

# Syllabus of SUMO-Urban Traffic Simulation Workshop Spring 2021

### **C2SMART** Learning Hub

Welcome to the C2SMART SUMO-Urban Traffic Simulation workshop. This workshop provides an entry-level introduction to the Simulation of Urban Mobility <u>SUMO</u>, an open-source, highly flexible microscopic simulation software, and teaches how to develop microscopic traffic simulation models under multiple urban scenarios. Also, python-based outsourcing simulation control will be included in the workshop, which could provide more opportunities to implement complex scenarios,



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such as dynamic traffic signal control or basic vehicle-to-vehicle/vehicle-to-infrastructure connections. Participants will get started quickly at SUMO by practicing real-world scenario analysis and development.

### **Instructor Information:**

Fan Zuo: <u>fz380@nyu.edu</u> Di Sha: <u>ds5317@nyu.edu</u> Requirements: Basic Python Skills Session Dates and Times: Friday 1 PM EST

### Schedule:

Week 1: SUMO 101

- Concepts of SUMO.
- How does simulation run: A quick start.
- OSMWebWizard: 3-Click Scenario Generation.

### Week 2: SUMO API – TraCI

- TraCI: The magic tool of implementing engineering ideas.
- Advanced SUMO: Text editor style.
- Example Scenario: Pedestrian signal with push-button.

### Week 3: SUMO V2V/V2I Implementation



- Mechanism Design
- What tools do we need? How to search for tools to achieve our goal?
- Example Scenario: Queuing warning application.

## **Optional References:**

- Official documents of SUMO: <u>https://sumo.dlr.de/docs/index.html</u>
- Useful Tutorials: <u>https://sumo.dlr.de/docs/Tutorials.html</u>
- Basic/Computer Skills: <u>https://sumo.dlr.de/docs/Basics/Basic\_Computer\_Skills.html</u>
- Introduction papers:

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Krajzewicz, D., Erdmann, J., Behrisch, M. and Bieker, L., 2012. Recent development and applications of SUMO-Simulation of Urban MObility. *International journal on advances in systems and measurements*, 5(3&4).

Lopez, P.A., Behrisch, M., Bieker-Walz, L., Erdmann, J., Flötteröd, Y.P., Hilbrich, R., Lücken, L., Rummel, J., Wagner, P. and Wießner, E., 2018, November. Microscopic traffic simulation using sumo. In 2018 21st International Conference on Intelligent Transportation Systems (ITSC) (pp. 2575-2582). IEEE.

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Note: If you are a NYU student and is taking TR-GY 7353: Data Driven Mobility Modeling and Simulation course in Spring 2021, you may skip the first two sessions of this workshop.