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Behavior Trees in Robotics and AI An Introduction *CRC Press* **Behavior Trees (BTs) provide a way to structure the behavior of an artificial agent such as a robot or a non-player character in a computer game. Traditional design methods, such as finite state machines, are known to produce brittle behaviors when complexity increases, making it very hard to add features without breaking existing functionality. BTs were created to address this very problem, and enables the creation of systems that are both modular and reactive. Behavior Trees in Robotics and AI: An Introduction provides a broad introduction as well as an in-depth exploration of the topic, and is the first comprehensive book on the use of BTs. This book introduces the subject of BTs from simple topics, such as semantics and design principles, to complex topics, such as learning and task planning. For each topic, the authors provide a set of examples, ranging from simple illustrations to realistic complex behaviors, to enable the reader to successfully combine theory with practice. Starting with an introduction to BTs, the book then describes how BTs relate to, and in many cases, generalize earlier switching structures, or control architectures. These ideas are then used as a foundation for a set of efficient and easy to use design principles. The book then presents a set of important extensions and provides a set of tools for formally analyzing these extensions using a state space formulation of BTs. With the new analysis tools, the book then formalizes the descriptions of how BTs generalize earlier approaches and shows how BTs can be automatically generated using planning and learning. The final part of the book provides an extended set of tools to capture the behavior of Stochastic BTs, where the outcomes of actions are described by probabilities. These tools enable the computation of both success probabilities and time to completion. This book targets a broad audience, including both students and professionals interested in modeling complex behaviors for robots, game characters, or other AI agents. Readers can choose at which depth and pace they want to learn the subject, depending on their needs and background. Behavior Trees in Robotics and AI An Introduction** *CRC Press* **Behavior Trees (BTs) provide a way to structure the behavior of an artificial agent such as a robot or a non-player character in a computer game. Traditional design methods, such as finite state machines, are known to produce brittle behaviors when complexity increases, making it very hard to add features without breaking existing functionality. BTs were created to address this very problem, and enables the creation of systems that are both modular and reactive. 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Throughout the text, the work of leading researchers is presented in depth, which helps to paint the socio-economic picture of how robots are transforming our world and will continue to do so. This work is presented along with the influences and ideas from futurists, such as Asimov, Moravec, Lem, Vinge, and of course Kurzweil. The book furthers the discussion with concepts of Artificial Intelligence and how it manifests in robotic agents. Discussions across various topics are presented in the book, including control paradigm, navigation, software, multi-robot systems, swarm robotics, robots in social roles, and artificial consciousness in robots. These discussions help to provide an overall picture of current day agent-based robotics and its prospects for the future. Examples of software and implementation in hardware are covered in Chapter 5 to encourage the imagination and creativity of budding robot enthusiasts. The book addresses several broad themes, such as AI in theory versus applied AI for robots, concepts of anthropomorphism, embodiment and situatedness, extending theory of psychology and animal behavior to robots, and the proposal that in the future, AI may be the new definition of science. Behavior-based robotics is covered in Chapter 2 and retells the debate between deliberative and reactive approaches. The text reiterates that the effort of modern day robotics is to replicate human-like intelligence and behavior, and the tools that a roboticist has at his or her disposal are open source software, which is often powered by crowd-sourcing. Open source meta-projects, such as Robot Operating System (ROS), etc. are briefly discussed in Chapter 5. The ideas and themes presented in the book are supplemented with cartoons, images, schematics and a number of special sections to make the material engaging for the reader. Designed for robot enthusiasts – researchers, students, or the hobbyist, this comprehensive book will entertain and inspire anyone interested in the exciting world of robots. Automated Planning and Acting** *Cambridge University Press* **This book presents the most recent and advanced techniques for creating autonomous AI systems capable of planning and acting effectively. Algorithmic and Computational Robotics New Directions 2000 WAFR** *CRC Press* **Algorithms that control the computational processes relating sensors and actuators are indispensable for robot navigation and the perception of the world in which they move. Therefore, a deep understanding of how algorithms work to achieve this control is essential for the development of efficient and usable robots in a broad