

Program Repair using a Model Checker

Motivation

Debugging is time consuming and frustrating. More automation is desperately needed. A lot of research has been done to automate error detection, but error localization and especially error correction are mostly done manually. In this project we want to use a model checker (a tool which is able to check a program for correctness) to fix incorrect programs automatically.

Project description

- Goals
 - Implementation in a prototype tool
 - Performance evaluation
- Tasks
 - Understand Theory
 - model checking
 - program sketching and repair
 - Experiment
 - with existing model checkers
 - Implement
 - a simple command-line tool
 - Evaluate

Literature

- A. Griesmayer, S. Staber, R. Bloem: **Automated Fault Localization for C Programs**. Electr. Notes Theor. Comput. Sci. 174(4): 95-111 (2007).
- A. Solar-Lezama, L. Tancau, R. Bodík, S. A. Seshia, V. A. Saraswat: **Combinatorial sketching for finite programs**. ASPLOS 2006: 404-415.

Deliverables

- Code
- Documentation
- Presentation (10 .ppt slides)

Project schedule

- Start Immediately
- Month 1 Understand theory, experiment
- Month 2 Develop algorithm, implement
- Month 3 Implement, evaluate, improve

Master Project

Studies: INF SEW TEL Tech. Math.

Prerequisites

- Interest in formal methods
- Basic programming skills

Advisor / contact

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