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Hierarchical Bayesian Optimization Algorithm Toward a New Generation of Evolutionary Algorithms Springer Science &

Business Media This book provides a framework for the design of competent optimization techniques by combining advanced evolutionary algorithms with state-of-the-art machine learning techniques. The book focuses on two algorithms that replace traditional variation operators of evolutionary algorithms by learning and sampling Bayesian networks: the Bayesian optimization algorithm (BOA) and the hierarchical BOA (hBOA). BOA and hBOA are theoretically and empirically shown to provide robust and scalable solution for broad classes of nearly decomposable and hierarchical problems. A theoretical model is developed that estimates the scalability and adequate parameter settings for BOA and hBOA. The performance of BOA and hBOA is analyzed on a number of artificial problems of bounded difficulty designed to test BOA and hBOA on the boundary of their design envelope. The algorithms are also extensively tested on two interesting classes of real-world problems: MAXSAT and Ising spin glasses with periodic boundary conditions in two and three dimensions. Experimental results validate the theoretical model and confirm that BOA and hBOA provide robust and scalable solution for nearly decomposable and hierarchical problems with only little problem-specific information. **Clever Algorithms Nature-inspired Programming Recipes Jason Brownlee** This book provides a handbook of algorithmic recipes from the fields of Metaheuristics, Biologically Inspired Computation and Computational Intelligence that have been described in a complete, consistent, and centralized manner. These standardized descriptions were carefully designed to be accessible, usable, and understandable. Most of the algorithms described in this book were originally inspired by biological and natural systems, such as the adaptive capabilities of genetic evolution and the acquired immune system, and the foraging behaviors of birds, bees, ants and bacteria. An encyclopedic algorithm reference, this book is intended for research scientists, engineers, students, and interested amateurs. Each algorithm description provides a working code example in the Ruby Programming Language. **Scalable Optimization via Probabilistic Modeling From Algorithms to Applications Springer** I’m not usually a fan of edited volumes. Too often they are an incoherent hodgepodge of remnants, renegades, or rejects foisted upon an unsuspecting reading public under a misleading or fraudulent title. The volume Scalable Optimization via Probabilistic Modeling: From Algorithms to Applications is a worthy addition to your library because it succeeds on exactly those dimensions where so many edited volumes fail. For example, take the title, Scalable Optimization via Probabilistic M- eling: From Algorithms to Applications. You need not worry that you’re going to pick up this book and ?nd stray articles about anything else. This book focuseslikealaserbeamononeofthehottesttopicsinevolutionary compu- tion over the last decade or so: estimation of distribution algorithms (EDAs). EDAs borrow evolutionary computation’s population orientation and sel- tionism and throw out the genetics to give us a hybrid of substantial power, elegance, and extensibility. The article sequencing in most edited volumes is hard to understand, but from the get go the editors of this volume have assembled a set of articles sequenced in a logical fashion. The book moves from design to e?ciency enhancement and then concludes with relevant applications. The emphasis on e?ciency enhancement is particularly important, because the data-mining perspectiveimplicitinEDAsopensuptheworldofoptimizationtonewme- ods of data-guided adaptation that can further speed solutions

through the construction and utilization of e?ective surrogates, hybrids, and parallel and temporal decompositions. **Exploitation of Linkage Learning in Evolutionary Algorithms Springer Science & Business Media** One major branch of enhancing the performance of evolutionary algorithms is the exploitation of linkage learning. This monograph aims to capture the recent progress of linkage learning, by compiling a series of focused technical chapters to keep abreast of the developments and trends in the area of linkage. In evolutionary algorithms, linkage models the relation between decision variables with the genetic linkage observed in biological systems, and linkage learning connects computational optimization methodologies and natural evolution mechanisms. Exploitation of linkage learning can enable us to design better evolutionary algorithms as well as to potentially gain insight into biological systems. Linkage learning has the potential to become one of the dominant aspects of evolutionary algorithms; research in this area can potentially yield promising results in addressing the scalability issues. **Parameter Setting in Evolutionary Algorithms Springer Science & Business Media** One of the main difficulties of applying an evolutionary algorithm (or, as a matter of fact, any heuristic method) to a given problem is to decide on an appropriate set of parameter values. Typically