

Boy, 13, builds Braille printer with Legos, starts company

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Shubham Banerjee, right, works on his Lego robotics braille printer as his dad Neil watches at home Tuesday, Jan. 6, 2015, in Santa Clara, Calif. Banerjee launched a company to develop a low-cost machine to print Braille materials for the blind. It's based on a prototype he built with his Lego robotics kit for a school science fair project. Last month, tech giant Intel Corp. invested in his startup, Braigo Labs, making the 8th grader the youngest entrepreneur to receive venture capital funding. (AP Photo/Marcio Jose Sanchez)

In Silicon Valley, it's never too early to become an entrepreneur. Just ask

13-year-old Shubham Banerjee.

The California eighth-grader has launched a company to develop low-cost machines to print Braille, the tactile writing system for the [visually impaired](#). Tech giant Intel Corp. recently invested in his startup, Braigo Labs.

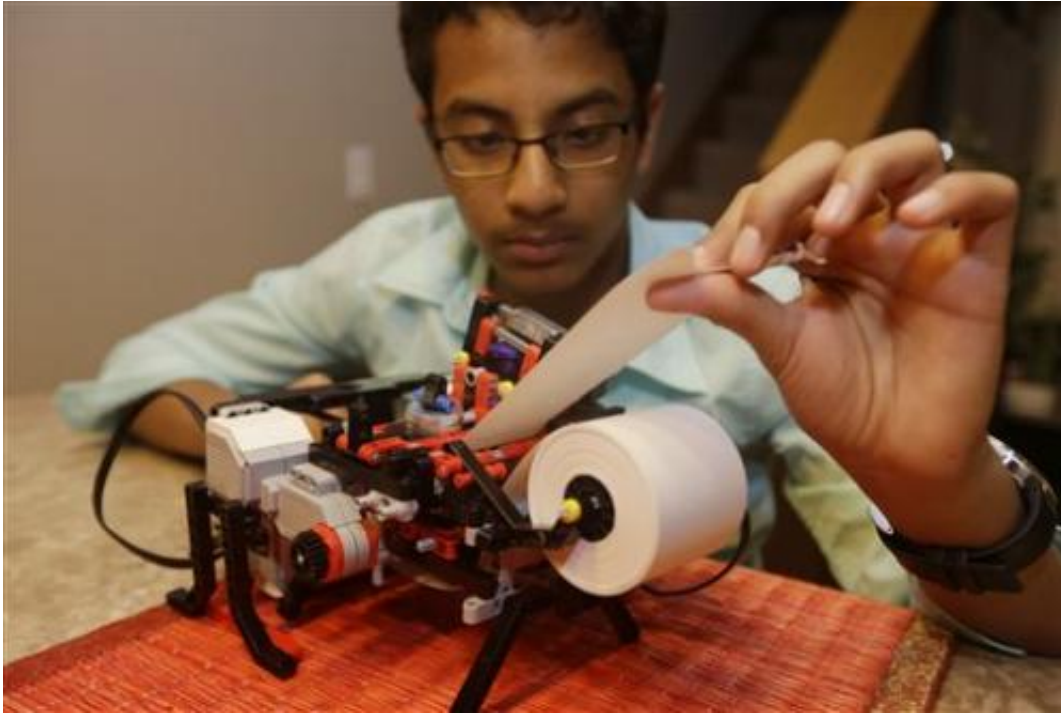
Shubham built a Braille printer with a Lego robotics kit as a school science fair project last year after he asked his parents a simple question: How do blind people read? "Google it," they told him.

Shubham then did some online research and was shocked to learn that Braille printers, also called embossers, cost at least \$2,000—too expensive for most blind readers, especially in developing countries.

"I just thought that price should not be there. I know that there is a simpler way to do this," said Shubham, who demonstrated how his printer works at the kitchen table where he spent many late nights building it with a Lego Mindstorms EV3 kit.

Shubham wants to develop a desktop Braille printer that costs around \$350 and weighs just a few pounds, compared with current models that can weigh more than 20 pounds. The machine could be used to print Braille reading materials on paper, using raised dots instead of ink, from a personal computer or electronic device.

"My end goal would probably be having most of the [blind people](#) ... using my Braille printer," said Shubham, who lives in the Silicon Valley suburb of Santa Clara, just minutes away from Intel headquarters.



