

High level synthesis from algorithm to digital circuit (Download Only)

Exact Exponential Algorithms High-Level Synthesis Introduction to Parallel Computing Experimental Algorithmics Algorithms For Dummies A Programmer's Companion to Algorithm Analysis Advances in Distributed Systems Text Algorithms Learning Motor Skills From Algorithms to Hardware Architectures Algorithms for Data Science From Algorithm to Digital System Algorithms to Live By Optimal Algorithms Scalable Optimization via Probabilistic Modeling Introduction to Algorithms, fourth edition Learn Data Structures and Algorithms with Golang Algorithms in Bioinformatics Competitive Programming in Python Problem Solving in Data Structures & Algorithms Using Python Learning Genetic Algorithms with Python Genetic Algorithms Algorithms: The Building Blocks of Computer Programming Combinatorial Search: From Algorithms to Systems The Design and Analysis of Algorithms Codeless Data Structures and Algorithms Thinking in Algorithms Wireless Medical Systems and Algorithms Algorithms in Combinatorial Geometry Dominant Algorithms to Evaluate Artificial Intelligence: From the View of Throughput Model Algorithmic Thinking Learning in Energy-Efficient Neuromorphic Computing: Algorithm and Architecture Co-Design Essential Algorithms Hypercube Algorithms Data Structures and Algorithms Algorithms Unlocked Genetic Algorithms in Electromagnetics Dynamic Reconfiguration OmeGA Pattern Mining with Evolutionary Algorithms

Exact Exponential Algorithms

2010-10-26

for a long time computer scientists have distinguished between fast and slow algorithms fast or good algorithms are the algorithms that run in polynomial time which means that the number of steps required for the algorithm to solve a problem is bounded by some polynomial in the length of the input all other algorithms are slow or bad the running time of slow algorithms is usually exponential this book is about bad algorithms there are several reasons why we are interested in exponential time algorithms most of us believe that there are many natural problems which cannot be solved by polynomial time algorithms the most famous and oldest family of hard problems is the family of np complete problems most likely there are no polynomial time algorithms solving these hard problems and in the worst case scenario the exponential running time is unavoidable every combinatorial problem is solvable in finite time by enumerating all possible solutions i.e. by brute force search but brute force search is always unavoidable definitely not already in the nineteen sixties and seventies it was known that some np complete problems can be solved significantly faster than by brute force search three classic examples are the following algorithms for the travelling salesman problem maximum independent set and coloring

High-Level Synthesis

2010-11-10

this book presents an excellent collection of contributions addressing different aspects of high level synthesis from both industry and academia it includes an overview of available eda tool solutions and their applicability to design problems

Introduction to Parallel Computing

2018-09-27

advancements in microprocessor architecture interconnection technology and software development have fueled rapid growth in parallel and distributed computing however this development is only of practical benefit if it is accompanied by progress in the design analysis and programming of parallel algorithms this concise textbook provides in one place three mainstream parallelization approaches open mpp mpi and opencl for multicore computers interconnected computers and graphical processing units an overview of practical parallel computing and principles will enable the reader to design efficient parallel programs for solving various computational problems on state of the art personal computers and computing clusters topics covered range from parallel algorithms programming tools openmp mpi and opencl followed by experimental measurements of parallel programs run times and by engineering analysis of obtained results for improved parallel execution performances many examples and exercises support the exposition

Experimental Algorithmics

2002-12-13

experimental algorithmics as its name indicates combines algorithmic work and experimentation algorithms are not just designed but also implemented and tested on a variety of instances perhaps the most important lesson in this process is that designing an algorithm is but the first step in the process of developing robust and efficient software for applications based on a seminar held at dagstuhl castle germany in september 2000 this state of the art survey presents a coherent survey of the work done in the area so far the 11 carefully reviewed chapters provide complete coverage of all current topics in experimental algorithmics

Algorithms For Dummies

2017-04-11

discover how algorithms shape and impact our digital world all data big or small starts with algorithms algorithms are mathematical equations that determine what we see based on our likes dislikes queries views interests relationships and more online they are in a sense the electronic gatekeepers to our digital as well as our physical world this book demystifies the subject of algorithms so you can understand how important they are business and scientific decision making algorithms for dummies is a clear and concise primer for everyday people who are interested in algorithms and how they impact our digital lives based on the fact that we already live in a world where algorithms are behind most of the technology we use this book offers eye opening information on the pervasiveness and importance of this mathematical science how it plays out in our everyday digestion of news and entertainment as well as in its influence on our social interactions and consumerism readers even learn how to program an algorithm using python become well versed in the major areas comprising algorithms examine the incredible history behind algorithms get familiar with real world applications of problem solving procedures experience hands on development of an algorithm from start to finish with python if you have a nagging curiosity about why an ad for that hammock you checked out on amazon is appearing on your facebook page you ll find algorithm for dummies to be an enlightening introduction to this integral realm of math science and business

