KS1-1  活き活き高齢者のための運転特性研究
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The Driving Characteristics Research for the Elderly with Vitality
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Nagoya COI (Center of Innovation) is aiming to create “The Mobility Society for the elderly, which leads to Active and Joyful Lifestyle” in order to realize a sustainable society for the elderly. To achieve the aim, we are investigating and analyzing the aging-related physical changes and the influences to the drive. The acquired knowledge is utilized for the research and development of sustainable safe-drive support from two points of view. The first view is a development of training method for maintaining and improving essential driving ability. The second view is a development of reliable and safe driving support optimized for individual drivers. This presentation introduces the perspective of the driving characteristic research for the elderly at Nagoya COI, and the following presentation gives a detail of the main part of the study.

KS1-2  高齢者の認知機能と自動車運転
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Automobile driving and cognitive function in older adult
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Aging cause cognitive declines to a varying degree and may threaten driving safety. Dementia largely affects cognitive functions while pre-mild cognitive impairment (MCI) dose not so much. It makes both clinician and older person difficult to judge their driving fitness.

Driving is essential for independent social life in most parts except for some large cities. Driving could provide autonomy, mobility and other psychosocial benefits while driving cessation may induce depression and reduced social activity. Therefore, driving fitness should be judged by not age but individual functional ability.

Although early diagnosis of MCI is important for prognosis, there is little study about the effect of MCI on driving performance and also no consensus about test battery to discriminate driving ability. However, previous studies show that subtypes of MCI may differentially affect driving ability. Amnestic MCI may affect driving performance in a limited way unlike other MCI. Understanding of older person’s cognitive and driving features may lead to maintain the mobility and improve quality of life. This presentation will show our past studies and future research direction.

KS1-3  自動車運転中の見落とし防止システムの開発にむけて
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On the development of oversight prevention system for car drivers
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We perceive different visual images even when we are in the same place and looking at the same visual scene. This is mostly due to the fact that retinal image of the identical visual scene can be different as characteristics of eye optics, eye movements, pupil and accommodative fluctuations, and spatial arrangement of retinal photoreceptors are all unique in each individual. Thus a driving scene that is easy to manage for some people may be dangerous for others who are prone to overlook important objects due to degraded quality of their retinal image by myopia, presbyopia, retinal detachment, improper gaze direction, or/and other factors. As such, to prevent car accidents caused by oversights, we have been developing a software system that estimates retinal image of each car driver, then quantifies risks of oversight on each part of visual scene, and thereby enables a personalized assistance. In this talk, I will introduce how the system calculates individual retinal image, and show examples of estimated time-varying retinal images during driving simulation as well as real car driving.