30 YEARS World Scientific 1981-2011

Programming and Software Engineering 2012

INTRODUCTION TO DIGITAL SIGNAL PROCESSING

Computer Musically Speaking

by **Tae Hong Park** *(Tulane University, USA)*

"In this book Tae Hong Park builds a sturdy bridge that connects the world of math, acoustics and engineering, on one shore, with the world of computer music on the other. A traveller going in either direction on this bridge will find the experience lucid and enlightening."

Paul Lansky
William Shubael Conant
Professor of Music
Princeton University, New Jersey

"Park's new book on musical DPS is a real gem. It takes every concept and provides many telling pictures and easy to follow code for each. I'm looking forward to teaching with it. Students will love it."

Georg Essl
Senior Research Scientist
Deutsche Telekom Laboratories, TU-Berlin

452pp	**Nov 2009**
978-981-279-027-9	**£72**

THE NONLINEAR WORKBOOK

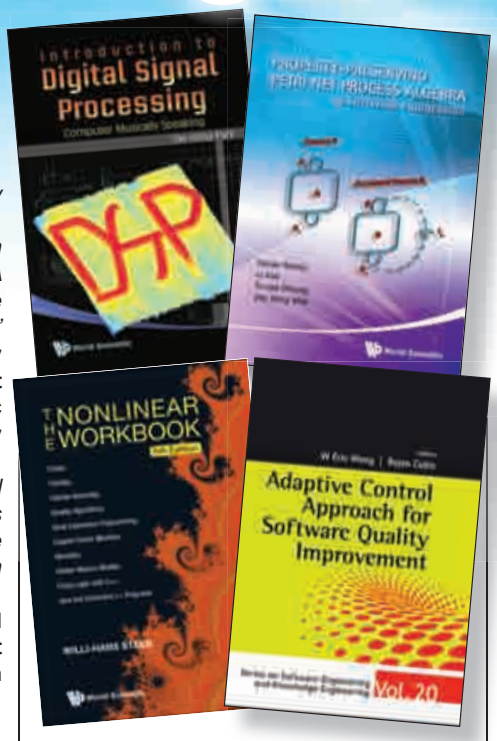
Chaos, Fractals, Cellular Automata, Genetic Algorithms, Gene Expression Programming, Support Vector Machine, Wavelets, Hidden Markov Models, Fuzzy Logic with C++, Java and SymbolicC++ Programs

(5th Edition)

by **Willi-Hans Steeb** *(University of Johannesburg, South Africa)*

The Nonlinear Workbook provides a comprehensive treatment of all the techniques in nonlinear dynamics together with C++, Java and SymbolicC++ implementations. The book not only covers the theoretical aspects of the topics but also provides the practical tools. To understand the material, more than 100 worked out examples and 150 ready to run programs are included. New topics added to the fifth edition are Langton's ant, chaotic data communication, self-controlling feedback, differential forms and optimization, T-norms and T-conorms with applications.

644pp	**Mar 2011**
978-981-4335-77-5	**£79**
978-981-4335-78-2(pbk)	**£38**



Series on Software Engineering and Knowledge Engineering - Vol. 20

ADAPTIVE CONTROL APPROACH FOR SOFTWARE QUALITY IMPROVEMENT

edited by **W Eric Wong** *(University of Texas at Dallas, USA)* & **Bojan Cukic** *(West Virginia University, USA)*

This book focuses on the topic of improving software quality using adaptive control approaches. As software systems grow in complexity, some of the central challenges include their ability to self-manage and adapt at run time, responding to changing user needs and environments, faults, and vulnerabilities. Control theory approaches presented in the book provide some of the answers to these challenges.

Written by world-renowned experts this is a truly noteworthy and authoritative reference for students, researchers and practitioners to better understand how the adaptive control approach can be applied to improve the quality of software systems. Book chapters also outline future theoretical and experimental challenges for researchers in this area.

308pp	**Jun 2011**
978-981-4340-91-5	**£61**

Series on Component-Based Software Development - Vol. 3

PROPERTY-PRESERVING PETRI NET PROCESS ALGEBRA IN SOFTWARE ENGINEERING

by **Hejiao Huang** *(Harbin Institute of Technology Shenzhen Graduate School, China)* & **Li Jiao** *(Chinese Academy of Sciences, China)*

This book presents a component -based methodology for the creation and verification of design specifications. The methodology is formally presented as algebra called Property-Preserving Petri Net Process Algebra (PPPA). PPPA includes five classes of operators, and the authors show that every operator of PPPA can preserve a large number of basic system properties. Therefore, if the initial set of primitive components satisfies some of these properties, the created components will also "automatically" satisfy them without the need for further verification — thus greatly saving verification efforts.

Readership: Graduate students and researchers in software engineering and theoretical computer science.

350pp (approx.)	**Feb 2012**
978-981-4324-28-1	**£56**

BUILDING SECURE AND HIGH-PERFORMANCE SOFTWARE SYSTEMS

by **Issa Traore** *(University of Victoria, Canada)* & **Ahmed Awad E Ahmed** *(University of Victoria, Canada)*

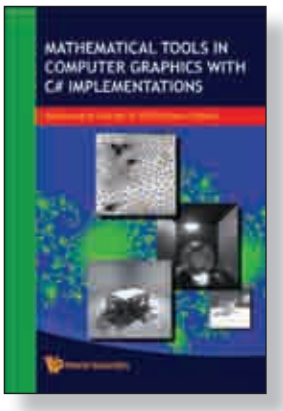
Designing reliable, complex and dependable software systems is a continuous challenge to the software engineering community. The contribution of this book is twofold: bring to light a large body of knowledge on this issue and proposing basic techniques to build secure high-performance software systems.

