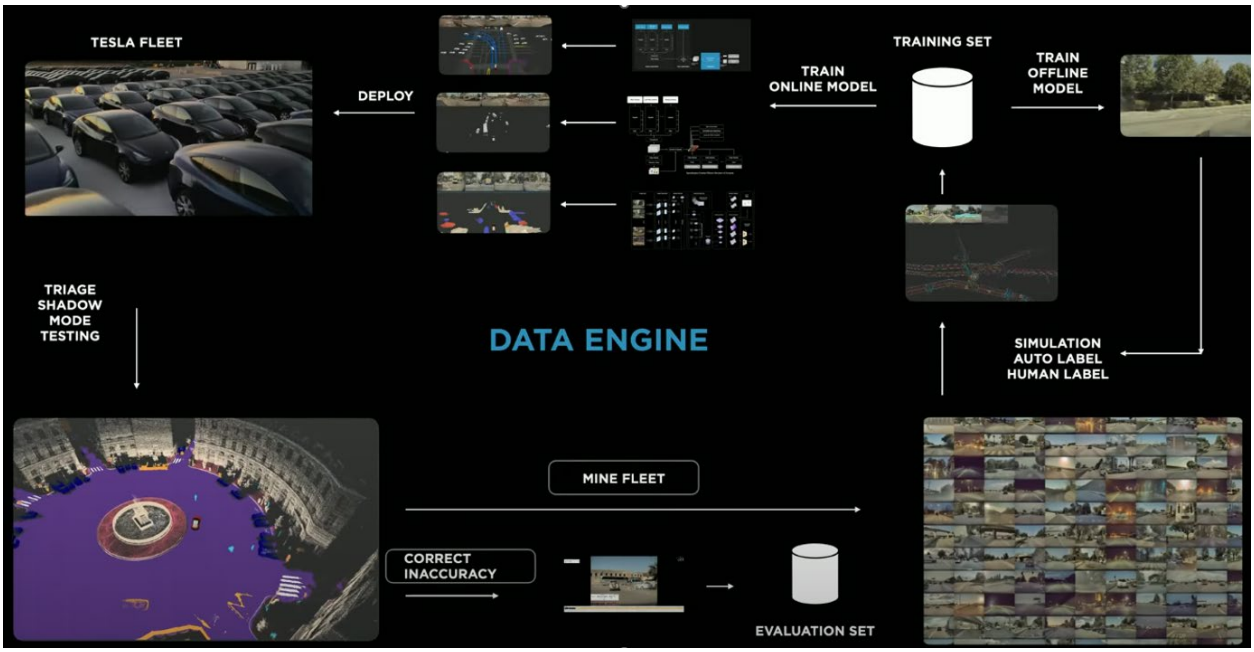




https://www.youtube.com/shorts/KVa4GWepX74 (ultimately predicting that the road user will make a right hand turn, rather than continue straight, as illustrated by the predicted right-hand turn blinker that is not actually used by the actual road user).



https://www.youtube.com/shorts/-fJzjyi6HkI (predicting that the pedestrian road user is likely to cross the road, rather than continue to stand).



https://www.youtube.com/watch?v=ODSJsviD_SU (Tesla AI Day 2022).

282. On information and belief, Tesla executes the trained model to predict a state of mind of a user in a new image. For example, the FSD software allows for autonomous operation of the vehicle, in which the Tesla vehicle continuously receives new images and predicts the state of mind of the users in such images. *See* https://www.tesla.com/fsd ("Watch the World's First Autonomous Car Delivery").

283. The specific ways in which the '046 Accused Products are configured to support the aforementioned features are further detailed in proprietary documents and/or source code that evidence infringement by the '046 Accused Products.

284. The technology discussion above and the exemplary '046 Accused Products provide context for Plaintiff's infringement allegations.

285. The '046 patent is valid, enforceable, and was duly issued in full compliance with Title 35 of the United States Code.

286. The ’046 patent issued from U.S. Patent Application No. 17/468,516, filed on September 7, 2021. The ’046 patent is a continuation of U.S. Patent Application No. 16/828,823, filed on Mach 24, 2020, which issued as the ’889 patent. The ’889 patent is a continuation of U.S. Patent Application No. 16/512,560, filed on July 16, 2019, which issued as the ’344 patent, and is also a continuation of U.S. Patent Application No. 15/830,549, filed on December 4, 2017. The ’889 patent also claims the benefit of U.S. Provisional Patent Application No. 62/528,771, filed on July 5, 2017.

287. The claims of the ’046 patent are entitled to a priority date at least as early as July 5, 2017, the filing date of U.S. Provisional Application No. 62/528,771.

288. The claims of the ’046 patent are not directed to any abstract idea.

289. The claims of the ’046 patent are not merely directed to using a machine learning model to drive a car. Instead, the claims of the ’046 patent are directed to specific technological improvements of autonomous vehicles for predicting the behavior of objects near the autonomous vehicle. The claims of the ’046 patent specifically claim improvements to the functionality of computer systems for autonomous vehicles. Also, the claims of the ’046 patent address problems specifically rooted in the field of computer systems for autonomous vehicles.

290. The claims of the ’046 patent recite inventive concepts.

291. Additionally, the claims of the ’046 patent do not recite subject matter that is well-understood, routine, or conventional as of July 5, 2017, the filing date of U.S. Provisional Application No. 62/528,771.

292. In its motion to dismiss (Dkt. 30), Tesla did not dispute that the claims of the ’046 patent are entitled to the priority date of U.S. Provisional Application No. 62/528,771.

293. The '046 patent specifically describes and identifies certain problems with autonomously operating a car. As the '046 patent states, "[t]he ability a driver of a car to look at a person—who is walking, driving another car, or riding a bike on or near a street—and predict what that person wants to do may be the single most important part of urban driving." '046 patent, 1:33-36. "For example, when a driver of a car sees people near the car, determining whether one person will cross the street, whether another person will remain standing on a street corner, and whether yet another person will change lanes on his or her bicycle is necessary to safely drive the car and avoid hitting the people." *Id.* at 1:36-41. "This ability is so fundamental, that operating in cities without it would be nearly impossible." *Id.* at 1:42-43.