these are specified before the algorithm is run and include population size, selection rate, operator probabilities, not to mention the representation and the operators themselves. This book gives the reader a solid perspective on the different approaches that have been proposed to automate control of these parameters as well as understanding their interactions. The book covers a broad area of evolutionary computation, including genetic algorithms, evolution strategies, genetic programming, estimation of distribution algorithms, and also discusses the issues of specific parameters used in parallel implementations, multi-objective evolutionary algorithms, and practical consideration for real-world applications. It is a recommended read for researchers and practitioners of evolutionary computation and heuristic methods. **Computational Intelligence and Intelligent Systems 7th International Symposium, ISICA 2015, Guangzhou, China, November 21-22, 2015, Revised Selected Papers Springer** This book constitutes the refereed proceedings of the 7th International Symposium on Intelligence Computation and Applications, ISICA 2015, held in Guangzhou, China, in November 2015. The 77 revised full papers presented were carefully reviewed and selected from 189 submissions. The papers feature the most up-to-date research in analysis and theory of evolutionary computation, neural network architectures and learning; neuro-dynamics and neuro-engineering; fuzzy logic and control; collective intelligence and hybrid systems; deep learning; knowledge discovery; learning and reasoning. **Parallel Problem Solving from Nature - PPSN XII 12th International Conference, Taormina, Italy, September 1-5, 2012, Proceedings, Part I Springer** The two volume set LNCS 7491 and 7492 constitutes the refereed proceedings of the 12th International Conference on Parallel Problem Solving from Nature, PPSN 2012, held in Taormina, Sicily, Italy, in September 2012. The total of 105 revised full papers were carefully reviewed and selected from 226 submissions. The meeting began with 5 workshops which offered an ideal opportunity to explore specific topics in evolutionary computation, bio-inspired computing and metaheuristics. PPSN 2012 also included 8 tutorials. The papers are organized in topical sections on evolutionary

computation; machine learning, classifier systems, image processing; experimental analysis, encoding, EDA, GP; multiobjective optimization; swarm intelligence, collective behavior, coevolution and robotics; memetic algorithms, hybridized techniques, meta and hyperheuristics; and applications. **Linkage in Evolutionary Computation Springer Science & Business Media** In recent years, the issue of linkage in GEAs has garnered greater attention and recognition from researchers. Conventional approaches that rely much on ad hoc tweaking of parameters to control the search by balancing the level of exploitation and exploration are grossly inadequate. As shown in the work reported here, such parameters tweaking based approaches have their limits; they can be easily ”fooled” by cases of triviality or peculiarity of the class of problems that the algorithms are designed to handle. Furthermore, these approaches are usually blind to the interactions between the decision variables, thereby disrupting the partial solutions that are being built up along the way. **Natural Intelligence for Scheduling, Planning and Packing Problems Springer** Scheduling, planning and packing are ubiquitous problems that can be found in a wide range of real-world settings. These problems transpire in a large variety of forms, and have enormous socio-economic impact. For many years, significant work has been devoted to automating the processes of scheduling, planning and packing using different kinds of methods. However, poor scaling and the lack of flexibility of many of the conventional methods coupled with the fact that most of the real-world problems across the application areas of scheduling, planning and packing nowadays tend to be of large scale, dynamic and full of complex dependencies have made it necessary to tackle them in unconventional ways. This volume, "Natural Intelligence for Scheduling, Planning and Packing Problems", is a collection of numerous natural intelligence based approaches for solving various kinds of scheduling, planning and packing problems. It comprises 12 chapters which present many methods that draw inspiration from nature, such as evolutionary algorithms, neural-fuzzy system, particle swarm algorithms, ant colony optimisation, extremal optimisation, raindrop optimisation, and so on. Problems addressed by these chapters include freight transportation, job shop scheduling, flowshop scheduling, electrical load forecasting, vehicle routing, two-dimensional strip packing, network configuration and forest planning, among others. Along with solving these problems, the contributing authors present a lively discussion of the various aspects of the nature-inspired algorithms utilised, providing very useful and important new insights into the research areas. **Parallel Problem Solving from Nature - PPSN IX 9th International Conference, Reykjavik, Iceland, September 9-13, 2006, Proceedings Springer Science & Business Media** This book constitutes the refereed proceedings of the 9th International Conference on Parallel Problem Solving from Nature, PPSN 2006. The book presents 106 revised full papers covering a wide range of topics, from evolutionary computation to swarm intelligence and bio-inspired computing to real-world applications. These are organized in topical sections on theory, new algorithms, applications, multi-objective optimization, evolutionary learning, as well as representations, operators, and empirical evaluation. **Search Methodologies Introductory Tutorials in Optimization and Decision Support Techniques Springer Science & Business Media** The first edition of Search Methodologies: Introductory Tutorials in Optimization and Decision Support Techniques

