Search-Based Software Engineering for Maintenance and Reengineering

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Abstract

This talk will explain how software maintenance and re-engineering activities can be viewed as a search for solutions that balance many competing constraints to achieve an optimal or near optimal result. This interpretation of the problems we face leads to the inevitable conclusion that the search process, as currently followed, is a woefully labour-intensive human activity; it may not scale to meet the demands of the new and emerging software evolution scenarios.

The aim of Search Based Software Engineering (SBSE) research is to move software engineering problems from human-based search to machine-based search, using a variety of techniques from the meta-heuristic search and evolutionary computation paradigms. As a result, human effort moves up the abstraction chain to focus on guiding the automated search, rather than performing it.

The talk will describe the search based approach, giving examples of past and possible future success in software maintenance and re-engineering automation. The talk will explain some of the benefits that accrue from this approach, paying particular attention to its attractive scalability and robustness characteristics and the way in which the search process yields insight and provides feedback on the solutions that it identifies.