Student Projects in *Cloud Robotics*

1. Production Process *CloudSimulation*

For the development of an AI cloud-based control of AGVs a simulation of the production process in necessary.
- Evaluation of simulation software
  - Event-based, discrete
  - Performance
  - Expandability
- Documentation of a real-world production process from industry partners
- Modeling of process in simulation
- Integration in Cloud-Infrastructure
- Documentation of Results

Requirements:
- Experience with simulation tools
- Experience with production processes

2. Architecture *CloudSimulation*

For the development of an AI cloud-based control of AGVs a cloud system for simulation of these AGVs in necessary
- Design Architektur
- Building necessary software in Docker images
- Relaization of communication in Manufacturing Service Bus
- Evaluation
- Documentation of Results

Requirements:
- Strong programming skills in at least one object oriented language
- Basics in Java
- First experiences with Docker

3. Implementation *Representational Production Planning*

Fitting of a SLAM-map of a mobile to the topology data of a production system using machine learning.
- Concept for realization
- Evaluation of software library to use
- Implementation of functionality
- Testing
- Documentation of results

Requirements:
- Strong programming skills in at least one object oriented language
- Interest in machine learning and localization

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4. Charging System for Mobile Robot System

Mobile robot systems need to be able to charge autonomously.
- Evaluation of available charging technologies
- Analysis of used batteries
- Implementation of wireless charging
- Testing of solution
- Documentation of results

Requirements:
- Experience in electronics design
- Interest in robotics

5. Implementation *Big Data* Clustering

We have recorded a big set of navigation data of an AGV fleet into a NoSQL-database.
The task is to evaluate this data using clustering algorithms.
- Evaluation of available clustering algorithms
- Implementation of algorithms
- Evaluation of results
- Documentation of results

Requirements:
- Strong programming skills in at least one object oriented language
- Strong background in linear algebra and statistics
- Interest in data analytics and robotics

The mentioned topics are ideas possible projects. But also **your own ideas in this field are always very welcome**!
All topics can be used for **Internships, Research Projects or Master Theses**. In case you are interested, please send your CV and transcript of records to:
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