was originally put together to offer a basic introduction to the various search and optimization techniques that students might need to use during their research, and this new edition continues this tradition. Search Methodologies has been expanded and brought completely up to date, including new chapters covering scatter search, GRASP, and very large neighborhood search. The chapter authors are drawn from across Computer Science and Operations Research and include some of the world's leading authorities in their field. The book provides useful guidelines for implementing the methods and frameworks described and offers valuable tutorials to students and researchers in the field. "As I embarked on the pleasant journey of reading through the chapters of this book, I became convinced that this is one of the best sources of introductory material on the search methodologies topic to be found. The book's subtitle, "Introductory Tutorials in Optimization and Decision Support Techniques", aptly describes its aim, and the editors and contributors to this volume have achieved this aim with remarkable success. The chapters in this book are exemplary in giving useful guidelines for implementing the methods and frameworks described." Fred Glover, Leeds School of Business, University of Colorado Boulder, USA "[The book] aims to present a series of well written tutorials by the leading experts in their fields. Moreover, it does this by covering practically the whole possible range of topics in the discipline. It enables students and practitioners to study and appreciate the beauty and the power of some of the computational search techniques that are able to effectively navigate through search spaces that are sometimes inconceivably large. I am convinced that this second edition will build on the success of the first edition and that it will prove to be just as popular." Jacek Blazewicz, Institute of Computing Science, Poznan University of Technology and Institute of Bioorganic Chemistry, Polish Academy of Sciences **Parallel Problem Solving from Nature, PPSN XI 11th International Conference, Krakov, Poland, September 11-15, 2010, Proceedings Springer Science & Business Media** This book constitutes the refereed proceedings of the 11th International Conference on Parallel Problem Solving from Nature - PPSN XI, held in Kraków, Poland, in September 2010. The 131 revised full papers were carefully reviewed and selected from 232 submissions. The conference covers a wide range of topics, from evolutionary computation to swarm intelligence, from bio-inspired computing to real world applications. Machine learning and mathematical games supported by evolutionary algorithms as well as memetic, agent-oriented systems are also represented. **Introduction to Evolutionary Algorithms Springer Science & Business Media** Evolutionary algorithms are becoming increasingly attractive across various disciplines, such as operations research, computer science, industrial engineering, electrical engineering, social science and economics. Introduction to Evolutionary Algorithms presents an insightful, comprehensive, and up-to-date treatment of evolutionary algorithms. It covers such hot topics as: • genetic algorithms, • differential evolution, • swarm intelligence, and • artificial immune systems. The reader is introduced to a range of applications, as Introduction to Evolutionary Algorithms demonstrates how to model real world problems, how to encode and decode individuals, and how to design effective search operators according to the chromosome structures with examples of constraint optimization, multiobjective optimization, combinatorial optimization, and supervised/unsupervised learning. This emphasis on practical applications

