Robots Bringing Intelligent Machines To Life

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The Robotic Imaginary

This book will advance the understanding and application of self-adaptive intelligent systems; therefore it will potentially benefit the long-term goal of replicating certain levels of brain-like intelligence in complex and networked engineering systems. It will provide new approaches for adaptive systems within uncertain environments. This will provide an opportunity to evaluate the strengths and weaknesses of the current state-of-the-art of knowledge, give rise to new research directions, and educate future professionals in this domain. Self-adaptive intelligent systems have wide applications from military security systems to civilian daily life. In this book, different application problems, including pattern recognition, classification, image recovery, and sequence learning, will be presented to show the capability of the proposed systems in learning, memory, and prediction. Therefore, this book will also provide potential new solutions to many real-world applications.

The Artist in the Machine

The Book Review Digest

Prediction Machines

Introduction to Autonomous Mobile Robots

How to educate the next generation of college students to invent, to create, and to discover--filling needs that even the most sophisticated robot cannot. Driverless cars are hitting the road, powered by artificial intelligence. Robots can climb stairs, open doors, win Jeopardy, analyze stocks, work in factories, find parking spaces, advise oncologists. In the past, automation was considered a threat to low-skilled

labor. Now, many high-skilled functions, including interpreting medical images, doing legal research, and analyzing data, are within the skill sets of machines. How can higher education prepare students for their professional lives when professions themselves are disappearing? In Robot-Proof, Northeastern University president Joseph Aoun proposes a way to educate the next generation of college students to invent, to create, and to discover--to fill needs in society that even the most sophisticated artificial intelligence agent cannot. A "robot-proof" education, Aoun argues, is not concerned solely with topping up students' minds with high-octane facts. Rather, it calibrates them with a creative mindset and the mental elasticity to invent, discover, or create something valuable to society--a scientific proof, a hip-hop recording, a web comic, a cure for cancer. Aoun lays out the framework for a new discipline, humanics, which builds on our innate strengths and prepares students to compete in a labor market in which smart machines work alongside human professionals. The new literacies of Aoun's humanics are data literacy, technological literacy, and human literacy. Students will need data literacy to manage the flow of big data, and technological literacy to know how their machines work, but human literacy--the humanities, communication, and design--to function as a human being. Life-long learning opportunities will support their ability to adapt to change. The only certainty about the future is change. Higher education based on the new literacies of humanics can equip students for living and working through change.

Robotics: Concepts, Methodologies, Tools, and Applications

The human brain has some capabilities that the brains of other animals lack. It is to these distinctive capabilities that our species owes its dominant position. Other animals have stronger muscles or sharper claws, but we have cleverer brains. If machine brains one day come to surpass human brains in general intelligence, then this new superintelligence could become very powerful. As the fate of the gorillas now depends more on us humans than on the gorillas themselves, so the fate of our species then would come to depend on the actions of the machine superintelligence. But we have one advantage: we get to make the first move. Will it be possible to construct a seed AI or otherwise to engineer initial conditions so as to make an intelligence explosion survivable? How could one achieve a controlled detonation? To get closer to an answer to this question, we must make our way through a fascinating landscape of topics and considerations. Read the book and learn about oracles, genies, singletons; about boxing methods, tripwires, and mind crime; about humanity's cosmic endowment and differential technological development; indirect normativity, instrumental convergence, whole brain emulation and technology couplings; Malthusian economics and dystopian evolution; artificial intelligence, and biological cognitive enhancement, and collective intelligence.

Rebooting AI

Robotics: economic, technical, and policy issues. Technological trends in agricultural electronics. Future use of robots in agriculture. Mobile robots in agriculture. Animal positioning, manipulation and restraint for a sheep shearing robot. Japan's technology farm. Application of agricultural robots in Japan. Agricultural robots in Japan: a challenge for U.S. agricultural engineers. Image

controlled robotics in agricultural environments. Nuclear magnetic resonance image interpretation. Intelligent robot systems: potential agricultural applications. Robotic harvesting of apples. Controlling agricultural machinery intelligently. Automatic control of tractors and field machines. Automatic combine. Robotic principles in the selective harverst of Valencia oranges. Hero 1 robot: educational applications. Conference wrap-up.

