

Master 2017

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Evaluation of PC based Realtime Simulation of Dynamic Systems for HIL Applications using RTAI Linux.

ABSTRACT - Masterthesis

Based on an existing test stand, two PCs running RTAI-Linux and connected by an EtherCAT field-bus, a real-time simulation environment has been implemented. The thesis task mainly involves automatic C-Code generation of models (Controller and Plant) with Matlab/Simulink with selection of a fixed-step solver and implementation of the controller and plant communication. The master PC acts as a real-time controller and the slave PC acts as a real-time plant. Together both PCs form a closed loop control. It has been evaluated, which task frequency and complexity of the models is possible to keep up the real-time performance and use the test stand as a HIL-system. Additionally, the possibility to feed in disturbances and visualize the behaviour of the plant a simple serial communication (send/receive) has been integrated.