294. As the '046 patent indicates, "human drivers have such a natural ability to predict a person's behavior. In fact, they can do it so effortlessly, that they often do not even notice that they are doing it." *Id.* at 1:44-47.

295. The '046 patent also describes the problems with such prediction in the context of autonomous driving, including that "computers and autonomous driving vehicles cannot adequately predict the behavior of people, especially in urban environments." *Id.* at 1:47-49.

296. The '046 patent describes certain pre-existing methods for addressing these then-existing shortcomings of autonomous vehicles, including that "autonomous driving vehicles may rely on methods that make decisions on how to control the vehicles by predicting 'motion vectors' of people near the vehicles." *Id.* at 1:50-52. As the '046 patent indicates, "[t]his is accomplished by collecting data of a person's current and past movements, determining a motion vector of the person at a current time based on these movements, and extrapolating a future motion vector representing the person's predicted motion at a future time based on the current motion vector." *Id.* at 1:53-58. As the '046 patent recognizes, "[h]owever, the methods do not predict a person's

actions or movements based on other observations besides his or her current and past movements, which lead to inferior results in predicting the person's future behavior." *Id.* at 1:58-61.

297. In addition, as of July 2017, there were numerous shortcomings in the field of autonomous vehicles that are addressed by the inventions of the claims of the '046 patent.

298. For example, as of July 2017, Waymo's fully self-driving vehicles were not yet on the road. Instead, until November 2017, Waymo was only operating vehicles on public roads with a test driver at the wheel. *See* https://waymo.com/blog/2017/11/waymos-fully-self-driving-vehicles-are (Ex. 11). Similarly, Tesla did not release a beta version of its FSD software until October 2020. *See* https://www.theverge.com/2020/10/21/21527577/tesla-full-self-driving-autopilot-beta-software-update (Ex. 12). As part of that release, Tesla CEO Elon Musk indicates that "Tesla was approaching this software update 'very cautiously' because the 'world is a complex and messy place.'" *Id.* In addition, according to a warning message that Tesla drivers received when given the option to enable the FSD software in its beta, Tesla's FSD software "may do the wrong thing at the worst time." *See* https://dawnproject.com/wp-content/uploads/2022/09/FSD-Beta-warning.png (Ex. 13).

299. In addition, as of June 2017, researchers at the Australian Centre for Field Robotics (ACFR) at the University of Sydney (NSW, Australia) commented that:

> Advanced driver assistance systems (ADAS) are increasingly seen as a mechanism to improve the safety and efficiency of transportation by understanding and reacting to potential vehicle safety threats using state-of-the-art sensing and algorithms. A major component of these systems is the ability to infer the future intentions of drivers to predict the likelihood of potential collisions. This is a challenging task, particularly in intersections where complex traffic scenarios result in a proportionally high number of accidents. Human drivers are able to estimate the future trajectory of other vehicles from a combination of potentially subtle cues – the combination of the various kinematic properties - and the position of the vehicle on the road relative to the lane. Being able to

> reproduce this driver intuition in a computer model is still an open area of research.

Zyner et. al., "Long Short Term Memory for Driver Intent Prediction," 2017 IEEE Intelligent Vehicles Symposium (IV) June 11-14, 2017, Redondo Beach, CA, USA (Ex. 14).

300. Similarly, in 2017, researchers from the Institute for Intelligent Systems Research and Innovation at Deakin University in Australia noted that autonomous vehicles "still have some difficulties specially when it comes to driving in urban traffic environment such as the interaction with Vulnerable Road Users (VRUs) such as pedestrians. Intuitively, interactions take place nowadays between human drivers and pedestrians are based on implicit cues between the two parties." Saleh et al., "Intent Prediction of Vulnerable Road Users from Motion Trajectories Using Stacked LSTM Network," 2017 IEEE 20th International Conference on Intelligent Transportation Systems (ITSC): Workshop (Ex. 15). *See also* Casas et al., "IntentNet: Learning to Predict Intention from Raw Sensor Data", 2nd Conference on Robot Learning , Zurich, Switzerland (2018) (Ex. 16) ("While a plethora of systems have been built in the past few decades, many challenges still remain. One of the fundamental difficulties is that self driving vehicles have to share the roads with human drivers, which can perform maneuvers that are difficult to predict."); Zyner et al., "Naturalistic Driver Intention and Path Prediction Using Recurrent Neural Networks", IEEE Transactions on Intelligent Transportation Systems, Vol. 21, No. 4 (April 2020) (Ex. 17) ("Driving vehicles is a highly skilled task that requires extensive understanding of the intentions of other road users. This knowledge allows drivers to safely navigate an area through other traffic. While this may become second nature to an experienced human driver, properly understanding the intentions of other drivers is still an unsolved problem for Advanced Driver Assistance Systems (ADAS), and by extension, autonomous vehicles."); Rasouli et al., "Are They Going to Cross? A Benchmark Dataset and Baseline for Pedestrian Crosswalk Behavior", 2017 IEEE International

Conference on Computer Vision Workshops, Venice, Italy, 2017 (Ex. 18) ("Designing autonomous vehicles suitable for urban environments remains an unresolved problem. One of the major dilemmas faced by autonomous cars is how to understand the intention of other road users and communicate with them. The existing datasets do not provide the necessary means for such higher level analysis of traffic scenes").

