



CALL FOR BOOK CHAPTERS

Proposals Submission Deadline: 15 DECEMBER 2009

Full Chapters Due: 15 FEBRUARY 2010

Website: <http://www.it-weise.de/book/>

Variants of Evolutionary Algorithms for Real-World Applications

A volume edited by Raymond Chiong, Thomas Weise and Zbigniew Michalewicz

To be published by Springer-Verlag in 2011

Book Objectives & Mission:

Started as a mere academic curiosity, Evolutionary Algorithms (EAs) first came into sight back in the 1960s. However, it was not until the 1980s that the research on EAs became less theoretical and more practical. As a manifestation of population-based, stochastic search algorithms that mimic natural evolution, EAs use genetic operators such as crossover and mutation for the search process to generate new solutions through a repeated application of variation and selection.

Due to their ability to find satisfactory solutions for conventionally hard and dynamic problems within acceptable time, EAs have attracted interests from many researchers and practitioners in recent years. The general-purpose, black-box character of EAs makes them suitable for a wide range of real-world applications. Standard EAs such as Genetic Algorithms, Evolutionary Programming, Evolution Strategies and Genetic Programming are becoming more and more accepted in the industry and commercial sectors. With the dramatic increase in computational power today, an incredible diversification of new application areas of these techniques can be observed. At the same time, new variants and classes of evolutionary optimisation methods such as Differential Evolution, Estimation of Distribution Algorithms, Cultural Algorithms, Grammatical Evolution, Gene Expression Programming, Cooperative and Competitive Co-evolutionary Algorithms, Multi-objective Evolutionary Algorithms, to name just a few, emerged.

When systems utilising EAs reach production stage, off-the-shelf versions of these methods are regularly replaced by dedicated algorithm variants. These specialised EAs often use tailored reproduction operators, search spaces differing significantly from the well-known binary or tree-based encodings, non-trivial genotype-phenotype mappings, or are hybridised with other optimisation algorithms. This book aims to promote the practitioner's view on EAs by giving a comprehensive discussion of how EAs can be adapted to the requirements of various applications in the real-world domains. It will pool knowledge and experience on how EAs can be exploited to solve a wide range of problems in diverse fields such as scheduling, manufacturing, logistics, space allocation, stock cutting, anomaly detection, engineering design, software testing, bioinformatics and data mining, among others. The main focus will be on applications which are actually delivered and integrated in some industrial or real-world settings.

Recommended topics include, but are not limited to, the following:

- Methods (variants of):
 - Genetic Algorithms
 - Genetic Programming
 - Evolution Strategies
 - Evolutionary Programming
 - Differential Evolution
 - Estimation of Distribution Algorithms
 - Co-evolutionary Algorithms
 - Multi-objective Evolutionary Algorithms
 - Memetic Algorithms

- Applications:
 - Planning, Scheduling and Timetabling
 - Space Allocation, Bin Packing and Stock Cutting
 - Logistics and Transportation
 - Computer Networks and Telecommunications
 - Computer Security, Privacy and Anomaly Detection
 - (Computer) System Configuration and Management
 - Software Testing and Software Engineering
 - Hardware Design and Testing, Circuit Layout, Circuit Synthesis
 - Engineering Design and (Industrial) Design Optimisation
 - Data Mining, Customer Decision Prediction
 - Expert Systems
 - Medicine, Diagnosis
 - Chemistry
 - Biology, Molecular Biology, Genetics, Bioinformatics
 - Business and Financial Applications, Fraud Detection

Submission Procedure:

Researchers and practitioners are invited to submit *on or before* **December 15, 2009** a 2-3 pages proposal to tweise@gmx.de (cc. rchiong@swin.edu.au) clearly explaining the mission and concerns of the proposed chapter. Authors of accepted proposals will be notified between 2 to 3 weeks time about the status of their proposals. Full chapters are expected to be submitted by **February 15, 2010**. All submitted chapters will be reviewed by at least three reviewers and the final decision of acceptance or rejection will be based on their recommendations.

Manuscript Preparation:

The full chapters must be prepared according to Springer's style guide for contributed books and conform to additional instructions provided at <http://www.it-weise.de/book/style.zip>. Manuscript preparation in LaTeX is strongly recommended. Works based on previously published materials must be substantially extended.

Important Dates:

Deadline for chapter proposals	15 December 2009
Deadline for full chapters	15 February 2010
Notification of review results	15 May 2010
Deadline for submission of revised chapters	15 July 2010
Notification of the final decision	15 September 2010
Deadline for submission of final chapters	15 October 2010
Publication of book	First half of 2011

All inquiries can be forwarded to **Dr.-Ing. Thomas Weise** via e-mail at tweise@gmx.de.