A Programmer's Companion to Algorithm Analysis

2006-09-26

until now no other book examined the gap between the theory of algorithms and the production of software programs focusing on practical issues a programmer's companion to algorithm analysis carefully details the transition from the design and analysis of an algorithm to the resulting software program consisting of two main complementary parts the book emphasizes the concrete aspects of translating an algorithm into software that should perform based on what the algorithm analysis indicated in the first part the author describes the idealized universe that algorithm designers inhabit while the second part outlines how this ideal can be adapted to the real world of programming the book explores analysis techniques including crossover points the influence of the memory hierarchy implications of programming language aspects such as recursion and problems arising from excessively high computational complexities of solution methods it concludes with four appendices that discuss basic algorithms memory hierarchy virtual memory management optimizing compilers and garbage collection np completeness and higher complexity classes and undecidability in practical terms applying the theory of algorithms to the production of software a programmer's companion to algorithm analysis fulfills the needs of software programmers and developers as well as students by showing that with the correct algorithm you can achieve a functional software program

Advances in Distributed Systems

2000-02-23

this book documents the main results developed in the course of the european project basic research on advanced distributed computing from algorithms to systems broadcast eight major european research groups in distributed computing cooperated on this projects from 1992 to 1999 the 21 thoroughly cross reviewed final full papers present the state of the art results on distributed systems in a coherent way the book is divided in parts on distributed algorithms systems architecture applications support and case studies

Text Algorithms

1994

this much needed book on the design of algorithms and data structures for text processing emphasizes both theoretical foundations and practical applications it is intended to serve both as a textbook for courses on algorithm design especially those related to text processing and as a reference for computer science professionals the work takes a unique approach one that goes more deeply into its topic than other more general books it contains both classical algorithms and recent results of research on the subject the book is the first text to contain a collection of a wide range of text algorithms many of them quite new and appearing here for the first time other algorithms while known by reputation have never been published in the journal literature two such important algorithms are those of karp miller and rosenberg and that of weiner here they are presented together for the first time the core of the book is the material on suffix trees and subword graphs applications of these data structures new approaches to time space optimal string matching and text compression also covered are basic parallel algorithms for text problems applications of all these algorithms are given for problems involving data retrieval systems treatment of natural languages investigation of genomes data compression software and text processing tools from the theoretical point of view the book is a goldmine of paradigms for the development of efficient algorithms providing the necessary foundation to creating practical software dealing with sequences a crucial

point in the authors approach is the development of a methodology for presenting text algorithms so they can be fully understood throughout the book emphasizes the efficiency of algorithms holding that the essence of their usefulness depends on it this is especially important since the algorithms described here will find application in big science areas like molecular sequence analysis where the explosive growth of data has caused problems for the current generation of software finally with its development of theoretical background the book can be considered as a mathematical foundation for the analysis and production of text processing algorithms

Learning Motor Skills

2013-11-23

this book presents the state of the art in reinforcement learning applied to robotics both in terms of novel algorithms and applications it discusses recent approaches that allow robots to learn motor skills and presents tasks that need to take into account the dynamic behavior of the robot and its environment where a kinematic movement plan is not sufficient the book illustrates a method that learns to generalize parameterized motor plans which is obtained by imitation or reinforcement learning by adapting a small set of global parameters and appropriate kernel based reinforcement learning algorithms the presented applications explore highly dynamic tasks and exhibit a very efficient learning process all proposed approaches have been extensively validated with benchmarks tasks in simulation and on real robots these tasks correspond to sports and games but the presented techniques are also applicable to more mundane household tasks the book is based on the first author s doctoral thesis which won the 2013 euron georges giralt phd award

From Algorithms to Hardware Architectures

2023-08-06

this book uses digital radios as a challenging design example generalized to bridge a typical gap between designers who work on algorithms and those who work to implement those algorithms on silicon the author shows how such a complex system can be moved from high level characterization to a form that is ready for hardware implementation along the way readers learn a lot about how algorithm designers can benefit from knowing the hardware they target and how hardware designers can benefit from a familiarity with the algorithm the book shows how a high level description of an algorithm can be migrated to a fixed point block diagram with a well defined cycle accurate architecture and a fully documented controller this can significantly reduce the length of the hardware design cycle and can improve its outcomes ultimately the book presents an explicit design flow that bridges the gap between algorithm design and hardware design provides a guide to baseband radio design for wi fi and cellular systems from an implementation focused perspective explains how arithmetic is moved to hardware and what the cost of each operation is in terms of delay area and power enables strategic architectural decisions based on the algorithm available processing units and design requirements

Algorithms for Data Science

2016-12-25

this textbook on practical data analytics unites fundamental principles algorithms and data algorithms are the keystone of data analytics and the focal point of this textbook clear and intuitive explanations of the mathematical and statistical foundations make the algorithms transparent but practical data analytics requires more than just the foundations problems and data are enormously variable and

