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Artificial Intelligence and Problem Solving - Danny Kopec 2016-06-09
This book lends insight into solving some well-known AI problems using the most efficient problem-solving methods by humans and computers. The book discusses the importance of developing critical-thinking methods and skills, and develops a consistent approach toward each problem. This book assembles in one place a set of interesting and challenging AI–type problems that students regularly encounter in computer science, mathematics, and AI courses. These problems are not new, and students from all backgrounds can benefit from the kind of deductive thinking that goes into solving them. The book is especially useful as a companion to any course in computer science or mathematics where there are interesting problems to solve. Features: •Addresses AI and problem-solving from different perspectives •Covers classic AI problems such as Sudoku, Map Coloring, Twelve Coins, Red Donkey, Cryptarithms, Monte Carlo Methods, Rubik's Cube, Missionaries/Cannibals, Knight's Tour, Monty Hall, and more •Includes a companion disc with source code, solutions, figures, and more •Offers playability sites where students can exercise the process of developing their solutions •Describes problem-solving methods that might be applied to a variety of situations eBook Customers: Companion files are available for downloading with order number/proof of purchase by writing to the publisher at info@merclearning.com.
Artificial Intelligence - George F. Luger 2011-11-21
This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. Artificial Intelligence: Structures and Strategies for Complex Problem Solving is ideal for a one- or two-semester undergraduate course on AI. In this accessible, comprehensive text, George Luger captures the essence of artificial intelligence–solving the complex problems that arise wherever computer technology is applied. Ideal for an undergraduate course in AI, the Sixth Edition presents the fundamental concepts of the discipline first then goes into detail with the practical information necessary to implement the algorithms and strategies discussed. Readers learn how to use a number of different software tools and techniques to address the many challenges faced by today's computer scientists.
Principles of Artificial Intelligence - Nils J. Nilsson 2014-06-28
A classic introduction to artificial intelligence intended to bridge the gap between theory and practice, Principles of Artificial Intelligence describes fundamental AI ideas that underlie applications such as natural language processing, automatic programming, robotics, machine vision, automatic theorem proving, and intelligent data retrieval. Rather than focusing on the subject matter of the applications, the book is organized around general computational concepts involving the kinds of data structures used, the types of operations performed on the data structures, and the properties of the control strategies used. Principles of Artificial

Intelligenceevolved from the author's courses and seminars at Stanford University and University of Massachusetts, Amherst, and is suitable for text use in a senior or graduate AI course, or for individual study.

Artificial Intelligence - Roman Shirkin 2020-02-04

If you are searching for resources to start studying Artificial Intelligence then you are in the right place. The author discusses all the things step by step in this short and cheap textbook for beginners.Artificial intelligence is one of the most important breakthroughs in today's world. Experts from various industries study its capabilities and discover new methods of its application. If you want to know about AI, so this book is the perfect one to start Get your copy now!!!Book ObjectivesThis book is about Artificial Intelligence. The author wrote the book with the following objectives: To help you understand what artificial intelligence is. To help you learn the various approaches to artificial intelligence. To help you appreciate the power of artificial intelligence and how it has revolutionized the various sectors in the world. To equip you with Python programming skills good for artificial intelligence. To help you understand the future of artificial intelligence and its expected impact on the various sectors in the world. Who this Book is for? This book as written with the following groups of people in mind: Any individual in need of learning the basics and theories of artificial intelligence. Any individual who needs to understand the various practical approaches to artificial intelligence. Anyone who needs to learn how artificial intelligence has impacted the world and how it will impact the world in the future. Anyone who needs to learn Python programming skills good for artificial intelligence. RequirementsThe author expects you to have a computer installed with the Python interpreter. What you will learn? Basics of AI Intelligent Systems Intelligent Agents and Environments Problem Solving Through Searching Machine Learning Deep Learning Convolutional Networks Natural Language Processing Fuzzy Logic Systems Knowledge Representation The future of AI The author begins by introducing you to the basics of artificial intelligence. The aim is to help you know what artificial intelligence is, its goals and its components. Intelligent systems, intelligent agents and their environments have been discussed. You will know what intelligent systems/agents are and where they are applied. The author has also discussed the various challenges intelligent systems/agents face when acting on their environments. Searching is a common technique of solving problems in artificial intelligence. The various search algorithms have been discussed. Machine learning is a very important field in artificial intelligence. This has been discussed in detail. You will also learn how to implement various machine learning algorithms in Python programming language. Deep learning and artificial neural networks have been explored in detail. You will learn how artificial neural networks work. The various applications of deep learning have been discussed. The process of creating artificial neural networks in the Python programming language has been discussed. Other topics that have been discussed include convolutional neural networks, natural language processing, knowledge representation, and fuzzy logic. The author has finally done a prediction to help you know how artificial intelligence is expected to revolutionize the various sectors in the world.

Artificial Intelligence - Stuart Russell 2016-09-10

Artificial Intelligence: A Modern Approach offers the most comprehensive, up-to-date introduction to the theory and practice of artificial intelligence. Number one in its field, this textbook is ideal for one or two-semester, undergraduate or graduate-level courses in Artificial Intelligence.

