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 A Field Guide to Genetic Programming

Genetic Algorithms In Java Basics

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HARPER CARLIE

Parallel Genetic Algorithms Springer Science & Business Media

This book constitutes the refereed proceedings of the 6th International Symposium on Search-Based Software Engineering, SSBSE 2014, held in Fortaleza, Brazil. The 14 revised full papers presented together with 2 keynote addresses, 1 invited talk, 1 short paper, 3 papers of the graduate track, and 4 challenge track papers were carefully reviewed and selected from 51 submissions. Search Based Software Engineering (SBSE) studies the application of meta-heuristic optimization techniques to various software engineering problems, ranging from requirements engineering to software testing and maintenance.

Clever Algorithms Simon and Schuster

A state-of-the-art guide on how to build intelligent Web-based applications using Java Joseph and Jennifer Bigus update and significantly expand their book on building intelligent Web-based applications using Java. Geared to network programmers or Web developers who have previously

programmed agents in Smalltalk or C++, this practical book explains in detail how to construct agents capable of learning and competing, including both design principles and actual code for personal agents, network or Web agents, multi-agent systems and commercial agents. New and revised coverage includes agent tools, agent uses for Web applications (including personalization, cross-selling, and e-commerce), and additional AI technologies such as fuzzy logic and genetic algorithms.

Hands-On Genetic Algorithms with Python John Wiley & Sons

This book is intended for students, researchers, and professionals interested in evolutionary algorithms at graduate and postgraduate level. No mathematics beyond basic algebra and Cartesian graphs methods is required, as the aim is to encourage applying the JAVA toolkit to develop an appreciation of the power of these techniques.

Artificial Intelligence with Python Lulu.com

Genetic algorithms have been used in science and engineering as adaptive algorithms for solving practical problems and as computational models of natural evolutionary systems. This brief, accessible introduction describes some of the most interesting research in the field and also

enables readers to implement and experiment with genetic algorithms on their own. It focuses in depth on a small set of important and interesting topics—particularly in machine learning, scientific modeling, and artificial life—and reviews a broad span of research, including the work of Mitchell and her colleagues. The descriptions of applications and modeling projects stretch beyond the strict boundaries of computer science to include dynamical systems theory, game theory, molecular biology, ecology, evolutionary biology, and population genetics, underscoring the exciting "general purpose" nature of genetic algorithms as search methods that can be employed across disciplines. An Introduction to Genetic Algorithms is accessible to students and researchers in any scientific discipline. It includes many thought and computer exercises that build on and reinforce the reader's understanding of the text. The first chapter introduces genetic algorithms and their terminology and describes two provocative applications in detail. The second and third chapters look at the use of genetic algorithms in machine learning (computer programs, data analysis and prediction, neural networks) and in scientific models (interactions among learning, evolution, and culture; sexual selection; ecosystems; evolutionary activity). Several approaches to the theory of genetic algorithms are discussed in depth in the fourth chapter. The fifth chapter

takes up implementation, and the last chapter poses some currently unanswered questions and surveys prospects for the future of evolutionary computation.

Simulation for the Social Scientist John Wiley & Sons Incorporated

Containing 101 fun, interesting, and useful ways to get more out of Java, this title targets developers and system architects who have some basic Java knowledge but may not be familiar with the wide range of libraries available.

Evolutionary Multi-Criterion Optimization No Starch Press

This book gathers the proceedings of the 2nd International Conference on Advanced Intelligent Systems and Informatics (AISIS2016), which took place in Cairo, Egypt during October 24–26, 2016. This international interdisciplinary conference, which highlighted essential research and developments in the field of informatics and intelligent systems, was organized by the Scientific Research Group in Egypt (SRGE) and sponsored by the IEEE Computational Intelligence Society (Egypt chapter) and the IEEE Robotics and Automation Society (Egypt Chapter). The book's content is divided into four main sections: Intelligent Language Processing, Intelligent Systems, Intelligent Robotics Systems, and Informatics.

Practical Genetic Algorithms Genetic Algorithms in Java Basics

Interested in the Genetic Algorithm? Simulated Annealing? Ant Colony Optimization? Essentials of Metaheuristics covers these and other metaheuristics algorithms, and is intended for undergraduate students, programmers, and non-experts. The book covers a wide range of algorithms, representations, selection and modification operators, and related topics, and includes 71 figures and 135 algorithms great and small. Algorithms include: Gradient Ascent techniques, Hill-Climbing variants, Simulated Annealing, Tabu Search variants, Iterated Local Search, Evolution Strategies, the Genetic Algorithm, the Steady-State Genetic Algorithm, Differential Evolution, Particle Swarm Optimization, Genetic Programming variants, One- and Two-Population Competitive Coevolution, N-Population Cooperative Coevolution, Implicit Fitness Sharing, Deterministic Crowding, NSGA-II, SPEA2, GRASP, Ant Colony Optimization variants, Guided Local Search, LEM, PBIL, UMDA, cGA, BOA, SAMUEL, ZCS, XCS, and XCSF.