2015-11-10

4/17

high level synthesis from
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only the most elementary of algorithms can be used without modification programming fluency and experience with real and challenging data is indispensable and so the reader is immersed in python and r and real data analysis by the end of the book the reader will have gained the ability to adapt algorithms to new problems and carry out innovative analyses this book has three parts a data reduction begins with the concepts of data reduction data maps and information extraction the second chapter introduces associative statistics the mathematical foundation of scalable algorithms and distributed computing practical aspects of distributed computing is the subject of the hadoop and mapreduce chapter b extracting information from data linear regression and data visualization are the principal topics of part ii the authors dedicate a chapter to the critical domain of healthcare analytics for an extended example of practical data analytics the algorithms and analytics will be of much interest to practitioners interested in utilizing the large and unwieldy data sets of the centers for disease control and prevention s behavioral risk factor surveillance system c predictive analytics two foundational and widely used algorithms k nearest neighbors and naive bayes are developed in detail a chapter is dedicated to forecasting the last chapter focuses on streaming data and uses publicly accessible data streams originating from the twitter api and the nasdaq stock market in the tutorials this book is intended for a one or two semester course in data analytics for upper division undergraduate and graduate students in mathematics statistics and computer science the prerequisites are kept low and students with one or two courses in probability or statistics an exposure to vectors and matrices and a programming course will have no difficulty the core material of every chapter is accessible to all with these prerequisites the chapters often expand at the close with innovations of interest to practitioners of data science each chapter includes exercises of varying levels of difficulty the text is eminently suitable for self study and an exceptional resource for practitioners

From Algorithm to Digital System

2020-11-24

this book is about how to use the synthagate tool for the design of complex digital systems at the high level and register transfer level specifically it demonstrates how to use synthagate through the design of a processor to showcase the potential of synthagate the main difference between synthagate and other design tools is that the designer is not required to use hardware description languages instead synthagate uses algorithmic state machines asms at the different steps of design synthagate covers most digital system designs from dsp to processing units this tool can be used in the design of robots controllers processors iot ai systems video and voice processing systems digital systems for automated and autonomous cars et cetera most importantly not only experienced hardware designers but application engineers can design complex digital systems with synthagate synthagate can also be useful for students and educators of universities and colleges in courses such as digital system design systems on the chips vlsi system design embedded systems computer system architecture and many others how should you begin to work with the synthagate tool and this book first you can download the synthagate tool for two months for free at synthesizez.com download synthagate if you are familiar with fsm and asm head straight to chapter 2 in the second chapter i demonstrate the design of a processor with synthagate in detail you can take the example of the same processor in folder cpu_4_16_8altera in gui.zip from the benchmark s list synthesizez.com hsl and rtl benchmarks and follow the step by step design guide explained in the second chapter of course you can take any example from benchmarks and do the same or try to design a device that has behavior you are familiar with if you have any ideas suggestions or comments we would be delighted to hear from you at support.synthesizez.com

Algorithms to Live By

2016-04-19

an exploration of how computer algorithms can be applied to our everyday lives to solve common decision making problems and illuminate the workings of the human mind what should we do or leave undone in a day or a lifetime how much messiness should we accept what balance of the new and familiar is the most fulfilling these may seem like uniquely human quandaries but they are not computers like us confront limited space and time so computer scientists have been grappling with similar problems for decades and the solutions they've found have much to teach us in a dazzlingly interdisciplinary work brian christian and tom griffiths show how algorithms developed for computers also untangle very human questions they explain how to have better hunches and when to leave things to chance how to deal with overwhelming choices and how best to connect with others from finding a spouse to finding a parking spot from organizing one's inbox to peering into the future algorithms to live by transforms the wisdom of computer science into strategies for human living

Optimal Algorithms

1989-11-08

this volume brings together papers from various fields of theoretical computer science including computational geometry parallel algorithms algorithms on graphs data structures and complexity of algorithms some of the invited papers include surveys of results in particular fields and some report original research while all the contributed papers report original research most of the algorithms given are for parallel models of computation the papers were presented at the second international symposium on optimal algorithms held in varna bulgaria in may june 1989 the volume will be useful to researchers and students in theoretical computer science especially in parallel computing

Scalable Optimization via Probabilistic Modeling

2006-09-25

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 modeling from algorithms to applications you need not worry that you're going to pick up this book and find stray articles about anything else this book focuses like a laser beam on one of the hottest topics in evolutionary computation over the last decade or so estimation of distribution algorithms edas edas borrow evolutionary computation's population orientation and selectionism 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 efficiency enhancement and then concludes with relevant applications the emphasis on efficiency enhancement is particularly important because the data mining perspective implicit in edas opens up the world of optimization to new methods of data guided adaptation that can further speed solutions through the construction and utilization of effective surrogates hybrids and parallel and temporal decompositions

Introduction to Algorithms, fourth edition

2022-04-05

a comprehensive update of the leading algorithms text with new material on matchings in bipartite graphs online algorithms machine learning and other topics some books on algorithms are rigorous but incomplete others cover masses of material but lack rigor introduction to algorithms uniquely combines rigor and comprehensiveness it covers a broad range of algorithms in depth yet makes their design and analysis accessible to all levels of readers with self contained chapters and algorithms in pseudocode since the publication of the first edition introduction to algorithms has become the leading algorithms text in universities worldwide as well as the standard reference for professionals this fourth edition has been updated throughout new for the fourth edition new chapters on matchings in bipartite graphs online algorithms and machine learning new material on topics including solving recurrence equations hash tables potential functions and suffix arrays 140 new exercises and 22 new problems reader feedback informed improvements to old problems clearer more personal and gender neutral writing style color added to improve visual presentation notes bibliography and index updated to reflect developments in the field website with new supplementary material warning avoid counterfeit copies of introduction to algorithms by buying only from reputable retailers counterfeit and pirated copies are incomplete and contain errors