Artificial Intelligence - B. J. Copeland 2019-09-24

Artificial intelligence (AI), the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience. Since the development of the digital computer in the 1940s, it has been demonstrated that computers can be programmed to carry out very complex tasks-as, for example, discovering proofs for mathematical theorems or playing chess-with great proficiency. Still, despite continuing advances in computer processing speed and memory capacity, there are as yet no

programs that can match human flexibility over wider domains or in tasks requiring much everyday knowledge. On the other hand, some programs have attained the performance levels of human experts and professionals in performing certain specific tasks, so that artificial intelligence in this limited sense is found in applications as diverse as medical diagnosis, computer search engines, and voice or handwriting recognition.What is intelligence?All but the simplest human behaviour is ascribed to intelligence, while even the most complicated insect behaviour is never taken as an indication of intelligence. What is the difference? Consider the behaviour of the digger wasp, Sphex ichneumoneus. When the female wasp returns to her burrow with food, she first deposits it on the threshold, checks for intruders inside her burrow, and only then, if the coast is clear, carries her food inside. The real nature of the wasp's instinctual behaviour is revealed if the food is moved a few inches away from the entrance to her burrow while she is inside: on emerging, she will repeat the whole procedure as often as the food is displaced. Intelligence-conspicuously absent in the case of Sphex-must include the ability to adapt to new circumstances.Psychologists generally do not characterize human intelligence by just one trait but by the combination of many diverse abilities. Research in AI has focused chiefly on the following components of intelligence: learning, reasoning, problem solving, perception, and using language.Artificial Intelligence HistoryThe term artificial intelligence was coined in 1956, but AI has become more popular today thanks to increased data volumes, advanced algorithms, and improvements in computing power and storage.Early AI research in the 1950s explored topics like problem solving and symbolic methods. In the 1960s, the US Department of Defense took interest in this type of work and began training computers to mimic basic human reasoning. For example, the Defense Advanced Research Projects Agency (DARPA) completed street mapping projects in the 1970s. And DARPA produced intelligent personal assistants in 2003, long before Siri, Alexa or Cortana were household names.This early work paved the way for the automation and formal reasoning that we see in computers today, including decision support systems and smart search systems that can be designed to complement and augment human abilities.While Hollywood movies and science fiction novels depict AI as human-like robots that take over the world, the current evolution of AI technologies isn't that scary - or quite that smart. Instead, AI has evolved to provide many specific benefits in every industry. Keep reading for modern examples of artificial intelligence in health care, retail and more.

Artificial Intelligence - Ela Kumar 2013-12-30

AI is an emerging discipline of computer science. It deals with the concepts and methodologies required for computer to perform an intelligent activity. The spectrum of computer science is very wide and it enables the computer to handle almost every activity, which human beings could. It deals with defining the basic problem from viewpoint of solving it through computer, finding out the total possibilities of solution, representing the problem from computational orientation, selecting data structures, finding the solution through searching the goal in search space dealing the real world uncertain situations etc. It also develops the techniques for learning and understanding, which make the computer able to exhibit an intelligent behavior. The list is exhaustive and is applied now a days in almost every field of technology. This book presents almost all the components of AI like problem solving, search techniques, knowledge concepts, expert system and many more in a very simple language. One of the unique features of this book is inclusion of number of solved examples; in between the chapters and also at the end of many chapters. Real life examples have been discussed to make the reader conversant with the intricate phenomenon of computer science in general, and artificial intelligence in particular. The book is primarily developed for undergraduate and postgraduate engineering students.

The Handbook of Artificial Intelligence - Paul R. Cohen 2014-06-05

The Handbook of Artificial Intelligence, Volume I focuses on the progress in artificial intelligence (AI) and its increasing applications, including parsing, grammars, and search methods. The book first elaborates on AI, AI handbook and literature, problem representation, search methods, and sample search programs. The text

then ponders on representation of knowledge, including survey of representation techniques and representation schemes. The manuscript explores understanding natural languages, as well as machine translation, grammars, parsing, test generation, and natural language processing systems. The book also takes a look at understanding spoken language, including systems architecture and the ARPA SUR projects. The text is a valuable source of information for computer science experts and researchers interested in pursuing further research in artificial intelligence

Human and Machine Problem Solving - K.J. Gilhooly 2012-12-06

Problem solving is a central topic for both cognitive psychology and artificial intelligence (AI). Psychology seeks to analyze naturally occur ring problem solving into hypothetical processes, while AI seeks to synthesize problem-solving performance from well-defined processes. Psychology may suggest possible processes to AI and, in turn, AI may suggest plausible hypotheses to psychology. It should be useful for both sides to have some idea of the other's contribution-hence this book, which brings together overviews of psychological and AI re search in major areas of problem solving. At a more general level, this book is intended to be a contribution toward comparative cognitive science. Cognitive science is the study of intelligent systems, whether natural or artificial, and treats both organ isms and computers as types of information-processing systems. Clearly, humans and typical current computers have rather different functional or cognitive architectures. Thus, insights into the role of cognitive ar chitecture in performance may be gained by comparing typical human problem solving with efficient machine problem solving over a range of tasks. Readers may notice that there is little mention of connectionist ap proaches in this volume. This is because, at the time of writing, such approaches have had little or no impact on research at the problem solving level. Should a similar volume be produced in ten years or so, of course, a very different story may need to be told.

