NUSIP

ALUMNI INTERNATIONAL SYMPOSIUM 2022

November 5, 2022

10:00-12:00 [JST]

Online (Zoom & oVice)

We invite alumni to reunite and meet new friends as well as everyone who is interested in participation or program details to share information and network.

10:00-10:50	Opening remarks & Invited Talks
10:50-11:35	Presentations by NUSIP Alumni
11:35-12:00	Round table Discussion & Closing remarks
12:00 -	Free interaction time for reunion and networking (via oVice)

For program details click here

Register form: https://forms.gle/h1ByNwJbiz4q5jFn7

Organized by the NUSIP Committee,
School/Graduate School of Engineering, Nagoya University
advisors@int.engg.nagoya-u.ac.jp

Invited Talks & Lecturers

Perspectives for future intelligent vehicle design

Prof. Tatsuya Suzuki
(Vice dean of Graduate School of Engineering, Nagoya University)

This talk presents several future perspectives for intelligent vehicle design. One of the most crucial concern for intelligent vehicle is how to manage the interaction with vulnerable road users (VRU) such as pedestrian, cyclist and so on. This is particularly emphasized when we consider the automation level 4 and 5. Based on this concern, the important research steps can be organized as follows: (1) How to model the behavior of the VRU, (2) How to design the intelligent control architecture exploiting the behavior model of VRUs, (3) How to verify the effectiveness of the designed intelligent controller. For the first topic, a new decision making model of the pedestrian is introduced with showing the accuracy and performance of the model.

In the second topic, a new control architecture based on the model predictive control (MPC) framework is investigated. The proposed MPC architecture has a behavior model of VRUs as one of the prediction models. The third topic is addressed from the viewpoint of verification by using digital twin. Since the verification of the interactive behavior between car and VRU in the real world is quite unsafe, the verification in the virtual world is highly recommended. Some demonstrative examples of the digital twin for mobility will be presented. Finally, other several important open problems for future intelligent vehicle will be discussed.

Towards a mobility society where elderly people can drive safer

Prof. Hirofumi AOKI
(GREMO: Global Research Institute for Mobility in Society, Nagoya University)

In recent years, there have been many reports of traffic accidents involving elderly drivers. In the super-aging society that Japan is facing, the private car use by the elderly is expected to increase, and there is a movement to seek restrictions on driving by promoting the return of driver's licenses and tightening regulations. On the other hand, since public transportation is limited in many areas outside of urban areas, some form of "mobility" is essential to ensure the quality of life (QOL) of the elderly as a means to go out freely and stay engaged with society. To fundamentally counteract accidents involving elderly drivers, it is necessary to provide assistance that takes into account human characteristics such as cognitive and visual functions, as well as driving characteristics such as judgment and operation when driving. With the support of the Center of Innovation (COI) program of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Japan Science and Technology Agency (JST) since the end of 2013, we have developed a database on human and driving characteristics of elderly drivers, called "Dahlia" (Data Repository for Human Life- Driving Anatomy). Dahlia consists of 1) human characteristics obtained from cognitive function tests such as MMSE (Mini Mental State Examination), TMT (Trail Making Test), and UFOV (Useful Field of View), visual function tests such as visual acuity, visual field, and contrast sensitivity, 2) subjective evaluation by various questionnaires collected in Dahlia, and 3) driving characteristics obtained from on-dash cams installed in their private cars, driving simulators, and instrumented vehicles. From a multifaceted analysis of Dahlia, it has become clear that the frequency of near-misses is greatly influenced by cognitive and physical functions. It can be inferred that drivers with low safety awareness and who do not pause and check left and right sides of the road do not suffer near-misses thanks to their cognitive and physical functions when young, but that changes in cognitive and physical abilities due to aging increase near-misses, which may lead to accidents depending on when other road users (e.g., crossing cars, bicycles, or pedestrians) appear. We believe that one of the keys to future countermeasures is to look back on one's own driving using a drive recorder, etc., and to cultivate meta- cognition, which is how to make people aware of aging-related changes in human characteristics.

For program details click here