CTU
CZECH TECHNICAL UNIVERSITY IN PRAGUE

Czech Technical University in Prague

Faculty of Transportation Sciences

Institute of Vehicles

Ing. Alina Mashko

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Faculty of transportation sciences

Research areas

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Research and doctoral study areas

- **Transportation Systems and Technology (3708V009)**
- **Technology and Management in Transportation and Telecommunications (3708V024)**
- **Engineering Informatics of Transportation and Communication (3902V036)**
- **Air Traffic Control and Management (3708V017)**
- **Transportation Logistics (3706V006)**

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Transportation Systems and Technology

Modernisation of railway corridors with respect to planned construction of high-speed tracks in Europe and in the Czech Republic

Acceptable modes of city transport – e.g. Mass urban transit preference, parking organisation and other means of management, regulation and organisation of the city transportation.

Project elements for accident reduction

Design of roads and highways using the computer-aided technology

Passive safety of the means of transport

Model management and road transport modelling

Transport systems simulation

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Technology and Management in Transportation and Telecommunications

- Funding of transport and its infrastructure
- Energetics with respect to the use of the alternative energy sources in transportation
- Economics and management of transport and telecommunication enterprises
- Marketing in the Transportation and Telecommunications
- Economics of the tourist trade
- Problems of the traffic service in an area
- Logistics and technology in the transportation

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Engineering Informatics of Transportation and Communication

Transport systems simulation

Software tools for picture processing of thermovision measurement

Monitoring and control of moving objects on airport surface

Virtual reality and geographic information systems in transportation

Development and construction of a group of mobile robots

Intelligent vehicle

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Air traffic control and management

- Quality management of civil aviation
- Modern trends of airport development
- Operation and economics of air transport
- Air transport control and operation systems

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Institute of vehicles

Laboratory of Systems Reliability

(DSRG – Driving Simulation Research Group)