Robotics and Intelligent Machines in Agriculture

Profiles eleven individuals, including mathematicians, engineers, and inventors, who have greatly influenced the field of robotics, focusing on their struggle to accomplish what they have.

Children's Book Review Index

"Startling in scope and bravado." —Janet Maslin, The New York Times "Artfully envisions a breathtakingly better world." —Los Angeles Times "Elaborate, smart and persuasive." —The Boston Globe "A pleasure to read." —The Wall Street Journal One of CBS News's Best Fall Books of 2005 • Among St Louis Post-Dispatch's Best Nonfiction Books of 2005 • One of Amazon.com's Best Science Books of 2005 A radical and optimistic view of the future course of human development from the bestselling author of How to Create a Mind and The Age of Spiritual Machines who Bill Gates calls "the best person I know at predicting the future of artificial intelligence" For over three decades, Ray Kurzweil has been one of the most respected and provocative advocates of the role of technology in our future. In his classic The Age of Spiritual Machines, he argued that computers would soon rival the full range of human intelligence at its best. Now he examines the next step in this inexorable evolutionary process: the union of human and machine, in which the knowledge and skills embedded in our brains will be combined with the vastly greater capacity, speed, and knowledge-sharing ability of our creations. From the Trade Paperback edition.

Robot Intelligence

Social robotics is a cutting edge research area gathering researchers and stakeholders from various disciplines and organizations. The transformational potential that these machines, in the form of, for example, caregiving, entertainment or partner robots, pose to our societies and to us as individuals seems to be limited by our technical limitations and phantasy alone. This collection contributes to the field of social robotics by exploring its boundaries from a philosophically informed standpoint. It constructively outlines central potentials and challenges and thereby also provides a stable fundament for further research of empirical, qualitative or methodological nature.

Developmental Robotics

Robot intelligence has become a major focus of intelligent robotics. Recent innovation in computational intelligence including fuzzy learning, neural networks, evolutionary computation and classical Artificial Intelligence provides sufficient

theoretical and experimental foundations for enabling robots to undertake a variety of tasks with reasonable performance. This book reflects the recent advances in the field from an advanced knowledge processing perspective; there have been attempts to solve knowledge based information explosion constraints by integrating computational intelligence in the robotics context.

Robots

This volume includes extended and revised versions of a set of selected papers from the International Conference on Electric and Electronics (EEIC 2011) , held on June 20-22 , 2011, which is jointly organized by Nanchang University, Springer, and IEEE IAS Nanchang Chapter. The objective of EEIC 2011 Volume 3 is to provide a major interdisciplinary forum for the presentation of new approaches from Electrical Power Systems and Computers, to foster integration of the latest developments in scientific research. 133 related topic papers were selected into this volume. All the papers were reviewed by 2 program committee members and selected by the volume editor Prof. Xiaofeng Wan. We hope every participant can have a good opportunity to exchange their research ideas and results and to discuss the state of the art in the areas of the Electrical Power Systems and Computers.

Self-Adaptive Systems for Machine Intelligence

"How will the law change to accommodate the role of artificial intelligence in society and how much of that change has occurred already? When machines make their own decisions with financial impact, who receives credit or blame? This new guide provides anexamination of how artificial intelligence has evolved, how it will affect the legal profession, and how the law will be reformed to meet the new realities created by AI. Written by high-level industry experts, this guide discusses a wide-range of AI topics including a history and introduction, healthcare regulation, entertainment, labor laws, aviation, military applications, cybernetics and biorobotics, copyright law, cybersecurity issues, product liability, AI and the transactional law practice, the future of AI, and more."--

On Advances in Robot Kinematics

Describes how humans first started using tools and traces the evolution of tools from simple stone implements to the high-tech devices of today, and includes experiments illustrating the scientific concepts behind tools.