will benefit all students, whether they choose to continue their academic career or to enter a particular industry. Introduction to Evolutionary Algorithms is intended as a textbook or self-study material for both advanced undergraduates and graduate students. Additional features such as recommended further reading and ideas for research projects combine to form an accessible and interesting pedagogical approach to this widely used discipline. **Markov Networks in Evolutionary Computation Springer Science & Business Media** Markov networks and other probabilistic graphical modes have recently received an upsurge in attention from Evolutionary computation community, particularly in the area of Estimation of distribution algorithms (EDAs). EDAs have arisen as one of the most successful experiences in the application of machine learning methods in optimization, mainly due to their efficiency to solve complex real-world optimization problems and their suitability for theoretical analysis. This book focuses on the different steps involved in the conception, implementation and application of EDAs that use Markov networks, and undirected models in general. It can serve as a general introduction to EDAs but covers also an important current void in the study of these algorithms by explaining the specificities and benefits of modeling optimization problems by means of undirected probabilistic models. All major developments to date in the progressive introduction of Markov networks based EDAs are reviewed in the book. Hot current research trends and future perspectives in the enhancement and applicability of EDAs are also covered. The contributions included in the book address topics as relevant as the application of probabilistic-based fitness models, the use of belief propagation algorithms in EDAs and the application of Markov network based EDAs to real-world optimization problems. The book should be of interest to researchers and practitioners from areas such as optimization, evolutionary computation, and machine learning. **Natural Computing Algorithms Springer** The field of natural computing has been the focus of a substantial research effort in recent decades. One particular strand of this research concerns the development of computational algorithms using metaphorical inspiration from systems and phenomena that occur in the natural world. These naturally inspired computing algorithms have proven to be successful problem-solvers across domains as diverse as management science, bioinformatics, finance, marketing, engineering, architecture and design. This book is a comprehensive introduction to natural computing algorithms, suitable for academic and industrial researchers and for undergraduate and graduate courses on natural computing in computer science, engineering and management science. **Simulated Evolution and Learning 6th International Conference, SEAL 2006, Hefei, China, October 15-18, 2006, Proceedings Springer** This book constitutes the refereed proceedings of the 6th International Conference on Simulated Evolution and Learning, SEAL 2006, held in Hefei, China in October 2006. The 117 revised full papers presented were carefully reviewed and selected from 420 submissions. **Innovative Computing Technology First International Conference, INCT 2011, Tehran, Iran, December 13-15, 2011, Proceedings Springer Science & Business Media** This book constitutes the proceedings of the First International Conference on Innovative Computing Technology, INCT 2011, held in Tehran, Iran, in December 2011. The 40 revised papers included in this book were carefully reviewed and selected from 121 submissions. The contributions are organized in topical sections on

software; Web services and service architecture; computational intelligence; data modeling; multimedia and image segmentation; natural language processing; networks; cluster computing; and discrete systems. **Modeling Applications and Theoretical Innovations in Interdisciplinary Evolutionary Computation IGI Global** Evolutionary computation has emerged as a major topic in the scientific community as many of its techniques have successfully been applied to solve problems in a wide variety of fields. Modeling Applications and Theoretical Innovations in Interdisciplinary Evolutionary Computation provides comprehensive research on emerging theories and its aspects on intelligent computation. Particularly focusing on breaking trends in evolutionary computing, algorithms, and programming, this publication serves to support professionals, government employees, policy and decision makers, as well as students in this scientific field. **Towards a New Evolutionary Computation Advances on Estimation of Distribution Algorithms Springer Science & Business Media** Estimation of Distribution Algorithms (EDAs) are a set of algorithms in the Evolutionary Computation (EC) field characterized by the use of explicit probability distributions in optimization. Contrarily to other EC techniques such as the broadly known Genetic Algorithms (GAs) in EDAs, the crossover and mutation operators are substituted by the sampling of a distribution previously learnt from the selected individuals. EDAs have experienced a high development that has transformed them into an established discipline within the EC field. This book attracts the interest of new researchers in the EC field as well as in other optimization disciplines, and that it becomes a reference for all of us working on this topic. The twelve chapters of this book can be divided into those that endeavor to set a sound theoretical basis for EDAs, those that broaden the methodology of EDAs and finally those that have an applied objective. **Computational Intelligence in Security for Information Systems 4th International Conference, CISIS 2011, Held at IWANN 2011, Torremolinos-Málaga, Spain, June 8-10, 2011, Proceedings Springer Science & Business Media** This book constitutes the refereed proceedings of the 