

## **Symposium 2021 Breakout Session Title:**

### **B206-ADS Simulation and Testing Part 1: “What’s New?”**

#### **Session Contact/Organizers:**

- Chris Schwarz, Director of Engineering & Modeling Research, The National Advanced Driving Simulator
- Jiaqi Ma, Associate Professor, University of California Los Angeles
- Guoyuan Wu, University of California Riverside
- Sky Guo, Texas A&M University
- Yi Guo, Senior Research Associate, University of Cincinnati
- Jia Hu, Tongji University
- Shawn Kimmel, Quantitative Scientific Solutions (QS-2)

#### **TRB Sponsor/Partner Committees (if any):**

Part 1 of a 2-part session on same common theme ADS Simulation and Testing.

See other session description ADS Simulation and Testing Part 2: “Approaches for Collaboration and Validation”. Shawn Kimmel, Chris Schwarz, and Jiaqi Ma are collaborating on these sessions.

#### **Session Description**

Simulation is fundamental to the development and testing of automated driving systems. Waymo alone has tested on over 10 billion simulated miles. There are several powerful software tools available commercially or as open source projects. They support simulation of sensor suites, environmental conditions, full control of all static and dynamic actors, maps generation and much more that enable training and testing of automated vehicles. They have large and growing communities who can contribute to the simulation ecosystem and develop use cases. This year we plan to highlight a fresh set of tools and the latest research.

#### **Goals/Objectives/Outputs**

The ADS community continues to need exposure, education, and training on simulation options available to them. Much research continues to be done by graduate students who will benefit from this exposure. Specific goals for the session presenting new research and new simulation tool frameworks or functions to the audience. Additionally, time for questions and audience interaction will be programmed into the schedule for a highly engaging session.

Some objectives for the session include the following:

- Share new simulation tool features and functions
- Highlight new research
- Publish a chapter in the Springer Journal following the symposium

## Agenda

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| <b>7:00</b> | <b>Introduction</b>  |
| <b>7:05</b> | David Florence, Texas Transportation Institute, <i>Traffic Optimization for Signalized Corridors (TOSCo), Vehicle System Development and Evaluation using VISSIM</i>                 |
| <b>7:25</b> | Runsheng Xu & Jiaqi Ma, UCLA, <i>OpenCDA: An Open framework for Testing Cooperative Driving Automation Technologies using Multi-Resolution Simulation</i>                            |
| <b>7:45</b> | Dan Negrut, University of Wisconsin, <i>Chrono: A Scalable, Human-in-the-Loop Platform for the Simulation of the Interplay Between Multiple Autonomous and Conventional Vehicles</i> |
| <b>8:05</b> | Panel Questions & Discussion   |
| <b>8:25</b> | <b>Break / Networking</b>  |
| <b>8:40</b> | Jia Hu, Tongji, <i>PTV VISSIM Developments: A Generic Simulation Platform for Cooperative Adaptive Cruise Control under Partially Connected and Automated Environment</i>            |
| <b>9:00</b> | Zhitong Huang, Leidos, <i>CARMA Everything-in-the-Loop Simulation: Development of a Co-Simulation Tool for Cooperative Driving Automation Research</i>                               |
| <b>9:20</b> | Ben Hager, dSPACE Inc., <i>Bridging the Gap to Safe Autonomous Systems</i>   |
| <b>9:40</b> | Panel Questions & Discussion   |