



Methods and tools for driving simulation

Prof. eng. Galante Francesco

Credits: 3 CFU

Number of hours: 18 frontal hours

Date: 15, 17, 22, 24, 29 June and 1 July 2027

Objectives: Driving simulation has become a key component of regional, national, and international research aimed at investigating driver performance under a wide range of traffic, safety, weather, and lighting conditions. It is also used to assess fitness to drive in individuals experiencing performance declines due to aging, impairment, sleep disturbances, or the effects of medication, drugs, or alcohol. In addition, driving simulators support the evaluation of the impact of alternative signs, signals, pavement markings, and road layouts on driver behaviour, as well as the assessment of the advantages and disadvantages of in-vehicle technologies such as Advanced Driver Assistance Systems (ADAS) and Connected and Automated Vehicles (CAVs).

Today, there are hundreds, if not thousands, of driving simulators in use around the world, and governments and industry are increasingly investing in simulator-based research.

This course aims to provide students with the fundamental and comprehensive knowledge and skills required to: a) select and validate the most appropriate driving simulator technology for a given application; b) design and conduct simulator studies, beginning with the formulation of research hypotheses and including participant recruitment, road environment modelling, and the scenario authoring; c) analyse experimental data and c) evaluate and interpret the results of simulator studies.

Teaching materials:

Slides.

Hichem A., Lamri N. (2013). Driving Simulation. Wiley-ISTE.

Assessment methods: Final interview

Contact for information:

Prof. eng. Galante Francesco

Department of Civil, Building and Environmental Engineering

Email: galante.francesco@unina.it

Phone: 081 7683940



Lectures Program

N	Date	Schedule	Duration	Topic
1	15/06/27	10:30 - 13:30	3 hours	Driving simulation: <i>overview, main concepts, advantages and limitations, classifications and applications.</i>
2	17/06/27	10:30 - 13:30	3 hours	Design of driving simulator experiments: <i>hypotheses definition, subjects' selection, 3D roads modelling, scenario authoring, independent and dependent variables.</i>
3	22/06/27	10:30 - 13:30	3 hours	Lab Activities: <i>driving simulator experiment set-up, road environment modelling and scenario creation.</i>
4	24/06/27	10:30 - 13:30	3 hours	Lab Activities: <i>Experiment with DICEA driving simulator.</i>
5	29/06/27	10:30 - 13:30	3 hours	Analyses of data: <i>simulator data reduction, analytical tools, statistical concepts, qualitative interviews.</i>
6	01/07/27	10:30 - 13:30	3 hours	Lab activities: <i>experiment data analysis and results reporting.</i>