ARTIFICIAL INTELLIGENCE - PARAG KULKARNI 2015-02-26

There has been a movement over the years to make machines intelligent. With the advent of modern technology, AI has become the core part of day-to-day life. But it is accentuated to have a book that keeps abreast of all the state-of-the-art concepts (pertaining to AI) in simplified, explicit and elegant way, expounding on ample examples so that the beginners are able to comprehend the subject with ease. The book on Artificial Intelligence, dexterously divided into 21 chapters, fully satisfies all these pressing needs. It is intended to put each and every concept related to intelligent system in front of the readers in the most simplified way so that while understanding the basic concepts, they will develop thought process that can contribute to the building of advanced intelligent systems. Various cardinal landmarks pertaining to the subject such as problem solving, search techniques, intelligent agents, constraint satisfaction problems, knowledge representation, planning, machine learning, natural language processing, pattern recognition, game playing, hybrid and fuzzy systems, neural network-based learning and future work and trends in AI are now under the single umbrella of this book, thereby showing a nice blend of theoretical and practical aspects. With all the latest information incorporated and several pedagogical attributes included, this textbook is an invaluable learning tool for the undergraduate and postgraduate students of computer science and engineering, and information technology. KEY FEATURES • Highlights a clear and concise presentation through adequate study material • Follows a systematic approach to explicate fundamentals as well as recent advances in the area • Presents ample relevant problems in the form of multiple choice questions, concept review questions, critical thinking exercise and project work • Incorporates various case studies for major topics as well as numerous industrial examples

Search in Artificial Intelligence - Leveen Kanal 2012-12-06

Search is an important component of problem solving in artificial intelligence (AI) and, more generally, in computer science, engineering and operations research. Combinatorial optimization, decision analysis, game playing, learning, planning, pattern recognition, robotics and theorem proving are some of the areas in which search algbrithms playa key role. Less than a

decade ago the conventional wisdom in artificial intelligence was that the best search algorithms had already been invented and the likelihood of finding new results in this area was very small. Since then many new insights and results have been obtained. For example, new algorithms for state space, AND/OR graph, and game tree search were discovered. Articles on new theoretical developments and experimental results on backtracking, heuristic search and constraint propaga tion were published. The relationships among various search and combinatorial algorithms in AI, Operations Research, and other fields were clarified. This volume brings together some of this recent work in a manner designed to be accessible to students and professionals interested in these new insights and developments.

Signs, Search and Communication - René J. Jorna 1993-01-01

Artificial Intelligence - David L. Poole 2017-09-25

Artificial Intelligence presents a practical guide to AI, including agents, machine learning and problem-solving simple and complex domains.

Artificial Intelligence Programming - Eugene Charniak 1987

First Published in 1987. Routledge is an imprint of Taylor & Francis, an informa company.

A Guided Tour of Artificial Intelligence Research - Pierre Marquis 2020-05-08

The purpose of this book is to provide an overview of AI research, ranging from basic work to interfaces and applications, with as much emphasis on results as on current issues. It is aimed at an audience of master students and Ph.D. students, and can be of interest as well for researchers and engineers who want to know more about AI. The book is split into three volumes: - the first volume brings together twenty-three chapters dealing with the foundations of knowledge representation and the formalization of reasoning and learning (Volume 1. Knowledge representation, reasoning and learning) - the second volume offers a view of AI, in fourteen chapters, from the side of the algorithms (Volume 2. AI Algorithms) - the third volume, composed of sixteen chapters, describes the main interfaces and applications of AI (Volume 3. Interfaces and applications of AI). This second volume presents the main families of algorithms developed or used in AI to learn, to infer, to decide. Generic approaches to problem solving are presented: ordered heuristic search, as well as metaheuristics are considered. Algorithms for processing logic-based representations of various types (first-order formulae, propositional formulae, logic programs, etc.) and graphical models of various types (standard constraint networks, valued ones, Bayes nets, Markov random fields, etc.) are presented. The volume also focuses on algorithms which have been developed to simulate specific ‘intelligent” processes such as planning, playing, learning, and extracting knowledge from data. Finally, an afterword draws a parallel between algorithmic problems in operation research and in AI.