301. In addition, the USPTO, in *Ex parte Desjardins*, recently rejected the Board's findings that a patent application directed to learning models and artificial intelligence was abstract stating: "Under a charitable view, the overbroad reasoning of the original panel below is perhaps understandable given the confusing nature of existing § 101 jurisprudence, but troubling, because this case highlights what is at stake. Categorically excluding AI innovations from patent protection in the United States jeopardizes America's leadership in this critical emerging technology. Yet, under the panel's reasoning, many AI innovations are potentially unpatentable-even if they are adequately described and nonobvious-because the panel essentially equated any machine learning with an unpatentable "algorithm" and the remaining additional elements as "generic computer components," without adequate explanation. Dec. 24. Examiners and panels should not evaluate claims at such a high level of generality. However, it is with this view that the panel's *sua sponte* action is most troubling, as it eschewed the clear teachings of *Enfish*, and instead substituted only a cursory analysis that ignored this well-settled precedent. Panels should treat such precedent with more care, especially when acting *sua sponte*. At the same time, the claims at issue stand rejected under§ 103. This case demonstrates that§§ 102, 103 and 112 are the traditional and appropriate tools to limit patent protection to its proper scope. These statutory provisions should be the focus of examination. For these reasons, we determine that although independent claim 1 may recite an abstract idea, it is not directed to an abstract idea. Instead, we determine that independent claim 1,

when considered as a whole, integrates an abstract idea into a practical application." *Ex parte Desjardins*, Appeal No. 2024-000567, Decision on Request for Rehearing (Sept. 26, 2025), *available at* https://www.uspto.gov/sites/default/files/documents/202400567-arp-rehearing-decision-20250926.pdf.

302. The '046 patent specifically describes and claims novels methods, non-transitory computer readable storage media, and systems which address these shortcomings of then-existing autonomous vehicle systems. The '046 patent also specifically describes and claims novels methods, non-transitory computer readable storage media, and systems which provide improvements in the functionality of autonomous vehicle systems and addresses problems specifically rooted in the field of autonomous vehicle systems.

303. For example, claim 1 of the '046 patent recites "[a] computer-implemented method comprising" "storing a plurality of images, each image displaying one or more users;" "generating training data from the plurality of images, the generating comprising, for each image:" "sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of mind of a user in the image," "receiving, from each of the plurality of human observers, a response representing a judgment by the human observer of the state of mind of the user in the image," "generating summary statistics describing the state of mind of the user in the image based on the received responses from the plurality of human observers," "storing the summary statistics in association with the image as part of the training data;" "training a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image;" and "executing the trained model to predict a state of mind of a user in a new image."

304. Claim 1 improves the functionality of an autonomous vehicle by "storing a plurality of images, each image displaying one or more users;" "generating training data from the plurality of images, the generating comprising, for each image:" "sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of mind of a user in the image," "receiving, from each of the plurality of human observers, a response representing a judgment by the human observer of the state of mind of the user in the image," "generating summary statistics describing the state of mind of the user in the image based on the received responses from the plurality of human observers," "storing the summary statistics in association with the image as part of the training data;" "training a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image;" and "executing the trained model to predict a state of mind of a user in a new image."

305. By "storing a plurality of images, each image displaying one or more users;" "generating training data from the plurality of images, the generating comprising, for each image:" "sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of mind of a user in the image," "receiving, from each of the plurality of human observers, a response representing a judgment by the human observer of the state of mind of the user in the image," "generating summary statistics describing the state of mind of the user in the image based on the received responses from the plurality of human observers," "storing the summary statistics in association with the image as part of the training data;" "training a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image;" and "executing the trained model to predict a state of mind of a user in a new image," the

method of claim 1 allows an autonomous vehicle to consider summary statistics describing a state of mind of the road user, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "storing a plurality of images, each image displaying one or more users;" "generating training data from the plurality of images, the generating comprising, for each image:" "sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of mind of a user in the image," "receiving, from each of the plurality of human observers, a response representing a judgment by the human observer of the state of mind of the user in the image," "generating summary statistics describing the state of mind of the user in the image based on the received responses from the plurality of human observers," "storing the summary statistics in association with the image as part of the training data;" "training a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image;" and "executing the trained model to predict a state of mind of a user in a new image" allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

306. Claim 8 of the '046 patent recites "[a] non-transitory computer readable storage medium storing instructions that when executed by one or more processors, cause the one or more processors to perform steps" comprising "storing a plurality of images, each image displaying one or more users;" "generating training data from the plurality of images, the generating comprising, for each image:" "sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of mind of a user in the image,"

"receiving, from each of the plurality of human observers, a response representing a judgment by the human observer of the state of mind of the user in the image," "generating summary statistics describing the state of mind of the user in the image based on the received responses from the plurality of human observers," "storing the summary statistics in association with the image as part of the training data;" "training a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image;" and "executing the trained model to predict a state of mind of a user in a new image."

307. Claim 8 of the '046 patent improves the functionality of an autonomous vehicle by "storing a plurality of images, each image displaying one or more users;" "generating training data from the plurality of images, the generating comprising, for each image:" "sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of mind of a user in the image," "receiving, from each of the plurality of human observers, a response representing a judgment by the human observer of the state of mind of the user in the image," "generating summary statistics describing the state of mind of the user in the image based on the received responses from the plurality of human observers," "storing the summary statistics in association with the image as part of the training data;" "training a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image;" and "executing the trained model to predict a state of mind of a user in a new image." By "storing a plurality of images, each image displaying one or more users;" "generating training data from the plurality of images, the generating comprising, for each image:" "sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of

mind of a user in the image," "receiving, from each of the plurality of human observers, a response representing a judgment by the human observer of the state of mind of the user in the image," "generating summary statistics describing the state of mind of the user in the image based on the received responses from the plurality of human observers," "storing the summary statistics in association with the image as part of the training data;" "training a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image;" and "executing the trained model to predict a state of mind of a user in a new image," the non-transitory computer readable storage medium of claim 8 allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "storing a plurality of images, each image displaying one or more users;" "generating training data from the plurality of images, the generating comprising, for each image:" "sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of mind of a user in the image," "receiving, from each of the plurality of human observers, a response representing a judgment by the human observer of the state of mind of the user in the image," "generating summary statistics describing the state of mind of the user in the image based on the received responses from the plurality of human observers," "storing the summary statistics in association with the image as part of the training data;" "training a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image;" and "executing the trained model to predict a state of mind of a user in a new image," allows an autonomous vehicle to consider a distribution of user

responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

308. Claim 15 of the '046 patent similarly recites "[a] computing system" comprising "one or more processors" and "a non-transitory computer readable storage medium, storing instructions that when executed by the one or more processors, cause the one or more processors to perform steps" comprising "storing a plurality of images, each image displaying one or more users;" "generating training data from the plurality of images, the generating comprising, for each image:" "sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of mind of a user in the image," "receiving, from each of the plurality of human observers, a response representing a judgment by the human observer of the state of mind of the user in the image," "generating summary statistics describing the state of mind of the user in the image based on the received responses from the plurality of human observers," and "storing the summary statistics in association with the image as part of the training data;" "training a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image;" and "executing the trained model to predict a state of mind of a user in a new image."