field of applications. Robotics, Autonomous Systems and Contemporary International Security** *Routledge* **Rapid technological advances in the field of robotics and autonomous systems (RAS) are transforming the international security environment and the conduct of contemporary conflict. Bringing together leading experts from across the globe, this book provides timely analysis on the current and future challenges associated with greater utilization of RAS by states, their militaries, and a host of non-state actors. Technologically driven change in the international security environment can come about through the development of one significant technology, such as the atomic bomb. At other times, it results from several technologies maturing at roughly the same pace. This second image better reflects the rapid technological change that is taking us into the robotics age. Many of the chapters in this edited volume explore unresolved ethical, legal, and operational challenges that are only likely to become more complex as RAS technology matures. Though the precise ways in which the impact of autonomous systems – both physical and non-physical – will be felt in the long-run is hidden from us, attempting to anticipate the direction of travel remains an important undertaking and one that this book makes a critical effort to contend with. The chapters in this book were originally published as a special issue of the journal Small Wars & Insurgencies. Learning for Adaptive and Reactive Robot Control A Dynamical Systems Approach** *MIT Press* **Methods by which robots can learn control laws that enable real-time reactivity using dynamical systems; with applications and exercises. This book presents a wealth of machine learning techniques to make the control of robots more flexible and safe when interacting with humans. It introduces a set of control laws that enable reactivity using dynamical systems, a widely used method for solving motion-planning problems in robotics. These control approaches can replan in milliseconds to adapt to new environmental constraints and offer safe and compliant control of forces in contact. The techniques offer theoretical advantages, including convergence to a goal, non-penetration of obstacles, and passivity. The coverage of learning begins with low-level control parameters and progresses to higher-level competencies composed of combinations of skills. Learning for Adaptive and Reactive Robot Control is designed for graduate-level courses in robotics, with chapters that proceed from fundamentals to more advanced content. Techniques covered include learning from demonstration, optimization, and reinforcement learning, and using dynamical systems in learning control laws, trajectory planning, and methods for compliant and force control . Features for teaching in each chapter: • applications, which range from arm manipulators to whole-body control of humanoid robots; • pencil-and-paper and programming exercises; • lecture videos, slides, and MATLAB code**

examples available on the author's website . • an eTextbook platform website offering protected material[EPS2] for instructors including solutions. Artificial Intelligence for Autonomous Networks *CRC Press* Artificial Intelligence for Autonomous Networks introduces the autonomous network by juxtaposing two unique technologies and communities: Networking and AI. The book reviews the technologies behind AI and software-defined network/network function virtualization, highlighting the exciting opportunities to integrate those two worlds. Outlining the new frontiers for autonomous networks, this book highlights their impact and benefits to consumers and enterprise customers. It also explores the potential of the autonomous network for transforming network operation, cyber security, enterprise services, 5G and IoT, infrastructure monitoring and traffic optimization, and finally, customer experience and care. With contributions from leading experts, this book will provide an invaluable resource for network engineers, software engineers, artificial intelligence, and machine learning researchers. Introduction to AI Robotics, second edition *MIT Press* A comprehensive survey of artificial intelligence algorithms and programming organization for robot systems. This textbook offers a comprehensive survey of artificial intelligence (AI) algorithms and programming organization for robot systems. Readers who master the topics covered will be able to design and evaluate an artificially intelligent robot for applications involving sensing, acting, planning, and learning. A background in AI is not required; the book introduces key AI topics from all AI subdisciplines throughout the book and explains how they contribute to autonomous capabilities. This second edition is a major expansion and reorganization of the first edition, reflecting the dramatic advances made in AI over the past fifteen years. An introductory overview provides a framework for thinking about AI for robotics, distinguishing between the fundamentally different design paradigms of automation and autonomy. The book then discusses the reactive functionality of sensing and acting in AI robotics; introduces the deliberative functions most often associated with intelligence and the capability of autonomous initiative; surveys multi-robot systems and (in a new chapter) human-robot interaction; and offers a "metaview" of how to design and evaluate autonomous systems and the ethical