The Quest for Artificial Intelligence

Today's great paradox is that we feel the impact of technology everywhere--in our cars, our phones, the supermarket, the doctor's office--but not in our paychecks. In the past, technological advancements dramatically increased wages, but for three decades now, the median wage has remained stagnant. Machines have taken over much of the work of humans, destroying old jobs while increasing profits for business owners. The threat of ever-widening economic inequality looms, but in Learning by Doing, James Bessen argues that increased inequality is not inevitable.

Workers can benefit by acquiring the knowledge and skills necessary to implement rapidly evolving technologies; unfortunately, this can take years, even decades. Technical knowledge is mostly unstandardized and difficult to acquire, learned through job experience rather than in the classroom. As Bessen explains, the right policies are necessary to provide strong incentives for learning on the job. Politically influential interests have moved policy in the wrong direction recently. Based on economic history as well as analysis of today's labor markets, his book shows a way to restore broadly shared prosperity.

Robot-Proof

Computers are already approving financial transactions, controlling electrical supplies, and driving trains. Soon, service robots will be taking care of the elderly in their homes, and military robots will have their own targeting and firing protocols. Colin Allen and Wendell Wallach argue that as robots take on more and more responsibility, they must be programmed with moral decision-making abilities, for our own safety. Taking a fast paced tour through the latest thinking about philosophical ethics and artificial intelligence, the authors argue that even if full moral agency for machines is a long way off, it is already necessary to start building a kind of functional morality, in which artificial moral agents have some basic ethical sensitivity. But the standard ethical theories don't seem adequate, and more socially engaged and engaging robots will be needed. As the authors show, the quest to build machines that are capable of telling right from wrong has begun. Moral Machines is the first book to examine the challenge of building artificial moral agents, probing deeply into the nature of human decision making and ethics.

All in a Day's Work

Discusses the fundamentals of building and engineering robots, addresses the challenges of making them more functional and intelligent, and provides examples from science, technology, and motion pictures.

Cyborg Futures

"This book explores some of the most recent developments in robotic motion, artificial intelligence, and human-machine interaction, providing insight into a wide variety of applications and functional areas"--Provided by publisher.

Architects of Intelligence

An "intriguing, insightful" look at how algorithms and robots could lead to social unrest—and how to avoid it (The Economist, Books of the Year). After decades of effort, researchers are finally cracking the code on artificial intelligence. Society stands on the cusp of unprecedented change, driven by advances in robotics, machine learning, and perception powering systems that rival or exceed human capabilities. Driverless cars, robotic helpers, and intelligent agents that promote our interests have the potential to usher in a new age of affluence and leisure—but as AI expert and Silicon Valley entrepreneur Jerry Kaplan warns, the transition may

be protracted and brutal unless we address the two great scourges of the modern developed world: volatile labor markets and income inequality. In Humans Need Not Apply, he proposes innovative, free-market adjustments to our economic system and social policies to avoid an extended period of social turmoil. His timely and accessible analysis of the promises and perils of AI is a must-read for business leaders and policy makers on both sides of the aisle. "A reminder that AI systems don't need red laser eyes to be dangerous."—Times Higher Education Supplement "Kaplan…sidesteps the usual arguments of techno-optimism and dystopia, preferring to go for pragmatic solutions to a shrinking pool of jobs."—Financial Times