309. Claim 15 improves the functionality of an autonomous vehicle by "storing a plurality of images, each image displaying one or more users;" "generating training data from the plurality of images, the generating comprising, for each image:" "sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of mind of a user in the image," "receiving, from each of the plurality of human observers, a response representing a judgment by the human observer of the state of mind of the user in the image," "generating summary statistics describing the state of mind of the user in the image based

on the received responses from the plurality of human observers," and "storing the summary statistics in association with the image as part of the training data;" "training a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image;" and "executing the trained model to predict a state of mind of a user in a new image." By "storing a plurality of images, each image displaying one or more users;" "generating training data from the plurality of images, the generating comprising, for each image:" "sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of mind of a user in the image," "receiving, from each of the plurality of human observers, a response representing a judgment by the human observer of the state of mind of the user in the image," "generating summary statistics describing the state of mind of the user in the image based on the received responses from the plurality of human observers," and "storing the summary statistics in association with the image as part of the training data;" "training a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image;" and "executing the trained model to predict a state of mind of a user in a new image," the computer system of claim 15 allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian walking in a direction that approaches the autonomous vehicle's path will continue walking into the vehicle's path or stop. Similarly, such "storing a plurality of images, each image displaying one or more users;" "generating training data from the plurality of images, the generating comprising, for each image:" "sending the image to a plurality of human observers, each human observer presented with a request to answer a question about a state of mind of a user in the image," "receiving, from each of the plurality of human observers, a response representing a judgment by

the human observer of the state of mind of the user in the image," "generating summary statistics describing the state of mind of the user in the image based on the received responses from the plurality of human observers," and "storing the summary statistics in association with the image as part of the training data;" "training a model using the training data, the model configured to receive an input image showing a user and predict summary statistics describing a state of mind of the user in the input image;" and "executing the trained model to predict a state of mind of a user in a new image" allows an autonomous vehicle to consider a distribution of user responses, such as whether a pedestrian or animal standing at an intersection the autonomous vehicle is approaching will move in front of the vehicle's path.

310. The dependent claims of the '046 patent provide additional improvements to the functionality of autonomous vehicles and the claimed methods, non-transitory computer readable storage media, and computer systems. For example, dependent claim 2 further improves on claim 1 by specifying that "the image is manipulated by adjusting values of pixels of the image before presenting to a human [observer]." *See also* claim 9. Similarly, dependent claim 3 further improves on claim 1 by specifying that "the state of mind of the user in the image indicates whether the user is likely to perform a predetermined action." *See also* claims 10, 17. Dependent claim 4 further improves on claim 1 by specifying that "the state of mind of the user in the image represents a measure of awareness of the user regarding an object." *See also* claims 11, 18. Dependent claim 6 further improves on claim 1 by specifying that "the model is one of a random forest regressor, a support vector regressor, a simple neural network, a deep convolutional neural network, a recurrent neural network, or a long short-term memory (LSTM) neural network." *See also* claim 13. Dependent claim 7 further improves on claim 1 by specifying that "the summary statistics is associated with at least one of a content of a response, a time associated with entering a response,

and a position of an eye of a human observer associated with the response, the position being measured with respect to a display associated with the image." *See also* claims 14, 16.

311. These and other processes and their benefits are described in the '046 patent specification as well. For example, Figure 2A of the '046 patent is "a flow chart showing the process of predicting human behavior, according to some embodiments of the present disclosure." '046 patent, 3:23-25. Figure 2A is reproduced below:

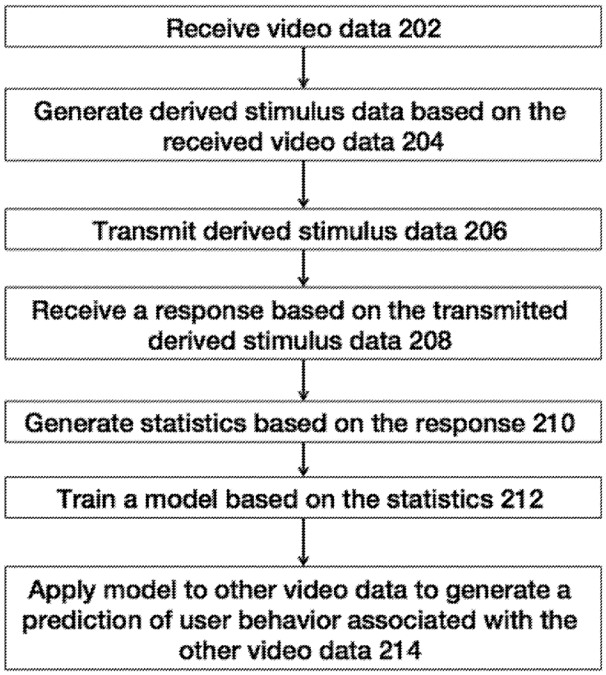


FIG. 2A

312. As the '046 patent specification states, "[i]n step 202, this video or other data captured by the camera or other sensor is transmitted from the vehicle 102, over the network 104, and to the server 106 where it is stored." *Id.* at 5:18-21. "Then, in step 204, video frames or segments are extracted from the stored video or other data and are used to create stimulus data including derived stimulus (or stimuli). In one implementation, the derived stimulus corresponds to a scene in which one or more humans are conducting activities (e.g., standing, walking, driving,

riding a bicycle, etc.) beside or on a street and/or near a vehicle." *Id.* at 5:22-28. "In step 206, the derived stimulus is transmitted from the server 106 and displayed to a large number of users (or human observers) on the user terminal 108 (or multiple terminals 108). The terminal(s) 108 prompt the human observers to predict how the people shown in the derived stimulus will act, and upon viewing the displayed stimulus, the observers input their responses corresponding to their predictions." *Id.* at 5:52-59. "In step 208, the derived stimulus and associated human observer responses are transmitted from the terminal(s) 108 to the server 106 and recorded in the user response database 110." *Id.* at 6:10-13.