considerations in doing so. New material covers locomotion, simultaneous localization and mapping, human-robot interaction, machine learning, and ethics. Each chapter includes exercises, and many chapters provide case studies. Endnotes point to additional reading, highlight advanced topics, and offer robot trivia. Fundamentals in Modeling and Control of Mobile Manipulators *CRC Press* Mobile manipulators combine the advantages of mobile platforms and robotic arms, extending their operational range and functionality to large spaces and remote, demanding, and/or dangerous environments. They also bring complexity and difficulty in dynamic modeling and control system design. However, advances in nonlinear system analysis and control system design offer powerful tools and concepts for the control of mobile manipulator systems. Fundamentals in Modeling and Control of Mobile Manipulators presents a thorough theoretical treatment of several fundamental problems for mobile robotic manipulators. The book integrates fresh concepts and state-of-the-art results to systematically examine kinematics and dynamics, motion generation, feedback control, coordination, and cooperation. From this treatment, the authors form a basic theoretical framework for a mobile robotic manipulator that extends the theory of nonlinear control and applies to more realistic problems. Drawing on their research over the past ten years, the authors propose novel control theory concepts and techniques to tackle key problems. Topics covered include kinematic and dynamic modeling, control of nonholonomic systems, path planning that considers motion and manipulation, hybrid motion/force control and hybrid position/force control where the mobile manipulator is required to interact with environments, and coordination and cooperation strategies for multiple mobile manipulators. The book also includes practical examples of applications in engineering systems. This timely book investigates important scientific and engineering issues for researchers and engineers working with either single or multiple mobile manipulators for larger operational space, better cooperation, and improved productivity. Artificial Intelligence for Robotics Build intelligent robots that perform human tasks using AI techniques *Packt Publishing Ltd* Bring a new degree of interconnectivity to your world by building your own intelligent robots Key Features Leverage fundamentals of AI and robotics Work through use cases to implement various machine learning algorithms Explore Natural Language Processing (NLP) concepts for efficient decision making in robots Book Description Artificial Intelligence for Robotics starts with an introduction to Robot Operating Systems (ROS), Python, robotic fundamentals, and the software and tools that are required to start out with robotics. You will learn robotics concepts that will be useful for making decisions, along with basic navigation skills. As you make your way through the chapters, you will learn about object recognition and genetic algorithms, which will teach your robot to identify and pick up an irregular object. With plenty of use cases throughout, you will explore natural language processing (NLP) and machine learning techniques to further enhance your robot. In the concluding chapters, you will learn about path planning and goal-oriented programming, which will help your robot prioritize tasks. By the end of this book, you will have learned to give your robot an artificial personality using simulated intelligence. What you will learn Get started with robotics and artificial intelligence Apply simulation techniques to give your robot an artificial personality Understand object recognition using neural networks and supervised learning techniques Pick up objects using genetic algorithms for manipulation Teach your robot to listen using NLP via an expert system Use machine learning and computer vision to teach your robot how to avoid obstacles Understand path planning, decision trees, and search algorithms in order to enhance your robot Who this book is for If you have basic knowledge about robotics and want to build or enhance your existing robot's intelligence, then Artificial Intelligence for Robotics is for you. This book is also for enthusiasts who want to gain knowledge of AI and robotics. Communications, Signal Processing, and Systems Proceedings of the 9th International Conference on Communications, Signal Processing, and Systems *Springer Nature* This book brings together papers presented at the 2020 International Conference on Communications, Signal Processing, and Systems, which provides a venue to disseminate the latest developments and to discuss the interactions and links between these multidisciplinary fields. Spanning topics ranging from communications, signal processing and systems, this book is aimed at undergraduate and graduate students in Electrical Engineering, Computer Science and Mathematics, researchers and engineers from academia and industry as well as government employees (such as NSF, DOD and DOE). Robotics, AI and the Future of Law *Springer* Artificial intelligence and related technologies are changing both the law and the legal profession. In particular, technological advances in fields ranging from machine learning to more advanced robots, including sensors, virtual realities, algorithms, bots, drones, self-driving cars, and more sophisticated "human-like" robots are creating new and previously