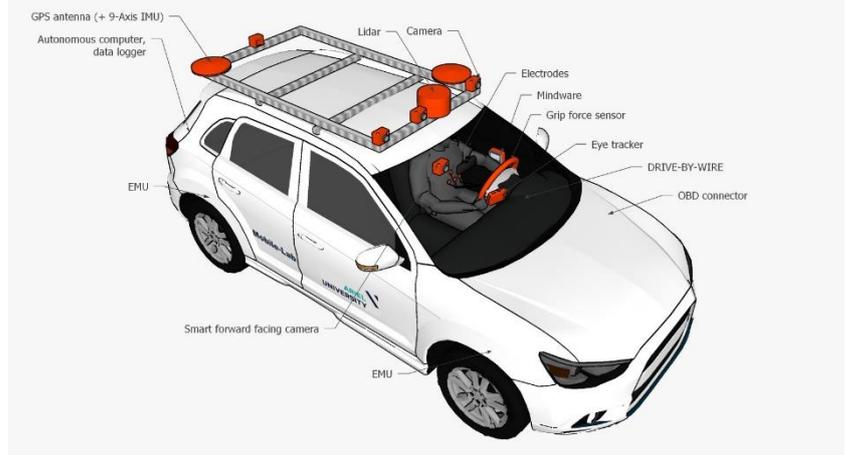


## A 'Mobile Laboratory' for the Development of Autonomous Capabilities

The National Institute for Transportation Innovation has awarded a grant to a research team from Ariel University for building and designing a Mobile Laboratory (Mobile-Lab) to promote research and development of autonomous driving vehicles.

**The Mobile-Lab:** The Mobile-Lab (see illustration in Figure 1) includes a vehicle, sensors for monitoring the road environment (e.g. Lidar and cameras), and sensors for monitoring indices of driver attention, fatigue, mental workload, stress and vigilance (eye activity measures, heart rate, respiration, skin conductance and grip force). A significant amount of data will be processed in real time by a 'control computer' that can be interfaced with a Drive-By-Wire unit to control the vehicle maneuvers. A data logger will enable retrospective analysis of the accumulated data.

**Vision:** The Mobile-Lab is shaped by the understanding that the human driver would continue to play a central role during the transition to full autonomy. Based on this understanding, a series of studies are planned to support the design of semi-autonomous vehicle-human driver interaction, to enhance autonomous control and autonomous decision making, and to explore the human aspects of trust and adoption of autonomous vehicles. The Mobile-Lab can serve as a platform for a wide range of research topics and use cases. These include developing a human-aided reinforcement learner for navigation at high speed, workload-aided automatic cruise control, bio-measures for trust in autonomy, eco-driving, fatigue management for drivers with sleep apnea and applications for the "third-age" passengers. We encourage industry agents, startups, and governmental agencies to use the Mobile-Lab for their R&D and testing initiatives.



**Research team:** The interdisciplinary research team (list presented below) includes experts in Robotics, Computer Science, and Human Factors scientists with experience in designing interfaces, feedback systems, and driver-intervention schemas. The design of the Mobile-Lab and the designated research projects expresses the team's accumulated knowledge and the high ability of its members to contribute to the development of advanced driver-assistance systems and autonomous capabilities.

**Sponsorship for equipment, research projects and outreach program:** The research team is looking for sponsorships to expand the battery of sensors, to support ongoing and planned research projects and to build an outreaching program that would encourage industry partners to use the Mobile-Lab for the development of advanced driving assistance systems and autonomous capabilities.

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