313. As the '046 patent describes, "[i]n step 210, summary statistics are generated based on the user responses." *Id.* at 6:14-15. The '046 patent describes that "the statistics may characterize the aggregate responses of multiple human observers to a particular derived stimulus. For instance, if the derived stimulus shows a pedestrian walking on a sidewalk towards an intersection, the response can be categorized in terms of how many human observers believe that the pedestrian will stop upon reaching the intersection, continue walking straight across the intersection, turn a corner and continue walking along the sidewalk without crossing the intersection, etc." *Id.* at 6:15-24.

314. The '046 patent also describes an example of how "the stored statistics and corresponding images . . . are sent over the network 104 to the model training system 112 and used to train a prediction algorithm":

> For example, the collection of images and statistics can be used to train a supervised learning algorithm, which can comprise a random forest regressor, a support vector regressor, a simple neural network, a deep convolutional neural network, a recurrent neural network, a long-short-term memory (LSTM) neural network with linear or nonlinear kernels that are two dimensional or three dimensional, or any other supervised learning algorithm which is able to take a collection of data labeled with continuous values and adapt its

> architecture in terms of weights, structure or other characteristics to minimize the deviation between its predicted label on a novel stimulus and the actual label collected on that stimulus using the same method as was used on the set of stimuli used to train that network. The model is given data which comprises some subset of the pixel data from the video frames that the summary statistics were generated from. In one implementation, this subset includes the pixel data contained in a box (such as the box 221 shown in FIG. 2B) drawn to contain the boundaries of the person, cyclist, motorist and vehicle, or other road user, including their mode of conveyance. In some other implementations, it also includes the entire pixel data from the rest of the image. In one of those implementations, that pixel data is selected according to criteria such as the salience of those features in terms of contrast, lighting, presence of edges, or color. In an additional implementation, the features can include descriptive meta-data about the images such as the dimensions and location of the bounding box, the shape of the bounding box or the change in size or position of the bounding box from one frame to the next.

Id. at 6:50-7:17.

315. The ’046 patent further states that, “[i]n step 214, the prediction engine 114 uses the trained model from the model training system 112 to predict the actual, ‘real-world’ or ‘live data’ behavior of people on or near a road.” *Id.* at 7:18-21. The ’046 patent further explains this prediction process:

> The trained model or algorithm makes a prediction of what a pedestrian or other person shown in the “live data” would do based on the summary statistics and/or training labels of one or more derived stimulus. The accuracy of the model is determined by having it make predictions of novel derived stimuli that were not part of the training images previously mentioned but which do have human ratings attached to them, such that the summary statistics on the novel images can be generated using the same method as was used to generate the summary statistics for the training data, but where the correlation between summary statistics and image data was not part of the model training process. The predictions produced by the trained model comprise a set of predictions of the state of mind of road users that can then be used to improve the performance of autonomous vehicles, robots, virtual agents, trucks, bicycles, or other systems that operate on roadways by allowing them to make

> judgments about the future behavior of road users based on their state of mind.

Id. at 7:32-50.

316. The '046 patent also provides additional descriptions of these processes through its figures and their accompanying descriptions. *See* '046 patent, Fig. 4 (which "shows a process of generating derived stimuli from raw camera or sensor data in the vehicle, according to some embodiments of the present disclosure"), Fig. 5 (which "is a flowchart showing a process of collecting predictions and other information from human observers based on derived stimuli, according to some embodiments of the present disclosure"), Fig. 6 (which "shows a data structure associated with tracking video frame data, according to some embodiments of the present disclosure"), Fig. 7 (which "is a flowchart showing a process for producing summary statistics of a video frame or derived stimulus according to some embodiments of the present disclosure"), Fig. 8 (which "is a flowchart showing a process of training a learning algorithm using summary statistics, according to some embodiments of the present disclosure"), Fig. 9 (which "is a flowchart showing a process of predicting the state of mind of road users using a trained learning algorithm, according to some embodiments of the present disclosure"), Fig. 10 (which "is a diagram showing an example of an application of a context user prediction process in an automobile context, according to some embodiments of the present disclosure") and their accompanying descriptions.

317. Any functional language in the claims of the '046 patent is not determinative of those such claims being abstract, especially when the claims provide a technical improvement to a computer system, as discussed above. *See, e.g.*, *Evolved Wireless, LLC v. Apple Inc.*, 221 F. Supp. 3d 485, 491 (D. Del. 2016) ("Applying these guidelines in the relevant field of technology can be somewhat difficult, because '[t]he essence of software is manipulating existing data and generating additional data through algorithms.' *Cal. Inst. of Tech. v. Hughes Commc'ns Inc.*, 59

F. Supp. 3d 974, 987 (C.D. Cal. 2014); *Oplus Techs. Ltd. v. Sears Holding Corp.*, 2013 U.S. Dist. LEXIS 35474, 2013 WL 1003632, at *12 (C.D. Cal. Mar. 4, 2013) ('All software only receives data, applies algorithms, and ends with decisions.'). Ultimately, the Federal Circuit instructs that not all 'claims directed to software ... are inherently abstract.' *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016). Claims 'improv[ing] the functioning of [a] computer' or 'improving an existing technological process' are patent-eligible even if they rely on a mathematical algorithm. *Id.* at 1336; *see also Hughes*, 59 F. Supp. 3d at 993 ('When claims provide a specific computing solution for a computing problem, these claims should generally be patentable, even if their novel elements are mathematical algorithms.').").

