

Editorial

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Cobots Expand Automation Opportunities

Today's manufacturers are faced with increasing cost pressures, growing product diversity, and fluctuating demands. Even where workers are affordable, this new generation of complex products requires assembly adaptability, precision, and reliability that is beyond the skills of human workers alone. To be prepared for this high-mix, low-volume era, manufacturing methods must be flexible and automated.

Traditional industrial robots continue to evolve to meet today's automation needs, with a broad mix of form factors, payloads, and capabilities. But new automation opportunities are also emerging for variable and semi-structured environments, especially in small and mid-sized businesses.

Dubbed "collaborative robots" (or "cobots") due to their ability to work side-by-side with employees, these lightweight, flexible tools can be easily moved and reprogrammed to solve new tasks. User-friendly, affordable cobots are lowering the automation barrier tremendously, enabling automation in areas previously considered too complex or costly. While the old rule of thumb was that the cost of a robot should be equivalent to a worker's two-year salary, collaborative robots are closer to a quarter of that price.



Tegra Medical in Boston, MA uses a UR5

Cobots help meet the short-run production challenge faced by many SMBs, bridging the gap between fully manual assembly and fully automated manufacturing lines. This is helping small business owners address overseas competition with affordable automation solutions that can be deployed in a wide range of applications. As these small businesses compete more effectively, their growth can drive the use of additional automation solutions, including multiple cobots—or another form of collaboration, between cobots and traditional industrial robots for high-speed, repeatable applications.

Cobots optimize a full gamut of industries and applications

Today, there are nearly 10,000 Universal Robots installed worldwide, optimizing almost any application that features a repeated task with a payload less than 10kg/22 lbs (the

payload of our largest, UR10 robot). A classic application is machine tending, such as loading and unloading parts into a CNC or injection molding machine. UR cobots are also increasingly deployed on assembly lines handling screw-driving, gluing, and welding, as well as other production processes such as polishing, laser-marking, life-cycle testing, packaging, and palletizing.



Paradigm Electronics, CAN, uses a UR10

Every week, we're seeing unexpected opportunities appear for collaborative robots. Cobots are in applications that receive a 3D laser scan of people's feet and cut out customized flip flops; cobots are being used in agriculture, spraying iodine on cow udders before milking; they assemble thermal cups; and they work as cameramen, shooting Champions League games in France. Our new tabletop robot, the UR3, is experiencing a high demand from the electronics assembly market where our cobots perform tasks such as life-cycle testing and epoxy-filling in circuit boards. Even the automotive industry, which has a long history of using traditional robots, is now also using cobots in new ways. A recent example is BMW, which is deploying UR cobots to automate an assembly line that was predominantly manual labor in the past.

As cobots arrive on the factory floor, it does not take long for end users to realize the many benefits their new colleagues bring in terms of optimized production, improved work environment, and increased competitiveness. This has proven to be the case not just at management levels but also among operators who might have feared the cobots at first. Employees with no prior programming experience are now being promoted from operators to robot programmers as the robot takes over the "3D jobs" – the Dull, Dangerous, and Dirty. The result is an improved work environment where humans are freed up to focus on more rewarding tasks – both financially and mentally.

This approach puts control of factory automation back into the hands of operators. By empowering the lower-skilled labor force, we add knowledge back onto the factory floor. Doing this may be the best long-term result derived from leveraging collaborative robots. While the industrial revolution created enormous wealth, at the same time it removed passion and knowledge about the product from production itself. If we can close that gap again — if we can mix people and machines in the right way on the factory floor – we see enormous potential for adding value rather than just cranking up production levels. This redeployment of human creativity interspersed with the robot's repeatability addresses market evolution and customer requirements for a high degree of individualization in the products they buy. It's qualitative change both in the products made and for the people making them.

Collaborative robots are leading the departure from man vs. machine and ushering us into the man AND machine era. Humans and robots will continue to work in ever-closer collaboration as base-income earners move into higher-value positions, effectively addressing the skills gap faced by many industries.

Case Stories

A UR10 robot works in tandem with employees polishing loudspeakers at Paradigm Electronics in Toronto, Canada. <http://www.universal-robots.com/case-stories/paradigm-electronics/>

Scott Fetzer Electrical Group in Nashville, TN, has installed UR robots on the assembly line, promoting employees to handle the intuitive programming. Chapter 5.7

Tegra Medical in Boston, MA, uses a UR5 robot to handle medical device manufacturing, which has doubled throughput and increased product quality. <http://www.universal-robots.com/case-stories/tegra-medical/> or World Robotics 2015