unimagined challenges for regulators. These advances also give rise to new opportunities for legal professionals to make efficiency gains in the delivery of legal services. With the exponential growth of such technologies, radical disruption seems likely to accelerate in the near future. This collection brings together a series of contributions by leading scholars in the newly emerging field of artificial intelligence, robotics, and the law. The aim of the book is to enrich legal debates on the social meaning and impact of this type of technology. The distinctive feature of the contributions presented in this edition is that they address the impact of these technological developments in a number of different fields of law and from the perspective of diverse jurisdictions. Moreover, the authors utilize insights from multiple related disciplines, in particular social theory and philosophy, in order to better understand and address the legal challenges created by AI. Therefore, the book will contribute to interdisciplinary debates on disruptive new AI technologies and the law. Bio-Inspired Artificial Intelligence Theories, Methods, and Technologies *MIT Press* A comprehensive introduction to new approaches in artificial intelligence and robotics that are inspired by self-organizing biological processes and structures. New approaches to artificial intelligence spring from the idea that intelligence emerges as much from cells, bodies, and societies as it does from evolution, development, and learning. Traditionally, artificial intelligence has been concerned with reproducing the abilities of human brains; newer approaches take inspiration from a wider range of biological structures that are capable of autonomous self-organization. Examples of these new approaches include evolutionary computation and evolutionary electronics, artificial neural networks, immune systems, biorobotics, and swarm intelligence—to mention only a few. This book offers a comprehensive introduction to the emerging field of biologically inspired artificial intelligence that can be used as an upper-level text or as a reference for researchers. Each chapter presents computational approaches inspired by a different biological system; each begins with background information about the biological system and then proceeds to develop computational models that make use of biological concepts. The chapters cover evolutionary computation and electronics; cellular systems; neural systems, including neuromorphic engineering; developmental systems; immune systems; behavioral systems—including several approaches to robotics, including behavior-based, bio-mimetic, epigenetic, and evolutionary robots; and collective systems, including swarm robotics as well as cooperative and competitive co-evolving systems. Chapters end with a concluding overview and suggested reading. Swarm Intelligence 11th International Conference, ANTS 2018, Rome, Italy, October 29-31, 2018, Proceedings *Springer* This book constitutes the proceedings of the 11th International Conference on Swarm Intelligence, ANTS 2018, held in Rome, Italy, in October 2018. The 24 full papers and 12 short papers presented in this volume were carefully reviewed and selected from 69 submissions. They are devoted to the field of swarm intelligence as a whole, without any bias towards specific research directions. Handbook of Collective Robotics Fundamentals and Challenges *CRC Press* This book is devoted to mechatronic, chemical, bacteriological, biological, and hybrid systems, utilizing cooperative, networked, swarm, self-organizing, evolutionary and bio-inspired design principles and targeting underwater, ground, air, and space applications. It addresses issues such as open-ended evolution, self-replication, self-development, reliability, scalability, energy foraging, adaptivity, and artificial sociality. The book has been prepared by 52 authors from world-leading research groups in 14 countries. This book covers not only current but also future key technologies and is aimed at anyone who is interested in learning more about collective robotics and how it might affect our society. The Quest for Artificial Intelligence *Cambridge University Press* Artificial intelligence (AI) is a field within computer science that is attempting to build enhanced intelligence into computer systems. This book traces the history of the subject, from the early dreams of eighteenth-century (and earlier) pioneers to the more successful work of today's AI engineers. AI is becoming more and more a part of everyone's life. The technology is already embedded in face-recognizing cameras, speech-recognition software, Internet search engines, and health-care robots, among other applications. The book's many diagrams and easy-to-understand descriptions of AI programs will help the casual reader gain an understanding of how these and other AI systems actually work. Its thorough (but unobtrusive) end-of-chapter notes containing citations to important source materials will be of great use to AI scholars and researchers. This book promises to be the definitive history of a field that has captivated the imaginations of scientists, philosophers, and writers for centuries. Planning Algorithms *Cambridge University Press* Planning algorithms are impacting technical disciplines and industries around the world, including robotics, computer-aided design, manufacturing, computer graphics, aerospace applications, drug design, and protein