The Robots Are Coming

AI is radically transforming business. Are you ready? Look around you. Artificial intelligence is no longer just a futuristic notion. It's here right now--in software that senses what we need, supply chains that "think" in real time, and robots that respond to changes in their environment. Twenty-first-century pioneer companies are already using AI to innovate and grow fast. The bottom line is this: Businesses that understand how to harness AI can surge ahead. Those that neglect it will fall behind. Which side are you on? In Human + Machine, Accenture leaders Paul R. Daugherty and H. James (Jim) Wilson show that the essence of the AI paradigm shift is the transformation of all business processes within an organization--whether related to breakthrough innovation, everyday customer service, or personal productivity habits. As humans and smart machines collaborate ever more closely, work processes become more fluid and adaptive, enabling companies to change them on the fly--or to completely reimagine them. AI is changing all the rules of how companies operate. Based on the authors' experience and research with 1,500 organizations, the book reveals how companies are using the new rules of AI to leap ahead on innovation and profitability, as well as what you can do to achieve similar results. It describes six entirely new types of hybrid human + machine roles that every company must develop, and it includes a "leader's guide" with the five crucial principles required to become an AI-fueled business. Human + Machine provides the missing and much-needed management playbook for success in our new age of AI. BOOK PROCEEDS FOR THE AI GENERATION The authors' goal in publishing Human + Machine is to help executives, workers, students and others navigate the changes that AI is making to business and the economy. They believe AI will bring innovations that truly improve the way the world works and lives. However, AI will cause disruption, and many people will need education, training and support to prepare for the newly created jobs. To support this need, the authors are donating the royalties received from the sale of this book to fund education and retraining programs focused on developing fusion skills for the age of artificial intelligence.

Tools and Machines

This volume brings together academics from evolutionary biology, literary theory, robotics, digital culture, anthropology, sociology, and environmental studies to consider the impact of robotics and AI on society. By bringing these perspectives together in one book, readers gain a sense of the complex scientific, social, and ideological contexts within which AI and robotics research is unfolding, as well

the illusory suppositions and distorted claims being mobilized by the industry in the name of bettering humanity's future. Discussions about AI and robotics have been shaped by computer science and engineering, steered by corporate and military interests, forged by transhumanist philosophy and libertarian politics, animated by fiction, and hyped by the media. From fiction passing as science to the illusion of AI autonomy to the business of ethics to the automation of war, this collection recognizes the inevitable entanglement of humanity and technology, while exposing the problematic assumptions and myths driving the field in order to better assess its risks and potential.

Proceedings

"What does AI mean for your business? Read this book to find out." -- Hal Varian, Chief Economist, Google Artificial intelligence does the seemingly impossible, magically bringing machines to life--driving cars, trading stocks, and teaching children. But facing the sea change that AI will bring can be paralyzing. How should companies set strategies, governments design policies, and people plan their lives for a world so different from what we know? In the face of such uncertainty, many analysts either cower in fear or predict an impossibly sunny future. But in Prediction Machines, three eminent economists recast the rise of AI as a drop in the cost of prediction. With this single, masterful stroke, they lift the curtain on the AI-is-magic hype and show how basic tools from economics provide clarity about the AI revolution and a basis for action by CEOs, managers, policy makers, investors, and entrepreneurs. When AI is framed as cheap prediction, its extraordinary potential becomes clear: Prediction is at the heart of making decisions under uncertainty. Our businesses and personal lives are riddled with such decisions. Prediction tools increase productivity--operating machines, handling documents, communicating with customers. Uncertainty constrains strategy. Better prediction creates opportunities for new business structures and strategies to compete. Penetrating, fun, and always insightful and practical, Prediction Machines follows its inescapable logic to explain how to navigate the changes on the horizon. The impact of AI will be profound, but the economic framework for understanding it is surprisingly simple.