318. The claims of the '046 patent cover patent eligible improvements to autonomous vehicles that were more than well-understood, routine, or conventional activity. The inventions in the '046 patent were years ahead of the release of the accused products and functionalities. Taken alone and together, the limitations of the asserted claims involve an inventive concept. For example, the claim limitations identified above as not being directed to abstract ideas are also claim elements that contain inventive concepts. As discussed above, those claim elements provide an improvement over existing autonomous vehicle systems, methods, and software.

319. Tesla has filed its own patent applications for alleged inventions related to autonomous vehicle technology. Tesla's own patent applications demonstrate that, even after July 2017, autonomous vehicle technology (including prediction of human behavior) was still in its early stages and that improvements to autonomous vehicle technology (including prediction of human behavior) were still needed. Further, in filing those patents application, Tesla represented to the USPTO that, as of the time of each filing, the alleged inventions in those patent applications were directed to patent eligible subject matter and that, even after July 2017, a need existed for

such inventions in the market. This further demonstrates that the inventions claimed in the '046 patent were not well-understood, routine, and conventional in the July 2017 time period but are instead directed to patent eligible subject matter. *See, e.g.*, U.S. Patent Application Publication Nos. 2021/0271259, 2020/0348909, 2023/0176593, 2022/0284712; U.S. Patent Nos. 11,748,620, 11,816,585, 11,537,811, 11,215,999, 11,150,664, 11,636,333, 10,678,244.

320. As discussed above, as of July 2017, Waymo's fully self-driving vehicles were not yet on the road without safety drivers. Instead, until November 2017, Waymo was only operating vehicles on public roads with a test driver at the wheel. *See* https://waymo.com/blog/2017/11/waymos-fully-self-driving-vehicles-are (Ex. 11). Similarly, Tesla did not release a beta version of its FSD software until October 2020. *See* https://www.theverge.com/2020/10/21/21527577/tesla-full-self-driving-autopilot-beta-software-update (Ex. 12). As part of that release, Tesla CEO Elon Musk indicates that "Tesla was approaching this software update 'very cautiously' because the 'world is a complex and messy place.'" *Id.* In addition, according to a warning message that Tesla drivers received when given the option to enable the FSD software in its beta, Tesla's FSD software "may do the wrong thing at the worst time." *See* https://dawnproject.com/wp-content/uploads/2022/09/FSD-Beta-warning.png (Ex. 13). These facts also demonstrate that operating autonomous vehicles was not a well-understood, routine, or conventional activity as of July 2017.

321. In addition, other researchers in the field of autonomous vehicles confirmed that the subject matter of the claims of the '046 patent was not well-understood, routine, or conventional in July 2017. For example, in June 2017, researchers at the Australian Centre for Field Robotics (ACFR) at the University of Sydney (NSW, Australia) commented that:

> Advanced driver assistance systems (ADAS) are increasingly seen as a mechanism to improve the safety and efficiency of

> transportation by understanding and reacting to potential vehicle safety threats using state-of-the-art sensing and algorithms. A major component of these systems is the ability to infer the future intentions of drivers to predict the likelihood of potential collisions. This is a challenging task, particularly in intersections where complex traffic scenarios result in a proportionally high number of accidents. Human drivers are able to estimate the future trajectory of other vehicles from a combination of potentially subtle cues – the combination of the various kinematic properties - and the position of the vehicle on the road relative to the lane. Being able to reproduce this driver intuition in a computer model is still an open area of research.

Zyner et. al., "Long Short Term Memory for Driver Intent Prediction," 2017 IEEE Intelligent Vehicles Symposium (IV) June 11-14, 2017, Redondo Beach, CA, USA (Ex. 14).

322. Similarly, in 2017, researchers from the Institute for Intelligent Systems Research and Innovation at Deakin University in Australia noted that autonomous vehicles "still have some difficulties specially when it comes to driving in urban traffic environment such as the interaction with Vulnerable Road Users (VRUs) such as pedestrians. Intuitively, interactions take place nowadays between human drivers and pedestrians are based on implicit cues between the two parties." Saleh et al., "Intent Prediction of Vulnerable Road Users from Motion Trajectories Using Stacked LSTM Network," 2017 IEEE 20th International Conference on Intelligent Transportation Systems (ITSC): Workshop (Ex. 15). *See also* Casas et al., "IntentNet: Learning to Predict Intention from Raw Sensor Data", 2nd Conference on Robot Learning , Zurich, Switzerland (2018) (Ex. 16) ("While a plethora of systems have been built in the past few decades, many challenges still remain. One of the fundamental difficulties is that self driving vehicles have to share the roads with human drivers, which can perform maneuvers that are difficult to predict."); Zyner et al., "Naturalistic Driver Intention and Path Prediction Using Recurrent Neural Networks", IEEE Transactions on Intelligent Transportation Systems, Vol. 21, No. 4 (April 2020) (Ex. 17) ("Driving vehicles is a highly skilled task that requires extensive understanding of the intentions of other

road users. This knowledge allows drivers to safely navigate an area through other traffic. While this may become second nature to an experienced human driver, properly understanding the intentions of other drivers is still an unsolved problem for Advanced Driver Assistance Systems (ADAS), and by extension, autonomous vehicles."); Rasouli et al., "Are They Going to Cross? A Benchmark Dataset and Baseline for Pedestrian Crosswalk Behavior", 2017 IEEE International Conference on Computer Vision Workshops, Venice, Italy, 2017 (Ex. 18) ("Designing autonomous vehicles suitable for urban environments remains an unresolved problem. One of the major dilemmas faced by autonomous cars is how to understand the intention of other road users and communicate with them. The existing datasets do not provide the necessary means for such higher level analysis of traffic scenes"). That these problems existed in the art demonstrates that the subject matter of the claims of the '046 patent was not well-understood, routine, or conventional as of July 2017.

