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Innovations

What happens when factory robots are freed from their cages

By Matt McFarland April 14 at 12:13 PM

ABB, a massive Swiss company, says it has installed about 250,000 robots worldwide. The vast majority have been locked in factory cages for security purposes. It hasn't been safe for robotic arms to be flailing around near precious humans.

But that's all changing now, and the implications could be big. On Monday, ABB introduced YuMi, a robot with up to 30 sensors that detect whether a human is nearby. Touch it, and it will automatically stop. YuMi joins other advanced robots capable of working safely alongside humans, such as Baxter from Boston's Rethink Robotics.

YuMi was designed to require about the same amount of space as a human worker, so it can easily slide into roles alongside humans in factories. YuMi is safe enough that ABB chief executive Ulrich Spiesshofer encouraged German chancellor Angela Merkel to put her finger in YuMi's grip at an event Monday.

These companies see a huge opportunity in manufacturing to grow their businesses. A Boston Consulting Group report from earlier this year found that only 10 percent of manufacturing tasks are automated.

They say they have strong interest from China's massive manufacturing sector. One of Rethink Robotics' clients in China loses 25 percent of its workforce a month. That churn rate requires it to constantly retain workers, which hampers its efficiency.

"We will get to a point in time, whether it's five years from now or 10 year from now, where you will not be a successful manufacturer if you do not have collaborative robots in your environment," said Jim Lawton, chief product and marketing officer at Rethink Robotics. "They allow you to do things in fundamentally different and better ways."

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Lawton says that in the second half of 2014 Rethink Robotics sold four times as many collaborative robots as in first six months of the year. Baxter's price starts at $25,000. ABB has already received orders for YuMi (base price, $40,000) in the 24 hours since introducing it.

With advances in sensors and artificial intelligence, these robots have a degree of common sense, and a flexibility that's traditionally limited to humans.

If Baxter drops a screw while assembling something, it won't continue on with the task. It will realize it's dropped a screw, and pick up another before carrying on. If YuMi picks up a screw, but is holding it in the wrong direction — making its next assembly step impossible — it's 3D sensing and 3D cameras in its hands will realize and reorient the screw.

Spiesshofer says that for simple assembly tasks, an unskilled person can train YuMi to do a task in 20 minutes. Lawton tells me his 10-year-old son taught Baxter some simple tasks in 10 minutes.

The robotic elephant in the room is this: What happens to employment? Won't jobs be swept away by the tide of automation?

"If you look at the countries with the highest level of robotization and automation, these are the countries with the lowest unemployment rates in the world," Spiesshofer said. "Germany, Japan and South Korea have the highest robotization and the lowest unemployment rates. So for me, a smart application of a robot is a job security measure, it's a job creation machine, if you do it right. The combination between human beings and robots to add additional jobs rather than destroy them."

Lawton argues that as robots shift from caged-off areas of factories to workstations alongside humans, a level of creativity can emerge. Given that these robots can be programmed by those without coding skills, humans can help optimize the robot's efforts and the overall process. (A human can demonstrate a required gesture with the robot's arms, and the robot will automatically mimic that gesture.)

"You're giving the human the ability to interact with the robot and actually change the robot, change what it does, change how it does what it does," Lawton said. "To the extent that the human comes up with ideas like, 'Wow I can make my process better if instead of having it work like this, I can have it work like that.' "

Methodical, repetitive tasks will likely shift away from humans. This can be seen as unfortunate, or an opportunity. History does offer some reason for optimism. There was once a time when most humans worked in agriculture. Now it takes 13 people to make enough cotton for 9.4 million T-shirts. That shift hasn't stopped us from learning new things and finding other work.

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