

QuickChecking C kod i Haskell

Sebastian Lagerman
seblag@student.chalmers.se

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Description:

Build a tool that one can use to QuickCheck C code against a Haskell specification. Use this to test open-source libraries in C, for example for datastructures, image manipulation, compression, encryption, etc.

Backgrounds:

Intro. FP, Datastructures, C, AFP

1 Introduction

Briefly describe and motivate the project, and convince the reader of the importance of the proposed thesis work. A good introduction will answer these questions: Why is addressing these challenges significant for gaining new knowledge in the studied domain? How and where can this new knowledge be applied?

Build a tool that one can use to QuickCheck C code against a Haskell specification. Use this to test open-source libraries in C, for example for datastructures, image manipulation, compression, encryption, etc. This tool will be a good way to streamline the testing to ensure software quality.

2 Context

Use one of two high quality references for providing evidence from the literature that the proposed study indeed includes scientific and engineering challenges, or is related to existing ones. Convince the reader that the problem addressed in this thesis has not been solved prior to this project.

3 Goals and Challenges

Describe your contribution with respect to concepts, theory and technical goals. Ensure that the scientific and engineering challenges stand out so that the reader can easily recognize that you are planning to solve an advanced problem.

4 Approach

Various scientific approaches are appropriate for different challenges and project goals. Outline and justify the ones that you have selected. For example, when your project considers systematic data collection, you need to explain how you will analyze the data, in order to address your challenges and project goals.

One scientific approach is to use formal models and rigorous mathematical argumentation to address aspects like correctness and efficiency. If this is relevant, describe the related algorithmic subjects, and how you plan to address the studied problem. For example, if your plan is to study the problem from a computability aspect, address the relevant issues, such as algorithm and data structure design, complexity analysis, etc. If you plan to develop and evaluate the prototype, briefly describe your plans to design, implement, and evaluate your prototype by reviewing at most two relevant issues, such as key functionalities and their evaluation criteria.

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- The design and implementation should specify prototype properties, such as functionalities and performance goals, e.g., scalability, memory, energy. Motivate key design, with respect to state of the art and existing platforms, libraries, etc.
- When discussing evaluation criteria, describe the testing environment, e.g., test-bed experiments, simulation, and user studies, which you plan to use when assessing your prototype. Specify key tools, and preliminary test-case scenarios. Explain how and why you plan to use the evaluation criteria in order to demonstrate the functionalities and design goals. Explain how you plan to compare your prototype to the state of the art using the proposed test-case evaluation scenarios and benchmarks.

5 References

Reference all sources that are cited in your proposal using, e.g. the APA, Harvard², or IEEE³ style