4th International Conference on Computational Intelligence in Security for Information Systems, CISIS 2011, held in Torremolinos-Málaga, in June 2011 as a satellite event of IWANN 2011, the International Work-Conference on Artificial and Natural Neural Networks. The 38 revised full papers presented were carefully reviewed and selected from a total of 70 submissions. The papers are organized in topical sections on machine learning and intelligence, network security, cryptography, securing software, and applications of intelligent methods for security. **Parallel Problem Solving from Nature - PPSN X 10th International Conference Dortmund, Germany, September 13-17, 2008 Proceedings Springer Science & Business Media** This book constitutes the refereed proceedings of the 10th International Conference on Parallel Problem Solving from Nature, PPSN 2008, held in Dortmund, Germany, in September 2008. The 114 revised full papers presented were carefully reviewed and selected from 206 submissions. The conference covers a wide range of topics, such as evolutionary computation, quantum computation, molecular computation, neural computation, artificial life, swarm intelligence, artificial ant systems, artificial immune systems, self-organizing systems, emergent behaviors, and applications to real-world problems. The paper are organized in topical sections on formal theory, new techniques, experimental analysis, multiobjective

optimization, hybrid methods, and applications. **Learning Classifier Systems 10th International Workshop, IWLCS 2006, Seattle, MA, USA, July 8, 2006, and 11th International Workshop, IWLCS 2007, London, UK, July 8, 2007, Revised Selected Papers Springer Science & Business Media** This volume includes extended and revised versions of the papers presented at the 9th and 10th International Workshops on Learning Classi?er Systems (IWLCS 2006 and IWLCS 2007). Both workshops were held in association with theGeneticandEvolutionaryComputationConference(GECCO).IWLCS2006 was held on July 8th, 2006, in Seattle, USA, during GECCO 2006.IWLCS 2007 was held on July 8th, 2007, in London, UK, during GECCO 2007. The IWLCS is the annual meeting of researchers wishing to discuss recent developments in learning classi?er systems (LCS). At the last IWLCS, the LCS researchers commemorated the 10th anniversary of the workshop and ackno- edged the contribution of Stewart Wilson to the ?eld. Following his proposal of the XCS classi?er system in 1995, research on LCS was reactivated leading to signi?cant contributions and promising perspectives. The annual IWLCS wo- shops are the proof of this fruitful research. We include an invited paper from Stewart Wilson. We greatly appreciate his contribution to the volume. The contents of this book are as follows. First, Bacardit, Bernadó- Mansilla and Butz review LCS research over the past ten years and point out new ch- lenges and open issues in the LCS ?eld. Next, papers investigating knowledge representations are presented. Lanzi et al. analyze the evolution of XCS with symbolic representations using a novel method that identi?es useful substr- tures and tracks the emergence of optimal solutions. Ioannides and Browne investigate the scaling of LCSs using ternary and symbolic representations. **Pattern Recognition 4th Mexican Conference, MCPR 2012, Huatulco, Mexico, June 27-30, 2012. Proceedings Springer** This book constitutes the refereed proceedings of the 4th Mexican Conference on Pattern Recognition, MCPR 2012, held in Huatulco, Mexico, in June 2012. The 31 revised full papers and 3 keynotes presented were carefully reviewed and selected from 64 submissions and are organized in topical sections on image processing; computer vision and image recognition; pattern recognition and neural networks; and document processing and speech recognition. **Learning Classifier Systems in Data Mining Springer Science & Business Media** The ability of Learning Classifier Systems (LCS) to solve complex real-world problems is becoming clear. This book brings together work by a number of individuals who demonstrate the good performance of LCS in a variety of domains. **Design of Modern Heuristics Principles and Application Springer Science & Business Media** Most textbooks on modern heuristics provide the reader with detailed descriptions of the functionality of single examples like genetic algorithms, genetic programming, tabu search, simulated annealing, and others, but fail to teach the underlying concepts behind these different approaches. The author takes a different approach in this textbook by focusing on the users' needs and answering three fundamental questions: First, he tells us which problems modern heuristics are expected to perform well on, and which should be left to traditional optimization methods. Second, he teaches us to systematically design the "right" modern heuristic for a particular problem by providing a coherent view on design elements and working principles. Third, he shows how we can make use of problem-specific knowledge for the design of efficient and effective modern heuristics that

