IEEE/ASME AIM 2008 Conference Plenary Talk 3

Distributed and Cooperative Robot Technology for Adaptive Service Systems

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Abstract: For highly productivity in service innovation toward sustainable society, a new disciple called service engineering is emerging. RT (Robot Technology) plays a very important role as a technology to realize service systems. In other hand, service RT is expected to create new markets in robot industry. Adaptiveness for environment, for tasks, and for users is one of key function of service systems. However, the adaptive function realized so far in conventional RT is still far behind from the requirement. In this talk, distributed and cooperative robot technologies for realization of adaptive function of service systems are presented, as well as the concept of service engineering. Some realized examples of cooperative behaviors of multiple autonomous robots, and adaptive robot systems achieved by a strategy to make the environment intelligent by embedding intelligent data carriers and ubiquitous sensor nodes are introduced. Finally, *Mobiligence* approach, which is a Japanese national program for the purpose of understanding the mechanisms for humans, animals, and insects to generate adaptive behaviors, is shown, which must bring hints of design principle of adaptive robot systems.

Short Bio: Hajime Asama was born on Jan. 18, 1959. He received MS and DS degrees in Engineering from the University of Tokyo, in 1984 and 1989, respectively. He worked at RIKEN (The Institute of Physical and Chemical Research, Japan) from 1986 to 2002, and became the professor of RACE (Research into Artifacts, Center for Engineering), the University of Tokyo in 2002. He received JSME Robotics and Mechatronics Division Best Paper Award in 1995, JSME Robotics and Mechatronics Division Academic Achievement Award in 2000, Best Paper Award of Fanuc FA Robot Foundation in 2006, etc. He played an editorship of "Distributed Autonomous Robotics Systems", its second and fifth volume which were published from Springer-Verlag, Tokyo in 1994, 1996 and 2002 respectively. He was the IFAC TC chair on Intelligent Autonomous Vehicles from 2002 to 2005. He is a fellow of JSME since 2004, an AdCom member of IEEE Robotics and Automation Society since 2007, and a member of IEEE, JSME, RSJ, SICE, etc. He is the director of the Mobiligence program in the MEXT Grant-in-Aid for Scientific Research on Priority Areas from 2005. His main interests are distributed autonomous robotic systems, cooperation of multiple autonomous mobile robots, emergent robotic systems, ubiquitous systems, service engineering, and Mobiligence, namely emergence of adaptive motor function through the body, brain and environment.

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