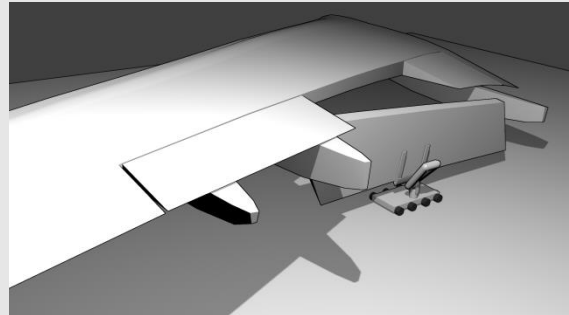# Hi-Digit Pro 4.0

Flexible high-lift wing assembly with a digital and efficient high-rate production in the industry 4.0

Graph-based navigation planning for multi-agent intralogistics

Application scenario in the context of high-lift wing assembly for increased production efficiency

Efficient processes in the face of high complexity

In order to increase efficiency and optimize utilization of available capacities in production facilities it is necessary to quickly adapt to changing requirements like client requests, material shortages and other deviations from the most recent plan. The non-trivial complexity of production processes and relevant state variables renders it currently infeasible to produce and evaluate different courses of action by hand.

To enable a better handling of this situation in the context of a highly dynamic production environment, a virtual, simulated production environment shall be developed. This serves the purpose to evaluate interdependent task schedules with respect to available resources, dependencies between tasks and other relevant factors.

Automatic intralogistics in a simulated production environment

In a simulated production environment robotic agents carry out intralogistics tasks. For this planning algorithms and autonomous navigation-schemes are developed, in order to establish a minimal-conflict transportation and to provide the required parts for the assembly workers at all times.

By continuously updating the state variables that define the starting point of the simulation the system will be able to provide viable response behaviors to anomalies in production immediately. In order to achieve this, an integration with the digital twin representation of the actual production environment is possible. The other project partners are working on these related tasks simultaneously.

Innovative approach with transferability in mind

The specific tasks that make up the production process are modeled according to the real environment in order to increase the relevance and improve the transferability to the industrial setting. In order to facilitate a long-term usefulness and a broader applicability of the system, a focus is put on extendability and transferability.

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