

Preface

Testing is an important part of the software development life cycle. Many testing techniques have been proposed and used, to increase the quality and reliability of software and systems. Among them, combinatorial testing is a kind of black-box testing method that is gaining increasing popularity. It is particularly useful to reveal faults that are caused by the interaction of a few components/parameters of the system.

For many kinds of testing techniques, a challenging problem is to generate a small set of test cases which achieves certain coverage criterion. This is also true for combinatorial testing. Over the past 30 years or so, many different kinds of algorithms have been proposed. Some of them were designed specifically to solve the problem, while others are based on ideas from evolutionary computation and constraint processing communities.

This book intends to review the state of the art of automatic data generation methods for combinatorial testing. The first chapter introduces the basic concepts and notations that will be used later. It also gives a brief overview of the applications of combinatorial testing. The next five chapters describe various kinds of methods for generating input data for combinatorial testing. Each of these chapters can be read almost independently. Chapter 7 gives a list of tools that can be readily used. In the last chapter, we briefly discuss several other problems that are closely related to test data generation.

The book can be read by graduate students and researchers who work in the area of combinatorial testing (or testing in general). It should also be interesting to those who work in discrete mathematics, constraint solving, evolutionary computation, and other related fields. Practitioners may find the book useful when selecting a suitable technique and tool.

Due to the limit on the size of the book, we could not explain every algorithm in detail. We may also miss some important works in this field. You are welcome to contact us if you have any comments and suggestions.

Our research on software testing is partially supported by the 973 Program of China (grant No. 2014CB340701) and the National Science Foundation of China (NSFC grant No. 61100064). We are indebted to Charles Colbourn, Jacek

Czerkwonka, Lijun Ji, Changhai Nie, Zhilei Ren, Ziyuan Wang, Huayao Wu, Hantao Zhang, and Lie Zhu who read earlier drafts of this book and made many good suggestions. We would like to thank Jun Yan for his assistance during the preparation of this book. Thanks to Jeff Lei and Linbin Yu for answering our questions on the IPO algorithms. The editors at Springer, Celine Chang and Jane Li, are always helpful. We are grateful to them for their constructive suggestions and patience. In addition, the first author would like to thank Alfred Hofmann for his encouragement. Finally, we are very grateful to our families for their support.

Beijing, June 2014

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Automatic Generation of Combinatorial Test Data

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2014, XI, 90 p. 31 illus., Softcover

ISBN: 978-3-662-43428-4