

Advisor Anders Møller
Students Søren Baadsgaard
Languages English / Danish
Text tools L^AT_EX
Other tools Scala (Programming language)

Project Description (at least 10-20 lines)

Testing programs thoroughly requires good selections of input values, to make sure that all corner cases of the programs are reached. Symbolic execution is a classic technique for automatically obtaining such input values. Instead of running programs using concrete values, it uses symbolic expressions together with automated theorem proving tools. Within the last decade, a variant called directed automated random testing, which combines concrete and symbolic execution, has become widely used. The aim of this project is to explore symbolic execution techniques. The work will consist of reading and summarizing research papers, and in implementing a small prototype tool that performs symbolic execution for a simple programming language.

Provisional Table of Contents

- Abstract (10-20 lines)
- Section 1: Introduction (1-2 pages)
- Section 2: Review of literature (4-8 pages)
- Section 3: Description of Task A (4-8 pages)
- Section 4: Description of Task B (4-8 pages)
- Section 5: Description of Task C (4-8 pages)
- Section 6: Comparison to other work and ideas for future work (2-4 pages)
- Section 7: Conclusion (1-2 pages)
- Acknowledgements (3-5 lines)
- References ($\frac{1}{2}$ -1 page)
- Appendix with programming code, tables, full proofs, etc. (5-20 pages)

Provisional Time Plan

First week of February (15 hours)

Planning of activities, including the production of the Bachelor's contract.

Rest of February and first half of March (3×15 hours)

Read literature (one or more scientific papers) and make draft of Section 2 in Bachelor's report.

Rest of March and first week of April ($2 \times 15 + 2 \times 30$ hours)

Completion of task A and make draft of Section 3 in Bachelor's report.

Rest of April (3×30 hours)

Completion of task B and make draft of Section 4 in Bachelor's report.

First three weeks of May (3×30 hours)

Completion of task C and make draft of Section 2 in Bachelor's report.

Last week of April of first half of June (3×30 hours)

Write the missing parts, put drafts together, make things consistent, proof reading.