Human and Machine Problem Solving - K.J. Gilhooly 2012-04-24

Problem solving is a central topic for both cognitive psychology and artificial intelligence (AI). Psychology seeks to analyze naturally occur ring problem solving into hypothetical processes, while AI seeks to synthesize problem-solving performance from well-defined processes. Psychology may suggest possible processes to AI and, in turn, AI may suggest plausible hypotheses to psychology. It should be useful for both sides to have some idea of the other's contribution-hence this book, which brings together overviews of psychological and AI re search in major areas of problem solving. At a more general level, this book is intended to be a contribution toward comparative cognitive science. Cognitive science is the study of intelligent systems, whether natural or artificial, and treats both organ isms and computers as types of information-processing systems. Clearly, humans and typical current computers have rather different functional or cognitive architectures. Thus, insights into the role of cognitive ar chitecture in performance may be gained by comparing typical human problem solving with efficient machine problem solving over a range of tasks. Readers may notice that there is little mention of connectionist ap proaches in this volume. This is because, at the time of writing, such approaches have had little or no impact on research at the problem solving level. Should a similar volume be produced in ten

years or so, of course, a very different story may need to be told.

Artificial Intelligence Brings Positive Or Negative Impaction - Johnny Ch Lok 2019-01-14

(AI) researchers are native in a variety of domains, e.g. formal tasks (mathematics, games), tasks (perception, robotics, natural language, common sense reasoning), expert tasks (financial analysis, medical diagnostics, engineering, scientific analysis and other areas). From the second business perspective reason view point, (AI) is a set of many powerful tools, and methodologies for using those tools to solve business problems. From a programming perspective reason view point, (AI) includes the study of symbolic programming problem solving and search . From the third human technological perspective reason view point, today's computer can do many well-defined tasks, for example, arithmetic operations, are much faster and more accurate than human beings. However, the computers' interaction with their environment is not very sophisticated yet. How can human test whether a computer has reached the general intelligence level of a human being? Can a computer convince a human interrogator that it is a human? But before thinking of such advanced kinds of machines, human will start developing our own extremely simple " intelligent" machines. So, it is possible that human society job nature will to be changed to artificial intelligent society when (AI) technology is developed to the mature stage in the future.Why does human need artificial intelligence machines?One of major division in (AI) is between humans who think (AI) is the only serious way of finding out how we (human) work and human who want companies to do very smart things, independently of how we (human) work. This is the important distinction between cognitive scientists vs engineers. One of another major division in (AI) is between symbolic (AI), which represents information through symbols and their relationships. Specific Algorithms are used to process these symbols to solve problems or deduce new knowledge and connectionist. So (AI), which represents information in network. Biological processes underlying learning, task performance and problem solving are imitated from human mind behaviors. Thus, it is possible that artificial intelligence machines can do the better judgicious behavior to compare human.

The Handbook of Artificial Intelligence - Avron Barr 2014-05-12

The Handbook of Artificial Intelligence, Volume II focuses on the improvements in artificial intelligence (AI) and its increasing applications, including programming languages, intelligent CAI systems, and the employment of AI in medicine, science, and education. The book first elaborates on programming languages for AI research and applications-oriented AI research. Discussions cover scientific applications, teiresias, applications in chemistry, dependencies and assumptions, AI programming-language features, and LISP. The manuscript then examines applications-oriented AI research in medicine and education, including ICAI systems design, intelligent CAI systems, medical systems, and other applications of AI to education. The manuscript explores automatic programming, as well as the methods of program specification, basic approaches, and automatic programming systems. The book is a valuable source of data for computer science experts and researchers interested in conducting further research in artificial intelligence.

Heuristics - Judea Pearl 1984

Problem-solving strartegies and the nature of Heuristic informatio n.Heuristics and problem representations. Basic Heuristic-Search procedures. Formal properties of Heuristic methods. Heuristics viewed as information provided by simplified models. Performance analysis of Heuristic methods. Abstract models for quantitative performace analysis. Complexity versus precision of admissible Heuristics. Searching with nonadmissible Heuristics. Game-playing programs. Strategies and models for game-playing programs. Performace analysis for game-searching strategies. Decision quality in game searching. Bibliography. Index.

Operations Research and Artificial Intelligence: The Integration of Problem-Solving Strategies - Donald E. Brown 2012-12-06

The purpose of this book is to introduce and explain research at the boundary between two fields that view problem solving from different perspectives. Researchers in operations research and artificial intelligence have traditionally remained separate in their activities. Recently, there has been an explosion of work at the

border of the two fields, as members of both communities seek to leverage their activities and resolve problems that remain intractable to pure operations research or artificial intelligence techniques. This book presents representative results from this current flurry of activity and provides insights into promising directions for continued exploration. This book should be of special interest to researchers in artificial intelligence and operations research because it exposes a number of applications and techniques, which have benefited from the integration of problem solving strategies. Even researchers working on different applications or with different techniques can benefit from the descriptions contained here, because they provide insight into effective methods for combining approaches from the two fields. Additionally, researchers in both communities will find a wealth of pointers to challenging new problems and potential opportunities that exist at the interface between operations research and artificial intelligence. In addition to the obvious interest the book should have for members of the operations research and artificial intelligence communities, the papers here are also relevant to members of other research communities and development activities that can benefit from improvements to fundamental problem solving approaches.

