Research Assistant / Master's Thesis

Towards using microscopic traffic simulations for safety evaluation of Autonomous Vehicle models

Full Time Position at TUMCREATE, Singapore

Availability: Now
Contact: Dr. Jordan Ivanchev (jordan.ivanchev@tum-create.edu.sg)

Background

Interest in autonomous vehicles is rapidly growing in the past few years due to the big benefits they can potentially bring to the transportation sector in terms of travel time reduction, fuel consumption, accident prevention etc. This is a strong indicator that such vehicles will soon be part of our everyday life. However, the transition from human-driven to autonomous vehicles will not be instantaneous. There will be a period of time when the transportation systems will have both human-driven and autonomous vehicles interacting and a considerably body of the research community as well as policy-makers are interested in the possible outcomes of such type of co-existence.

Objective & tasks

The goal of this project will be to evaluate the potential of different types of traffic simulations from the macro to the micro scale to evaluate the safety aspects of autonomous vehicle control logic. The motivation behind this project is the possible mitigation of the risks accompanying the real life testing of Autonomous Vehicles by performing big body of the tests in a simulation environment. However, before this can happen the plausibility of the approach must be evaluated and the respective scale of the simulation to be used has to be identified. Completing the project would require the following steps:

1. Literature review on existing methods for quality assurance in automotive and especially AV sector
2. Definition of metrics that describe the safety performance of the AV model control logic
3. Identification of needed simulation functionalities for safety assessment
4. Determining which test measures can be found using which type of simulation
6. Using real data and simulation to verify findings
6. Dissertation/paper writing

What we expect from you

- Object-oriented programming concepts
- C++
- Knowledge of QA and safety evaluation processes
- Statistical Modelling
- Basic understanding of discrete event simulations

What we offer you

- An international and multidisciplinary working environment
- Opportunity to work on a project with real-life relevance
- Work with researches from world-renowned Universities (TU Munich and NTU Singapore)

Send your resume/CV to the contact person if interested
NOTE: Only shortlisted candidates will be contacted