Development tablet-based testing system for driving situational awareness for elderly driver

Hyun Seo Cho, MS; Eunjoo Lee, PhD; and Il Kon Kim, PhD

The purpose of the study is to develop a tablet-based driving situation awareness (DSA) test system for the people aged more than 65 years and test its usability. With aging process, declining of physical function and cognition may result in more car accidents than other age groups. However, screening test for driving appropriateness is not commonly perform for the elderly people experiencing decreased physical and cognitive function in South Korea. This study developed a system called Tablet- based DSA with MVC (Model View Controller) architecture. After reviewing the style suitability of MVC architecture, this web-based advancement had been developed. In addition, server functions were added to make it easy to manage stored data. MVC architecture is one of web architecture's characteristics and data mean answers which users respond to Tablet based DSA system. To test the usability and appropriateness of Tablet- based DSA, five drivers aged over 65 years (mean age: 70 years) participated in the driving situation awareness test. The User-Interface and architecture of data communication had higher scores compared with the computer based driving situation recognition program that developed before (4.18 vs 3.85 with 5 Likert scale) and the participants expressed high satisfaction during interview. During the interview, participants reported that the touch screen function make them easier to respond and answer the questions because they were accustomed with smartphone use. All the participants also reported that they want to utilize the system frequently to monitor their ability for driving with a reliable tool at the convenient place. However, it needs more validation with more participants with diverse cognition and physical function level. In further study, whether the tablet based DSA system could be used as a way to assess the cognitive function of elderly to effective prevent traffic accidents in older drivers needs to be elucidated. Also mobile technologies are not a new trend in elderly anymore, thus more active adoption and validation of mobile technologies that are in the market are needed as a way to provide better care for the clients in hospitals as well as community settings by nurses because elderly are willing to use technologies as long as they are effective and useful.