

AWARE2ALL

Demonstrators

Safety systems and human-machine interfaces oriented to diverse population towards future scenarios with increasing share of highly automated vehicles

DEMO 1

Passive Safety virtual prototype

Leader: DLR. Participants: THI, ESI, HUM

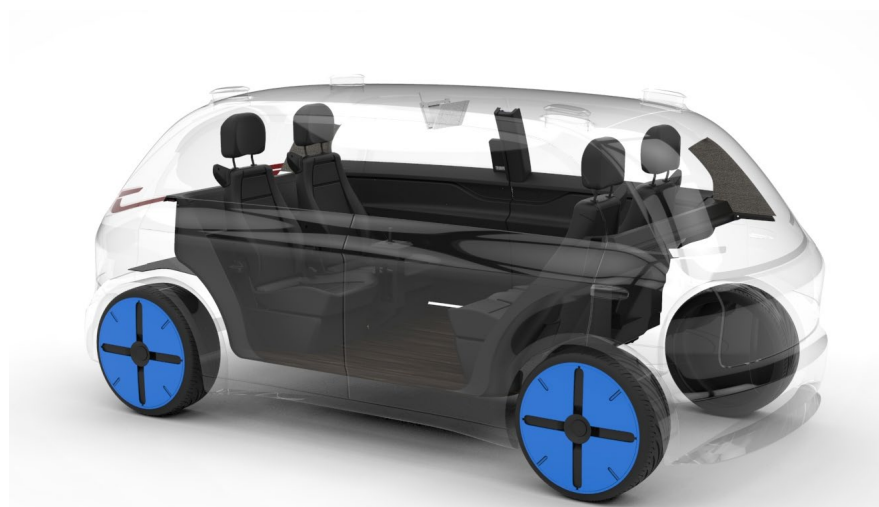
Virtual Scenarios

- Forward and rearward facing seating arrangement
- Multiple occupants & greater occupant diversity **(T1.2)**
- Integration of pre-crash kinematics and mitigative maneuvers **(T2.2)** into crash-phase
- Critical accident & new use case scenarios **(T1.1,T1.3, T2.1)**

Software components

- 3D simulation model of the new vehicle interior configuration **(T2.3)**
- Novel seat restraint system integration **(T2.3)**
- Advanced smart-airbag integration and activation strategy **(T2.3)**
- New occupant postures, positions and increased diversity through Human Body Model (HBM) and virtual Anthropomorphic Test Devices (ATD) development **(T2.3)**

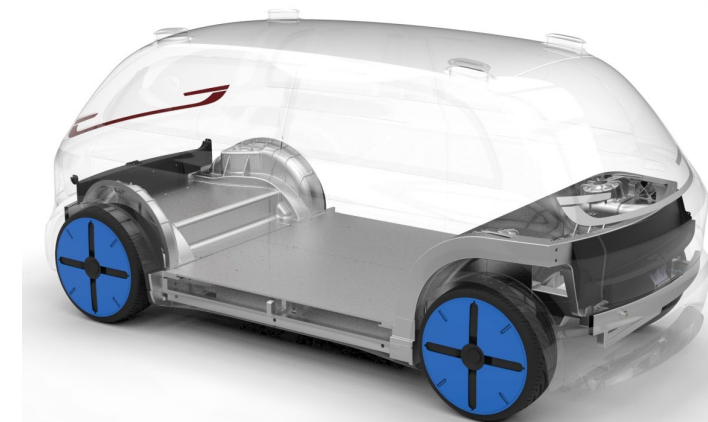
Advanced crashworthiness and safety solutions to protect passengers and mitigate injury risk in unavoidable collisions for a greater variety of possible occupant postures, orientations and diversity.



Next Generation Car Urban Modular Vehicle (NGC UMV)

interior concept:

- 2+2 seating arrangement
- Relaxed environment
- No central floor mounted console or dashboard
- No fixed "driver" location



DEMO 2

Active safety

Leader: TEC. Participants: THI.

