

Robots break new ground in construction industry

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Built Robotics CEO Noah Ready-Campbell poses for a picture in front of the company's autonomous track loader Wednesday, Feb. 21, 2018, in San Francisco. Backed by Silicon Valley money, tech startups are developing self-driving bulldozers, drones to inspect work sites and robot bricklayers that can lay bricks faster than human and work without lunch breaks. (AP Photo/Marcio Jose Sanchez)

As a teenager working for his dad's construction business, Noah Ready-

Campbell dreamed that robots could take over the dirty, tedious parts of his job, such as digging and leveling soil for building projects.

Now the former Google engineer is turning that dream into a reality with Built Robotics, a startup that's developing technology to allow bulldozers, excavators and other construction vehicles to operate themselves.

"The idea behind Built Robotics is to use automation technology make construction safer, faster and cheaper," said Ready-Campbell, standing in a dirt lot where a small bulldozer moved mounds of earth without a human operator.

The San Francisco startup is part of a wave of automation that's transforming the [construction industry](#), which has lagged behind other sectors in technological innovation.

Backed by venture capital, tech startups are developing robots, drones, software and other technologies to help the construction industry to boost speed, safety and productivity.

Autonomous machines are changing the nature of construction work in an industry that's struggling to find enough [skilled workers](#) while facing a backlog of building projects.

"We need all of the robots we can get, plus all of the workers working, in order to have economic growth," said Michael Chui, a partner at McKinsey Global Institute in San Francisco. "As machines do some of the work that people used to do, the people have to migrate and transition to other forms of work, which means lots of retraining."



Bichen Wu, center, and Ed Walker use a laptop to determine what a autonomous bulldozer is seeing at Built Robotics Wednesday, Feb. 21, 2018, in San Francisco. Backed by Silicon Valley money, tech startups are developing self-driving bulldozers, drones to inspect work sites and robot bricklayers that can lay bricks faster than human and work without lunch breaks. (AP Photo/Marcio Jose Sanchez)

Workers at Berich Masonry in Englewood, Colorado, recently spent several weeks learning how to operate a bricklaying robot known as SAM. That's short for Semi-Automated Mason, a \$400,000 machine which is made by Victor, New York-based Construction Robotics. The machine can lay about 3,000 bricks in an eight-hour shift - several times more than a mason working by hand.

SAM's mechanical arm picked up bricks, covered them with mortar and carefully placed them to form the outside wall of a new elementary school. Working on a scaffold, workers loaded the machine with bricks

and scraped off excess mortar left behind by the robot.

The goal, said company president Todd Berich, is to use technology to take on more work and keep his existing customers happy. "Right now I have to tell them 'no' because we're at capacity," he said.

Bricklayer Michael Walsh says the robot lessens the load on his body, but he doesn't think it will take his job. "It ain't going to replace people," Walsh said.



In this Tuesday, Feb. 27, 2018, photo taken with a fisheye lens, Samantha, a robotic bricklayer, is shown at work on the facade of a school in the south Denver suburb of Englewood, Colo. Faced with a shortage of skilled labor, the construction industry hopes that robots and other technologies will help boost productivity, safety and speed to build more housing and deal with infrastructure needs in the decades ahead. (AP Photo/David Zalubowski)

The International Union of Bricklayers and Allied Craftworkers isn't too concerned that robots will displace its members anytime soon, according to policy director Brian Kennedy.

"There are lots of things that SAM isn't capable of doing that you need skilled bricklayers to do," Kennedy said. "We support anything that supports the masonry industry. We don't stand in the way of technology."

The rise of construction robots comes as the building industry faces a severe labor shortage.

A recent survey by the Associated General Contractors of America found that 70 percent of construction firms are having trouble finding skilled workers.



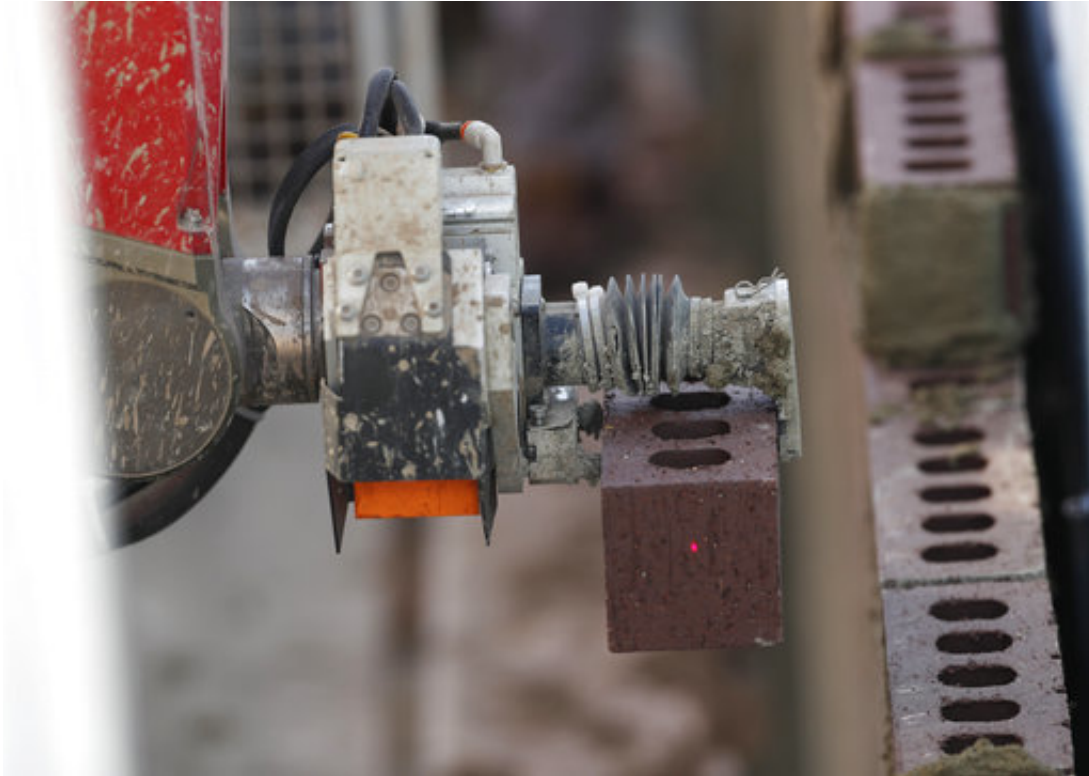
In this Tuesday, Feb. 27, 2018, photo, Samantha, a robotic bricklayer, is shown at work on the facade of a school in the south Denver suburb of Englewood, Colo. Faced with a shortage of skilled labor, the construction industry hopes that robots and other technologies will boost productivity, safety and speed in building much-needed housing and infrastructure in the decades ahead. (AP Photo/David Zalubowski)

