RESEARCH.moves

helyOS® - Leitstandsoftware für automatisierte Fahrzeuge und Fahrzeugflotten

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www.ivi.fraunhofer.de
Yard Automation at Fraunhofer IVI

The bigger picture
Yard Automation Business Area at IVI

Core Topics

Business Area

Yard Automation

Technologies

Motion Planning

Control-Tower Software

Road-Side Systems

Products

...
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Control Tower
Software Framework
What is helyOS?

helyOS is a control tower software framework for automated mobile machines.

- Create your own control tower software
- Connect, monitor, control and simulate your mobile machine fleet → robot orchestration with no headache
- Made for engineers, researchers and geeks - use existing planning and control algorithms or add your own
helyOS Framework
Application fields (1)

Create your own control tower software to automate

- logistics centers
- factory yards
- farming
- maritime ports
- airports
- municipal services
helyOS Framework
Application fields (2)

Create your own test-bench

- to create reproducible tests
- test and benchmark your autonomous driving algorithms
helyOS Framework

How does it look like?

- Like most plans/blueprints:
  - architectural diagrams (multi-domain, different layers, functional & interface descriptions)
  - textual descriptions
  - data models
  - APIs / SDK
  - “Hello World!” demo implementations
- By nature, it is know-how / knowledge.
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Some insights in the architecture.
Control Tower Software helyOS
Plugin for helyOS – TruckTrix Path
Live Path Planning even for complex vehicles

Example shows abnormal load road survey app
(www.HeavyGoods.net)
Plugin for helyOS – TruckTrix Field

Key Features

- Automatic swath/seed row covering
- Cooperative planning for multiple robots
- Automatic subfield segmentation
- Optimizes machine utilization
- Compatible to helyOS control tower software
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Demo Implementations of the architecture.
helyOS control tower for distribution center

Application Example 1
helyOS control tower for agriculture applications
Application Example II
Motion Planning with TruckTrix®

Demonstration I

Automated Truck Operation on Yards
helyOS, TruckTrix and AutoTruck at Airport Frankfurt
What are the next Steps?

Exploitation of Technology
Roadmap helyOS

2016
- Idea of helyOS and Start of AutoTruck Project

2018
- Redesign based on Lessons Learned (Work Process Oriented)

2020
- 1st Demonstration in YA with Infrastructure (Proof of Technology)
- Start of SAFE20

2021
- Next Step:
  - Preparations for launching open-source development
  - Creating R&D community
  - Looking for supporting companies
Questions or feedback? – Get in touch!

AutoTruck is available for R&D Projects
- Safe drive-by-wire e-Truck
- Safe steer-by-wire system
- Safe environment perception
- Many research options…

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Fragen zum Vortrag:

Der Open Source Ansatz klingt spannend:
1. Warum favorisieren sie diesen Weg gegenüber z.B. einem klassischen Technologietransfer?
2. Wie sehen die nächsten Schritte bei helyOS konkret aus?