Metaheuristics McGraw-Hill Education (UK)

What can computer simulation contribute to the social sciences? Which of the many approaches to simulation would be best for my social science project? How do I design, carry out and analyse the results from a computer simulation? Interest in social simulation has been growing rapidly worldwide as a result of increasingly powerful hardware and software and also a rising interest in the application of ideas of complexity, evolution, adaptation and chaos in the social sciences.

Simulation for the Social Scientist is a practical textbook on the techniques of building computer simulations to assist understanding of social and economic issues and problems. This authoritative book details all the common approaches to social simulation, to provide social scientists with an appreciation of the literature and allow those with some programming skills to create their own simulations. New for this edition: A new chapter on designing multi-agent systems, to support the fact that multi-agent modelling has become the most common approach to simulation New examples and guides to current software Updated throughout to take new approaches into account The book is an essential tool for social scientists in a wide range of fields, particularly sociology, economics, anthropology, geography, organizational theory, political science, social policy, cognitive psychology and cognitive science. It will also appeal to computer scientists interested in distributed artificial intelligence, multi-agent systems and agent technologies.

The Nature of Code Apress

Evolutionary models (e.g., genetic algorithms, artificial life), explored in other fields for the past two decades, are now emerging as an important new tool in GIS for a number of reasons. First, they are highly appropriate for modeling geographic phenomena. Secondly, geographical problems are often spatially separate (broken down into local or regional problems) and evolutionary algorithms can exploit this structure. Finally, the ability to store, manipulate, and visualize spatial data has increased to the point that space-time-attribute databases can be easily handled.

Introduction to Evolutionary Computing John Wiley & Sons

* This book deals with the fundamentals of genetic algorithms and their applications in a variety of different areas of engineering and science * Most significant update to the second edition is the MATLAB codes that accompany the text * Provides a thorough discussion of hybrid genetic algorithms * Features more examples than first edition

Fuzzy Modeling and Genetic Algorithms for Data Mining and Exploration Packt Publishing Ltd

A unified view of metaheuristics This book provides a complete background on metaheuristics and

shows readers how to design and implement efficient algorithms to solve complex optimization problems across a diverse range of applications, from networking and bioinformatics to engineering design, routing, and scheduling. It presents the main design questions for all families of metaheuristics and clearly illustrates how to implement the algorithms under a software framework to reuse both the design and code. Throughout the book, the key search components of metaheuristics are considered as a toolbox for: Designing efficient metaheuristics (e.g. local search, tabu search, simulated annealing, evolutionary algorithms, particle swarm optimization, scatter search, ant colonies, bee colonies, artificial immune systems) for optimization problems Designing efficient metaheuristics for multi-objective optimization problems Designing hybrid, parallel, and distributed metaheuristics Implementing metaheuristics on sequential and parallel machines Using many case studies and treating design and implementation independently, this book gives readers the skills necessary to solve large-scale optimization problems quickly and efficiently. It is a valuable reference for practicing engineers and researchers from diverse areas dealing with optimization or machine learning; and graduate students in computer science, operations research, control, engineering, business and management, and applied mathematics.

Hands-On Genetic Algorithms with Python BPB Publications

The first complete overview of evolutionary computing, the collective name for a range of problem-solving techniques based on principles of biological evolution, such as natural selection and genetic inheritance. The text is aimed directly at lecturers and graduate and undergraduate students. It is also meant for those who wish to apply evolutionary computing to a particular problem or within a given application area. The book contains quick-reference information on the current state-of-the-art in a wide range of related topics, so it is of interest not just to evolutionary computing specialists but to researchers working in other fields.

Proceedings of the International Conference on Advanced Intelligent Systems and Informatics 2016 Jason Brownlee

A gentle introduction to genetic algorithms. Genetic algorithms revisited: mathematical foundations. Computer implementation of a genetic algorithm. Some applications of genetic algorithms. Advanced operators and techniques in genetic search. Introduction to genetics-based machine learning. Applications of genetics-based machine learning. A look back, a glance ahead. A review of combinatorics and elementary probability. Pascal with random number generation for fortran, basic, and cobol programmers. A simple genetic algorithm (SGA) in pascal. A simple classifier system(SCS) in pascal. Partition coefficient transforms for problem-coding analysis.