Human + Machine

Tracing the connections between human-like robots and AI at the site of dehumanization and exploited labor The word robot—introduced in Karel Čapek's 1920 play R.U.R.—derives from rabota, the Czech word for servitude or forced labor. A century later, the play's dystopian themes of dehumanization and exploited labor are being played out in factories, workplaces, and battlefields. In The Robotic Imaginary, Jennifer Rhee traces the provocative and productive connections of contemporary robots in technology, film, art, and literature. Centered around the twinned processes of anthropomorphization and dehumanization, she analyzes the coevolution of cultural and technological robots and artificial intelligence, arguing that it is through the conceptualization of the human and, more important, the dehumanized that these multiple spheres affect and transform each other. Drawing on the writings of Alan Turing, Sara Ahmed, and Arlie Russell Hochschild; such films and novels as Her and The Stepford Wives; technologies like Kismet (the pioneering "emotional robot"); and contemporary

drone art, this book explores anthropomorphic paradigms in robot design and imagery in ways that often challenge the very grounds on which those paradigms operate in robotics labs and industry. From disembodied, conversational AI and its entanglement with care labor; embodied mobile robots as they intersect with domestic labor; emotional robots impacting affective labor; and armed military drones and artistic responses to drone warfare, The Robotic Imaginary ultimately reveals how the human is made knowable through the design of and discourse on humanoid robots that are, paradoxically, dehumanized.

Moral Machines

How biology has inspired technology -- from a watch with an alarm modeled on a cricket's noisemaking to a robot that can dance. Humans have modeled their technology on nature for centuries. The inventor of paper was inspired by a wasp's nest; Brunelleschi demonstrated the principles of his famous dome with an egg; a Swiss company produced a wristwatch with an alarm modeled on the sound-producing capabilities of a cricket. Today, in the era of the "new bionics," engineers aim to reproduce the speed and maneuverability of the red tuna in a submarine; cochlear implants send sound signals to the auditory nerve of a hearing-impaired person; and robots replicate a baby's cognitive development. How to Catch a Robot Rat examines past, present, and future attempts to apply the methods and systems found in nature to the design of objects and devices. The authors look at "natural technology transfers": how the study of nature inspired technological breakthroughs -- including the cricket-inspired watch; Velcro, which duplicates the prickly burrs of a burdock flower; and self-sharpening blades that are modeled on rats' self-sharpening teeth. They examine autonomous robots that imitate animals and their behaviors -- for example, the development of an unmanned microdrone that could fly like an albatross. And they describe hybrids of natural and artificial systems: neuroprostheses translating the thought of quadriplegics; and a nanorobot controlled by muscle cells. Some of the ideas described have outstripped technology's capacity to realize them; nature has had more than three billion years to perfect its designs, humankind not quite so long.

War in the Age of Intelligent Machines

Collects thirty-four brief interviews with professionals who use science in their jobs, including an astronaut, animal nutritionist, oceanographer, and automotive technician.

Social Robots

Book Description How will AI evolve and what major innovations are on the horizon? What will its impact be on the job market, economy, and society? What is the path toward human-level machine intelligence? What should we be concerned about as artificial intelligence advances? Architects of Intelligence contains a series of in-depth, one-to-one interviews where New York Times bestselling author, Martin Ford, uncovers the truth behind these questions from some of the brightest minds in the Artificial Intelligence community. Martin has wide-ranging conversations with twenty-three of the world's foremost researchers and entrepreneurs working in AI

and robotics: Demis Hassabis (DeepMind), Ray Kurzweil (Google), Geoffrey Hinton (Univ. of Toronto and Google), Rodney Brooks (Rethink Robotics), Yann LeCun (Facebook) , Fei-Fei Li (Stanford and Google), Yoshua Bengio (Univ. of Montreal), Andrew Ng (AI Fund), Daphne Koller (Stanford), Stuart Russell (UC Berkeley), Nick Bostrom (Univ. of Oxford), Barbara Grosz (Harvard), David Ferrucci (Elemental Cognition), James Manyika (McKinsey), Judea Pearl (UCLA), Josh Tenenbaum (MIT), Rana el Kaliouby (Affectiva), Daniela Rus (MIT), Jeff Dean (Google), Cynthia Breazeal (MIT), Oren Etzioni (Allen Institute for AI), Gary Marcus (NYU), and Bryan Johnson (Kernel). Martin Ford is a prominent futurist, and author of Financial Times Business Book of the Year, Rise of the Robots. He speaks at conferences and companies around the world on what AI and automation might mean for the future.