Interactive simulation

Driving simulator categories upon their construction

Non interactive

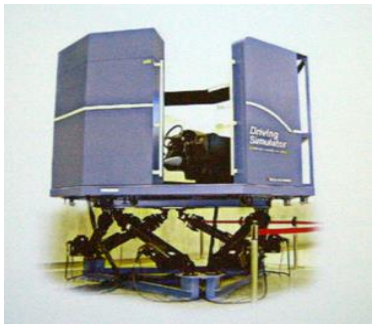
PC "gaming" simulátors

Virtual simulátors

Light (cockpit) simulators

Full simulators

Motion base



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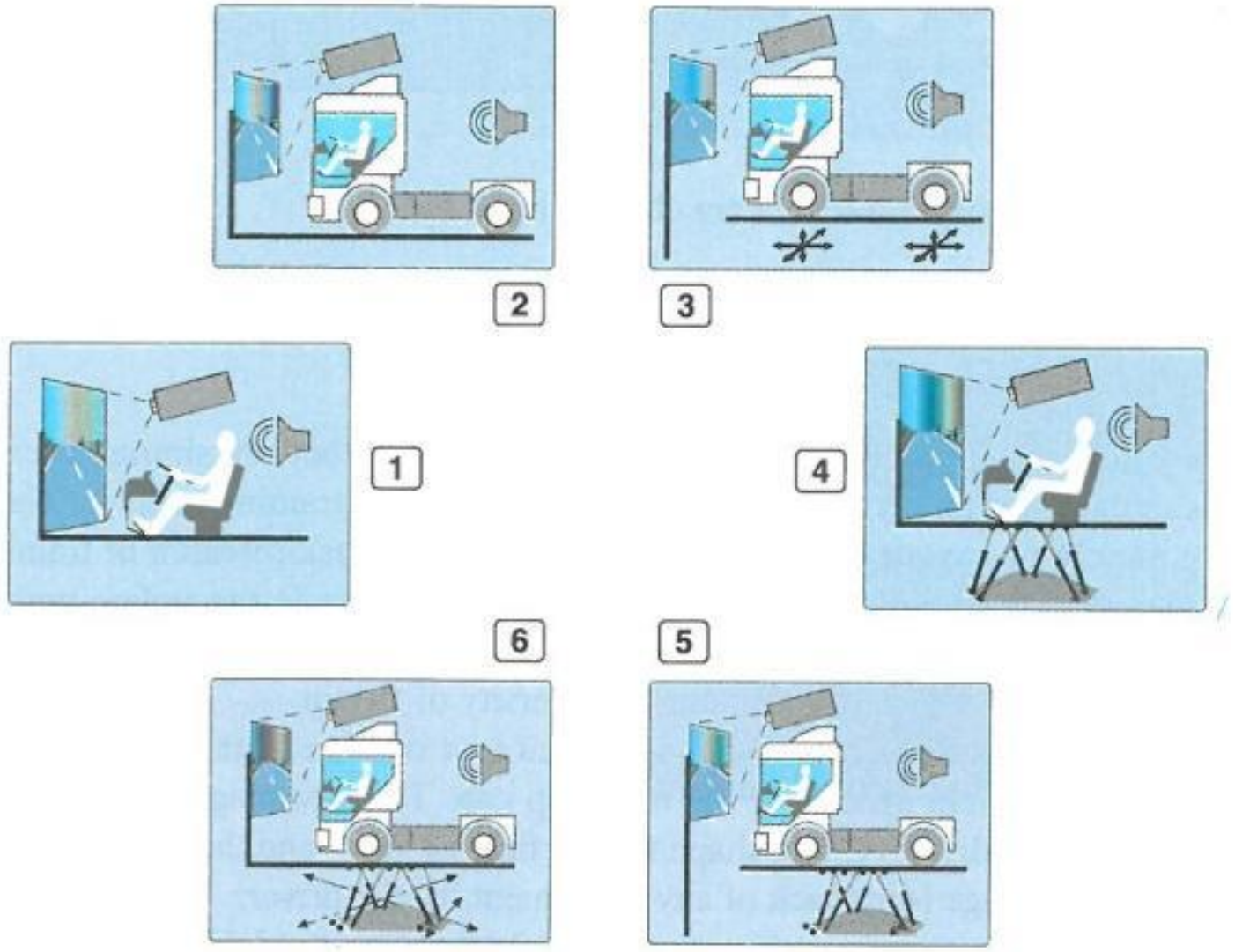
Basic concepts of driving simulators



