Abstract

Independent mobility is essential for everyone.Rehabilitation robotics is a field of research dedicated to understanding and augmenting rehabilitation through the application of robotic devices.Powered Wheelchairs (PWC) provided a better solution for those who suffer from mobility impairment. But most of the users find it difficult to operate their chairs effectively, resulting in loss of their residual skill; which can be due to variety of physical or cognitive impairments. Developments of Intelligent wheelchairs have provided better solution for such users. Such Intelligent Assistive Devices (IADs) need to be cognitively enhanced for better Human Robot Interaction (HRI). Therefore we propose to have a Cognitive collaborative architecture (CCA) for the Intelligent Wheelchair, and a formal description is established to further develop the theory in a precise manner.Since humans are the ultimate users of these systems, therefore these systems must interact with human as a teammate. If user find difficult to drive the WC, it transfer the control to a robotic agent who uses human adaptive navigation strategy and provide seamless navigation. Therefore user of WC thinks that (s)he have improved their driving skill, which reduces their loss of residual skill.For the systematic development of CCA, a formal description is established to further develop the theory in a precise manner.

Keywords: Intelligent Wheelchair, Human Robot Interaction, Cognitive Architecture, Navigation.