Mobile Robotics

The robot population is rising on Earth and other planets. (Mars is inhabited entirely by robots.) As robots slip into more domains of human life--from the operating room to the bedroom--they take on our morally important tasks and decisions, as well as create new risks from psychological to physical. This makes it all the more urgent to study their ethical, legal, and policy impacts. To help the robotics industry and broader society, we need to not only press ahead on a wide range of issues, but also identify new ones emerging as quickly as the field is evolving. For instance, where military robots had received much attention in the past (and are still controversial today), this volume looks toward autonomous cars here as an important case study that cuts across diverse issues, from liability to psychology to trust and more. And because robotics feeds into and is fed by AI, the Internet of Things, and other cognate fields, robot ethics must also reach into those domains, too. Expanding these discussions also means listening to new voices; robot ethics is no longer the concern of a handful of scholars. Experts from different academic disciplines and geographical areas are now playing vital roles in shaping ethical, legal, and policy discussions worldwide. So, for a more complete study, the editors of this volume look beyond the usual suspects for the latest thinking. Many of the views as represented in this cutting-edge volume are provocative--but also what we need to push forward in unfamiliar territory.

Robot Ethics 2. 0

A guide to AI's thorniest implications that asks: How shall we navigate our brave new world? We are at a monumental turning point in human history. AI is taking intelligence in new directions. The strongest human competitors in chess, go, and Jeopardy! have been beaten by AIs, and AI is getting more sophisticated by the day. Further, AI research is going inside the human brain itself, attempting to augment human minds. It may even create greater-than-human-level intelligence, leading to a new generation of artificial minds—Minds 2.0. Susan Schneider, a philosopher, argues that these undertakings must not be attempted without a richer understanding of the nature of the mind. An insufficient grasp of the underlying philosophical issues could undermine the use of AI and brain enhancement technology, bringing about the demise or suffering of conscious beings. Examining the philosophical questions lying beneath the algorithms, Schneider takes on AI's thorniest implications.

Humans Need Not Apply

Superintelligence

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.

Electrical Power Systems and Computers

For Readers of Ray Kurzweil and Michio Kaku, a New Look at the Cutting Edge of Artificial Intelligence Imagine a robotic stuffed animal that can read and respond to a child's emotional state, a commercial that can recognize and change based on a customer's facial expression, or a company that can actually create feelings as though a person were experiencing them naturally. Heart of the Machine explores the next giant step in the relationship between humans and technology: the ability of computers to recognize, respond to, and even replicate emotions. Computers have long been integral to our lives, and their advances continue at an exponential rate. Many believe that artificial intelligence equal or superior to human intelligence will happen in the not-too-distance future; some even think machine consciousness will follow. Futurist Richard Yonck argues that emotion, the first, most basic, and most natural form of communication, is at the heart of how we will soon work with and use computers. Instilling emotions into computers is the next leap in our centuries-old obsession with creating machines that replicate humans. But for every benefit this progress may bring to our lives, there is a possible pitfall. Emotion recognition could lead to advanced surveillance, and the same technology that can manipulate our feelings could become a method of mass control. And, as shown in movies like Her and Ex Machina, our society already holds a deep-seated anxiety about what might happen if machines could actually feel and break free from our control. Heart of the Machine is an exploration of the new and inevitable ways in which mankind and technology will interact. The paperback edition has a new foreword by Rana el Kaliouby, PhD, a pioneer in artificial emotional intelligence, as well as the cofounder and CEO of Affectiva, the acclaimed AI startup spun off from the MIT Media Lab.

