The Master Algorithm Pedro Domingos

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<u>Superintelligence</u> - Nick Bostrom 2014
This profoundly ambitious and original book picks its way carefully through a vast tract of forbiddingly difficult intellectual terrain.
AI for People and Business - Alex Castrounis 2019-07-05
If you're an executive, manager, or anyone interested in leveraging AI within your organization, this is your guide. You'll understand exactly what AI is, learn how to identify AI opportunities, and develop and execute a successful AI vision and strategy. Alex Castrounis, business consultant and former IndyCar engineer and race strategist, examines the value of AI and shows you how to develop an AI vision and strategy that benefits both people and business. AI is exciting, powerful, and game changing—but too many AI initiatives end in failure. With this book, you'll explore the risks, considerations, trade-offs, and constraints for pursuing an AI initiative. You'll learn how to create better human experiences and greater business success through winning AI solutions and human-centered products. Use the book's AIPB Framework to conduct end-to-end, goal-driven innovation and value creation with AI Define a goal-aligned AI vision and strategy for stakeholders, including businesses, customers, and users Leverage AI successfully by focusing on concepts such as scientific innovation and AI readiness and maturity Understand the importance of executive leadership for pursuing AI initiatives "A must read for business executives and managers interested in learning about AI and unlocking its benefits. Alex Castrounis has simplified complex topics so that anyone can begin to leverage AI within their organization." - Dan Park, GM & Director, Uber "Alex Castrounis has been at the forefront of helping organizations understand the promise of AI and leverage its benefits, while avoiding the many pitfalls that can derail success. In this essential book, he shares his expertise with the rest of us." - Dean Wampler, Ph.D., VP, Fast Data Engineering at Lightbend
<u>An Introduction to Approaches and Modern Applications with Ensemble Learning</u> - Yi-Tung Chan 2020
From the successful application of deep learning (DL) in AlphaGo in 2012 to the recent advances in edge computing, artificial intelligence (AI) has continued to develop over the years. In the face of the current sweeping trend of AI, ensemble learning (EL) is expected to be further applied to DL and AI for developing higher-level ensemble systems in the future. Moreover, it could become an important step for achieving "The Master Algorithm" proposed by Prof. Pedro Domingos. In light of this, EL will continue to make a significant contribution to future development. The purpose of this book is to provide insights into EL for readers not majoring in computer science or related subjects, introduce the latest development and applications of EL; in particular, share its practical applications in various fields. Accordingly, this book intends to present theoretical parts relating to mathematics and computing in a simple and concise manner. The examples and practical use of EL have been used to explain methods that utilize EL to solve readers'' issues in their fields, which demonstrates the essence of EL for practical applications. While many AI and ML books are available on the market, most require a certain level of mathematical and machine learning (ML) knowledge. Complicated theories of mathematics and computation may be intimidating for people without a background in computer science and engineering, such as biological and medical researchers. It would be unfortunate if they were to miss the opportunity to use EL as a practical tool to solve data analysis problems at hand. Moreover, EL is usually introduced in the later or advanced chapters of AI and ML books. Beginners in ML, or readers without a technical background, are likely to be frustrated by mathematical or technical terms that only appear occasionally in the book or be anxious about complicated mathematical and computational theories related to classification algorithms. It would be regrettable if they were intimidated, and therefore, missed the opportunity to learn and use EL. From a practical perspective, existing classification techniques, such as decision trees with the C4.5 algorithm, support vector machines, and neural networks are now relatively mature and have been proven to be effective. For readers without a technical background, it is not essential to understand the complicated mathematical and computational theories behind the above techniques. Instead, it is recommended to grasp the logic and meaning of parameters in these classification algorithms and directly conduct tests using EL. Learning through practice can help readers to establish computational thinking. It is the best approach to learning EL, ML, AI, and DL.Furthermore, this book provides references and recommended reading for each technique to satisfy the curiosity of some readers with regard to mathematical theories and algorithms so that they can acquire further knowledge and answer their questions. Finally, the hope is that readers can be made aware, through practical use of EL, that they can build a robust ensemble system and solve problems in their areas without having to learn the absolute details of specific ML algorithms and mathematics behind the algorithms.This book provides insights into EL from worldwide experts and scholars in various fields. This book extensively introduces and discusses the application of EL in various fields and the current and future research directions of its novel applications. It also reviews some of the more popular areas in which EL has received widespread attention in recent years in the ML and AI. Each chapter opens with an introduction to ML and EL techniques, and then, analyzes the applications of EL in different fields, such as signal and image processing, medical care, education, geology, and agriculture. More than two experts and scholars in related fields acted as reviewers for the peer review of each chapter. It is hoped that these applications in various fields can inspire readers to use EL in practice.
<u>Artificial Intelligence</u> - Melanie Mitchell 2019-10-15
Melanie Mitchell separates science fact from science fiction in this sweeping examination of the current state of AI and how it is remaking our world No recent scientific enterprise has proved as alluring, terrifying, and filled with extravagant promise and frustrating setbacks as artificial intelligence. The award-winning author Melanie Mitchell, a leading computer scientist, now reveals AI's turbulent history and the recent spate of apparent successes, grand hopes, and emerging fears surrounding it. In Artificial Intelligence, Mitchell turns to the most urgent questions concerning AI today: How intelligent—really—are the best AI programs? How do they work? What can they actually do, and when do they fail? How humanlike do we expect them to become, and how soon do we need to worry about them surpassing us? Along the way, she introduces the dominant models of modern AI and machine learning, describing cutting-edge AI programs, their human inventors, and the historical lines of thought underpinning recent achievements. She meets with fellow experts such as Douglas Hofstadter, the cognitive scientist and Pulitzer Prize–winning author of the modern classic Gödel, Escher, Bach, who explains why he is "terrified" about the future of AI. She explores the profound disconnect between the hype and the actual achievements in AI, providing a clear sense of what the field has accomplished and how much further it has to go. Interweaving stories about the science of AI and the people behind it, Artificial Intelligence brims with clear-sighted, captivating, and accessible accounts of the most interesting and provocative modern work in the field, flavored with Mitchell's humor and personal observations. This frank, lively book is an indispensable guide to understanding today's AI, its quest for "human-level" intelligence, and its impact on the future for us all.
Einstein's Greatest Mistake - David Bodanis 2016-10-18
"What Bodanis does brilliantly is to give us a feel for Einstein as a person. I don't think I've ever read a book that does this as well" (Popular Science). In this "fascinating" biography, the acclaimed author of E=mc2 reveals that in spite of his indisputable brilliance, Albert Einstein found himself ignored by most working scientists during the

