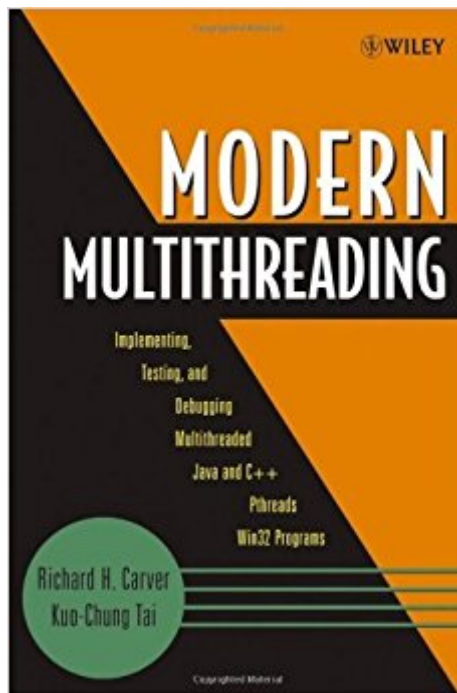


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# Modern Multithreading: Implementing, Testing, And Debugging Multithreaded Java And C++/Pthreads/Win32 Programs



## Synopsis

Master the essentials of concurrent programming, including testing and debugging. This textbook examines languages and libraries for multithreaded programming. Readers learn how to create threads in Java and C++, and develop essential concurrent programming and problem-solving skills. Moreover, the textbook sets itself apart from other comparable works by helping readers to become proficient in key testing and debugging techniques. Among the topics covered, readers are introduced to the relevant aspects of Java, the POSIX Pthreads library, and the Windows Win32 Applications Programming Interface. The authors have developed and fine-tuned this book through the concurrent programming courses they have taught for the past twenty years. The material, which emphasizes practical tools and techniques to solve concurrent programming problems, includes original results from the authors' research. Chapters include: \* Introduction to concurrent programming \* The critical section problem \* Semaphores and locks \* Monitors \* Message-passing \* Message-passing in distributed programs \* Testing and debugging concurrent programs. As an aid to both students and instructors, class libraries have been implemented to provide working examples of all the material that is covered. These libraries and the testing techniques they support can be used to assess student-written programs. Each chapter includes exercises that build skills in program writing and help ensure that readers have mastered the chapter's key concepts. The source code for all the listings in the text and for the synchronization libraries is also provided, as well as startup files and test cases for the exercises. This textbook is designed for upper-level undergraduates and graduate students in computer science. With its abundance of practical material and inclusion of working code, coupled with an emphasis on testing and debugging, it is also a highly useful reference for practicing programmers.

## Book Information

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## Customer Reviews

This book is simply excellent. I have already completed my bachelors degree in Computer Science, which means I only had a basic understanding of threading from my Distributed Computing class. So, I knew a whole bunch of thread jargon and slightly understood how threads are created and what the critical section problem is, as well as a basic understanding of how semaphores can solve the problem. Beyond that, the book has taught me what goes on behind the scenes of thread creation and why critical sections can be so complicated. The average Computer Science student is not interested in how it works behind the scenes, only how to make it work for their current needs. This book, while useful to a more adept coder, will not quickly and easily fulfill that requirement. It is definitely geared toward those that are really serious about multithreading and intend to test/use their threading knowledge over and over again. If that is you and you don't really understand threading too well, this book can take you from novice to expert in only a few months. I'd definitely recommend it to my co-workers!

As a Java engineer, I cannot really recommend this book. While the authors are definitely knowledgeable about their subject, they do not do a good job in communicating their knowledge to a reader. The book reads like a doctoral thesis, poorly organized, not well laid out. Brian Goetz book on Concurrency is a much better book.

I got this book hoping for helpful ideas on how to debug multithreaded programs. This book has them, but the writing isn't that clear or readable. It reads like a grad. level paper more than a standard technical book that most of us are used to. The book lightly covers standard multithreading concepts and objects, but you're better off learning those someplace else because I'm sure it's explained in more "laymen" terms elsewhere. The one thing this book does do well is offer a way for

you to write mutexes, semaphores, monitors, etc. in a way that would allow you to replay a given run of a multithreaded program (assuming you also can reproduce the input to said program somehow). If you know how to debug a single threaded application, this ability makes it easier to debug a multithreaded program. (As things become deterministic.) However, if you already have a program that you're trying to debug, you end up out of luck, unless you want to port your program to use these new libraries. Also note that all the examples in this book are for C++ or Java. C doesn't have the object-oriented abilities that would be needed to easily use the examples.

Even though title suggests it is 'modern multithreading', this book reiterates typical multithreading issues. However subjects addressed are not presented well enough and code snippets are not explained properly.

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