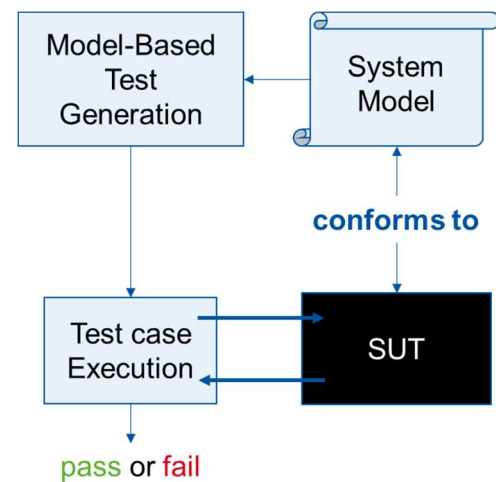


Masterthesis

Application of Model-Based Testing to a Cyber-Physical Production System

Motivation

To meet the demands of today's markets, the manufacturing processes need to be flexible. Reconfigurability of Cyber-Physical Production Systems (CPPS) plays a crucial role for guaranteeing high productivity and cost-effective manufacturing, however, changes can cause unforeseeable problems.



INDUSTRIAL CONTROL BY EDGE COMPUTING FOR AUTOMATION TECHNOLOGY

The Industrial Control by Edge Computing for Automation Technology (ICECAT) combines cloud and edge technologies for enabling a self-adaptive and self-optimizing manufacturing process. In order to guarantee safety due to adaptations to the process based on production data, Model-Based Testing (MBT) shall be applied to the ICECAT. For this purpose, an open-source implementation of a machine-to-machine (M2M) communication protocol has to be extended by additional test routines with the aim to make MBT applicable during the operating phase of the ICECAT. At the end of this work, the concept will be evaluated using the ICECAT.

Tasks

This thesis aims at making Model-Based Testing (MBT) applicable to an existing use-case from a mechanical engineering institute within the Cluster of Excellence "Internet of Production". The tasks comprise:

- ▶ Literature research regarding MBT (Starting points will be given)
- ▶ Functional requirement analysis and modelling of a subsystem of a CPPS
- ▶ Model-based test generation
- ▶ Extension of a machine-to-machine (M2M) communication protocol (MQTT)
- ▶ Test execution and evaluation (traceability) using the real system
- ▶ If time permits: Change-Impact Analysis for Reconfigurations

General Information

- ▶ German/English
- ▶ Experience with C/C++

Contact Information

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