

BACHELOR PROJECT ASSIGNMENT

Student: Martin Hořeňovský

Study programme: Open Informatics

Specialisation: Computer and Information Science

Title of Bachelor Project: The Use of Symbolic Execution for Testing of Real-Time Safety-Related Software

Guidelines:

1. Familiarise yourself with "symbolic execution" and the LLVM framework-based tool KLEE.
2. Explore possibilities of using KLEE for verification of safety-critical, real-time applications and analyse what guarantees using KLEE gives us.
3. Using KLEE, first analyse a simple library for motor control and then a complex software module provided by Infineon company for controlling electrical motors in cars.
4. Analyse the results and propose generalised methodology for verification of safety-critical, real-time applications.
5. Document the results thoroughly.

Bibliography/Sources:

- [1] Cristian Cadar, Daniel Dunbar, Dawson Engler: KLEE: Unassisted and Automatic Generation of High-Coverage Tests for Complex Systems Programs - USENIX Symposium on Operating Systems Design and Implementation (OSDI 2008).
- [2] Matthew J. Renzelmann, Asim Kadav, and Michael M. Swift SymDrive: Testing Drivers without Devices. – USENIX Symposium on Operating Systems Design and Implementation (OSDI 2012).

Bachelor Project Supervisor: Ing. Michal Sojka, Ph.D.

Valid until: the end of the summer semester of academic year 2014/2015

L.S.

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Prague, January 10, 2014