Shuttle & scenarios

- Autonomous SAE L4-HAV
- PIX Robobus shuttle equipped with 6 seats (up to 9 occupants)
- 3 possible configurations and mixes: front row facing backward, standing and back row facing forward (T1.2)
- Driving scenarios (T1.3)

Software components

- Mass distribution estimation based on occupancy (T3.1)
- Fallbacks with missing or defective sensors
- Optimal trajectory calculation
- Advanced traction and steering control systems (T2.4)

Hardware components

- GNSS with RTK corrections
- Up to 10 LiDARs, 14 cameras with multiple focal lengths, 2 radars and 12 ultrasonic sensors (T2.2)
- Industrial PC with Nvidia Graphics

Services

- Autonomous Emergency Braking
- Emergency Maneuvering
- Active safety with fallbacks
- Informing Occupants through onboard displays



DEMO 3

iHMI, OMS and Active Safety

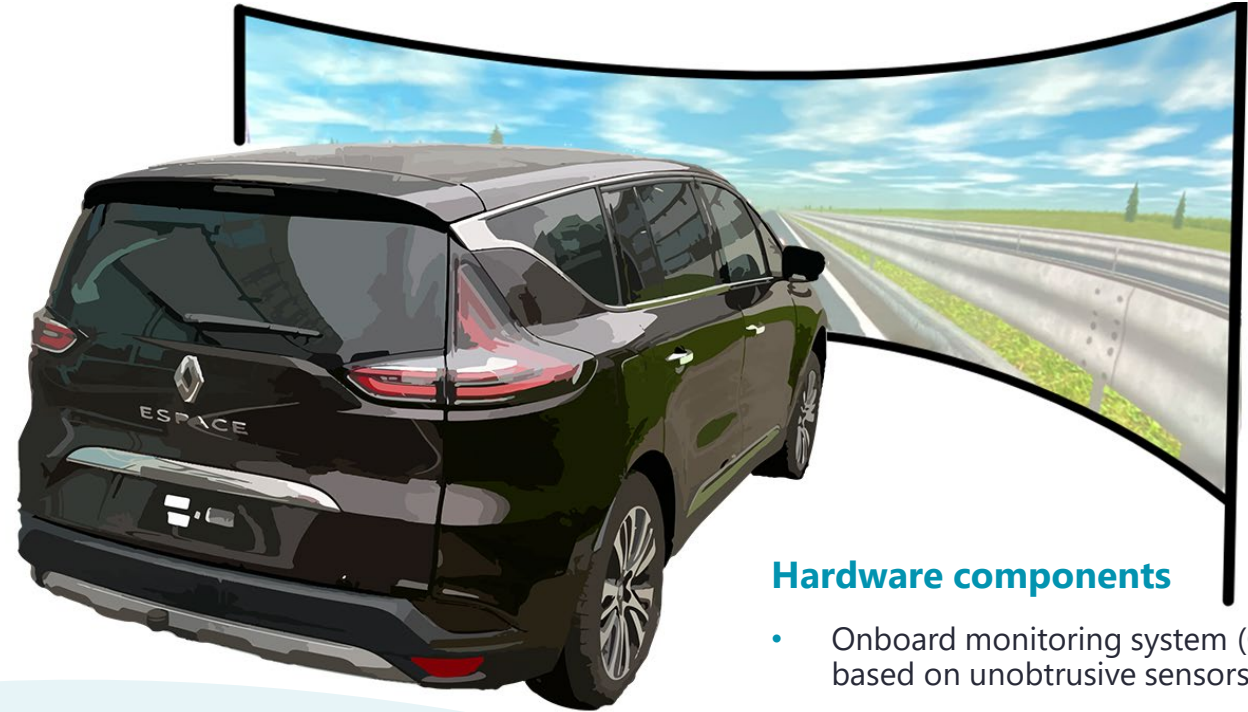
Leader: IRTSX. Participants: VICOM, CAP, CERTH, TNO, CEA, TEC, NEVS, GEST, SYR

Hybrid simulator & scenarios

- Driving simulation (made with SCANeR Studio) projected on a 180° hemispheric screen
- Large family car equipped with 4 seats
- 2 possible configurations: L4-HAV (front row face forward) ; autonomous shuttle (front row facing rearward)
- Driving scenarios **(T1.3)**

