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Formal Approaches to Software Testing

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Preface

Formal methods provide system designers with the possibility to analyze system models and reason about them with mathematical precision and rigor. The use of formal methods is not restricted to the early development phases of a system, though. The different testing phases can also benefit from them to ease the production and application of effective and efficient tests. Many still regard formal methods and testing as an odd combination. Formal methods traditionally aim at verifying and proving correctness (a typical academic activity), while testing shows only the presence of errors (this is what practitioners do). Nonetheless, there is an increasing interest in the use of formal methods in software testing. It is expected that formal approaches are about to make a major impact on emerging testing technologies and practices. Testing proves to be a good starting point for introducing formal methods in the software development process.

This volume contains the papers presented at the 3rd Workshop on Formal Approaches to Testing of Software, FATES 2003, that was in affiliation with the IEEE/ACM Conference on Automated Software Engineering (ASE 2003). This year, FATES received 43 submissions. Each submission was reviewed by at least three independent reviewers from the program committee with the help of additional reviewers. Based on their evaluations, 18 papers submitted by authors from 13 different countries were selected for presentation at the workshop. The papers present different approaches to using formal methods in software testing. One of the main themes is the generation of an efficient and effective set of test cases from a formal description. Different models and formalisms are used, such as finite state machines, input/output transition systems, timed automata, UML, and Abstract State Machines. An increasing number of test methodologies (re)uses techniques from model checking. The prospects for using formal methods to improve software quality and reduce the cost of software testing are encouraging. But more efforts are needed, both in developing new theories and making existing methods applicable to the current practice of software development projects. Without doubt, coming FATES workshops will continue to contribute to the growing and evolving research activities in this field.

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Montréal and München
October 2003

Alexandre Petrenko, Andreas Ulrich
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