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These 6 Women Undergrads At MIT Invented A Game Changer For The Blind

Devin Thorpe Former Contributor
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- With a target price approaching \$100, this could represent a quantum leap forward for the blind community.

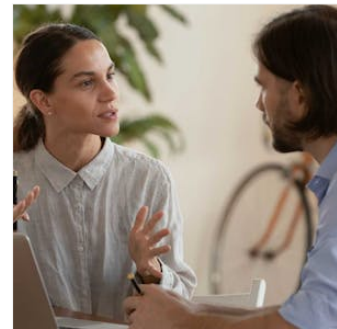


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Six women, all undergraduate students at MIT, have [invented](#) a text to braille scanner that significantly advances the state of the art for text scanners, most of which convert text to speech. The patent-pending device is not yet available in the marketplace, but the inventors are committed to the project, called [Tactile](#), full time upon graduation in the spring. (Disclosure: My wife owns fewer than 100 shares of Microsoft.)

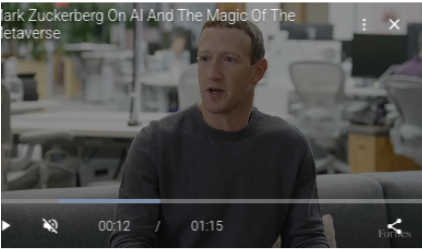
The team comprises three students in Mechanical Engineering, Jialin Shi, Charlene Xia and Grace Li; two students in Electrical Engineering, Tania Yu and Chandani Doshi; and Bonnie Wang, who studies Materials Sciences.

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A spokesperson for Microsoft points out that women hold just 5.5 percent of commercial patents in the United States. The company is trying to change that by providing pro bono legal support to female inventors. Team Tactile has been accepted into this program.

Keely Swan, IDEAS Global Challenge Administrator at MIT, boasts, "The Tactile team won a \$10,000 grant in last year's MIT IDEAS Global Challenge, an annual innovation, service, and social entrepreneurship program run by MIT's Priscilla King Gray Public Service Center. The program helps students take what they learn in the classroom and apply it to real-world challenges. As one of our winning teams, Tactile received a 15-month grant, and we'll work with them through summer 2017 as they refine their project."



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redefine their project.

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Team Tactile, six undergrads from MIT, are redefining what inventors look like. Photo courtesy of... [+]

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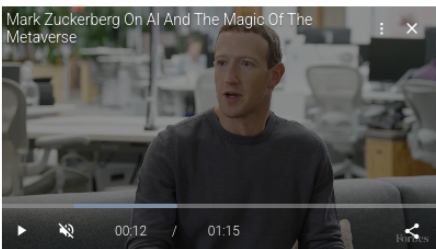
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Keely describes the team's work ethic and effort on their winning project. "When I first read the Tactile project plan, it was clear that they had spent time working with people who are visually impaired to understand the challenges they face, and how a real-time text-to-Braille converter could help them read almost anything, from product labels to sensitive personal information like bank statements and medical paperwork. After developing a prototype at a hackathon, Tactile continued working closely with partners and prospective users to refine the concept and create a device they believe can significantly improve the quality of life for people with visual impairments."

Paul Parravano, Co-director of Government and Community Relations at MIT, is visually impaired and has advised the Tactile team during their product development efforts. He says the market is full of devices, many of which are expensive. Braille display devices cost about \$1,500 and they don't scan documents at that price.

The team hasn't set a price point, but they believe they can produce their device for just \$100, giving them the opportunity to price theirs well below the price of competing devices that don't provide scanning.

Parravano points out that pricing is key. Many visually impaired people are unemployed or underemployed and therefore don't have resources for expensive technology. He says, if the team can price the product below \$1,500 it could represent a real breakthrough.



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With a target price approaching \$100, this could represent a quantum leap forward for the blind community. [Twitter icon](#)

Team member Jialin Shi adds, "According to the National Federation of the Blind, only 40.4% of adults with significant vision loss were employed in 2014 and more than 30% live below the poverty line."

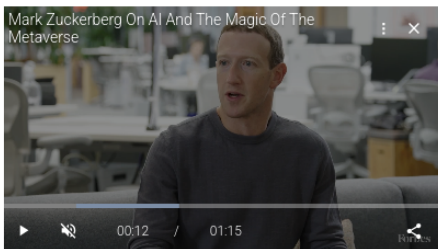
Shi describes the team's bold plan, "We want to make Tactile affordable and accurate. If we can do that, then we believe we will be able to increase the braille literacy rate, and in turn, increase the employment rate of adults with significant vision loss. We think it's incredibly important to invest in technology that will enable, empower and allow people with disabilities to go and do amazing things. Getting Tactile to a point where we can sell it for \$100 or less would be ideal, and would allow us to help many more people than the technologies that exist today."



Team Tactile, working on their prototype. Courtesy of Microsoft.

The device isn't market ready, yet. Team member Bonnie Wang explains, "There is a lot of work we still have to do to refine our product. The largest roadblock is shrinking the size of our braille linear actuation mechanism to meet the size requirements of standard braille characters. We are continuing to make steps in decreasing the size of our device to make it portable for users."

The biggest limitation the team faces is the state of optical character recognition (OCR) technology. "One limitation is the complexity of processing images of irregular surfaces. Especially with the limited processing power of our device, it is difficult to adjust for folds in the surface and distortions in text," Wang says.



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Despite the challenges and limitations, Keely notes that what they have accomplished is remarkable. "I have been deeply impressed by the team's knowledge, passion, and ability to work together quickly and effectively. The IDEAS Global Challenge judges were also impressed by how much the team accomplished in such a short period of time."

Shi explains the team's vision for the product's impact. "Ultimately, this will provide people with visual impairment access to information that they wouldn't otherwise have. No more than 5 percent of books have braille translations. Tactile would allow them to read anything they wanted from text books and novels to food labels and mathematical equations. It truly would open up a world of opportunity for an entire community of people."

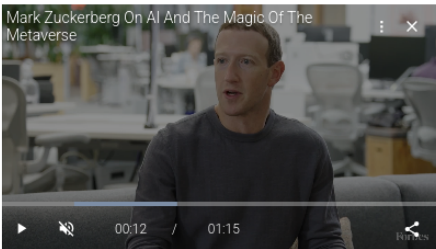
The team's efforts have impact beyond the community of people with visual impairments, Keely points out. "As an all-female undergraduate team, they are setting a great example for other young women and girls, demonstrating what they can accomplish in science, technology, and engineering."

On Thursday, December 22, 2016 at 5:00 Eastern, all six members of the team will join me here for a live discussion about their project, their progress and their passion. Tune in here then to watch the interview live. Post questions in the comments below or tweet questions before the interview to @devindthorpe.



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