

Futuristic Human-Robot Communication

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Abstract

In the last few years, we have witnessed in Information Technologies that virtual communication over the network has become highly multi-modal, thus richer. In addition to the online chat and short text messaging (SMS), video and audio have become common and well integrated in order to realize the richness. In communication and interactions among humans and robots, such richness are still rare despite its high potential. We are currently studying this throughout relevant technology development as the new, futuristic style of communication among humans and robots.

Almost all the robots that we see at factory or home are controlled based on positions. When shifting the control paradigm from position to force, robots are said to increase intelligence and flexibility in their movement and tasks. However, this control paradigm shift has brought up two technical challenges: loss of accuracy and certainty of repeatability. We are currently in search of alternatives, including Artificial Intelligence that has been proved effective in ambiguous and uncertain situation.

We will introduce the futuristic style of communication among humans and robots and advances of the control paradigm shift in this lecture. We then promote discussions in many different aspects about the futuristic human-robot communication throughout the hands-on demonstration of the touch-force-controlled robot arm, so-called "NEKONOTE", and attached sensing devices.

Short Bio.

Yuki Nakagawa, the CEO of RT Corporation headquartered in the center of 'Akihabara Electric Town', Tokyo, Japan, is a well established specialist in robotics. She has developed various intelligent robots such as autonomous and collaborative mobile robots for the RoboCup small robot soccer league and the cutting-edge humanoid robot RIC 90. Prior to her venture at RT Corporation, she participated as a researcher in the Kitano Symbiotic System Research Project, that is a part of the Exploratory Research for Advanced Technology program within the Japan Science and Technology Agency. She also served as a lead curator at the National Museum of Emerging Science and Innovation, and an assistant professor at the Interdisciplinary Graduate School of Science and Engineering at Tokyo Institute of Technology.

She has been commended for numerous significant contributions in robotics from the Japanese Society of Artificial Intelligence, the Japan Society for Fuzzy Technologies and Intelligent Informatics and RoboCup Japan Open. She earned M.Sc. in System Engineering and B.E. in Measurement and Control Engineering from Hosei University, Japan.

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