



Systematic Program Design: From Clarity to Efficiency

By Professor Yanhong Annie Liu

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A systematic program design method can help developers ensure the correctness and performance of programs while minimizing the development cost. This book describes a method that starts with a clear specification of a computation and derives an efficient implementation by step-wise program analysis and transformations. The method applies to problems specified in imperative, database, functional, logic, and object-oriented programming languages with different data, control, and module abstractions. Designed for courses or self-study, this book includes numerous exercises and examples that require minimal computer science background, making it accessible to novices. Experienced practitioners and researchers will appreciate the detailed examples in a wide range of application areas including hardware design, image processing, access control, query optimization, and program analysis. The last section of the book points out directions for future studies.

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- Sales Rank: #1821979 in Books
- Published on: 2013-05-20
- Released on: 2013-05-20
- Original language: English
- Number of items: 1
- Dimensions: 9.21" h x .63" w x 6.14" l, .90 pounds
- Binding: Paperback
- 253 pages

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About the Author

Yanhong Annie Liu is a Professor of Computer Science at Stony Brook University. She received her BS from Peking University, MEng from Tsinghua University, and PhD from Cornell University. Her primary research has focused on general and systematic methods for program development, algorithm design, and problem solving. She has published in many top journals and conferences, served more than fifty conference chair or committee roles, and been awarded more than twenty research grants in her areas of expertise. She has taught more than twenty different courses in a wide range of Computer Science areas and presented close to a hundred research talks and invited talks at international conferences, universities, and research institutes. She received a State University of New York Chancellor's Award for Excellence in Scholarship and Creative Activities in 2010.

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