

Autonomous Robotics

Suzhou, 2017

Shaping the digital enterprise – China as a cradle for innovation in Autonomous Robotics

The word “Robot” has stepped out of science fiction. Robots have become a revolutionary element in the industrial world. They have become our work mate, or even competitor of human workers in many industrial branches. Thanks to development of artificial intelligence, the robot has evolved from a stationary machine for repetitive simple motions to an intelligent system for sensing, learning and actuating autonomously. It even collaborates with other robots and humans seamlessly as a cluster.

The robotics market sees a revolution initiated by lightweight robots that cooperate with humans in the workplace omitting fences. Advanced teaching and a fast ROI lowered the barrier to make this robot class our work mate.

China being the leading manufacturing country in the world, sees a huge demand for new installations of robots in its factories: China's economic growth shifts gears from quantitative to qualitative growth. It calls for optimizing the current economic structure and strengthening innovation. China's manufacturing industry also needs an update. This journey of modernizing a whole industry is a market momentum: China is the world's largest market of robotics. In 2019 some 40 percent of the worldwide market volume of industrial robots will be sold there alone, according to the 2016 World Robotics Report, as published by the International Federation of Robotics (IFR).

According to the Chinese Institute of Electronics, China's industrial robot market is expected to reach 4.22 billion U.S. dollars in 2017. According to MIIT (Ministry of Industry and Information Technology of P.R. China), China aims to achieve major technological breakthroughs in key robotics components and high-end technologies by issuing a development plan for robotics industry during the 13th Five-Year Plan. It aims to produce 100,000 Chinese-branded industrial robots annually by 2020.

Hype or trend? What does autonomous robotics mean for Siemens?

Siemens as a global leader in automation and digitalization solutions is committed to continuous enhancement of its leadership position. Robots at the boundary to the physical world of classical manufacturing are a perfect extension for Siemens' industrial automation business – and China is the strategic battlefield for realizing the Digital Enterprise and thus defending leadership in industrial automation.

Siemens aims to do so by combining its industrial automation portfolio with autonomous robotics control and realizing top notch manufacturing solutions, heavily investing in the future of China and partnering with the country on its way to digitalization. Together with local partners Siemens China will lead the company's global R&D in autonomous robotics control and build an open innovation eco-system with government, SME, and universities:

- Concentration of research activities in China, addressing the local needs of the robotics market. Experienced experts from around the world will focus on the research and development of new mechatronics systems, human-robot collaboration and the application of artificial intelligence in robotic controllers.
- Siemens installs a Robotics Center at Tsinghua University, Beijing, as a platform of global university collaboration. The center starts operation in late 2017. Siemens anticipates leading edge research results coming from the CKI partners.
- Creation of a local eco-system in which customers will co-create with Siemens researchers. For this Siemens aims to leverage the innovative power of the Robot Operating System (ROS) community to realize their technological ideas.
- Further research at Siemens China Innovation Center: Based on initial achievement of Siemens China Innovation Center, the research is based on existing Siemens technology, for example, using PROFINET / OPC UA, and fully compatible with Industrie 4.0. This technology enables superior performance required by multi-axes robotic control at a competitive price level. Other plug-n-play edge devices are also in development, aiming to expand functionalities beyond traditional tasks.
- Development of engineering tools and digital twins which are seamlessly compatible in order to further solidify the user base of Siemens industrial automation and lower the entry barrier of robotics OEMs and system integrators.
- Enhancement of our TIA platform by seamlessly incorporating the state of art technologies that the robotics industry has to offer.