How to Catch a Robot Rat

From an Oxford economist, a visionary account of how technology will transform

the world of work, and what we should do about it From mechanical looms to the combustion engine to the first computers, new technologies have always provoked panic about workers being replaced by machines. For centuries, such fears have been misplaced, and many economists maintain that they remain so today. But as Daniel Susskind demonstrates, this time really is different. Breakthroughs in artificial intelligence mean that all kinds of jobs are increasingly at risk. Drawing on almost a decade of research in the field, Susskind argues that machines no longer need to think like us in order to outperform us, as was once widely believed. As a result, more and more tasks that used to be far beyond the capability of computers – from diagnosing illnesses to drafting legal contracts, from writing news reports to composing music – are coming within their reach. The threat of technological unemployment is now real. This is not necessarily a bad thing, Susskind emphasizes. Technological progress could bring about unprecedented prosperity, solving one of humanity's oldest problems: how to make sure that everyone has enough to live on. The challenges will be to distribute this prosperity fairly, to constrain the burgeoning power of Big Tech, and to provide meaning in a world where work is no longer the center of our lives. Perceptive, pragmatic, and ultimately hopeful, A World Without Work shows the way.

Artificial You

The truth about robots: two experts look beyond the hype, offering a lively and accessible guide to what robots can (and can't) do. The robots are coming, and they're going to take our jobs! Or, on second thought, perhaps they will be our friends! In case you haven't noticed, there's a lot of hype about robots; some of it is scary and some of it utopian. In this book, two robotics experts look beyond the fearmongering and the cheerleading to offer an engaging, accessible guide to robots: what they can (and can't) do, how they work, and what we can reasonably expect their future capabilities to be. The authors discuss the history of our fascination with the creation of artificial humans and why we find it so frightening. They outline the basic capabilities of robots--movement, navigation, and grasping and touching--and unpack the language we use to talk about robots, investigating the terms intelligence (perhaps a misnomer in the context of robotics) and learning (explaining the varieties of machine learning). They describe cooperating robots, used in applications ranging from robot football to search and rescue; ask if robots can feel emotions; and consider interactive robots as pets, butlers, and companions. Finally, they look at robots that raise ethical and social issues: killer robots, sexbots, and robots that might be gunning for your job. The Robots Are Coming equips readers to look at robots concretely--as human-made artifacts rather than placeholders for our anxieties.

The Singularity Is Near

Two leaders in the field offer a compelling analysis of the current state of the art and reveal the steps we must take to achieve a truly robust artificial intelligence. Despite the hype surrounding AI, creating an intelligence that rivals or exceeds human levels is far more complicated than we have been led to believe. Professors Gary Marcus and Ernest Davis have spent their careers at the forefront of AI research and have witnessed some of the greatest milestones in the field, but they argue that a computer beating a human in Jeopardy! does not signal that we are

on the doorstep of fully autonomous cars or superintelligent machines. The achievements in the field thus far have occurred in closed systems with fixed sets of rules, and these approaches are too narrow to achieve genuine intelligence. The real world, in contrast, is wildly complex and open-ended. How can we bridge this gap? What will the consequences be when we do? Taking inspiration from the human mind, Marcus and Davis explain what we need to advance AI to the next level, and suggest that if we are wise along the way, we won't need to worry about a future of machine overlords. If we focus on endowing machines with common sense and deep understanding, rather than simply focusing on statistical analysis and gatherine ever larger collections of data, we will be able to create an AI we can trust--in our homes, our cars, and our doctors' offices. Rebooting AI provides a lucid, clear-eyed assessment of the current science and offers an inspiring vision of how a new generation of AI can make our lives better.

Modern Robotics

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Rise of the Robots

In the last decade, we have seen an extraordinary progress in the the ory and applications of robot kinematics. This has been motivated espe cially by the development of complex parallel and humanoid robots. The present book reports the most recent research advances in the theory, design, control and application of robotic systems, which are intended for a variety of purposes such as manipulation, manufacturing, automa tion, surgery, locomotion and biomechanics. The issues addressed are fundamentally kinematic in nature, including synthesis, calibration, re dundancy, force control, dexterity, inverse and forward kinematics, kine matic singularities, as well as over-constrained systems. Methods used include line geometry, quaternion algebra, screw algebra, and linear alge bra. These methods are applied to both parallel and serial multi-degree of-freedom systems. The results should interest researchers, teachers and students, in fields of engineering and mathematics related to robot theory, design, control and

