Software Engineering Seminar

Automated Repair with Specifications

– Data Structures –

Description

Recognizing an error in a software system may for example either be achieved by utilizing a test suite with the "right" set of test cases, or by attaching some kind of *formal specifications* to the system that is able to describe the control or data flow within the system. In the latter case, errors can be detected by ensuring that the specifications are not violated. Specifications can either be derived from the software system under consideration, or they can be specified by the user as a description (a model) of how the system *should* work.

This topic examines the automated repair of errors in *data structures* that are enriched with formal (consistency) specifications. The goal is to identify and analyze ways to *detect*, *locate* and to *repair* inconsistent or corrupt states of data structures.

References

[1] Brian Demsky, Md Ernst, and Pj Guo. Inference and enforcement of data structure consistency specifications. *Proceedings of the 2006 international symposium on Software testing and analysis*, (1):233–244, 2006.

[2] Brian Demsky and Martin Rinard. Automatic detection and repair of errors in data structures. *ACM SIGPLAN Notices*, 38(11):78, 2003.

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