Artificial Intelligence for Advanced Problem Solving Techniques - Vlahavas, Ioannis 2008-01-31

One of the most important functions of artificial intelligence, automated problem solving, consists mainly of the development of software systems designed to find solutions to problems. These systems utilize a search space and algorithms in order to reach a solution. Artificial Intelligence for Advanced Problem Solving Techniques offers scholars and practitioners cutting-edge research on algorithms and techniques such as search, domain independent heuristics, scheduling, constraint satisfaction, optimization, configuration, and planning, and highlights the relationship between the search categories and the various ways a specific application can be modeled and solved using advanced problem solving techniques.

Cognition and the Creative Machine - Ana-Maria Oltețeanu 2020-05-23

How would you assemble a machine that can be creative, what would its cogs be? Starting from how humans do creative problem solving, the author has developed a framework to explore whether a diverse set of creative problem-solving tasks can be solved computationally using a unified set of principles. In this book she describes the implementation of related prototype AI systems, and the computational and empirical experiments conducted. The book will be of interest to researchers, graduate students, and laypeople engaged with ideas in artificial intelligence, cognitive science, and creativity.

a methodology for solving problems in artificial intelligence - suk in yoo 1985

Artificial Intelligence with Python - Alberto Artasanchez 2020-01-31

New edition of the bestselling guide to artificial intelligence with Python, updated to Python 3.x, with seven new chapters that cover RNNs, AI and Big Data, fundamental use cases, chatbots, and more. Key FeaturesCompletely updated and revised to Python 3.xNew chapters for AI on the cloud, recurrent neural networks, deep learning models, and feature selection and engineeringLearn more about deep learning algorithms, machine learning data pipelines, and chatbotsBook Description Artificial Intelligence with Python, Second Edition is an updated and expanded version of the bestselling guide to artificial intelligence using the latest version of Python 3.x. Not only does it provide you an introduction to artificial intelligence, this new edition goes further by giving you the tools you need to explore the amazing world of intelligent apps and create your own applications. This edition also includes seven new chapters on more advanced concepts of Artificial Intelligence, including fundamental use cases of AI; machine learning data pipelines; feature selection and feature engineering; AI on the cloud; the basics of chatbots; RNNs and DL models; and AI and Big Data. Finally, this new edition explores various real-world scenarios and teaches you how to apply relevant AI algorithms to a wide swath of problems, starting with the most basic AI concepts and progressively building from there to solve more difficult challenges so that by the end, you will have gained a solid understanding of, and when best to use, these many artificial

intelligence techniques. What you will learnUnderstand what artificial intelligence, machine learning, and data science areExplore the most common artificial intelligence use casesLearn how to build a machine learning pipelineAssimilate the basics of feature selection and feature engineeringIdentify the differences between supervised and unsupervised learningDiscover the most recent advances and tools offered for AI development in the cloudDevelop automatic speech recognition systems and chatbotsApply AI algorithms to time series dataWho this book is for The intended audience for this book is Python developers who want to build real-world Artificial Intelligence applications. Basic Python programming experience and awareness of machine learning concepts and techniques is mandatory.

Fundamentals of Artificial Intelligence: Problem Solving and Automated Reasoning - Miroslav Kubat 2023-02-17

A hands-on introduction to the principles and practices of modern artificial intelligence This comprehensive textbook focuses on the core techniques and processes underlying today's artificial intelligence, including algorithms, data structures, logic, automated reasoning, and problem solving. The book contains information about planning and about expert systems. Fundamentals of Artificial Intelligence: Problem Solving and Automated Reasoning is written in a concise format with a view to optimizing learning. Each chapter contains a brief historical overview, control questions to reinforce important concepts, plus computer assignments and ideas for independent thought. The book includes many visuals to illustrate the essential ideas and many examples to show how to use these ideas in practical implementations. Presented in a concise format to optimize learning Includes historical overviews, summaries, exercises, thought experiments, and computer assignments Written by a recognized artificial intelligence expert and experienced author

Readings in Artificial Intelligence - Bonnie Lynn Webber 2014-05-12

Readings in Artificial Intelligence focuses on the principles, methodologies, advancements, and approaches involved in artificial intelligence. The selection first elaborates on representations of problems of reasoning about actions, a problem similarity approach to devising heuristics, and optimal search strategies for speech understanding control. Discussions focus on comparison with existing speech understanding systems, empirical comparisons of the different strategies, analysis of distance function approximation, problem similarity, problems of reasoning about action, search for solution in the reduction system, and relationship between the initial search space and the higher level search space. The book then examines consistency in networks of relations, non-resolution theorem proving, using rewriting rules for connection graphs to prove theorems, and closed world data bases. The manuscript tackles a truth maintenance system, elements of a plan-based theory of speech acts, and reasoning about knowledge and action. Topics include problems in reasoning about knowledge, integration knowledge and action, models of plans, compositional adequacy, truth maintenance mechanisms, dialectical arguments, and assumptions and the problem of control. The selection is a valuable reference for researchers wanting to explore the field of artificial intelligence.