Learn Data Structures and Algorithms with Golang

2019-03-30

explore golang s data structures and algorithms to design implement and analyze code in the professional setting key features learn the basics of data structures and algorithms and implement them efficiently use data structures such as arrays stacks trees lists and graphs in real world scenarios compare the complexity of different algorithms and data structures for improved code performance book description golang is one of the fastest growing programming languages in the software industry its speed simplicity and reliability make it the perfect choice for building robust applications this brings the need to have a solid foundation in data structures and algorithms with go so as to build scalable applications complete with hands on tutorials this book will guide you in using the best data structures and algorithms for problem solving the book begins with an introduction to go data structures and algorithms you ll learn how to store data using linked lists arrays stacks and queues moving ahead you ll discover how to implement sorting and searching algorithms followed by binary search trees this book will also help you improve the performance of your applications by stringing data types and implementing hash structures in algorithm design finally you ll be able to apply traditional data structures to solve real world problems by the end of the book you ll have become adept at implementing classic data structures and algorithms in go propelling you to become a confident go programmer what you will learn improve application performance using the most suitable data structure and algorithm explore the wide range of classic algorithms such as recursion and hashing algorithms work with algorithms such as garbage collection for efficient memory management analyze the cost and benefit trade off to identify algorithms and data structures for problem solving explore techniques for writing pseudocode algorithm and ace whiteboard coding in interviews discover the pitfalls in selecting data structures and algorithms by predicting their speed and efficiency who this book is for this book is for developers who want to understand how to select the best data structures and algorithms that will help solve coding problems basic go programming experience will be an added advantage

Algorithms in Bioinformatics

2007-08-22

the refereed proceedings from the 7th international workshop on algorithms in bioinformatics are provided in this volume papers address current issues in algorithms in bioinformatics ranging from mathematical tools to experimental studies of approximation algorithms to significant computational analyses biological problems examined include genetic mapping sequence alignment and analysis phylogeny comparative genomics and protein structure

Competitive Programming in Python

2020-11-30

want to kill it at your job interview in the tech industry want to win that coding competition learn all the algorithmic techniques and programming skills you need from two experienced coaches problem setters and jurors for coding competitions the authors highlight the versatility of each algorithm by considering a variety of problems and show how to implement algorithms in simple and efficient code readers can expect to master 128 algorithms in python and discover the right way to tackle a problem and quickly implement a solution of low complexity classic problems like dijkstra s shortest path algorithm and knuth morris pratt s string matching algorithm are featured alongside lesser known data structures like fenwick trees and knuth s dancing links the book provides a framework to tackle algorithmic problem solving including definition complexity applications algorithm key information implementation variants in practice and problems python code included in the book and on the companion website

Problem Solving in Data Structures & Algorithms Using Python

2019-05-16

problem solving in data structures algorithms is a series of books about the usage of data structures and algorithms in computer programming the book is easy to follow and is written for interview preparation point of view in these books the examples are solved in various languages like go c c java c python vb javascript and php github repositories for these books github.com/hemant-jain/author-book-s-composition this book introduces you to the world of data structures and algorithms data structures defines the way in which data is arranged in memory for fast and efficient access while algorithms are a set of instruction to solve problems by manipulating these data structures designing an efficient algorithm is a very important skill that all software companies e.g. microsoft google facebook etc pursues most of the interviews for these companies are focused on knowledge of data structures and algorithms they look for how candidates use concepts of data structures and algorithms to solve complex problems efficiently apart from knowing a programming language you also need to have good command of these key computer fundamentals to not only qualify the interview but also excel in your jobs as a software engineer this book assumes that you are a c language developer you are not an expert in c language but you are well familiar with concepts of classes functions arrays pointers and recursion at the start of this book we will be looking into complexity analysis followed by the various data structures and their algorithms we will be looking into a linked list stack queue trees heap hash table and graphs we will also be looking into sorting searching techniques in last few chapters we will be looking into various algorithmic techniques such as brute force algorithms greedy algorithms divide and conquer algorithms dynamic programming

reduction and backtracking table of contents chapter 0 how to use this book chapter 1 algorithms analysis chapter 2 approach to solve algorithm design problems chapter 3 abstract data type c collections chapter 4 searching chapter 5 sorting chapter 6 linked list chapter 7 stack chapter 8 queue chapter 9 tree chapter 10 priority queue chapter 11 hash table chapter 12 graphs chapter 13 string algorithms chapter 14 algorithm design techniques chapter 15 brute force algorithm chapter 16 greedy algorithm chapter 17 divide conquer chapter 18 dynamic programming chapter 19 backtracking chapter 20 complexity theory