323. In addition, numerous accidents have been reported since 2017 involving shortcomings of Tesla's autonomous driving systems, its prior Autopilot systems, and other autonomous or semi-autonomous driving systems. *See, e.g.*, https://www.craftlawfirm.com/autonomous-vehicle-accidents-2019-2024-crash-data/ (Ex. 19); https://www.cbsnews.com/news/waymo-car-recall-software-crash-self-driving/ (Ex. 20); https://www.msn.com/en-us/news/us/waymo-is-being-investigated-by-the-feds-for-a-robotaxi-illegally-passing-a-school-bus/ar-AA1OQeGB (Ex. 21); https://www.msn.com/en-us/autos/news/driver-fell-asleep-at-wheel-of-autopilot-driven-tesla-before-it-hit-police-car/ar-AA1Px1Ku (Ex. 22); https://ktar.com/arizona-news/self-driving-uber-car-fatally-runs-over-pedestrian-in-tempe/1994638/ (Ex. 23); https://www.msn.com/en-us/autos/news/waymo-autonomous-vehicle-involved-in-multicar-crash-apd-says/ar-AA1Prszz (Ex. 24);

https://www.msn.com/en-us/pets-and-animals/pets/a-week-after-a-waymo-self-driving-car-killed-a-beloved-cat-san-francisco-still-mourns/ar-AA1PFvoq (Ex. 25); https://www.latimes.com/business/story/2025-08-01/tesla-must-pay-243-million-over-fatal-autopilot-crash (Ex. 26); https://www.techspot.com/news/110085-tesla-robotaxis-already-crashing-austin-data-points-gaps.html (Ex. 27); https://electrek.co/2018/06/07/tesla-fatal-crash-autopilot-ntsb-releases-preliminary-report (Ex. 28); https://www.theguardian.com/technology/2024/apr/26/tesla-autopilot-fatal-crash (Ex. 29); https://techcrunch.com/2024/02/13/waymo-recall-crash-software-self-driving-cars (Ex. 30); https://www.upi.com/Top_News/US/2024/06/13/waymo-recall-robotaxi-crash/2251718311972 (Ex. 31); https://abcnews.go.com/Business/tesla-autopilot-steered-driver-barrier-fatal-crash-ntsb/story?id=68936725 (Ex. 32); https://www.reuters.com/business/autos-transportation/nhtsa-opens-probe-into-24-mln-tesla-vehicles-over-full-self-driving-collisions-2024-10-18/ (Ex. 33); https://www.cnn.com/2021/08/27/cars/toyota-self-driving-vehicle-paralympics-accident (Ex. 34). These incidents likewise demonstrate that operating autonomous vehicles was not a well-understood, routine, or conventional activity as of July 2017.

324. Moreover, Tesla touts it's "cutting-edge research to train deep neural networks on problems ranging from perception to control." *See e.g.*, https://www.tesla.com/AI#:~:text=Neural%20Networks&text=Our%20networks%20learn%20from%20the,GPU%20hours%20to%20train%20%F0%9F%94%A5. And Elon Musk continued (in discussing the neural networks that driver their FSD products): "The entire picture that was presented on AI Day was amazing because the Tesla AI machine can go through the iterative data engine process of auto labelling plus manual labelling of edge cases so that labelling stage plus the data collection, retraining, deploying and again you go back to the data collection, the labelling,

retraining and deploying," he says. "And you can go through this loop as many times as you want to arbitrarily improve the performance of the network. I still think nobody knows how difficult the autonomous driving problem is, but I also think this loop does not have a ceiling. "I still think there's a big place for driver sensing, I still think you have to solve the human-robot interaction problem to make the experience more pleasant but damn it, this loop … is incredible," he says. "The second reason this whole effort is amazing is that Dojo can essentially become an AI training as a service, directly taking on AWS and Google Cloud. There's no reason it needs to be used specifically for the Autopilot computer. "You can basically use this for every machine learning problem, especially one that requires scale," he says. *See e.g.*, https://thedriven.io/2021/08/25/amazing-by-most-standards-musk-defends-tesla-full-self-driving-and-ai-day-takeaways/#:~:text=%E2%80%9CThe%20entire%20picture%20that%20was,requires%20scale%2C%E2%80%9D%20he%20says.

325. At a minimum, Tesla has known about the '046 patent and its infringement of the '046 patent at least as early as the filing date of the Original Complaint. Further, on information and belief, Tesla's conduct before the USPTO provides that Tesla was aware of the '046 patent and its infringement prior to the filing of the Original Complaint. For example, in prosecuting U.S. Patent No. 11,157,441, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,409,692, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 10,671,349, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,893,393, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 12,307,350, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,561,791, Tesla has known of the '046 patent.

In another example, in prosecuting U.S. Patent No. 11,215,999, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,361,457, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,636,333, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,562,231, Tesla has known of the '046 patent. In another example, in prosecuting European Patent Application Publication No. 3864573, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,196,678, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,816,585, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,537,811, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,610,117, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 10,997,461, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,150,664, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 11,567,514, Tesla has known of the '046 patent. In another example, in prosecuting U.S. Patent No. 10,956,755, Tesla has known of the '046 patent. In addition, on information and belief, Tesla was aware of Perceptive's patent portfolio, monitored Perceptive's patent portfolio, and it and/or its agents substantially cited to Perceptive's patents in connection with prosecuting Tesla patents, all prior to the filing of the Original Complaint.

326. On information and belief, since at least the above-mentioned dates when Tesla was on notice of its infringement, Defendant has indirectly infringed the '046 patent in violation of 35 U.S.C. § 271(b) at least by inducing customers to purchase the Accused Products and/or by instructing customers how to use and/or make the Accused Products in a way that directly infringes the asserted claims of the '046 Patent. *See, e.g.,* infringement allegations in this Count and Ex. 10.

