

HomeMate: Cognitive Robot for Elderly-Care

Sukhan Lee ^{*1}

^{*1} Intelligent Systems Research Institute, Sungkyunkwan University

For domestic/personal service robots such as elderly-care robots to be successful, their quality, represented as dependability, sociability and affordability, should reach a new dimension sufficient for satisfying the value-price-cost inequality. This talk introduces "HomeMate," a cognitive robot targeted for elderly-care with such services as errand, scheduled medicine and video chatting in home environments. Emphasis will be given to how to endow HomeMate with human-like dependability in search and recognition based on the self-generated cognitive processes and behaviors under, so called, w-Framework. In particular, the cognitive recognition, as a self-generated process for evidence collection and filtering, will be presented in more detail with its capability of selecting features optimal for the given situation, collecting proactively the evidences for reducing uncertainties and ambiguities in recognition, reaching highly reliable decisions based on the probabilistic fusion of evidences, incorporating the context into probabilistic information fusion. Finally, experimental results are presented to demonstrate the performance of the proposed cognitive recognition for the success of a search and recognition mission by a service robot for carrying out errand services in a cluttered home environment.

Profile

Prof. Sukhan Lee has been a Professor of College of Information and Communication Engineering, and WCU professor of Interaction Science at the Sungkyunkwan University, while serving as the Director of the Intelligent Systems Research Institute, since 2003. From 2011 to 2012, he assumed the Dean of the Graduate School of Sungkyunkwan University. Prof. Sukhan Lee has his research interest in the areas of Cognitive Robotics, Intelligent Systems, and Micro/Nano Electro-Mechanical systems. From 1998 to 2003, he was an Executive Vice President and a Chief Research Officer at the Samsung Advanced Institute of Technology. From 1990 to 1997, with the Jet Propulsion Laboratory, California Institute of Technology, as a Senior Member of Technical Staff and, from 1983 to 1997, he was with the Departments of Electrical Engineering and of Computer Science at the University of Southern California. Prof. Sukhan Lee is currently a fellow of IEEE and a fellow of Korean National Academy of Science and Technology.

Prof. Sukhan Lee received his Ph.D. degree in Electrical Engineering from Purdue University, West Lafayette in 1982. He received his M.S. and B.S. degrees in Electrical Engineering from Seoul National University in 1974 and 1972, respectively.