

Human-Centered AI Lab

Demos-Sessions

Human Telemetry System for multi-modal driver assessment

This showcase is about the measurement and analysis of physiological factors that affect the performance of motorsport drivers. These factors are related to perception, cognitive activity, and reaction. We collect physiological data from the driver using wearable sensors during driving in extreme simulated conditions such as formula cars qualifying sessions. Then, we synchronize human data with data from activity monitors like a professional driving simulator. Some of the technologies involved in this use case are wearable sensors, data science, and analytics about the cognitive state, muscle activity, and gaze behaviour of the driver.



Autonomous Racing

This use case demonstrates how Artificial Intelligence can drive a race car and achieve lap times similar to those of professional drivers. We developed a new autonomous driver model for racing cars based on reinforcement learning and vehicle telemetry. This model assists professional drivers in different driving aspects, like the best racing line achievement. In this demo, we will observe our model driving a formula car on a virtual racetrack while is trying to achieve the fastest lap time.



Intelligent immersive environments in Future Factories

This demo shows our research and development of intelligent immersive environments for teamwork operations coordination in collaborative teams of human and cyber-physical workforces. We use augmented reality devices and human factors technologies in the industrial intra-logistics environment of a highly flexible and automatized manufacturer shop floor. The technologies involved in this show-case include innovative augmented reality devices, mixed reality, IoT, digital twins, and visual analytics.



Haptics sensory substitution

This use case demonstrates how visually, and auditory impaired users can receive information from the environment through wearable devices and haptics feedback. Users can understand vibrotactile encoded symbols and complex messages combining such symbols. Through these messages, the user can receive information about his environment. Thanks to this possibility, visually and auditory impaired users can compensate for the lack of these senses through haptics feedback such as vibrations. In this demonstration, a haptics display and a mobile phone are combined to assist visually and auditory users in their daily activities.