327. On information and belief, Defendant's actions represented a specific intent to induce infringement of the asserted claims, including at least claims 1 and 15 of the '046 patent. In this judicial district and elsewhere in Texas and the United States, Defendant has offered its customers and prospective customers extensive customer support and instructions that instruct and encourage its customers to infringe the '046 patent via at least the making and/or use of the Accused Products in this judicial district and elsewhere in Texas and the United States. *See, e.g.*, materials cited in Ex. 10; https://www.tesla.com/drive (advertisement for Tesla demo drives using FSD in this judicial district and elsewhere in Texas and the United States); https://www.cnbc.com/2024/03/25/elon-musk-requires-fsd-demo-for-every-prospective-tesla-buyer-in-north-america.html (Elon Musk wrote an email to Tesla employees requiring them to encourage and instruct customer to install and use the accused FSD functionality in Tesla vehicles); https://www.tesla.com/ms/order/ (delivery of Tesla vehicle occurs at customer location and/or at a Tesla regular and established place of business in this judicial district and elsewhere in Texas and the United States); https://www.tesla.com/fsd (Tesla encouraging and instructing customers to demo drive a Tesla car with FSD and install/activate FSD in their Tesla vehicles to drive for the customer avoiding bikes, motorcycles, and other cars); https://www.tesla.com/ownersmanual/modely/en_us/GUID-2CB60804-9CEA-4F4B-8B04-09B991368DC5.html. In addition, Tesla's website is accessible in this judicial district and, as discussed and cited herein, is further evidence of Tesla's acts of indirect infringement in this judicial district. In this judicial district and elsewhere in Texas and the United States, Tesla induces its customers and prospective customers to use the entire claimed system of claim 15 by putting the system to use via Tesla's FSD system and receiving the benefit of that use, such as autonomously controlling a vehicle. In this judicial district and elsewhere in Texas and the United

States, Tesla induces its customers to make the system of claim 15 by installing the FSD software via over the air updates.

328. In addition, by receiving notice of the ’046 patent and Defendant’s infringement thereof, Defendant obtained a subjective belief that there is a high probability that the Accused Products infringe the ’046 patent. Despite being put on notice of infringement, on information and belief Defendant has not taken actions to avoid the conduct alleged to infringe, has not offered any reasons as to why Defendant does not infringe the ’046 patent, and has not sought to remedy its infringements by offering to take a license. Defendant’s failure to act reflects deliberate actions to avoid learning that the Accused Products infringe the ’046 patent and, more generally, a policy of not earnestly reviewing and respecting the intellectual property of others.

329. Since at least the above-mentioned dates when Tesla was on notice of its infringement, Tesla does so with knowledge, or with willful blindness of the fact, that the induced acts constitute infringement of the ’046 patent. Tesla intends to cause, and has taken affirmative steps to induce infringement by its distributors, importers, customers, subsidiaries, and/or consumers by at least, inter alia, creating advertisements that promote the infringing use of the ’046 Accused Products, creating and/or maintaining established distribution channels for the ’046 Accused Products into and within the United States, manufacturing the ’046 Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing and certifying features related to infringing features in the ’046 Accused Products, and/or providing technical support, replacement parts, or services for these products to these purchasers in the United States. *See, e.g.*, https://www.tesla.com/fsd.

330. On information and belief, despite having knowledge of the '046 patent and knowledge that it is directly and/or indirectly infringing one or more claims of the '046 patent, Tesla has nevertheless continued its infringing conduct and disregarded an objectively high likelihood of infringement. Tesla's infringing activities relative to the '046 patent have been, and continue to be, willful, wanton, malicious, in bad-faith, deliberate, consciously wrongful, flagrant, characteristic of a pirate, and an egregious case of misconduct beyond typical infringement such that Plaintiff is entitled under 35 U.S.C. § 284 to enhanced damages up to three times the amount found or assessed.

331. Perceptive has been damaged as a result of Tesla's infringing conduct described in this Count. Tesla is, thus, liable to Perceptive in an amount that adequately compensates Perceptive for Tesla's infringements, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

CONCLUSION

332. Plaintiff is entitled to recover from Tesla the damages sustained by Plaintiff as a result of Tesla's wrongful acts, and willful infringement, in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court.

333. Plaintiff has incurred and will incur attorneys' fees, costs, and expenses in the prosecution of this action. The circumstances of this dispute may give rise to an exceptional case within the meaning of 35 U.S.C. § 285, and Plaintiff is entitled to recover its reasonable and necessary attorneys' fees, costs, and expenses.

334. Plaintiff has complied with the requirements of 35 U.S.C. § 287, to the extent necessary and/or applicable, and is entitled to collect pre- and post-filing damages for Defendant's infringements of the Asserted Patents.

JURY DEMAND

335. Plaintiff hereby requests a trial by jury pursuant to Rule 38 of the Federal Rules of Civil Procedure.

PRAYER FOR RELIEF

336. Plaintiff respectfully requests that the Court find in its favor and against Tesla, and that the Court grant Plaintiff the following relief:

1. A judgment that Tesla has directly and/or indirectly infringed the Asserted Patents either literally and/or under the doctrine of equivalents;
2. A judgment that Tesla account for and pay to Plaintiff all damages and costs incurred by Plaintiff because of Tesla's infringing activities and other conduct complained of herein, including an accounting for any sales or damages not presented at trial;
3. A judgment and order requiring Tesla to pay Plaintiff damages under 35 U.S.C. § 284, including up to treble damages as provided by 35 U.S.C. § 284, and any royalties determined to be appropriate;
4. A judgment that Tesla account for and pay to Plaintiff a reasonable, ongoing, post judgment royalty because of Tesla's infringing activities, including continuing infringing activities, and other conduct complained of herein.
5. A judgment and order requiring Tesla to pay Plaintiff pre-judgment and post-judgment interest on the damages awarded;
6. A judgment and order finding this to be an exceptional case and requiring Tesla to pay the costs of this action (including all disbursements) and attorneys' fees as provided by 35 U.S.C. § 285; and
7. Such other and further relief as the Court deems just and equitable.

Dated: November 14, 2025

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned certifies that on November 14, 2025, the foregoing document was served by e-mail on all counsel of record.

/s/ Patrick J. Conroy