solve not only small toy problems but also perform well on large real-world problems. This book is written in an easy-to-read style and it is aimed at students and practitioners in computer science, operations research and information systems who want to understand modern heuristics and are interested in a guide to their systematic design and use. This book is written in an easy-to-read style and it is aimed at students and practitioners in computer science, operations research and information systems who want to understand modern heuristics and are interested in a guide to their systematic design and use. This book is written in an easy-to-read style and it is aimed at students and practitioners in computer science, operations research and information systems who want to understand modern heuristics and are interested in a guide to their systematic design and use. **Bayesian Methods in Finance John Wiley & Sons** Bayesian Methods in Finance provides a detailed overview of the theory of Bayesian methods and explains their real-world applications to financial modeling. While the principles and concepts explained throughout the book can be used in financial modeling and decision making in general, the authors focus on portfolio management and market risk management—since these are the areas in finance where Bayesian methods have had the greatest penetration to date. **Design and Analysis of Learning Classifier Systems A Probabilistic Approach Springer Science & Business Media** This book is probably best summarized as providing a principled foundation for Learning Classi?er Systems. Something is happening in LCS, and particularly XCS and its variants that clearly often produces good results. Jan Drug- itsch wishes to understand this from a broader machine learning perspective and thereby perhaps to improve the systems. His approach centers on choosing a statistical de?nition – derived from machine learning – of “a good set of cl- si?ers”, based on a model according to which such a set represents the data. For an illustration of this approach, he designs the model to be close to XCS, and tests it by evolving a set of classi?ers using that de?nition as a ?tness criterion, seeing ifthe setprovidesa goodsolutionto twodi?erent function approximation problems. It appears to, meaning that in some sense his de?nition of “good set of classi?ers” (also, in his terms, a good model structure) captures the essence, in machine learning terms, of what XCS is doing. In the process of designing the model, the author describes its components and their training in clear detail and links it to currently used LCS, giving rise to recommendations for how those LCS can directly gain from the design of the model and its probabilistic formulation. The seeming complexity of evaluating the quality ofa set ofclassi?ersis alleviatedby giving analgorithmicdescription of how to do it, which is carried out via a simple Pittsburgh-style LCS. **Computational Collective IntelligenceTechnologies and Applications Third International Conference, ICCCI 2011, Gdynia, Poland, September 21-23, 2011, Proceedings, Part I Springer** The two-volume set LNAI 6922 and LNAI 6923 constitutes the refereed proceedings of the Third International Conference on Computational Collective Intelligence, ICCCI 2011, held in Gdynia, Poland, in September 2011. The 112 papers in this two volume set presented together with 3 keynote speeches were carefully reviewed and selected from 300 submissions. The papers are organized in topical sections on knowledge management, machine learning and applications, autonomous and collective decision-making, collective computations and optimization, Web services and semantic Web, social

networks and computational swarm intelligence and applications. **Springer Handbook of Computational Intelligence Springer** The Springer Handbook for Computational Intelligence is the first book covering the basics, the state-of-the-art and important applications of the dynamic and rapidly expanding discipline of computational intelligence. This comprehensive handbook makes readers familiar with a broad spectrum of approaches to solve various problems in science and technology. Possible approaches include, for example, those being inspired by biology, living organisms and animate systems. Content is organized in seven parts: foundations; fuzzy logic; rough sets; evolutionary computation; neural networks; swarm intelligence and hybrid computational intelligence systems. Each Part is supervised by its own Part Editor(s) so that high-quality content as well as completeness are assured. **Artificial Intelligence and Computational Intelligence Second International Conference, AICIS 2011, Taiyuan, China, September 24-25, 2011, Proceedings Springer Science & Business Media** This three-volume proceedings contains revised selected papers from the Second International Conference on Artificial Intelligence and Computational Intelligence, AICI 2011, held in Taiyuan, China, in September 2011. The total of 265 high-quality papers presented were carefully reviewed and selected from 1073 submissions. The topics of Part I covered are: applications of artificial intelligence; applications of computational intelligence; automated problem solving; biomedical inforamtics and computation; brain models/cognitive science; data mining and knowledge discovering; distributed AI and