Machine Learning Algorithms for Problem Solving in Computational Applications: Intelligent Techniques - Kulkarni, Siddhivinayak 2012-06-30

Machine learning is an emerging area of computer science that deals with the design and development of new algorithms based on various types of data. Machine Learning Algorithms for Problem Solving in Computational Applications: Intelligent Techniques addresses the complex realm of machine learning and its applications for solving various real-world problems in a variety of disciplines, such as manufacturing, business, information retrieval, and security. This premier reference source is essential for professors, researchers, and students in artificial intelligence as well as computer science and engineering.

The Handbook of Artificial Intelligence - Avron Barr 2014-05-12

The Handbook of Artificial Intelligence, Volume I focuses on the progress in artificial intelligence (AI) and its increasing applications, including parsing, grammars, and search methods. The book first elaborates on AI, AI handbook and literature, problem representation, search methods, and sample search programs. The text

then ponders on representation of knowledge, including survey of representation techniques and representation schemes. The manuscript explores understanding natural languages, as well as machine translation, grammars, parsing, test generation, and natural language processing systems. The book also takes a look at understanding spoken language, including systems architecture and the ARPA SUR projects. The text is a valuable source of information for computer science experts and researchers interested in pursuing further research in artificial intelligence.

Artificial Intelligence Problems and Their Solutions - Danny Kopec 2014-04-15

This book lends insight into solving some well-known AI problems using the most efficient methods by humans and computers. The book discusses the importance of developing critical-thinking methods and skills, and develops a consistent approach toward each problem: 1) a precise description of a well-known AI problem coupled with an effective graphical representation; 2) discussion of possible approaches to solving each problem; 3) identifying and presenting the best known human solution to each problem; 4) evaluation and discussion of the Human Window aspects for the best solution; 5) a playability site where students can exercise the process of developing their solutions, as well as “experiencing” the best solution; 6) code or pseudo-code implementing the solution algorithm, and 7) academic references for each problem. Features: Addresses AI problems well known to computer science and mathematics students from a number of perspectives Covers classic AI problems such as Twelve Coins, Red Donkey, Cryptarithms, Rubik’s Cube, Missionaries/Cannibals, Knight’s Tour, Monty Hall, and more Includes a companion CD-ROM with source code, solutions, figures, and more Includes playability sites where students can exercise the process of developing their solutions Describes problem-solving methods which may be applied to many problem situations

Artificial Intelligence, the Search for the Perfect Machine - Lawrence Stevens 1985

Heuristic Search - Stefan Edelkamp 2011-05-31

Search has been vital to artificial intelligence from the very beginning as a core technique in problem solving. The authors present a thorough overview of heuristic search with a balance of discussion between theoretical analysis and efficient implementation and application to real-world problems. Current developments in search such as pattern databases and search with efficient use of external memory and parallel processing units on main boards and graphics cards are detailed. Heuristic search as a problem solving tool is demonstrated in applications for puzzle solving, game playing, constraint satisfaction and machine learning. While no previous familiarity with heuristic search is necessary the reader should have a basic knowledge of algorithms, data structures, and calculus. Real-world case studies and chapter ending exercises help to create a full and realized picture of how search fits into the world of artificial intelligence and the one around us. Provides real-world success stories and case studies for heuristic search algorithms Includes many AI developments not yet covered in textbooks such as pattern databases, symbolic search, and parallel processing units

The Handbook of Artificial Intelligence: Search ; Knowledge representation ; Understanding natural language ; Understanding spoken language - Avron Barr 1981

What is a "heuristic problem-solving program?" How do computers understand English? What are "semantic nets" or "frames?" Can computer programs outperform human experts? Such questions -- asked by scientists, engineers, students, and hobbyists encountering Artificial Intelligence for the first time -- can now be readily answered by The Handbook of Artificial Intelligence, a work which makes the full scope of important techniques and concepts of AI available for the first time to the rapidly expanding world of computer technologists and users. The scope of this handbook is broad: over 200 short articles covering all of the important ideas, techniques, and systems developed during 25 years of research in the AI field. The articles are written for people with no background in AI. Some articles serve as overviews, discussing the various approaches within a subfield, the issues, and the problems. The handbook is a reference work, a textbook, a guide to programming

techniques and to the extensive literature of the field, and a book for intellectual browsing. Jargon has been eliminated in each of the short, penetrating articles, and the hierarchical organization of the book allows readers to choose how deeply they wish to delve into a particular subject. Conceived and produced at Stanford University's Department of Computer Science, with contributions from universities and laboratories across the nation, The Handbook of Artificial Intelligence promises to become the standard reference work in the rapidly growing AI field. - Jacket.

