

A BRIEF BIOGRAPHY OF Dr. KOUHEI OHNISHI



Dr. Kouhei Ohnishi B.E. (1975), M.E.(1977) and Ph.D.(1980) all in electrical engineering from the University of Tokyo. Since 1980, he has been with Keio University, and is Professor at Dept. of System Design Engineering. He has been active in the IEEE IES for long time. He served as a President (2008- 2009) for IES and is now serving as a Co-Editor-in-Chief of the IEEE Transactions on Industrial Electronics. He also served as a President at the Institute of Electrical Engineers of Japan (IEEJ 2015 -2016). He has been a fellow of IEEE since 2001, a fellow of IEEJ since 2011 and a fellow of the Japan Society of Mechanical Engineering since 2002. He received numerous awards including EPE-PEMC Council Award in 2004. He is a member of the Science Council of Japan.

Abstract of the keynote speech

We can immediately know what the object is when we touch it. If the object is soft, it must be a sponge (or similar thing). If it is rigid, it may be a metal block. That sensation is an ability of the human being called “haptic sense”. “Real-haptics” is a technology to reconstruct haptic sense by acquiring dynamic physical information that is transferred bi-directionally between the surrounding environment and the human. An abandonment of haptics causes difficulty in further advance in automated machine, or may even result in threatening the safety and security of the process.

Maybe large gap between real human and robot comes from the excessive expectation induced at first from the S.F. movie entitled "Metropolis" released in 1926. In fact, the artificial machine has been developed from the machine tool. The performance has been measured by its stiffness almost proportional to the forward gain in the servo control. High stiffness seems to give high performance, however it loses compliant motion. The robot motion based on the existing servo system is quite stiff and generates the motion far from the human action.

Soft robotics is a new concept coming from real haptics. This gives not only compliant motion but also skillful motion to the robot and/or mechatronics. The talk will show the structure of motion control together with its implementation including a newly developed “haptic core-chip”. Also the talk will introduce various applications by visual demonstrations.