"To get qualified people to handle a loader or a haul truck or even run a plant, they're hard to find right now," said Mike Moy, a mining plant manager at Lehigh Hanson. "Nobody wants to get their hands dirty anymore. They want a nice, clean job in an office."

At his company's mining plant in Sunol, California, Moy is saving time and money by using a drone to measure the giant piles of rock and sand his company sells for construction.

The autonomous quadcopter can survey the entire 90-acre site in 25 minutes. Previously, the company hired a contractor who would take a whole day to measure the piles with a truck-mounted laser.

The drone is made by Silicon Valley-based Kespry, which converts the survey data into detailed 3-D maps and charges an annual subscription fee for its services. The startup also provides drones and mapping services to insurance companies surveying homes damaged by natural disasters.



In this Tuesday, Feb. 27, 2018, photo, Samantha, a robotic bricklayer, is shown at work on the facade of a school in the south Denver suburb of Englewood, Colo. Faced with a shortage of skilled laborers, construction industry leaders are pinning their hopes on robots—and other technologies—to be adapted to worksites in order to boost workplace productivity and safety as well as speed to accommodate the demands of future housing and infrastructure projects. (AP Photo/David Zalubowski)

"Not only is it safer and faster, but you get more data, as much as ten to a hundred times more data," said Kespry CEO George Mathew. "This becomes a complete game changer for a lot of the industrial work that's being accomplished today."

At Built Robotics, Ready-Campbell, the company's founder and CEO, envisions the future of construction work as a partnership between humans and smart machines.

"The robots basically do the 80 percent of the work, which is more repetitive, more dangerous, more monotonous," he said. "And then the operator does the more skilled work, where you really need a lot of finesse and experience."

Built Robotics recently used its automated bulldozer—retrofitted with sensors and autonomous driving technology—to grade the earth on a [construction](#) site in San Jose. The project allows the startup to both test its technology and generate some revenue.

"I'm very excited about where [autonomous machines](#) could be used in our industry," said Kyle Trew, a contractor who worked with Built Robotics on the San Jose project. "Hopefully I can use this as a tool to get an edge on some of my competitors."



In this Tuesday, Feb. 27, 2018, photo, a mason completes finishing work as he follows Samantha, a robotic bricklayer, at work on the facade of a school in the south Denver suburb of Englewood, Colo. Faced with a shortage of skilled laborers, construction industry leaders hope that robots—and other technologies—can be used to boost productivity, workplace safety and speed in building housing and infrastructure in the decades ahead. (AP Photo/David Zalubowski)



In this Tuesday, Feb. 27, 2018, photograph, foreman Rodney Strouse programs a tablet to control Samantha, a robotic bricklayer, as it works on the facade of a school in the south Denver suburb of Englewood, Colo. Faced with a shortage of skilled laborers, construction industry leaders are pinning their hopes on robots—and other technologies—to be adapted to worksites in an effort to boost productivity, workplace safety and speed on housing and infrastructure projects in the decades ahead. (AP Photo/David Zalubowski)



In this undated photo provided by Kespry, a Kespry drone hovers prior to measuring stockpiles at an aggregate site. Robots are coming to a construction site near you. Tech startups are developing self-driving bulldozers, survey drones and bricklaying robots to help the construction industry boost productivity, speed and safety as it struggles to find enough skilled workers. (Adam Crowley/Kespry via AP)



In this undated photo provided by Kespry, a Kespry drone is used to measure earthwork grading operations on a construction site. Robots are coming to a construction site near you. Tech startups are developing self-driving bulldozers, survey drones and bricklaying robots to help the construction industry boost productivity, speed and safety as it struggles to find enough skilled workers. (Adam Crowley/Kespry via AP)



In this undated photo provided by Kespry, an operator monitors a Kespry drone during its autonomous flight. Robots are coming to a construction site near you. Tech startups are developing self-driving bulldozers, survey drones and bricklaying robots to help the construction industry boost productivity, speed and safety as it struggles to find enough skilled workers. (Adam Crowley/Kespry via AP)



In this photo taken Jan. 26, 2018, Mike Moy, an assistant plant manager for Lehigh Hanson Cement Group, inspects a Kespry drone he uses to survey inventories of rock, sand and other building materials at a mining plant in Sunol, California. Robots are coming to a construction site near you. Tech startups are developing self-driving bulldozers, survey drones and bricklaying robots to help the construction industry boost productivity, speed and safety as it struggles to find enough skilled workers. (AP Photo/Terry Chea)

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