Software components

- Module to determine occupant's state **(T3.1)**
- Module to determine the evolution of occupants' actions **(T3.2)**
- Module to fuse cognitive data to provide holistic situation assessment **(T3.2)**
- Module to determine occupant's optimal state **(T3.3)**
- Module to synchronize and adapt HMI to the occupant state **(T3.4)**

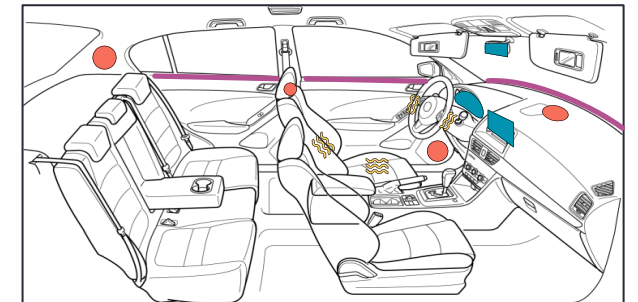


Hardware components

- Onboard monitoring system (OMS) based on unobtrusive sensors **(T3.1)**
- Onboard video cameras & microphone
- Other components to be added in the future

iHMI enablers

- Displays
- LEDs located in windows and windshield
 - Speakers in car & headrests
- Active haptic actuators in steering wheel, pedals and driver's seat



DEMO 4

eHMI Physical Prototype

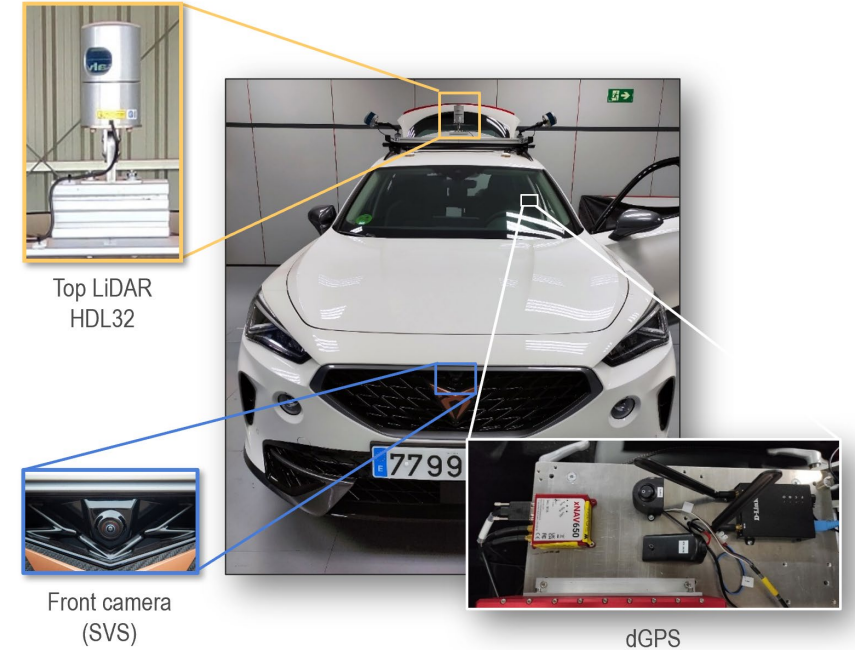
Leader: FICO Participants: VICOM, CAP, CEA, FEKA, CERTH

Software components

- Sensor fusion to provide 360° perception for out-of-vehicle environment **(T4.2)**
- Object detection to categorize HRU diversity **(T4.2)**
- Attention detection module to identify the attention level of HRU to the vehicle **(T4.2)**
- Intention prediction module to predict the intention of HRU to cross the street **(T4.3)**
- Multimodal communication system of vehicle and HRU through eHMI **(T4.1 and T4.3)**

Scenarios

- SEAT Cupra equipped with necessary hw/sw components
- eHMI Use Case scenarios **(T1.3)**



Hardware components

- Surround View System (SVS) using integrated sensors:
 - 4*camera (front, rear, left, right)
 - 3*LiDAR (top, left, right)
 - 1*dGPS
- OLED Taillight with projection capability
- V2X OBU for the vehicle telecommunication
- AVAS with directional sound emitting panels





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