NUS National University of Singapore | Department of Civil & Environmental Engineering
College of Design and Engineering

You are cordially invited to a Seminar Organized by
Centre for Transportation Research
Department of Civil and Environmental Engineering

Adapting Autonomous Vehicles to Mixed Traffic via Simulation Trainings

by

Dr. Abdullah KARAAGAC
Department of Geomatics, Karamanoglu Mehmetmey University, Turkey

Host: Prof Meng Qiang,
Director of Centre for Transport Research (CTR), CEE

Date: 13 October 2023, Friday
Time: 4.30 pm – 6.00 pm
Venue: EA-06-05
College of Design and Engineering
National University of Singapore
9 Engineering Drive 1
Singapore 117576

Scan code to register

Please register early. All are welcome and admission is free

Abstract

The integration of autonomous vehicles into real-world traffic systems presents a multifaceted challenge, requiring robust solutions to ensure safety and efficiency. It is impossible to develop autonomous vehicles directly in the real field because it is risky and costly. With the rapid advancement of artificial intelligence and machine learning technologies, training autonomous vehicles in virtual simulations has become a pivotal strategy for enhancing their adaptability and flexibility. However, the success of simulations is directly related to the modelling of reality and the reliability of the data. In this seminar, the process of developing an autonomous vehicle and its adaptation to real traffic and the difficulties encountered will be elaborated.

It is possible to comprehensively model traffic in spatio-temporal terms, from throttle control of a vehicle to international logistics. However, depending on the needs of the study to be carried out, traffic is modelled with some basic distinctions such as macroscopic, mesoscopic, and microscopic. Vehicle control and dynamics are handled at higher resolution, called sub-microscopic. There are traffic simulation environments at various levels on the market that allow modelling of traffic, as well as sub-microscopic simulation environments that include vehicle control and dynamics. Filling this gap between these two levels is another topic of this seminar.

Current and completed projects and their results will be shared and discussions will be held on future transportation projects. The findings suggest that combining cutting-edge technologies with realistic simulation environments can accelerate the development and deployment of autonomous vehicles,

fostering greater trust and acceptance among stakeholders and the public while contributing to the realization of a safer and more sustainable transportation future.

Speaker's Biography

Dr. Abdullah Karaagac is a Senior Lecturer in Department of Geomatics and coordinator of Agricultural Automation and Robotics Lab. in Karamanoglu Mehmetbey University, Turkey. He graduated BSc, MSc and PhD degrees from Department of Geomatics Engineering in Erciyes University, Turkey. He worked at Erciyes University as a Research Assistant for 7 years. Besides he founded and managed his own company on Smart Cities, IOT and Cloud Computing.

During his PhD term, he started to develop traffic simulation software to adapt autonomous vehicles to real mixed traffic. His specific interests include autonomous vehicles, traffic simulations, control systems, robotics, spatial AI, and GIS applications.

Abdullah Karaagac consults private companies and governmental organizations about smart mobility and robotics integration. Currently, he is a visiting scholar at NUS, sponsored by The Scientific and Technological Research Council of Turkey.

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Map of Seminar Room. EA-06-05. 9 Engineering Drive 1. Singapore 117576