Wicked Cool Java Springer Science & Business Media

Genetic Algorithms in Java BasicsApress

Hindawi Publishing Corporation

Refuel your AI Models and ML applications with High-Quality Optimization and Search Solutions DESCRIPTION Genetic algorithms are one of the most straightforward and powerful techniques used in machine learning. This book 'Learning Genetic Algorithms with Python' guides the reader right from the basics of genetic algorithms to its real practical implementation in production environments. Each of the chapters gives the reader an intuitive understanding of each concept. You will learn how to build a genetic algorithm from scratch and implement it in real-life problems. Covered with practical illustrated examples, you will learn to design and choose the best model architecture for the particular tasks. Cutting edge examples like radar and football manager problem statements, you will learn to solve high-dimensional big data challenges with ways of optimizing genetic algorithms. KEY FEATURES ● Complete coverage on practical implementation of genetic algorithms. ● Intuitive explanations and visualizations supply theoretical concepts. ● Added examples and use-cases on the performance of genetic algorithms. ● Use of Python libraries and a niche coverage on the performance optimization of genetic algorithms. WHAT YOU WILL LEARN ● Understand the mechanism of genetic algorithms using popular python libraries. ● Learn the principles and architecture of genetic algorithms. ● Apply and Solve planning, scheduling and analytics problems in Enterprise applications. ● Expert learning on prime concepts like Selection, Mutation and Crossover. WHO THIS BOOK IS FOR The book is for Data Science team, Analytics team, AI Engineers, ML Professionals who want to integrate genetic algorithms to refuel their ML and AI applications. No special expertise about machine learning is required although a basic knowledge of Python is expected. TABLE OF CONTENTS 1. Introduction 2. Genetic Algorithm Flow 3. Selection 4. Crossover 5. Mutation 6. Effectiveness 7. Parameter Tuning 8. Black-box Function 9. Combinatorial Optimization: Binary Gene Encoding 10. Combinatorial Optimization: Ordered Gene Encoding 11. Other Common Problems 12. Adaptive Genetic Algorithm 13.

Improving Performance

Introduction to Genetic Algorithms Morgan Kaufmann

This book offers a basic introduction to genetic algorithms. It provides a detailed explanation of genetic algorithm concepts and examines numerous genetic algorithm optimization problems. In addition, the book presents implementation of optimization problems using C and C++ as well as simulated solutions for genetic algorithm problems using MATLAB 7.0. It also includes application case studies on genetic algorithms in emerging fields.

Classic Computer Science Problems in Java MIT Press

Genetic Algorithms in Java Basics is a brief introduction to solving problems using genetic algorithms, with working projects and solutions written in the Java programming language. This brief book will guide you step-by-step through various implementations of genetic algorithms and some of their common applications, with the aim to give you a practical understanding allowing you to solve your own unique, individual problems. After reading this book you will be comfortable with the language specific issues and concepts involved with genetic algorithms and you'll have everything you need to start building your own. Genetic algorithms are frequently used to solve highly complex real world problems and with this book you too can harness their problem solving capabilities. Understanding how to utilize and implement genetic algorithms is an essential tool in any respected software developers toolkit. So step into this intriguing topic and learn how you too can improve your software with genetic algorithms, and see real Java code at work which you can develop further for your own projects and research. Guides you through the theory behind genetic algorithms Explains how genetic algorithms can be used for software developers trying to solve a range of problems Provides a step-by-step guide to implementing genetic algorithms in Java *Hands-on Machine Learning with JavaScript* Springer Science & Business Media

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.

Innovations in Smart Cities Applications Edition 2 Wiley

This book introduces a collection of algorithms for complex programming challenges in data analysis, machine learning, and graph computing. You'll discover cutting-edge approaches to a variety of tricky scenarios. --

Constructing Intelligent Agents Using Java Addison-Wesley Professional

Foundations of Algorithms, Fifth Edition offers a well-balanced presentation of algorithm design, complexity analysis of algorithms, and computational complexity. Ideal for any computer science students with a background in college algebra and discrete structures, the text presents mathematical concepts using standard English and simple notation to maximize accessibility and user-friendliness. Concrete examples, appendices reviewing essential mathematical concepts, and a student-focused approach reinforce theoretical explanations and promote learning and retention. C++ and Java pseudocode help students better understand complex algorithms. A chapter on numerical algorithms includes a review of basic number theory, Euclid's Algorithm for finding the greatest common divisor, a review of modular arithmetic, an algorithm for solving modular linear equations, an algorithm for computing modular powers, and the new polynomial-time algorithm for determining whether a number is prime. The revised and updated Fifth Edition features an all-new chapter on genetic algorithms and genetic programming, including approximate solutions to the traveling salesperson problem, an algorithm for an artificial ant that navigates along a trail of food, and an application to financial trading. With fully updated exercises and examples throughout and improved instructor resources including complete solutions, an Instructor's Manual and PowerPoint lecture outlines, Foundations of Algorithms is an essential text for undergraduate and graduate courses in the design and analysis of algorithms. Key features include: • The only text of its kind with a chapter on genetic algorithms • Use of C++ and Java pseudocode to help students better understand complex algorithms • No calculus background required • Numerous clear and student-friendly examples throughout the text • Fully updated exercises and examples throughout • Improved instructor resources, including complete solutions, an Instructor's Manual, and

PowerPoint lecture outlines

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