Master Thesis Topic

Adaptive Genetic Algorithms in Search-Based Software Engineering

Motivation and Background
Search based software engineering, especially the use of genetic algorithms is currently an important solution to many software engineering problems, e.g. architecture optimization [1]. However despite their general applicability, genetic algorithms have to be parameterized in order to produce results with high quality. Different parameter values may be optimal for different problems [2]. Therefore an interesting solution is to apply self-tuning adaptive optimization strategies [3] for software engineering problems.

Goals
The goal of this project is to evaluate (based on simulations and realistic examples) adaptive self-tuning genetic algorithms in the context of one or more specific software engineering problem(s).

Description of the Task
The project aims to apply adaptive GAs for a specific software engineering problem. The specific tasks are:
- Understand the current approaches in SBSE and adaptive genetic algorithms
- Select one or more specific software engineering problem(s)
- Perform an experimental evaluation of adaptive self-tuning genetic algorithms for this problem

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 and statistical foundations 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]-SBSE4AGA” to se-career@informatik.hu-berlin.de