



# Iterative Computer Algorithms with Applications in Engineering: Solving Combinatorial Optimization Problems

By Sadiq M. Sait, Habib Youssef

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## Iterative Computer Algorithms with Applications in Engineering: Solving Combinatorial Optimization Problems By Sadiq M. Sait, Habib Youssef

Iterative Computer Algorithms with Applications in Engineering describes in-depth the five main iterative algorithms for solving hard combinatorial optimization problems: Simulated Annealing, Genetic Algorithms, Tabu Search, Simulated Evolution, and Stochastic Evolution. The authors present various iterative techniques and illustrate how they can be applied to solve several NP-hard problems.

For each algorithm, the authors present the procedures of the algorithm, parameter selection criteria, convergence property analysis, and parallelization. There are also several real-world examples that illustrate various aspects of the algorithms. The book includes an introduction to fuzzy logic and its application in the formulation of multi-objective optimization problems, a discussion on hybrid techniques that combine features of heuristics, a survey of recent research work, and examples that illustrate required mathematical concepts.

The unique features of this book are: An integrated and up-to-date description of iterative non-deterministic algorithms; Detailed descriptions of Simulated Evolution and Stochastic Evolution; A level of treatment suitable for first year graduate student and practicing engineers; Parallelization aspects and particular parallel implementations; A brief survey of recent research work; Graded exercises and an annotated bibliography in each chapter

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From the Back Cover

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About the Author

Sadiq M. Sait obtained a Bachelor's degree in Electronics from Bangalore University, India, in 1981, and master's and Ph.D. degrees in Electrical Engineering from King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, in 1983 and 1987, respectively. He is currently a professor in the Department of Computer Engineering of KFUPM. Sait has authored over 85 research papers in international journals and conferences. He is coauthor of the book VLSI Physical Design Automation: Theory and Practice, published in January 1995. He has also contributed two chapters to a book entitled Progress in VLSI design. He served on the editorial board of International Journal of Computer-Aided Design between 1988 and 1990. Currently he is the editor of Arabian Journal for Science and Engineering for Computer Science & Engineering. His current areas of interest are in digital design automation, VLSI system design, high-level synthesis, and iterative algorithms.

Habib Youssef received a Diplome d'Ingenieur en Informatique from the Faculté des Sciences de Tunis in 1982 and a Ph.D. in Computer Science from the University of Minnesota in 1990. He is currently and Associate Professor of Computer Engineering at King Fahd University of Petroleum and Minerals, Saudi Arabia. Youssef has authored more than 45 journal and conference papers. He is the coauthor of the book VLSI Physical Design Automation: Theory and Practice, January 1995. His main research interests are CAD of VLSI, computer networks, and performance evaluation of computer systems, and general stochastic and evolutionary algorithms.

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