application. This is the sixth book of the series Advances in Robot Kinematics published by Kluwer. The contributions in this book had been rigorously reviewed by in dependent reviewers and fifty one articles had been recommended for publication. They were introduced in seven chapters. These articles were also reported and discussed at the ninth international symposium on Advances in Robot Kinematics which was held in June 2004 in Sestri Levante in Italy. Indexed in Conference Proceedings Citation Index- Science (CPCI-S)

Learning by Doing

An authority on creativity introduces us to AI-powered computers that are creating art, literature, and music that may well surpass the creations of humans. Today's computers are composing music that sounds "more Bach than Bach," turning photographs into paintings in the style of Van Gogh's Starry Night, and even writing screenplays. But are computers truly creative--or are they merely tools to be used by musicians, artists, and writers? In this book, Arthur I. Miller takes us on a tour of creativity in the age of machines. Miller, an authority on creativity, identifies the key factors essential to the creative process, from "the need for introspection" to "the ability to discover the key problem." He talks to people on the cutting edge of artificial intelligence, encountering computers that mimic the brain and machines that have defeated champions in chess, Jeopardy!, and Go. In the central part of the book, Miller explores the riches of computer-created art, introducing us to artists and computer scientists who have, among much else, unleashed an artificial neural network to create a nightmarish, multi-eyed dog-cat; taught AI to imagine; developed a robot that paints; created algorithms for poetry; and produced the world's first computer-composed musical, Beyond the Fence, staged by Android Lloyd Webber and friends. But, Miller writes, in order to be truly creative, machines will need to step into the world. He probes the nature of consciousness and speaks to researchers trying to develop emotions and consciousness in computers. Miller argues that computers can already be as creative as humans--and someday will surpass us. But this is not a dystopian account; Miller celebrates the creative possibilities of artificial intelligence in art, music, and literature.

Heart of the Machine

A comprehensive overview of an interdisciplinary approach to robotics that takes direct inspiration from the developmental and learning phenomena observed in children's cognitive development.

A World Without Work

The New York Times-bestselling guide to how automation is changing the economy, undermining work, and reshaping our lives Winner of Best Business Book of the Year awards from the Financial Times and from Forbes "Lucid, comprehensive, and unafraid;an indispensable contribution to a long-running argument."--Los Angeles Times What are the jobs of the future? How many will there be? And who will have them? As technology continues to accelerate and machines begin taking care of themselves, fewer people will be necessary.

Artificial intelligence is already well on its way to making "good jobs" obsolete: many paralegals, journalists, office workers, and even computer programmers are poised to be replaced by robots and smart software. As progress continues, blue and white collar jobs alike will evaporate, squeezing working- and middle-class families ever further. At the same time, households are under assault from exploding costs, especially from the two major industries-education and health care-that, so far, have not been transformed by information technology. The result could well be massive unemployment and inequality as well as the implosion of the consumer economy itself. The past solutions to technological disruption, especially more training and education, aren't going to work. We must decide, now, whether the future will see broad-based prosperity or catastrophic levels of inequality and economic insecurity. Rise of the Robots is essential reading to understand what accelerating technology means for our economic prospects-not to mention those of our children-as well as for society as a whole.

The Law of Artificial Intelligence and Smart Machines

The author aims to show how the emergence of intelligent and autonomous bombs and missiles equipped with artificial perception and decision-making capabilities represents a profound historical shift in the relation of human beings both to machines and to information.

ROMANCE ACTION & ADVENTURE MYSTERY & THRILLER BIOGRAPHIES & HISTORY CHILDREN'S YOUNG ADULT FANTASY HISTORICAL FICTION HORROR LITERARY FICTION NON-FICTION SCIENCE FICTION

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