folding. This coherent and comprehensive book unifies material from several sources, including robotics, control theory, artificial intelligence, and algorithms. The treatment is centered on robot motion planning, but integrates material on planning in discrete spaces. A major part of the book is devoted to planning under uncertainty, including decision theory, Markov decision processes, and information spaces, which are the 'configuration spaces' of all sensor-based planning problems. The last part of the book delves into planning under differential constraints that arise when automating the motions of virtually any mechanical system. This text and reference is intended for students, engineers, and researchers in robotics, artificial intelligence, and control theory as well as computer graphics, algorithms, and computational biology. Human-Machine Shared Contexts *Academic Press* Human-Machine Shared Contexts considers the foundations, metrics, and applications of human-machine systems. Editors and authors debate whether machines, humans, and systems should speak only to each other, only to humans, or to both and how. The book establishes the meaning and operation of "shared contexts between humans and machines; it also explores how human-machine systems affect targeted audiences (researchers, machines, robots, users) and society, as well as future ecosystems composed of humans and machines. This book explores how user interventions may improve the context for autonomous machines operating in unfamiliar environments or when experiencing unanticipated events; how autonomous machines can be taught to explain contexts by reasoning, inferences, or causality, and decisions to humans relying on intuition; and for mutual context, how these machines may interdependently affect human

awareness, teams and society, and how these "machines" may be affected in turn. In short, can context be mutually constructed and shared between machines and humans? The editors are interested in whether shared context follows when machines begin to think, or, like humans, develop subjective states that allow them to monitor and report on their interpretations of reality, forcing scientists to rethink the general model of human social behavior. If dependence on machine learning continues or grows, the public will also be interested in what happens to context shared by users, teams of humans and machines, or society when these machines malfunction. As scientists and engineers "think through this change in human terms," the ultimate goal is for AI to advance the performance of autonomous machines and teams of humans and machines for the betterment of society wherever these machines interact with humans or other machines. This book will be essential reading for professional, industrial, and military computer scientists and engineers; machine learning (ML) and artificial intelligence (AI) scientists and engineers, especially those engaged in research on autonomy, computational context, and human-machine shared contexts; advanced robotics scientists and engineers; scientists working with or interested in data issues for autonomous systems such as with the use of scarce data for training and operations with and without user interventions; social psychologists, scientists and physical research scientists pursuing models of shared context; modelers of the internet of things (IOT); systems of systems scientists and engineers and economists; scientists and engineers working with agent-based models (ABMs); policy specialists concerned with the impact of AI and ML on society and civilization; network scientists and engineers; applied mathematicians (e.g., holon theory, information theory); computational linguists; and blockchain scientists and engineers. Discusses the foundations, metrics, and applications of human-machine systems Considers advances and challenges in the performance of autonomous machines and teams of humans Debates theoretical human-machine ecosystem models and what happens when machines malfunction Algorithms and Law *Cambridge University Press* Exploring issues from big-data to robotics, this volume is the first to comprehensively examine the regulatory implications of AI technology. AI Superpowers China, Silicon Valley, and the New World Order *Houghton Mifflin* Introduction -- China's Sputnik moment -- Copycats in the Coliseum -- China's alternate Internet universe -- A tale of two countries -- The four waves of AI -- Utopia, dystopia, and the real AI crisis -- The wisdom of cancer -- A blueprint for human co-existence with AI -- Our global AI story Artificial Intelligence and Games *Springer* This is the first textbook dedicated to explaining how artificial intelligence (AI) techniques can be used in and for games. After introductory chapters that explain the background and key techniques in AI and games, the authors explain how to use AI to play games, to generate content for games and to model players. The book will be suitable for undergraduate and graduate courses in games, artificial intelligence, design, human-computer interaction, and computational intelligence, and also for self-study by industrial game developers and practitioners. The authors have developed a website (http://www.gameaibook.org) that complements the material covered in the book with up-to-date exercises, lecture slides and reading. Artificial Intelligence and Robotics *Springer Nature* This book provides insights into research in the