



Walking Assist Robotic System

by

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Abstracts

In this presentation, we will consider two types of walking assist systems, a wearable walking assist system and a Passive RT Walker. The original idea of wearable robot assist systems has been proposed in 1960's as a man amplifier, and several prototype systems have been developed for this purpose so far. The wearable robot assist systems are classified into two types; a man amplifier type, which has been developed for augmenting human power, and an assistive device type, which is used to assist the elderly/ disabled to perform daily activities by making up degraded functions. HAL developed by Professor Sankai's group at University of Tsukuba and Wearable Walking Helper developed by our group have been developed as the assistive devices. After having reviewed wearable assist systems developed so far, a control system without using EMG is presented and experimental results illustrate how it works.

Passive RT Walker is a walking assist system of a walker type and is controlled without using electric motors. The system moves by the external force/ moment applied by its user and the motion is controlled by a serve break system. The system is intrinsically safe in that it does not move by itself. By observing its user's state and estimating its user's intention, the dependability of the system is also increased. The passive robotics approach is shown effective as a solution for human-robot interaction without serious safety issues.



Biography of the Speaker

Dr. Kazuhiro Kosuge is a Professor in the Department of Bioengineering and Robotics at Tohoku University. He received the B.S., M.S., and Ph.D. in control engineering from the Tokyo Institute of Technology in 1978, 1980, and 1988 respectively. From 1980 through 1982, he was a Research Staff in the Production Engineering Department, Nippon Denso Co., Ltd. (DENSO Co., Ltd. at present). From 1982 through 1990, he was a Research Associate in the Department of Control Engineering at Tokyo Institute of Technology. From 1990 to 1995, he was an Associate Professor at Nagoya University. From 1995, he has been at Tohoku University. He received the JSME Awards for the best papers from the Japan Society of Mechanical Engineers in 2002 and 2005, the RSJ Award for the best papers from the Robotics Society of Japan in 2005. He is an IEEE Fellow, a JSME Fellow, RSJ Fellow, and a SICE Fellow. He is currently serving as President-elect, Robotics and Automation Society, IEEE.