Light simulators - Superb

The first simulator based on Skoda cockpit

2002-2010

Steady based simulation system

Car cockpit and driver's surroundings

100 Deg FOV

2 projection frontal system with blending

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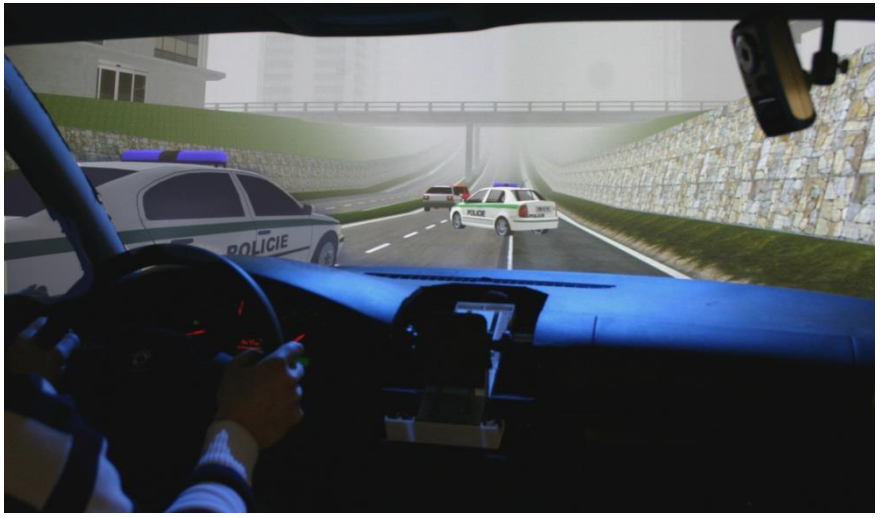
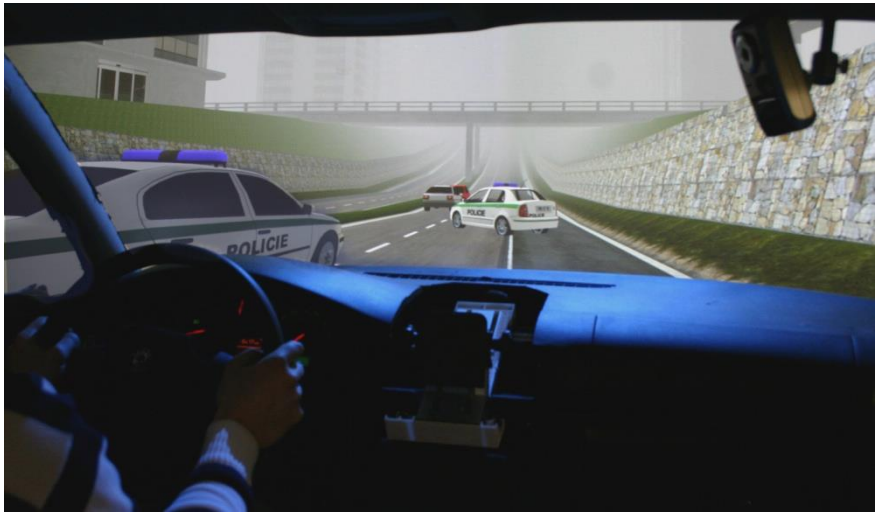
Light simulators – Superb