field of artificial intelligence in combination with robotics technologies. The integration of artificial intelligence and robotic technologies is a highly topical area for researchers and developers from academia and industry around the globe, and it is likely that artificial intelligence will become the main approach for the next generation of robotics research. The tremendous number of artificial intelligence algorithms and big data solutions has significantly extended the range of potential applications for robotic technologies, and has also brought new challenges for the artificial intelligence community. Sharing recent advances in the field, the book features papers by young researchers presented at the 4th International Symposium on Artificial Intelligence and Robotics 2019 (ISAIR2019), held in Daegu, Korea, on August 20-24, 2019. Artificial Intelligence and Soft Computing Behavioral and Cognitive Modeling of the Human Brain *CRC Press* With all the material available in the field of artificial intelligence (AI) and soft computing-texts, monographs, and journal articles-there remains a serious gap in the literature. Until now, there has been no comprehensive resource accessible to a broad audience yet containing a depth and breadth of information that enables the reader to fully understand and readily apply AI and soft computing concepts. Artificial Intelligence and Soft Computing fills this gap. It presents both the traditional and the modern aspects of AI and soft computing in a clear, insightful, and highly comprehensive style. It provides an in-depth analysis of mathematical models and algorithms and demonstrates their applications in real world problems. Beginning with the behavioral perspective of "human cognition," the text covers the tools and techniques required for its intelligent realization on machines. The author addresses the classical aspects-search, symbolic logic, planning, and machine learning-in detail and includes the latest research in these areas. He introduces the modern aspects of soft computing from first principles and discusses them in a manner that enables a beginner to grasp the subject. He also covers a number of other leading aspects of AI research, including nonmonotonic and spatio-temporal reasoning, knowledge acquisition, and much more. Artificial Intelligence and Soft Computing: Behavioral and Cognitive Modeling of the Human Brain is unique for its diverse content, clear presentation, and overall completeness. It provides a practical, detailed introduction that will prove valuable to computer science practitioners and students as well as to researchers migrating to the subject from other disciplines. Human-Robot Interaction Evaluation Methods and Their Standardization *Springer Nature* This book offers the first comprehensive yet critical overview of methods used to evaluate interaction between humans and social robots. It reviews commonly used evaluation methods, and shows that they are not always suitable for this purpose. Using representative case studies, the book identifies good and bad practices for evaluating human-robot interactions and proposes new standardized processes as well as recommendations, carefully developed on the basis of intensive discussions between specialists in various HRI-related disciplines, e.g. psychology, ethology, ergonomics, sociology, ethnography, robotics, and computer science. The book is the result of a close, long-standing collaboration between the editors and the invited contributors, including, but not limited to, their inspiring discussions at the workshop on Evaluation Methods Standardization for Human-Robot Interaction (EMSHRI), which have been organized yearly since 2015. By highlighting and weighing good and bad practices in evaluation design for HRI, the book will stimulate the scientific community to search for better solutions, take advantages of interdisciplinary collaborations, and encourage the development of new standards to accommodate the growing presence of robots in the day-to-day and social lives of human beings. The Robotics Primer *MIT Press* A broadly accessible introduction to robotics that spans the most basic concepts and the most novel applications; for students, teachers, and hobbyists. The Robotics Primer offers a broadly accessible introduction to robotics for students at pre-university and university levels, robot hobbyists, and anyone interested in this burgeoning field. The text takes the reader from the most basic concepts (including perception and movement) to the most novel and sophisticated applications and topics (humanoids, shape-shifting robots, space robotics), with an emphasis on what it takes to create autonomous intelligent robot behavior. The core concepts of robotics are carried through from fundamental definitions to more complex explanations, all presented in an engaging, conversational style that will appeal to readers of different backgrounds. The Robotics Primer covers such topics as the definition of robotics, the history of robotics ("Where do Robots Come From?"), robot components, locomotion, manipulation, sensors, control, control architectures, representation, behavior ("Making Your Robot Behave"), navigation, group robotics, learning, and the future of robotics (and its ethical implications). To encourage further engagement, experimentation, and course and lesson design, The Robotics Primer is accompanied by a free robot programming exercise workbook that implements