Automated Test-Case Generation by Cloning

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- Authors present an approach that generates useful test clones automatically, thereby eliminating some of the “grunt” work of testing
- The concept of analogous functionality is central for test case cloning. We say that pairs of software components exhibit analogous functionality
- Testing by cloning means identifying analogous software components and adapting the test cases of one of the analogs (called the model) to be used on the other (the component under test or CuT).
- Searched through seven open-source projects
- Found that on average, 8% of tests could be autogenerated
- TestCloner transcribes tests involving analogous functions from one class to the other.
- technique does not require algebraic specifications as in metamorphic testing
- Automated testing by cloning does detect defects.
- This approach does not eliminate testing effort entirely, reusing test cases saves work

Positives:

- Significant reduction in the number of “boilerplate” tests that need to be written by hand
- The transcribed tests do detect defects and can provide hints about missing functionality.

Negatives:

- Estimating the test coverage of cloned tests in a CuT is impossible
- Works with just JAVA programming language. Can not be used with any other programming language.
- Programmers have to provide analogs.
- Programmers must adapt constants
- Parameters may need to be reordered
- Identifiers must be replaced consistently
- Realistic Evaluation on large benchmarks is required