

Challenges and Proposed Solutions of CoverageBased Testing Tools

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Abstract

Automated test generation for object-oriented software typically consists of producing sequences of calls aiming at high code coverage. Test coverage is sometimes used as a way to measure how thoroughly software is tested. Coverage is used by software developers and sometimes by vendors to indicate their confidence in the readiness of their software. This survey studies and compares 7 coverage-based testing tools focusing on, but not restricted to coverage measurement. We also survey additional features, including program prioritization for testing, assistance in debugging, automatic generation of test cases, and customization of test reports. Such features make tools more useful and practical, especially for large-scale, real-life commercial software applications. This paper discusses the technical challenges that are testing tools need to address when handling Java classes coming from real-world open source projects, and when producing JUnit test suites intended for real users.

Keywords: Unit testing, Automated test generation, Search-based testing, Testing classes

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