many of the ideas on the book on iRobot platforms. The Robotics Primer is unique as a principled, pedagogical treatment of the topic that is accessible to a broad audience; the only prerequisites are curiosity and attention. It can be used effectively in an educational setting or more informally for self-instruction. The Robotics Primer is a springboard for readers of all backgrounds—including students taking robotics as an elective outside the major, graduate students preparing to specialize in robotics, and K-12 teachers who bring robotics into their classrooms. ROS by Example A Do-it-yourself Guide to the Robot Operating System : a Pi Robot Production This book is aimed at new ROS users who want to go beyond the Beginner Tutorials and create some working ROS applications, either in simulation or on a real robot like the TurtleBot. The book provides step-by-step explanations of a number of ROS programming examples using code that can be downloaded from the accompanying ros-by-example repository. Modern Robotics *Cambridge University Press* A modern and unified treatment of the mechanics, planning, and control of robots, suitable for a first course in robotics. Artificial Intelligence to Solve Pervasive Internet of Things Issues *Academic Press* Artificial Intelligence to Solve Pervasive Internet of Things Issues discusses standards and technologies and wide-ranging technology areas and their applications and challenges, including discussions on architectures, frameworks, applications, best practices, methods and techniques required for integrating AI to resolve IoT issues. Chapters also provide step-by-step measures, practices and solutions to tackle vital decision-making and practical issues affecting IoT technology, including autonomous devices and computerized systems. Such issues range from adopting, mitigating, maintaining, modernizing and protecting AI and IoT infrastructure components such as scalability, sustainability, latency, system decentralization and maintainability. The book enables readers to explore, discover and implement new solutions for integrating AI to solve IoT issues. Resolving these issues will help readers address many real-world applications in areas such as scientific research, healthcare, defense, aeronautics, engineering, social media, and many others. Discusses intelligent techniques for the implementation of Artificial Intelligence in Internet of Things Prepared for researchers and specialists who are interested in the use and integration of IoT and Artificial Intelligence technologies Ethics of Artificial Intelligence *Oxford University Press, USA* Should a self-driving car prioritize the lives of the passengers over the lives of pedestrians? Should we as a society develop autonomous weapon systems that are capable of identifying and attacking a target without human intervention? What happens when AIs become smarter and more capable than us? Could they have greater than human moral status? Can we prevent superintelligent AIs from harming us or causing our extinction? At a critical time in this fast-moving debate, thirty leading academics and researchers at the forefront of AI technology development come together to explore these existential questions, including Aaron James (UC Irvine), Allan Dafoe (Oxford), Andrea Loreggia (Padova), Andrew Critch (UC Berkeley), Azim Shariff (Univ. . Encyclopedia of Artificial Intelligence *IGI Global* "This book is a comprehensive and in-depth reference to the most recent developments in the field covering theoretical developments, techniques, technologies, among others"--Provided by publisher. AI for Games *CRC Press* What is artificial intelligence? How is artificial intelligence used in game development? Game development lives in its own technical world. It has its own idioms, skills, and challenges. That's one of the reasons games are so much fun to work on. Each game has its own rules, its own aesthetic, and its own trade-offs, and the hardware it will run on keeps changing. AI for Games is designed to help you understand one element of game development: artificial intelligence (AI). Artificial Intelligence in Behavioral and Mental Health Care *Academic Press* Artificial Intelligence in Behavioral and Mental Health Care summarizes recent advances in artificial intelligence as it applies to mental health clinical practice. Each chapter provides a technical description of the advance, review of application in clinical practice, and empirical data on clinical efficacy. In addition, each chapter includes a discussion of practical issues in clinical settings, ethical considerations, and limitations of use. The book encompasses AI based advances in decision-making, in assessment and treatment, in providing education to clients, robot assisted task completion, and the use of AI for research and data gathering. This book will be of use to mental health practitioners interested in learning about, or incorporating AI advances into their practice and for researchers interested in a comprehensive review of these advances in one source. Summarizes AI advances for use in mental health Includes advances in AI based decision-making and consultation Describes AI applications for assessment and treatment Details AI advances in robots for clinical settings Provides empirical data on clinical efficacy Explores practical issues of use in clinical settings Artificial Intelligence in Asset Management *CFA Institute Research Foundation* Artificial intelligence (AI) has grown in presence in asset management and has revolutionized the sector in many ways. It has improved portfolio management, trading, and risk management practices by increasing efficiency, accuracy, and compliance. In particular, AI techniques help construct portfolios based on more accurate risk and return forecasts and more complex constraints. Trading algorithms use AI to devise novel trading signals and execute trades with lower transaction costs. AI also improves risk modeling and forecasting by generating insights from new data sources. Finally, robo-advisors owe a large part of their success to AI techniques. Yet the use of AI can also create new risks and challenges, such