Learning Genetic Algorithms with Python

2021-02-13

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

Genetic Algorithms

2001-02-19

this comprehensive book gives a overview of the latest discussions in the application of genetic algorithms to solve engineering problems featuring real world applications and an accompanying disk giving the reader the opportunity to use an interactive genetic algorithms demonstration program

Algorithms: The Building Blocks of Computer Programming

2018-07-15

algorithms might sound like a complicated tech term but don t be intimidated people actually use them every day using accessible language and full color photographs this book simplifies algorithms in an easy to understand way readers will be amazed to learn that an algorithm is just a set of steps for computers to follow to get things done stem topics from the next generation science standards are

2015-11-10 **9/17** high level synthesis from algorithm to digital circuit

emphasized throughout the text sidebars featuring key terms help readers grow their tech vocabulary and fact boxes provide additional opportunities to learn

Combinatorial Search: From Algorithms to Systems

2013-10-29

although they are believed to be unsolvable in general tractability results suggest that some practical np hard problems can be efficiently solved combinatorial search algorithms are designed to efficiently explore the usually large solution space of these instances by reducing the search space to feasible regions and using heuristics to efficiently explore these regions various mathematical formalisms may be used to express and tackle combinatorial problems among them the constraint satisfaction problem csp and the propositional satisfiability problem sat these algorithms or constraint solvers apply search space reduction through inference techniques use activity based heuristics to guide exploration diversify the searches through frequent restarts and often learn from their mistakes in this book the author focuses on knowledge sharing in combinatorial search the capacity to generate and exploit meaningful information such as redundant constraints heuristic hints and performance measures during search which can dramatically improve the performance of a constraint solver information can be shared between multiple constraint solvers simultaneously working on the same instance or information can help achieve good performance while solving a large set of related instances in the first case information sharing has to be performed at the expense of the underlying search effort since a solver has to stop its main effort to prepare and communicate the information to other solvers on the other hand not sharing information can incur a cost for the whole system with solvers potentially exploring unfeasible spaces discovered by other solvers in the second case sharing performance measures can be done with little overhead and the goal is to be able to tune a constraint solver in relation to the characteristics of a new instance this corresponds to the selection of the most suitable algorithm for solving a given instance the book is suitable for researchers practitioners and graduate students working in the areas of optimization search constraints and computational complexity

The Design and Analysis of Algorithms

1992

these are my lecture notes from cs681 design and analysis of algorithms a one semester graduate course i taught at cornell for three consecutive fall semesters from 88 to 90 the course serves a dual purpose to cover core material in algorithms for graduate students in computer science preparing for their phd qualifying exams and to introduce theory students to some advanced topics in the design and analysis of algorithms the material is thus a mixture of core and advanced topics at first i meant these notes to supplement and not supplant a textbook but over the three years they gradually took on a life of their own in addition to the notes i depended heavily on the texts a v aho j e hopcroft and j d ullman the design and analysis of computer algorithms addison wesley 1975 m r garey and d s johnson computers and intractability a guide to the theory of np completeness w h freeman 1979 r e tarjan data structures and network algorithms siam regional conference series in applied mathematics 44 1983 and still recommend them as excellent references

Codeless Data Structures and Algorithms

2020-02-13

in the era of self taught developers and programmers essential topics in the industry are frequently

learned without a formal academic foundation a solid grasp of data structures and algorithms is imperative for anyone looking to do professional software development and engineering but classes in the subject can be dry or spend too much time on theory and unnecessary readings regardless of your programming language background codeless data structures and algorithms has you covered in this book author armstrong subero will help you learn dsas without writing a single line of code straightforward explanations and diagrams give you a confident handle on the topic while ensuring you never have to open your code editor use a compiler or look at an integrated development environment subero introduces you to linear tree and hash data structures and gives you important insights behind the most common algorithms that you can directly apply to your own programs codeless data structures and algorithms provides you with the knowledge about dsas that you will need in the professional programming world without using any complex mathematics or irrelevant information whether you are a new developer seeking a basic understanding of the subject or a decision maker wanting a grasp of algorithms to apply to your projects this book belongs on your shelf quite often a new refreshing and unpretentious approach to a topic is all you need to get inspired what you will learn understand tree data structures without delving into unnecessary details or going into too much theory get started learning linear data structures with a basic discussion on computer memory study an overview of arrays linked lists stacks and queues who this book is for this book is for beginners self taught developers and programmers and anyone who wants to understand data structures and algorithms but don't want to wade through unnecessary details about quirks of a programming language or don't have time to sit and read a massive book on the subject this book is also useful for non technical decision makers who are curious about how algorithms work

