



Fraunhofer
IVI

»helyOS®« — Online Control Center

For agricultural applications

www.ivi.fraunhofer.de/en



We developed the helyOS[®] online control center software for the use in logistics centers and autonomous agricultural vehicles. The software serves as a mediator between the logistics domain and the commercial vehicle, that receives and follows the respective orders.«

Dr. Felix Keppler,
Group Manager »Vehicle Control and Sensor Systems«

Challenges and Goals

Countless experts are currently working on projects in the field of automated driving, which has gained much importance in recent years. Before the first fully automated production vehicles are able to drive on public roads, however, there are still many technical challenges to be met.

The automation of commercial vehicles in gated areas (automation zones) is an ideal migration path in this regard. There are numerous application fields, including ports, factory yards, logistics centers, (open-cast) mines as well as agriculture.

helyOS® (highly efficient online yard Operating System) is a digital control center that connects automated vehicles in automation zones. The software is based on up-to-date web technologies and has a browser-based user interface.

The system can be used locally as well as via the Internet. It is therefore possible to conveniently monitor and control remote vehicles, such as agricultural machinery, via a web browser.



Application Areas

Use case agriculture – Feldschwarm® (field swarm)

The swarm consisting of (semi-)autonomously operating mobile machines is coordinated and controlled by helyOS®.

Use case yard – AutoTruck

The helyOS® solution is also applied in the AutoTruck project: the objective is to develop a system that enables the fully automated operation of commercial vehicles in defined, spatially limited areas.

Application

Automated agriculture is a well-suited application field for helyOS®. By connecting communication sensors and (if necessary) stationary sensors, an automation zone is created for the respective area.

In the next step, farmers can have their machines carry out tasks listed in the farm management system. Using a web-based control system, they can assign, control and monitor tasks while detecting disturbances at the same time.

helyOS® is responsible for

- Coordinating the available machinery (tractors, etc.),
- The secure performance of the planned tasks, and
- Advanced cooperative path planning for multi-unit vehicles such as agricultural machinery and trucks.

In the networked automation zone, vehicles do not only communicate with each other, but also with external sensors. Using the TruckTrix® algorithm developed by Fraunhofer IVI, helyOS® calculates and synchronizes suitable routes. This helps avoid collisions and enables users to coordinate multiple automated vehicles simultaneously.

Features of the helyOS® system

- Execution layer for apps for automated vehicles / machinery
- Various services for apps, e. g., path planning and cooperative planning
- Open interface for third-party applications
- Open communication layer
- Centralized control node offering liberties and multiple application options
- Enormous capacity for computing and information processing
- Option of connecting with existing communication channels (e. g., from synchronized mobility)



Contact

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