Algorithms and Architectures of Artificial Intelligence - Enn Tyugu 2007

"This book gives an overview of methods developed in artificial intelligence for search, learning, problem solving and decision-making. It gives an overview of algorithms and architectures of artificial intelligence that have reached the degree of maturity when a method can be presented as an algorithm, or when a well-defined architecture is known, e.g. in neural nets and intelligent agents. It can be used as a handbook for a wide audience of application developers who are interested in using artificial intelligence methods in their software products. Parts of the text are rather independent, so that one can look into the index and go directly to a description of a method presented in the form of an abstract algorithm or an architectural solution. The book can be used also as a textbook for a course in applied artificial intelligence. Exercises on the subject are added at the end of each chapter. Neither programming skills nor specific knowledge in computer science are expected from the reader. However, some parts of the text will be fully understood by those who know the terminology of computing well."

Artificial Intelligence with Python Cookbook - Ben Auffarth 2020-10-30

Work through practical recipes to learn how to solve complex machine learning and deep learning problems using Python Key FeaturesGet up and running with artificial intelligence in no time using hands-on problem-solving recipesExplore popular Python libraries and tools to build AI solutions for images, text, sounds, and imagesImplement NLP, reinforcement learning, deep learning, GANs, Monte-Carlo tree search, and much moreBook Description Artificial intelligence (AI) plays an integral role in automating problem-solving. This involves predicting and classifying data and training agents to execute tasks successfully. This book will teach you how to solve complex problems with the help of independent and insightful recipes ranging from the essentials to advanced methods that have just come out of research. Artificial Intelligence with Python Cookbook starts by showing you how to set up your Python environment and taking you through the fundamentals of data exploration. Moving ahead, you'll be able to implement heuristic search techniques and genetic algorithms. In addition to this, you'll apply probabilistic models, constraint optimization, and reinforcement learning. As you advance through the book, you'll build deep learning models for text, images, video, and audio, and then delve into algorithmic bias, style transfer, music generation, and AI use cases in the healthcare and insurance industries. Throughout the book, you'll learn about a variety of tools for problem-solving and gain the knowledge needed to effectively approach complex problems. By the end of this book on AI, you will have the skills you need to write AI and machine learning algorithms, test them, and deploy them for production. What you will learnImplement data preprocessing steps and optimize model hyperparametersDelve into representational learning with adversarial autoencodersUse active learning, recommenders, knowledge embedding, and SAT solversGet to grips with probabilistic modeling with TensorFlow probabilityRun object detection, text-to-speech conversion, and text and music generationApply swarm algorithms, multi-agent systems, and graph networksGo from proof of concept to production by deploying models as microservicesUnderstand how to use modern AI in practiceWho this book is for This AI machine learning book is for Python developers, data scientists, machine learning engineers, and deep learning practitioners who want to learn how to build artificial intelligence solutions with easy-to-follow recipes. You'll also find this book useful if you're looking for state-of-the-art solutions to perform different machine learning tasks in various use cases. Basic working knowledge of the Python programming language and machine learning concepts will help you to work with code

effectively in this book.

Artificial Intelligence in Basic - Mike James 2013-09-03

Artificial Intelligence in BASIC presents some of the central ideas and practical applications of artificial intelligence (AI) using the BASIC programs. This eight-chapter book aims to explain these ideas of AI that can be used to produce programs on microcomputers. After providing an overview of the concept of AI, this book goes on examining the features and difficulties of a heuristic solution in a wide range of human problems. The discussion then shifts to the application of a heuristic solution to a two-ply search program for a two-person game. The following chapters are devoted to the other components of AI, including the expert systems, memory structure, pattern recognition, and language. The concluding chapter deals with the alternative and auxiliary approaches to the study of AI and its practical applications. Computer scientists and programmers will find this work invaluable.

Artificial Intelligence in Practice - Bernard Marr 2019-04-15

Cyber-solutions to real-world business problems Artificial Intelligence in Practice is a fascinating look into how companies use AI and machine learning to solve problems. Presenting 50 case studies of actual situations, this book demonstrates practical applications to issues faced by businesses around the globe. The rapidly evolving field of artificial intelligence has expanded beyond research labs and computer science departments and made its way into the mainstream business environment. Artificial intelligence and machine learning are cited as the most important modern business trends to drive success. It is used in areas ranging from banking and finance to social media and marketing. This technology continues to provide innovative solutions to businesses of all sizes, sectors and industries. This engaging and topical book explores a wide range of cases illustrating how businesses use AI to boost performance, drive efficiency, analyse market preferences and many others. Best-selling author and renowned AI expert Bernard Marr reveals how machine learning technology is transforming the way companies conduct business. This detailed examination provides an overview of each company, describes the specific problem and explains how AI facilitates resolution. Each case study provides a comprehensive overview, including some technical details as well as key learning summaries: Understand how specific business problems are addressed by innovative machine learning methods Explore how current artificial intelligence applications improve performance and increase efficiency in various situations Expand your knowledge of recent AI advancements in technology Gain insight on the future of AI and its increasing role in business and industry Artificial Intelligence in Practice: How 50 Successful Companies Used Artificial Intelligence to Solve Problems is an insightful and informative exploration of the transformative power of technology in 21st century commerce.

