2020 International Mechatronics Conference and Exhibition
Hosted virtually by Oklahoma State University

Workshops

A Workshop on

On-Ramp Merging for Autonomous Driving

Date: September 15, 2020, 1:00 p.m. – 5:00 p.m. CST

Registration: $100

Abstract

Merging is a challenging task for both human drivers and automated vehicles. According to the US Department of Transportation, nearly 300,000 merging accidents happen every year with 50,000 being fatal. The pilot vehicles of the leading self-driving car company, Waymo, were reportedly unable to merge autonomously. In the current literature, there are rule-based and optimization-based methods proposed to tackle the automated merging problem. In recent years, there are numerous studies that investigate automated merging using deep reinforcement learning, which is an artificial-intelligence(AI)-based method. This workshop introduces various methodologies for on-ramp merging for automated vehicles.

Structure

There will be a presentation on on-ramp merging using deep reinforcement learning. Then the audience are encouraged to download the open-source driving simulator, Simulation for Urban Mobility (SUMO), on their own laptops to study basic traffic simulations.

Intended Audience

High school, college, and graduate students; automotive, robotics, and AI scientists and engineers.
Materials provided: Lecture notes are provided. The audience are encouraged to bring their own laptops for studying the SUMO driving simulator.

Instructor

Dr. Yuan Lin is an assistant professor in the Mechanical Engineering Technology program of the Division of Engineering Technology at Oklahoma State University, USA. He obtained his Ph.D. degree in Engineering Mechanics from Virginia Tech, USA in 2016. He subsequently worked as a postdoctoral research fellow in Mechanical Engineering at Virginia Tech, USA and later in Systems Design Engineering at University of Waterloo, Canada. His research interests include decision-making, planning, coordination, and control of connected and automated vehicles. Dr. Lin has published numerous papers in peer-reviewed conferences and journals including IEEE transactions. He is a reviewer for multiple journals including the IEEE Transactions on Intelligent Transportation Systems.