

Development and Validation of Variables for Progress-Determination of a Controlled Experiment's Software

Motivation

The task of this diploma thesis is the implementation and analysis of a programming task which shall be applicable during an experiment. The main assignment is to define variables that describe the developed software in respect to progress, performance, error rate and architecture improvement. On top of this, a test-environment shall be arranged which evaluates the software concerning identified variables automatically (preferably) and at any desired time.

As for the experimental task, we have in mind the development of a just-in-time compiler on a microcontroller. The system is thought to be software-intensive and easy to test which simplifies the evaluation of the developed product of the experiment task due to independability concerning byte code commands.

The basic idea is to convert byte code of a to-be-specified virtual machine into machine code from a stream during run time. Preliminary work concerning writing the opcode and the following access of the written codes are already finished. There is also a CAN infrastructure already that can be used. The opcode which is supposed to be translated can and must be chosen appropriately. In other terms a realistic mix of simple commands and complex translations must take place.

An important aspect is the development of an external, automated test environment. The environment is supposed to offer different byte codes (and their combinations) to the embedded systems and inspect their correct execution.

The data shall be stored as a table in CVS format.

Goal

The goal of this thesis is the definition of automated and checkable variables that allow progress, performance and error detection of a previously and specifically defined software project.

You must implement a test environment as well as a test program.

Student

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Literature

- Kontrollierte Experimente in der Softwaretechnik [Pre03]
- Experimentation in Software Engineering [Woh02]
- Atmel Instruction Set

Tutor

- Dr.rer.nat. Dirk Wilking

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