Thinking in Algorithms

2021-10-02

think creatively like a human analyze and solve problems efficiently like a computer our everyday lives are filled with inefficient and ineffective decisions and solutions being overwhelmed by the magnitude of our problems makes it hard to think clearly we procrastinate and overthink our thoughts are tainted with biases if only there was a way to simplify our decision making and problem solving process and get satisfying consistent results the good news is there is apply computer algorithms to your everyday problems learn what algorithms are and use them for better decision making problem solving and staying on track with your plans become more productive organized finish what you start and make better decisions if you feel that you're not living up to your potential struggle with being consistent about your habits and would like to make quicker and better decisions this book is for you get things started immediately and finish them within your deadline thinking in algorithms presents research and scientific studies on behavioral economics cognitive science and neuropsychology about what constitutes a great decision what are and how to manage its roadblocks this is an interdisciplinary work that will help you learn how to apply computer algorithm based solutions to your life challenges know when to stop be efficient with your time and energy albert rutherford is an internationally bestselling author whose writing derives from various sources such as research coaching academic and real life experience machine learning principles for the laymen learn to build your own problem solving algorithms using a unique formula the science of optimal stopping how to overcome procrastination and overthinking using algorithms help your emotional biased brain to make more rational and predictable decisions and follow through plans using algorithm based problem solving today not convinced yet check out the look inside feature of this book hitting the top left corner of this page and read the first pages for free

Wireless Medical Systems and Algorithms

2017-11-22

wireless medical systems and algorithms design and applications provides a state of the art overview of the key steps in the development of wireless medical systems from biochips to brain computer interfaces and beyond the book also examines some of the most advanced algorithms and data processing in the field addressing the latest challenges and solutions related to the medical needs electronic design advanced materials chemistry wireless body sensor networks and technologies suitable for wireless medical devices the text investigates the technological and manufacturing issues associated with the development of wireless medical devices introduces the techniques and strategies that can optimize the performances of algorithms for medical applications and provide robust results in terms of data reliability includes a variety of practical examples and case studies relevant to engineers medical doctors chemists and biologists wireless medical systems and algorithms design and applications not only highlights new technologies for the continuous surveillance of patient health conditions but also shows how disciplines such as chemistry biology engineering and medicine are merging to produce a new class of smart devices capable of managing and monitoring a wide range of cognitive and physical disabilities

Algorithms in Combinatorial Geometry

1987-07-31

computational geometry as an area of research in its own right emerged in the early seventies of this century right from the beginning it was obvious that strong connections of various kinds exist to questions studied in the considerably older field of combinatorial geometry for example the combinatorial structure of a geometric problem usually decides which algorithmic method solves the problem most efficiently furthermore the analysis of an algorithm often requires a great deal of combinatorial knowledge as it turns out however the connection between the two research areas commonly referred to as computational geometry and combinatorial geometry is not as lop sided as it appears indeed the interest in computational issues in geometry gives a new and constructive direction to the combinatorial study of geometry it is the intention of this book to demonstrate that computational and combinatorial investigations in geometry are doomed to profit from each other to reach this goal i designed this book to consist of three parts a combinatorial part a computational part and one that presents applications of the results of the first two parts the choice of the topics covered in this book was guided by my attempt to describe the most fundamental algorithms in computational geometry that have an interesting combinatorial structure in this early stage geometric transforms played an important role as they reveal connections between seemingly unrelated problems and thus help to structure the field

Dominant Algorithms to Evaluate Artificial Intelligence: From the View of Throughput Model

2022-07-20

this book describes the throughput model methodology that can enable individuals and organizations to better identify understand and use algorithms to solve daily problems the throughput model is a progressive model intended to advance the artificial intelligence ai field since it represents symbol manipulation in six algorithmic pathways that are theorized to mimic the essential pillars of human cognition namely perception information judgment and decision choice the six ai algorithmic

pathways are 1 expedient algorithmic pathway 2 ruling algorithmic guide pathway 3 analytical algorithmic pathway 4 revisionist algorithmic pathway 5 value driven algorithmic pathway and 6 global perspective algorithmic pathway as ai is increasingly employed for applications where decisions require explanations the throughput model offers business professionals the means to look under the hood of ai and comprehend how those decisions are attained by organizations key features covers general concepts of artificial intelligence and machine learning explains the importance of dominant ai algorithms for business and ai research provides information about 6 unique algorithmic pathways in the throughput model provides information to create a roadmap towards building architectures that combine the strengths of the symbolic approaches for analyzing big data explains how to understand the functions of an ai algorithm to solve problems and make good decisions informs managers who are interested in employing ethical and trustworthiness features in systems dominant algorithms to evaluate artificial intelligence from the view of throughput model is an informative reference for all professionals and scholars who are working on ai projects to solve a range of business and technical problems

Algorithmic Thinking

2020-12-15

a hands on problem based introduction to building algorithms and data structures to solve problems with a computer algorithmic thinking will teach you how to solve challenging programming problems and design your own algorithms daniel zingaro a master teacher draws his examples from world class programming competitions like usaco and ioi you ll learn how to classify problems choose data structures and identify appropriate algorithms you ll also learn how your choice of data structure whether a hash table heap or tree can affect runtime and speed up your algorithms and how to adopt powerful strategies like recursion dynamic programming and binary search to solve challenging problems line by line breakdowns of the code will teach you how to use algorithms and data structures like the breadth first search algorithm to find the optimal way to play a board game or find the best way to translate a book dijkstra s algorithm to determine how many mice can exit a maze or the number of fastest routes between two locations the union find data structure to answer questions about connections in a social network or determine who are friends or enemies the heap data structure to determine the amount of money given away in a promotion the hash table data structure to determine whether snowflakes are unique or identify compound words in a dictionary note each problem in this book is available on a programming judge website you ll find the site s url and problem id in the description what s better than a free correctness check

