MASTER'S THESIS

LIGHTROCKS ON THE SHOP FLOOR

The Chair for Software Engineering at RWTH Aachen University offers the following master's thesis in cooperation with EXAPT.

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Task

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TASK

Industry 4.0 is the next phase in the digitization of manufacturing that arises from interconnected cyber-physical production systems. It aims at optimizing the complete value-added chain through individualized mass production, zero unscheduled downtime, and increased resource efficiency. The integration of mobile robots into computer-aided manufacturing (CAM) can greatly improve the efficiency of production processes. To achieve this, it is necessary to flexibly program the integrated mobile robots at production time.

LightRocks[1] is a modeling language for describing robotic assembly platform-independently. Assembly plans are composed from robot skills that are networks of primitive actions. The plans are transformed to Java programs and executed on the robot to perform assembly.

This thesis is performed in cooperation with EXAPT and should investigate the integration of the LightRocks modeling language into CAM planning and execution for flexible run-time programming of machine tools. This includes investigating the requirements for machine tool operation on robot skills, integrating LightRocks skills into CAM planning, developing a code generator from LightRocks to the target platform's general-purpose programming language, deploying the generated programs to the mobile robot, and demonstrating the results on a real robot.

[1] http://monticore.de/robotics/lightrocks/

NECESSARY BACKGROUND KNOWLEDGE

- English
- Software Construction
- Generative Software Engineering

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