Dynamic driving simulator

Simulator mock-up

Mock-up for the investigation of user acceptance of different assistance systems and human-technology interactions (MTI or HMI).

Set-up:

- Environmental visualization via 98" 4K screen
- active steering wheel (*Sensodrive*)
- Pedals (throttle, brake) / active pedals are planned

Function:

- Realization of a detailed vehicle simulation with different software tools (IPG CarMaker / PreScan / AMESim)
- CAN communication enables direct influence on steering wheel characteristics in the form of stiffness, damping and friction
- Hardware communication (dSpace / National Instruments): real-time transmission of steering angle and torque to the simulation environment
  - feedback active adjustment of the steering wheel

Hexapod motion system

Extension of the simulator mock-up by an electrical hexapod motion system for realistic vehicle dynamics simulation dynamic feedback.

Field of research:

- Development of novel vehicle dynamics control and driver assistance systems
- Acceptance studies of new driving systems
- Complex and realistic mixed traffic simulations
  - Cooperative driving with "human-in-the-loop"

Specification motion system:

direction	amplitude		speed	acceleration
longitudinal	-0,499 m	+0,628 m	+/- 0,79 m/s	+/- 7,00 m/s²
lateral	-0,506 m	+0,506 m	+/- 0,81 m/s	+/- 7,00 m/s²
vertical	-0,383 m	+0,372 m	+/- 0,55 m/s	+/- 10,00 m/s²
roll	-24,01 deg	+24,01 deg	+/- 34,3 deg/s	+/- 250 deg/s²
pitch	-25,05 deg	+28,02 deg	+/- 37,4 deg/s	+/- 250 deg/s²
yaw	-27,25 deg	+27,25 deg	+/- 41,3 deg/s	+/- 500 deg/s²