Artificial Intelligence How Raises Productivities And Efficiences - Johnny Ch Lok 2019-10-06

(AI) researchers are native in a variety of domains, e.g. formal tasks (mathematics, games), tasks (perception, robotics, natural language, common sense reasoning), expert tasks (financial analysis, medical diagnostics, engineering, scientific analysis and other areas). From the second business perspective reason view point, (AI) is a set of many powerful tools, and methodologies for using those tools to solve business problems. From a programming perspective reason view point, (AI) includes the study of symbolic programming problem solving and search . From the third human technological perspective reason view point, today's computer can do many well-defined tasks, for example, arithmetic operations, are much faster and more accurate than human beings. However, the computers' interaction with their environment is not very sophisticated yet. How can human test whether a computer has reached the general intelligence level of a human being? Can a computer convince a human interrogator that it is a human? But before thinking of such advanced kinds of machines, human will start developing our own extremely simple " intelligent" machines. So, it is possible that human society job efficiency and performance and productivity will to be changed better, due to artificial intelligent robots are applied to assist human to do anything when (AI) technology is developed to the mature stage in the future.□Why does human need artificial

intelligence machines?One of major division in (AI) is between humans who think (AI) is the only serious way of finding out how we (human) work and human who want companies to do very smart things, independently of how we (human) work. This is the important distinction between cognitive scientists vs engineers. One of another major division in (AI) is between symbolic (AI), which represents information through symbols and their relationships. Specific Algorithms are used to process these symbols to solve problems or deduce new knowledge and connectionist. So (AI), which represents information in network. Biological processes underlying learning, task performance and problem solving are imitated from human mind behaviors. Thus, it is possible that artificial intelligence machines can do the better human task behavior to achieve productivity and efficiency raising.□How does artificial intelligence influence future working changing in automation employment and productivity aspects?(AI) influences the automation working changing aspect, as companies increasingly use robots on production lines or algorithms to optimize their logistics manage inventory, any carry out other core business functions. Technological advances are creating a new automation age in which ever-smarter and more flexible machines will be deployed on an ever larger scale in the marketplace. However, researching artificial intelligence with how influences human working nature. We need to answer these questions: How will automation transform the workplace? What will the implications for employment? What is likely to be its impact both on productivity in the global economy and on employment?

Algorithms Are Not Enough - Herbert L. Roitblat 2020-10-13

Why a new approach is needed in the quest for general artificial intelligence. Since the inception of artificial intelligence, we have been warned about the imminent arrival of computational systems that can replicate human thought processes. Before we know it, computers will become so intelligent that humans will be lucky to kept as pets. And yet, although artificial intelligence has become increasingly sophisticated—with such achievements as driverless cars and humanless chess-playing—computer science has not yet created general artificial intelligence. In Algorithms Are Not Enough, Herbert Roitblat explains how artificial general intelligence may be possible and why a robopocalypse is neither imminent, nor likely. Existing artificial intelligence, Roitblat shows, has been limited to solving path problems, in which the entire problem consists of navigating a path of choices—finding specific solutions to well-structured problems. Human problem-solving, on the other hand, includes problems that consist of ill-structured situations, including the design of problem-solving paths themselves. These are insight problems, and insight is an essential part of intelligence that has not been addressed by computer science. Roitblat draws on cognitive science, including psychology, philosophy, and history, to identify the essential features of intelligence needed to achieve general artificial intelligence. Roitblat describes current computational approaches to intelligence, including the Turing Test, machine learning, and neural networks. He identifies building blocks of natural intelligence, including perception, analogy, ambiguity, common sense, and creativity. General intelligence can create new representations to solve new problems, but current computational intelligence cannot. The human brain, like the computer, uses algorithms; but general intelligence, he argues, is more than algorithmic processes.

Parallel Artificial Intelligence Search Techniques for Real Time Applications - Donald J. Shakley 1987

State space search is an important component of many problem solving methodologies. The computational models within Artificial Intelligence depend heavily upon state spaces searches. Production systems are one such computational model. Production systems are being explored for real-time environments where timing is of a critical nature. Parallel processing of these systems and in particular concurrent state space searching seems to provide a promising method to increase the performance (effective and efficient) of production systems in the real-time environment. Production systems in the form of expert systems, for example, are being used to govern the intelligent control of the Robotic Air Vehicle (RAV) which is currently a research project at the Air Force Wright Aeronautical Laboratories. Due to the nature of

the RAV system, the associated expert system needs to perform in a demanding real-time environment. The use of a parallel processing capability to support the associated computational requirement may be critical in this application. Thus, parallel search algorithms for real-time expert systems are designed, analyzed and synthesized on the Texas Instruments (TI) Explorer and Intel Hypercube. Keywords: Theses, Production, System control.

Problem-solving Methods in Artificial Intelligence - Nils J. Nilsson 1971

State-space representations. State-space methods. Problem-representations. Problem-reduction search methods. Theorem-proving in the predicate calculus. Applications of the predicate calculus in problem solving. Predicate-calculus proof-finding methods. Index.