Full simulator - Superb

The first "big" involving full car body

2003-2010 +

Based on WV simulation systems

Steady based simulation system

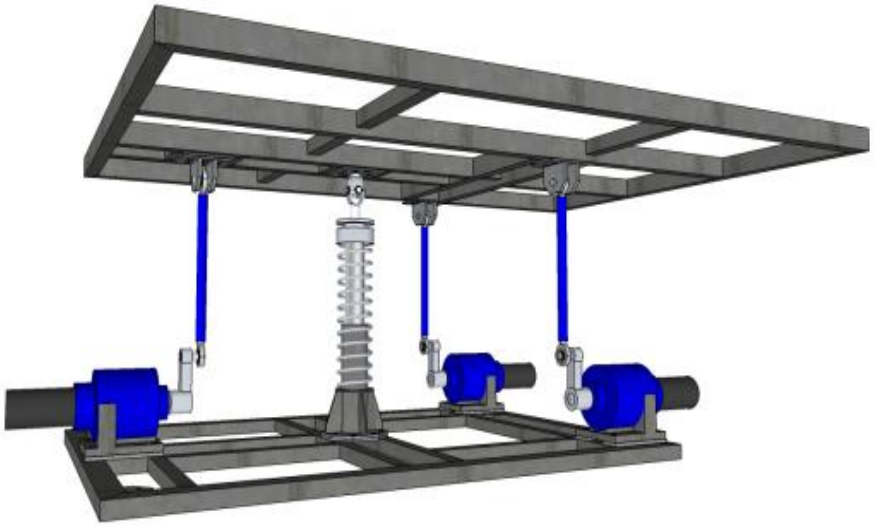
Full car

360 DEG FOV

270 projection system hexagonal without blending plus LCD mirrors

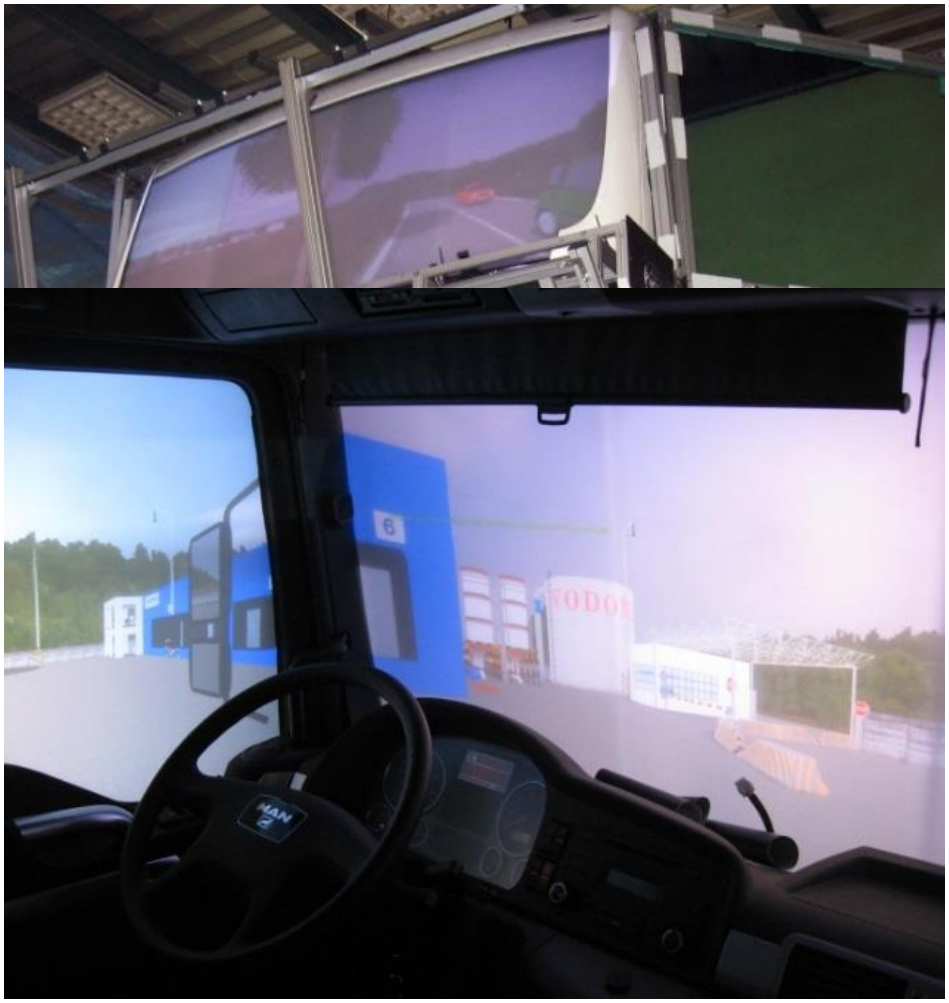
Target research – drowsiness

Light 3D simulator – Octavia II



- Cave-like (3*90 DEG) projection
- Plus mirrors
- 3D passive stereo
- Manual/ automatic gear shifting
- 3DOF moving platform

Full mission simulator of truck (MAN)



- 8 to 16 projectors projection system with coupled mirrors
- Stereo 3D capable with use of polarized glasses
- Direct on screen projection with 4000 x 1800 resolution wind shield

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Scenarios for basic training

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Measurements

Eye-tracking

Biofeedback

EEG

EOG

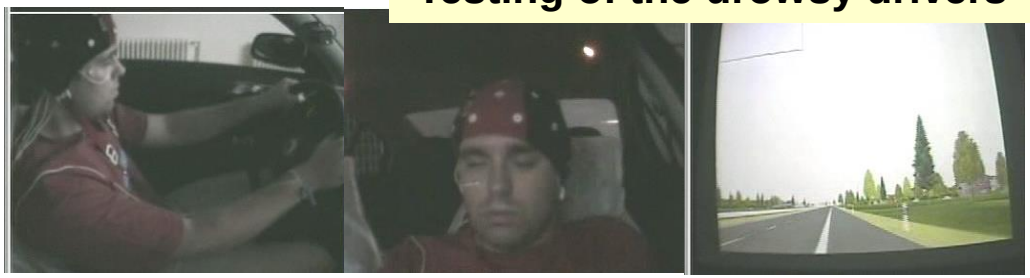
Driving quality:

- **Driving trajectory**
- **Steering**
- **Lane keeping**
- **Breaking and acceleration**
- **Speed fluctuation**

Main directions in investigations DVI

- HMI (IVIS, ergonomics, …)
- Drowsiness (sleepiness)
- Driving behavior assessments (tunnel design, grade crossing …)

Testing of the drowsy drivers



Testing of the Tunnel Design

Testing of the grade crossing design

Testing of the car systems ergonomics

Thank you for your attention

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