人間中心のシステム設計と福祉用パーソナルビークルへの応用

Human-Centric System Design and its Application to Welfare Personal Vehicle

キーワード：システム制御，人間中心，福祉、人間機械系　/key words: System Control, Human-Centric, Welfare, Human-Machin system

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Our study area is Human-Centric controlled system design using Virtual and Augmented Reality

>System control based on Human-Centric design: In the information society, the human-centered design and optimization will be key technology for system integration. In our laboratory, we study the robust control theory and application. The feature of our study is human modelling based on the subjectivity, and its application to human-machine design for easy operation. **Fig.1** shows an example of an optimization of driver model detecting gaze point information using driving simulator.

>Assistance/Automatic control of next-gen welfare vehicle: For improving quality of life in the super-aged society, we developed an easy-to-use welfare vehicle for elderly and physically disabled persons (**Fig.2**). The vehicle has a unique piggybacking concept that allows the elderly to climb into the vehicle from the bed. As the learning ability of the driving skills for elderly is different from person to person, automatic driving system using SLAM and smart driving assistance for the beginner have been studied.

>Control of things with Augmented Reality: In order to improve QOL of the elderly, we have studied assistance of the driver using AR and VR. Their driving skill rose significantly using a virtual vehicle projected on HoloLens. In addition, it is possible to drive automatically by using a 3D digital model of the environment and to void collision with the wall (**Fig.3)**. We are also studying collaboration with intelligent robots (**Fig.4)**.

Fig.1 Identification of steering model depending on gazing distance

Fig.2 Automatic and formation control of personal vehicle

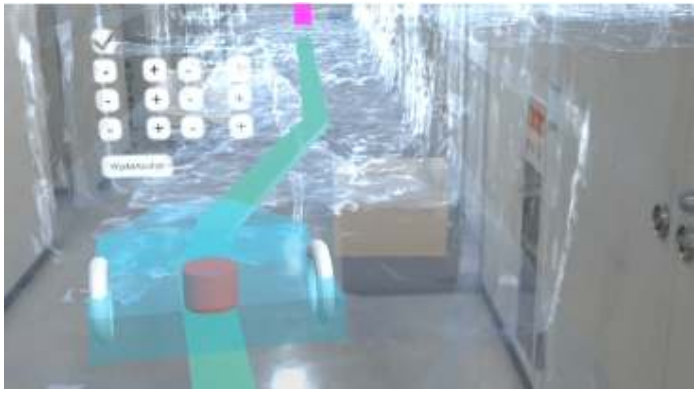

Fig.3 Driving assistance and automatic control using Augmented Reality

Fig.4 Intelligent robotics