

Implementation of a Simulator for a Renesas Microcontroller

Motivation

| We have been and still are developing a model-checker for microcontroller code called [mc]square at our chair. [mc]square is a CTL model-checker requiring an assembler or C program as input. The state space of the model checker is created when executing a program via a simulator of the respective microcontroller (simply stated). [mc]square currently has simulators for

- Atmel ATmega16
- Atmel ATmega128
- Intel 8051
- Infineon XC167



Some of these simulators are the result of diploma theses. In the scope of an industry project, [mc]square is supposed to be used for the verification of a system based on a Renesas microcontroller. Your task is the implementation of the respective simulator.

Task

Implementation of a simulator for a Renesas microcontroller. The definite type of the microcontroller will be determined at the beginning of the familiarization period at the latest. The minimum requirement for the final simulator is the ability to process the instruction set of the microcontroller. Further on-chip periphery is desirable but no mandatory goal.

Goal

Implementation of the simulator, application of the model-checker within the industry project.

Fields of Study

- Computer science

Required Knowledge

- Java
- Basic knowledge in microcontroller programming

Student

- [rasool](#)

Tutor

- [Dr. rer. nat. Dominique Marcel Gückel](#)

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