Readership: Researchers, academics, postgraduate students in software engineering and networking.

200pp (approx.)	**Nov 2012**
978-981-283-599-4	**£56**

MATHEMATICAL TOOLS IN COMPUTER GRAPHICS WITH C# IMPLEMENTATIONS

by **Alexandre Hardy** *(University of Johannesburg, South Africa)* & **Willi-Hans Steeb** *(University of Johannesburg, South Africa)*



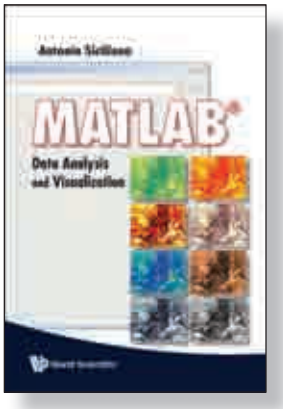
Mathematics is vital for an understanding of computer graphics. This volume helps the reader gain such an understanding by presenting all introductory and most advanced topics in the field of computer graphics with mathematical descriptions and derivations. Offering a balance of theory, applications, and code, the underlying numerical methods and algorithms are derived and a large number of examples are given. The book begins with a discussion of basic graphics tools such as vectors, matrices, and quaternions, and then builds up to more advanced topics such as the intersection of three-dimensional objects. Both classical and newer topics, such as parameterization, wavelets, fractals, and geometry images, are covered. In particular, the book contains all of the classes in C# necessary for computer graphics, providing a full explanation of the C# code and C# implementations for almost all algorithms.

496pp	**Jan 2008**
978-981-279-102-3	**£93**
978-981-279-103-0(pbk)	**£61**

MATLAB

Data Analysis and Visualization

by **Antonio Siciliano** *(University of Bari, Italy)*



MATLAB is currently the language of technical computing most known and used in academia, industry and services. It is composed of a set of tools and a very large number of functions, graphics objects with associated properties and operators. This book begins by looking at the main tools, in particular the Desktop, the Command and History Window, the Editor and the Help Browser of MATLAB; these basic elements are minutely treated both formally and through examples. The book then goes on to explore other basic elements, for instance, of data visualization — the main graphics objects and their properties – and emphasizes the arrangement of every data type as an array, unlike other MATLAB books.

296pp	**Oct 2008**
978-981-283-554-3	**£36**
978-981-283-751-6(pbk)	**£25**

Advances in Computer Science and Engineering: Texts - Vol. 3

FUNDAMENTAL CONCEPTS IN COMPUTER SCIENCE

edited by **Erol Gelenbe** *(Imperial College London, UK)* & **Jean-Pierre Kahane** *(Université de Paris Sud — Orsay, France)*

This book presents fundamental contributions to computer science as written and recounted by those who made the contributions themselves. As such, it is a highly original approach to a "living history" of the field of computer science. The scope of the book is broad in that it covers all aspects of computer science, going from the theory of computation, the theory of programming, and the theory of computer system performance, all the way to computer hardware and to major numerical applications of computers.

Contents:

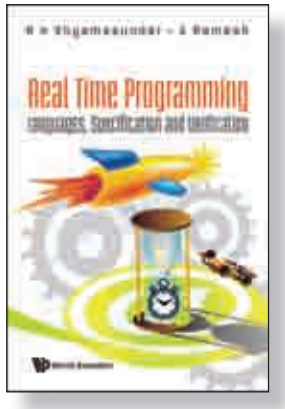
- Böhm's Theorem *(S Guerrini et al.)*
- Membrane Computing: History and Brief Introduction *(G Paun)*
- Critique of Computational Reason in the Natural Sciences *(G Longo)*
- Deterministic Computation with Random G-Networks *(E Gelenbe et al.)*
- Assertions: A Personal Perspective *(T Hoare)*
- The Call to ARMs *(S Furber)*
- Carl Adam Petri and "Petri Nets" *(W Brauer & W Reisig)*
- From Stochastic Modeling to Operational Analysis: The Journey Begins *(J P Buzen)*
- From Rocket Control to Virtual Design *(O Pironneau)*

Readership: Graduate students, academics, and professionals in the field of computer science.

172pp	**Feb 2009**
978-1-84816-290-7	**£66**
978-1-84816-291-4(ebook)	**US$129**

REAL TIME PROGRAMMING: LANGUAGES, SPECIFICATION AND VERIFICATION

by **R K Shyamasundar** *(Tata Institute of Fundamental Research, Mumbai)* & **S Ramesh** *(Indian Institute of Technology, Bombay)*



The primary aim of this monograph is to present the current research efforts that have gone into/ are going on in the systematic design of real-time programs. Such an effort would help researchers and users in the area to get a clear picture of the issues of specification, verification and design of real-time reactive programs. It will clearly enable us to identify languages that can be used for different kinds of applications. Obviously, in an upcoming area like this, this presentation is far from complete.

The quintessence of the monograph can be captured by the following question:
How can we design and develop Robust Reactive (real-time) Programs?

We address this question in this monograph through the various underlying issues listed, such as characteristics of real-time/reactive programs, reactive programming languages, verification and refinements.

264pp	**Nov 2009**
978-981-02-2566-7	**£76**