Learning in Energy-Efficient Neuromorphic Computing: Algorithm and Architecture Co-Design

2019-10-18

explains current co design and co optimization methodologies for building hardware neural networks and algorithms for machine learning applications this book focuses on how to build energy efficient hardware for neural networks with learning capabilities and provides co design and co optimization methodologies for building hardware neural networks that can learn presenting a complete picture from high level algorithm to low level implementation details learning in energy efficient neuromorphic computing algorithm and architecture co design also covers many fundamentals and essentials in neural networks e g deep learning as well as hardware implementation of neural networks the book begins with an overview of neural networks it then discusses algorithms for utilizing and training rate based artificial neural networks next comes an introduction to various

options for executing neural networks ranging from general purpose processors to specialized hardware from digital accelerator to analog accelerator a design example on building energy efficient accelerator for adaptive dynamic programming with neural networks is also presented an examination of fundamental concepts and popular learning algorithms for spiking neural networks follows that along with a look at the hardware for spiking neural networks then comes a chapter offering readers three design examples two of which are based on conventional cmos and one on emerging nanotechnology to implement the learning algorithm found in the previous chapter the book concludes with an outlook on the future of neural network hardware includes cross layer survey of hardware accelerators for neuromorphic algorithms covers the co design of architecture and algorithms with emerging devices for much improved computing efficiency focuses on the co design of algorithms and hardware which is especially critical for using emerging devices such as traditional memristors or diffusive memristors for neuromorphic computing learning in energy efficient neuromorphic computing algorithm and architecture co design is an ideal resource for researchers scientists software engineers and hardware engineers dealing with the ever increasing requirement on power consumption and response time it is also excellent for teaching and training undergraduate and graduate students about the latest generation neural networks with powerful learning capabilities

Essential Algorithms

2019-05-29

a friendly introduction to the most useful algorithms written in simple intuitive english the revised and updated second edition of essential algorithms offers an accessible introduction to computer algorithms the book contains a description of important classical algorithms and explains when each is appropriate the author shows how to analyze algorithms in order to understand their behavior and teaches techniques that can be used to create new algorithms to meet future needs the text includes useful algorithms such as methods for manipulating common data structures advanced data structures network algorithms and numerical algorithms it also offers a variety of general problem solving techniques in addition to describing algorithms and approaches the author offers details on how to analyze the performance of algorithms the book is filled with exercises that can be used to explore ways to modify the algorithms in order to apply them to new situations this updated edition of essential algorithms contains explanations of algorithms in simple terms rather than complicated math steps through powerful algorithms that can be used to solve difficult programming problems helps prepare for programming job interviews that typically include algorithmic questions offers methods can be applied to any programming language includes exercises and solutions useful to both professionals and students provides code examples updated and written in python and c essential algorithms has been updated and revised and offers professionals and students a hands on guide to analyzing algorithms as well as the techniques and applications the book also includes a collection of questions that may appear in a job interview the book s website will include reference implementations in python and c which can be easily applied to java and c

Hypercube Algorithms

2012-12-06

fundamentals algorithms for simd and mimd hypercubes are developed these include algorithms for such problems as data broadcasting data sum prefix sum shift data circulation data accumulation sorting random access reads and writes and data permutation the fundamental algorithms are then used to obtain efficient hypercube algorithms for matrix multiplication image processing problems such as convolution template matching hough transform clustering and image processing transformation and string editing most of the algorithms in this book are for hypercubes with the

number of processors being a function of problems size however for image processing problems the book also includes algorithms for and mimd hypercube with a small number of processes experimental results on an ncube 77 mimd hypercube are also presented the book is suitable for use in a one semester or one quarter course on hypercube algorithms for students with no prior exposure to parallel algorithms it is recommended that one week will be spent on the material in chapter 1 about six weeks on chapter 2 and one week on chapter 3 the remainder of the term can be spent covering topics from the rest of the book

Data Structures and Algorithms

2003

this is an excellent up to date and easy to use text on data structures and algorithms that is intended for undergraduates in computer science and information science the thirteen chapters written by an international group of experienced teachers cover the fundamental concepts of algorithms and most of the important data structures as well as the concept of interface design the book contains many examples and diagrams whenever appropriate program codes are included to facilitate learning this book is supported by an international group of authors who are experts on data structures and algorithms through its website at cs.pitt.edu/jung/growingbook so that both teachers and students can benefit from their expertise