Shubham Banerjee works on his lego robotics braille printer at home Tuesday, Jan. 6, 2015, in Santa Clara, Calif. Banerjee launched a company to develop a low-cost machine to print Braille materials for the blind. It's based on a prototype he built with his Lego robotics kit for a school science fair project. Last month, tech giant Intel Corp. invested in his startup, Braigo Labs, making the 8th grader the youngest entrepreneur to receive venture capital funding. (AP Photo/Marcio Jose Sanchez)

After the "Braigo"—a name that combines Braille and Lego—won numerous awards and enthusiastic support from the blind community, Banerjee started Braigo Labs last summer with an initial \$35,000 investment from his dad.

"We as parents started to get involved more, thinking that he's on to something and this innovation process has to continue," said his father, Niloy Banerjee, an engineer who works for Intel.

Shubham used the money to build a more sophisticated version of his Lego-based printer using an off-the-shelf desktop printer and a newly released Intel computer chip. The new model, Braigo 2.0, can translate electronic text into Braille before printing.

Intel executives were so impressed with Shubham's printer that in November they invested an undisclosed sum in his startup. Intel officials believe he's the youngest entrepreneur to receive venture capital, money invested in exchange for a financial stake in the company.

"He's solving a real problem, and he wants to go off and disrupt an existing industry. And that's really what it's all about," said Edward Ross, director of Inventor Platforms at Intel.

Braigo Labs is using the money to hire professional engineers and advisers to help design and build Braille printers based on Shubham's ideas.



Shubham Banerjee, right, works on his lego robotics braille printer as his dad Neil sets up a current computer version of the printer at home Tuesday, Jan. 6, 2015, in Santa Clara, Calif. Banerjee launched a company to develop a low-cost machine to print Braille materials for the blind. It's based on a prototype he built with his Lego robotics kit for a school science fair project. Last month, tech giant Intel Corp. invested in his startup, Braigo Labs, making the 8th grader the youngest entrepreneur to receive venture capital funding. (AP Photo/Marcio Jose Sanchez)

The company aims to have a prototype ready for blind organizations to test this summer and have a Braigo printer on the market later this year, Niloy Banerjee said.

"This Braille printer is a great way for people around the world who really don't have many resources at all to learn Braille and to use it practically," said Henry Wedler, who is blind and working on a doctorate in chemistry at the University of California, Davis. Wedler has become an adviser to Braigo Labs.

An affordable printer would allow the visually impaired readers to print out letters, household labels, shopping lists and short reading materials on paper in Braille, said Lisamaria Martinez, community services director at the San Francisco Lighthouse for the Blind, a nonprofit center that serves the visually impaired and prints Braille materials for public agencies.



Shubham Banerjee works on a Braigo 2.0 braille printer prototype at home Tuesday, Jan. 6, 2015, in Santa Clara, Calif. Banerjee launched a company to develop a low-cost machine to print Braille materials for the blind. It's based on a prototype he built with his Lego robotics kit for a school science fair project. Last month, tech giant Intel Corp. invested in his startup, Braigo Labs, making the 8th grader the youngest entrepreneur to receive venture capital funding. (AP Photo/Marcio Jose Sanchez)

"I love the fact that a young person is thinking about a community that is often not thought about," said Martinez, who is visually impaired.

Shubham is too young to be CEO of his own company, so his mother has taken the job, though she admits she wasn't too supportive when he started the project.

"I'm really proud of Shubham. What he has thought, I think most adults should have thought about it," Malini Banerjee said. "And coming out of

my 13-year-old, I do feel very proud."



Shubham Banerjee, center left, works on a prototype for his braille printer joined by his family including mom Malini, left, sister Anoushka, 8, center right, and dad Neil, right, at home Tuesday, Jan. 6, 2015, in Santa Clara, Calif. Banerjee launched a company to develop a low-cost machine to print Braille materials for the blind. It's based on a prototype he built with his Lego robotics kit for a school science fair project. Last month, tech giant Intel Corp. invested in his startup, Braigo Labs, making the 8th grader the youngest entrepreneur to receive venture capital funding. (AP Photo/Marcio Jose Sanchez)

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