as those resulting from model opacity, complexity, and reliance on data integrity. Artificial Intelligence for the Internet of Everything *Academic Press* Artificial Intelligence for the Internet of Everything considers the foundations, metrics and applications of IoE systems. It covers whether devices and IoE systems should speak only to each other, to humans or to both. Further, the book explores how IoE systems affect targeted audiences (researchers, machines, robots, users) and society, as well as future ecosystems. It examines the meaning, value and effect that IoT has had and may have on ordinary life, in business, on the battlefield, and with the rise of intelligent and autonomous systems. Based on an artificial intelligence (AI) perspective, this book addresses how IoE affects sensing, perception, cognition and behavior. Each chapter addresses practical, measurement, theoretical and research questions about how these "things may affect individuals, teams, society or each other. Of particular focus is what may happen when these "things begin to reason, communicate and act autonomously on their own, whether independently or interdependently with other "things . Considers the foundations, metrics and applications of IoE systems Debates whether IoE systems should speak to humans and each other Explores how IoE systems affect targeted audiences and society Discusses theoretical IoT ecosystem models Contemporary Artificial Intelligence *CRC Press* The notion of artificial intelligence (AI) often sparks thoughts of characters from science fiction, such as the Terminator and HAL 9000. While these two artificial entities do not exist, the algorithms of AI have been able to address many real issues, from performing medical diagnoses to navigating difficult terrain to monitoring possible failures of spacecrafts. Exploring these algorithms and applications, Contemporary Artificial Intelligence presents strong AI methods and algorithms for solving challenging problems involving systems that behave intelligently in specialized domains such as medical and software diagnostics, financial decision making, speech and text recognition, genetic analysis, and more. One of the first AI texts accessible to students, the book focuses on the most useful problem-solving strategies that have emerged from AI. In a student-friendly way, the authors cover logic-based methods; probability-based methods; emergent intelligence, including evolutionary computation and swarm intelligence; data-derived logical and probabilistic learning models; and natural language understanding. Through reading this book, students discover the importance of AI techniques in computer science. Robotics, AI, and Humanity Science, Ethics, and Policy *Springer* This open access book examines recent advances in how artificial intelligence (AI) and robotics have elicited widespread debate over their benefits and drawbacks for humanity. The emergent technologies have for instance implications within medicine and health care, employment, transport, manufacturing, agriculture, and armed conflict. While there has been considerable attention devoted to robotics/AI applications in each of these domains, a fuller picture of their connections and the possible consequences for our shared humanity seems needed. This volume covers multidisciplinary research, examines current research frontiers in AI/robotics and likely impacts on societal well-being, human – robot relationships, as well as the opportunities and risks for sustainable development and peace. The attendant ethical and religious dimensions of these technologies are addressed and implications for regulatory policies on the use and future development of AI/robotics technologies are elaborated. Wired for War The Robotics Revolution and Conflict in the 21st Century *Penguin* "[Singer's] enthusiasm becomes infectious . . . Wired for War is a book of its time: this is strategy for the Facebook generation." —Foreign Affairs "An engrossing picture of a new class of weapon that may revolutionize future wars. . ." —Kirkus Reviews P. W. Singer explores the greatest revolution in military affairs since the atom bomb: the dawn of robotic warfare We are on the cusp of a massive shift in military technology that threatens to make real the stuff of I, Robot and The Terminator. Blending historical evidence with interviews of an amazing cast of characters, Singer shows how technology is changing not just how wars are fought, but also the politics, economics, laws, and the ethics that surround war itself. Travelling from the battlefields of Iraq and Afghanistan to modern-day "skunk works" in the midst of suburbia, Wired for War will tantalise a wide readership, from military buffs to policy wonks to gearheads.