Algorithms Unlocked

2013-03-01

for anyone who has ever wondered how computers solve problems an engagingly written guide for nonexperts to the basics of computer algorithms have you ever wondered how your gps can find the fastest way to your destination selecting one route from seemingly countless possibilities in mere seconds how your credit card account number is protected when you make a purchase over the internet the answer is algorithms and how do these mathematical formulations translate themselves into your gps your laptop or your smart phone this book offers an engagingly written guide to the basics of computer algorithms in algorithms unlocked thomas cormen coauthor of the leading college textbook on the subject provides a general explanation with limited mathematics of how algorithms enable computers to solve problems readers will learn what computer algorithms are how to describe them and how to evaluate them they will discover simple ways to search for information in a computer methods for rearranging information in a computer into a prescribed order sorting how to solve basic problems that can be modeled in a computer with a mathematical structure called a graph useful for modeling road networks dependencies among tasks and financial relationships how to solve problems that ask questions about strings of characters such as dna structures the basic principles behind cryptography fundamentals of data compression and even that there are some problems that no one has figured out how to solve on a computer in a reasonable amount of time

Genetic Algorithms in Electromagnetics

2007-04-27

a thorough and insightful introduction to using genetic algorithms to optimize electromagnetic systems genetic algorithms in electromagnetics focuses on optimizing the objective function when a computer algorithm analytical model or experimental result describes the performance of an electromagnetic system it offers expert guidance to optimizing electromagnetic systems using genetic algorithms ga which have proven to be tenacious in finding optimal results where traditional high level synthesis from algorithm to digital circuit

techniques fail genetic algorithms in electromagnetics begins with an introduction to optimization and several commonly used numerical optimization routines and goes on to feature introductions to ga in both binary and continuous variable forms complete with examples of matlab r commands two step by step examples of optimizing antenna arrays as well as a comprehensive overview of applications of ga to antenna array design problems coverage of ga as an adaptive algorithm including adaptive and smart arrays as well as adaptive reflectors and crossed dipoles explanations of the optimization of several different wire antennas starting with the famous crooked monopole how to optimize horn reflector and microstrip patch antennas which require significantly more computing power than wire antennas coverage of ga optimization of scattering including scattering from frequency selective surfaces and electromagnetic band gap materials ideas on operator and parameter selection for a ga detailed explanations of particle swarm optimization and multiple objective optimization an appendix of matlab code for experimentation

Dynamic Reconfiguration

2013-04-26

dynamic reconfiguration architectures and algorithms offers a comprehensive treatment of dynamically reconfigurable computer architectures and algorithms for them the coverage is broad starting from fundamental algorithmic techniques ranging across algorithms for a wide array of problems and applications to simulations between models the presentation employs a single reconfigurable model the reconfigurable mesh for most algorithms to enable the reader to distill key ideas without the cumbersome details of a myriad of models in addition to algorithms the book discusses topics that provide a better understanding of dynamic reconfiguration such as scalability and computational power and more recent advances such as optical models run time reconfiguration on fpga and related platforms and implementing dynamic reconfiguration the book featuring many examples and a large set of exercises is an excellent textbook or reference for a graduate course it is also a useful reference to researchers and system developers in the area

OmeGA

2012-12-06

omega a competent genetic algorithm for solving permutation and scheduling problems addresses two increasingly important areas in ga implementation and practice omega or the ordering messy genetic algorithm combines some of the latest in competent ga technology to solve scheduling and other permutation problems competent gas are those designed for principled solutions of hard problems quickly reliably and accurately permutation and scheduling problems are difficult combinatorial optimization problems with commercial import across a variety of industries this book approaches both subjects systematically and clearly the first part of the book presents the clearest description of messy gas written to date along with an innovative adaptation of the method to ordering problems the second part of the book investigates the algorithm on boundedly difficult test functions showing principled scale up as problems become harder and longer finally the book applies the algorithm to a test function drawn from the literature of scheduling

Pattern Mining with Evolutionary Algorithms

2016-06-13

this book provides a comprehensive overview of the field of pattern mining with evolutionary algorithms to do so it covers formal definitions about patterns patterns mining type of patterns and

the usefulness of patterns in the knowledge discovery process as it is described within the book the discovery process suffers from both high runtime and memory requirements especially when high dimensional datasets are analyzed to solve this issue many pruning strategies have been developed nevertheless with the growing interest in the storage of information more and more datasets comprise such a dimensionality that the discovery of interesting patterns becomes a challenging process in this regard the use of evolutionary algorithms for mining pattern enables the computation capacity to be reduced providing sufficiently good solutions this book offers a survey on evolutionary computation with particular emphasis on genetic algorithms and genetic programming also included is an analysis of the set of quality measures most widely used in the field of pattern mining with evolutionary algorithms this book serves as a review of the most important evolutionary algorithms for pattern mining it considers the analysis of different algorithms for mining different type of patterns and relationships between patterns such as frequent patterns infrequent patterns patterns defined in a continuous domain or even positive and negative patterns a completely new problem in the pattern mining field mining of exceptional relationships between patterns is discussed in this problem the goal is to identify patterns which distribution is exceptionally different from the distribution in the complete set of data records finally the book deals with the subgroup discovery task a method to identify a subgroup of interesting patterns that is related to a dependent variable or target attribute this subgroup of patterns satisfies two essential conditions interpretability and interestingness