Highly Automated Driving@IAV

Enjoy the ride

Enter your car, put your feet up and relax: That’s what driving a car could mean in the future. While passengers watch a movie or surf the Internet, the car drives to the destination by itself. The former idea of highly automated driving could be reality soon. Driver assistance systems are already in control of various situations these days. „Feet-off“ has become reality and „hands-off“ is available too. Highly automated driving is technically feasible already today.

Automated driving functions have the potential to support future social and political goals as well as addressing several aspects of challenges like Vision Zero, Zero Emission, demographic change, increasing traffic density and securing the economic position.

Different concepts exist on different levels: Assistance Systems for vehicles like lane assist or park assist vs. Autonomous vehicles, e.g. robotic vehicles. IAV experience is based on different development concepts as well as several projects and business models.

IAV has a long history in the area of driver assistance and highly automated driving. Apart from a multitude of projects for external clients several internal projects were done to build up IP and Know-how.

Semi-automated driving functions are those functions the driver has to monitor permanently and which he can control all the time.

Highly and full automated driving functions do not have to be monitored permanently. To provide access based on regulatory law to such functions an adaption or clarification of national and international law has to be done.

In the future autonomous driving could refer to vehicles that won’t need a driver on board at all.
Core competencies and IP of IAV

Bottom-up approach:
The functional tension going from ADAS to highly automated driving

Algorithm development & Function concepts
- Image Processing
- Tracking
- Trajectory planning
- Adaptive Cruise Control, Lane Keeping Assist, Passing Assist
- Combining several functions

Modelbased Development with IAV ECU
- Lateral and longitudinal control
- Tracking and trajectory calculation
- Fused control for braking, steering and throttle
- Multiprocessor ECU for Safety Applications
- HMI Interface control

Validation & Simulation
- Scene-based or measurement data based
- Test Infrastructure
- MiL, SiL, HiL
- Compare defined trajectory with trajectory of simulated car

Prototype Integration & Demonstration
- Functional Safety
- Vehicle Integration
- Road test