Bachelor Thesis Topic

Survey on Runtime Verification Approaches

Motivation and Background

Runtime Verification (RV) describes a prominent technique that can be used to verify if a running program satisfies its requirements.
Multiple approaches exist that implement RV into tools to be used in various applications, e.g., for Scala-, Java- or C-programs.

Goals

The goal of this project is to generate a survey on existing approaches (both theoretical ideas and practical solutions) of RV.

Description of the Task

The student is supposed to read literature on RV and find out which other surveys exist on the topic. On that basis, existing surveys should be extended to incorporate novel approaches published after the surveys were concluded.
The student should try to apply existing approaches, analyze them theoretically and may even provide ideas on how to improve these approaches with concepts introduced in other studies.

Research Type

Theoretical Aspects:	****∗
Industrial Relevance:	***∗∗
Implementation	*∗∗∗∗

Prerequisite

The student should be enrolled in the bachelor of computer science program, and has completed the required course modules to start a bachelor thesis.

Skills required

Understanding of, or willingness to learn, the basic concepts of model checking, including temporal logics. Good skills of the English language, especially to review existing literature.

References

Bartocci, Ezio, et al. "MoonLight: a lightweight tool for monitoring spatio-temporal properties." *International Conference on Runtime Verification*. Springer, Cham, 2020.

Goldsby, Heather J., Betty HC Cheng, and Ji Zhang. "Amoeba-rt: Run-time verification of adaptive software." *International Conference on Model Driven Engineering Languages and Systems*. Springer, Berlin, Heidelberg, 2007.

Contacts

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Application

Please contact me during my office hours or write an email with the title: “[MC]Runtime Verification Survey” to se-career@informatik.hu-berlin.de