Use of AI in autonomous shuttle buses

Short description:

At HTWD, an autonomous EasyMile EZ10 shuttle is being used to develop new testing procedures. AI is being used in various areas, for example, in obstacle detection. It is important to ensure that the AI's results are comprehensible and reproducible. The lecture will first explain the necessary fundamentals for understanding. Building on this, concepts for AI validation will be developed and implemented during the on-site week. The autonomous shuttle can also be controlled remotely from Koper (Tele-Assistance).
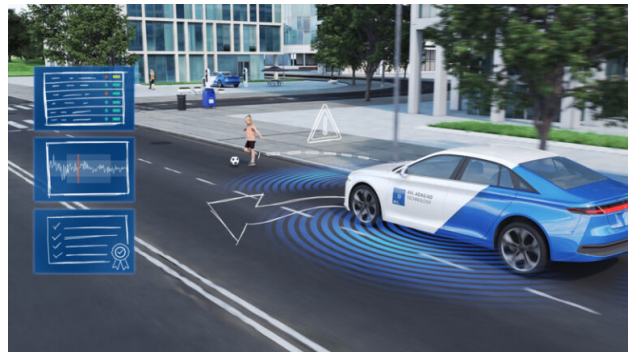
Goal:

Students learn about the overall system for operating autonomous vehicles and gain insight into the extensive process of type approval and ensuring daily operational release.
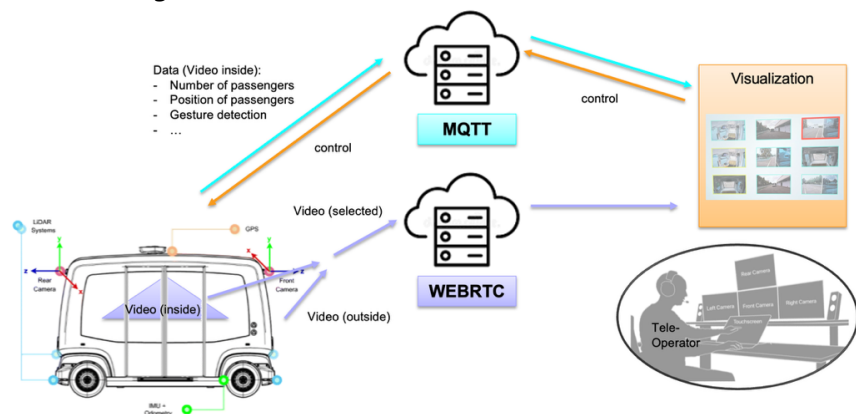
Theoretical part break-down:

PART 1 – Autonomous vehicle type approval process

For the type approval of autonomous vehicles, their functionality, particularly in critical situations, must be demonstrated. The reproducibility of the results is especially important. This presents enormous challenges, as many AI algorithms do not provide reproducibility for complex situations. Therefore, only AI algorithms whose results are "explainable" can be used. The introduction will thus discuss the possibilities and limitations of using AI for autonomous vehicles.

PART 2 – Data structure and data exchange in the control network

The overall information exchange system is presented, including remote control options (tele-operator, tele-assistant). Network latency and secure transmission paths are discussed based on the type approval.

PART 3 – Test procedures for daily operation

Daily use is only possible if extensive tests are carried out before each journey. The setup at HTW Dresden serves as an example of how such a clearance process can work. The existing shuttle is then remotely controlled from Koper, and the successful completion of the test maneuvers is verified using in-house developed algorithms.