State-Based Fault Localization

Description

Automated fault localization techniques assist developers with the task of pointing out program elements that are most probable to be responsible for a detected error. Over the years, many different techniques have been developed [7].

State-based fault localization techniques comprise several different strategies to locate software bugs by monitoring and manipulating the state of a program at various points in its executions, and to then draw conclusions about the cause of the error from the executions’ results. Notable techniques in this category include, e.g., the delta debugging approach [8] and its extension – the cause transition technique [1, 2]. There also exist techniques that alter the outcome of decisions during program execution [9, 6, 5, 4]. A very recent approach uses a decision tree learner to learn input features that are responsible for a specific program behavior [3].

The goal of this topic is to examine and discuss the current state of the art of state-based fault localization techniques, to evaluate their relevancy and to analyze/estimate their capabilities compared to other fault localization techniques.

References


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