agents; evolutionary programming; expert and decision support systems; fuzzy computation; fuzzy logic and soft computing; and genetic algorithms. **Engineering General Intelligence, Part 1 A Path to Advanced AGI via Embodied Learning and Cognitive Synergy Springer** The work outlines a novel conceptual and theoretical framework for understanding Artificial General Intelligence and based on this framework outlines a practical roadmap for the development of AGI with capability at the human level and ultimately beyond. **Life System Modeling and Intelligent Computing International Conference on Life System Modeling and Simulation, LSMS 2010, and International Conference on Intelligent Computing for Sustainable Energy and Environment, ICSEE 2010, Wuxi, China, September 17-20, 2010, Proceedings, Part II Springer** The 2010 International Conference on Life System Modeling and Simulation (LSMS 2010) and the 2010 International Conference on Intelligent Computing for Susta- able Energy and Environment (ICSEE 2010) were formed to bring together resear- ers and practitioners in the fields of life system modeling/simulation and intelligent computing applied to worldwide sustainable energy and environmental applications. A life system is a broad concept, covering both micro and macro components ra- ing from cells, tissues and organs across to organisms and ecological niches. To c- prehend and predict the complex behavior of even a simple life system can be - tremely difficult using conventional approaches. To meet this challenge, a variety of new theories and methodologies have emerged in recent years on life system mod- ing and simulation. Along with improved understanding of the behavior of biological systems, novel intelligent computing paradigms and techniques have emerged to h- dle complicated real-world problems and applications. In particular, intelligent c- puting approaches have been valuable in the design and development of systems and facilities

for achieving sustainable energy and a sustainable environment, the two most challenging issues currently facing humanity. The two LSMS 2010 and ICSEE 2010 conferences served as an important platform for synergizing these two research streams. **How the Mind Comes Into Being An Introduction to Cognitive Science from a Functional and Computational Perspective Oxford University Press** More than 2000 years ago Greek philosophers were pondering the puzzling dichotomy between our physical bodies and our seemingly non-physical minds. Yet even today, it remains puzzling how our mind controls our body, and vice versa, how our body shapes our mind. How is it that we can think highly abstract thoughts, seemingly fully detached from the actual, physical reality? This book offers an interdisciplinary introduction to embodied cognitive science, addressing the question of how the mind comes into being while actively interacting with and learning from the environment by means of the own body. By pursuing a functional and computational perspective, concrete answers are provided about the fundamental mechanisms and developing structures that must bring the mind about, taking into account insights from biology, neuroscience, psychology, and philosophy as well as from computer science, machine learning, and artificial intelligence. The book provides introductions to the most important challenges and available computational approaches on how the mind comes into being. The book includes exercises, helping the reader to grasp the material and understand it in a broader context. References to further studies, methodological details, and current developments support more advanced studies beyond the covered material. While the book is written in advanced textbook style with the primary target group being undergraduates in cognitive science and related disciplines, readers with a basic scientific background and a strong interest in how the mind works will find this book intriguing and revealing. **Advanced Data Mining and Applications 9th International Conference, ADMA 2013, Hangzhou, China, December 14-16, 2013, Proceedings, Part II Springer** The two-volume set LNAI 8346 and 8347 constitutes the thoroughly refereed proceedings of the 9th International Conference on Advanced Data Mining and Applications, ADMA 2013, held in Hangzhou, China, in December 2013. The 32 regular papers and 64 short papers presented in these two volumes were carefully reviewed and selected from 222 submissions. The papers included in these two volumes cover the following topics: opinion mining, behavior mining, data stream mining, sequential data mining, web mining, image mining, text mining, social network mining, classification, clustering, association rule mining, pattern mining, regression, predication, feature extraction, identification, privacy preservation, applications, and machine learning. **Inductive Logic Programming 21st International Conference, ILP 2011, Windsor Great Park, UK, July 31 -- August 3, 2011, Revised Selected Papers Springer** This book constitutes the thoroughly refereed post-proceedings of the 21st International Conference on Inductive Logic Programming, ILP 2011, held in Windsor Great Park, UK, in July/August 2011. The 24 revised full papers were carefully reviewed and selected from 66 submissions. Also included are five extended abstracts and three invited talks. The papers represent the diversity and vitality in present ILP research including ILP theory, implementations, probabilistic ILP, biological applications, sub-group discovery, grammatical inference, relational kernels, learning of Petri nets, spatial learning, graph-based learning, and learning of

