Bachelor/Master Thesis Topic
Localization of Performance Bugs

Motivation and Background
Performance is one of the most requested non-functional requirements of applications, and also one of the harder to achieve. Reasons for drops in performance can range from sloppy programming to bad usage of APIs and bugs in underlying code or third-party libraries. Most often, performance shortcomings arise as the result of combinations of these factors, making them hard to reproduce and fix. Several approaches exist [1,2,3,4]. Some are based on access to the code for instrumentation [2]; others require significant training to learn a baseline performance [1]; and others look only for known bug pattern instantiations [4].

Goals
This project will evaluate a location-based approach for localisation of performance issues based on runtime analysis of carefully selected tests, and attempt to improve its performance and accuracy, as well as applying it to a performance benchmark.

Description of the Task
The specific tasks are:
- Understand current approaches for performance problem identification and debugging.
- Create a tool for performance issue detection (C or Java) based on these approaches.
- Perform experimental evaluation and comparison of accuracy of selected approaches or their modified versions on example applications.

Research Type
Theoretical Aspects: 
Industrial Relevance: 
Implementation 

Prerequisite
The student should be enrolled in the bachelor/master of software engineering/informatics program, and has completed the required course modules to start a bachelor/master thesis.

Skills required
Programming skills in Java or C++, understanding of, or willingness to learn, the software engineering quantitative methods and of profiling and monitoring tools needed for the project.

References

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Application
Please contact me during my office hours or send me an email with the title: “[ThesisProject]-DLML” to se-career@informatik.hu-berlin.de