action models. **Engineering General Intelligence, Part 2 The CogPrime Architecture for Integrative, Embodied AGI Springer** The work outlines a detailed blueprint for the creation of an Artificial General Intelligence system with capability at the human level and ultimately beyond, according to the Cog Prime AGI design and the Open Cog software architecture. **Success in Evolutionary Computation Springer** Evolutionary Computation (EC) includes a number of techniques such as Genetic Algorithms which have been used in a diverse range of highly successful applications. This book brings together some of these EC applications in fields including electronics, telecommunications, health, bioinformatics, supply chain and other engineering domains, to give the audience, including both EC researchers and practitioners, a glimpse of this exciting and rapidly-evolving field. **Multidisciplinary Design Optimization Methods for Electrical Machines and Drive Systems Springer** This book presents various computationally efficient component- and system-level design optimization methods for advanced electrical machines and drive systems. Readers will discover novel design optimization concepts developed by the authors and other researchers in the last decade, including application-oriented, multi-disciplinary, multi-objective, multi-level, deterministic, and robust design optimization methods. A multi-disciplinary analysis includes various aspects of materials, electromagnetics, thermotics, mechanics, power electronics, applied mathematics, manufacturing technology, and quality control and management. This book will benefit both researchers and engineers in the field of motor and drive design and manufacturing, thus enabling the effective development of the high-quality production of innovative, high-performance drive systems for challenging applications, such as green energy systems and electric vehicles. **Soft Computing Techniques for Engineering Optimization CRC Press** This book covers the issues related to optimization of engineering and management problems using soft computing techniques with an industrial outlook. It covers a broad area related to real life complex decision making problems using a heuristics approach. It also explores a wide perspective and future directions in industrial engineering research on a global platform/scenario. The book highlights the concept of optimization, presents various soft computing techniques, offers sample problems, and discusses related software programs complete with illustrations. Features Explains the concept of optimization and relevance to soft computing techniques towards optimal solution in engineering and management Presents various soft computing techniques Offers problems and their optimization using various soft computing techniques Discusses related software programs, with illustrations Provides a step-by-step tutorial on how to handle relevant software for obtaining the optimal solution to various engineering problems **Advances in Computational Intelligence in Transport, Logistics, and Supply Chain Management Springer** Logistics and supply chain management deal with managing the ?ow of goods or services within a company, from suppliers to customers, and along a supply chain where companies act as suppliers as well as customers. As transportation is at the heart of logistics, the design of tra?c and transportation networks combined with the routing of vehicles and goods on the networks are important and demanding planning tasks. The in?uence of transport, logistics, and s- ply chain management on the modern economy and society has been growing steadily over the last few decades. The worldwide division

of labor, the conn- tion of distributed production centers, and the increased mobility of individuals lead to an increased demand for e?cient solutions to logistics and supply chain management problems. On the company level, e?cient and e?ective logistics and supply chain management are of critical importance for a company’s s- cessanditscompetitiveadvantage. Properperformanceofthelogisticsfunctions can contribute both to lower costs and to enhanced customer service. Computational Intelligence (CI) describes a set of methods and tools that often mimic biological or physical principles to solve problems that have been di?cult to solve by classical mathematics. CI embodies neural networks, fuzzy logic, evolutionary computation, local search, and machine learning approaches. Researchersthat workinthis areaoften comefromcomputer science,operations research,or mathematics, as well as from many di?erent engineering disciplines. Popular and successful CI methods for optimization and planning problems are heuristic optimization approaches such as evolutionary algorithms, local search methods, and other types of guided search methods.