final decades of his life, his ideas opposed by even his closest friends (Forbes). How did this happen? Einstein revolutionized our understanding of the cosmos with his general theory of relativity, and helped lead us into the atomic age. This book goes beyond his remarkable intellect and accomplishments to examine the man himself, from the skeptical, erratic student to the world's greatest physicist to the fallen-from-grace celebrity. An intimate biography that "imparts fresh insight into the genius—and failures—of the 20th century's most celebrated scientist," Einstein's Greatest Mistake reveals what we owe Einstein today—and how much more he might have achieved if not for his all-too-human flaws (Publishers Weekly). Named a Science Book of the Year by the Sunday Times and one of the Top Five Science Books of 2016 by ABC News Australia, this unique book "offers a window onto Einstein's achievements and missteps, as well as his life—his friendships, his complicated love life (two marriages, many affairs) and his isolation from other scientists at the end of his life" (BookPage).

The Master Algorithm - Pedro Domingos 2015-09-22
Under the aegis of machine learning in our data-driven machine age, computers are programming themselves and learning aboutand solvingan extraordinary range of problems, from the mundane to the most daunting. Today it is machine learning programs that enable Amazon and Netflix to predict what users will like, Apple to power Siri's ability to understand voices, and Google to pilot cars. These programs are already helping us fight the war on cancer and predict the movements of the stock market, and they are making great headway with instant language translation and discovering new laws of nature. But machine learning is incomplete, and its practitioners across the globe are seeking the most powerful algorithm of all. The Master Algorithm will not be limited to solving particular problems but will be able to learn anything and solve any problem, however difficult, and Pedro Domingos, a trailblazing computer scientist, is at the very forefront of the search for it. With the Master Algorithm in hand and data as its fuel, machine learningessentially the automation of discovery, a kind of scientific method on steroidswill become the most powerful technology humanity has ever devised. And The Master Algorithm will be its bible.

Markov Logic - Pedro Domingos 2009-05-08
Most subfields of computer science have an interface layer via which applications communicate with the infrastructure, and this is key to their success (e.g., the Internet in networking, the relational model in databases, etc.). So far this interface layer has been missing in AI. First-order logic and probabilistic graphical models each have some of the necessary features, but a viable interface layer requires combining both. Markov logic is a powerful new language that accomplishes this by attaching weights to first-order formulas and treating them as templates for features of Markov random fields. Most statistical models in wide use are special cases of Markov logic, and first-order logic is its infinite-weight limit. Inference algorithms for Markov logic combine ideas from satisfiability, Markov chain Monte Carlo, belief propagation, and resolution. Learning algorithms make use of conditional likelihood, convex optimization, and inductive logic programming. Markov logic has been successfully applied to problems in information extraction and integration, natural language processing, robot mapping, social networks, computational biology, and others, and is the basis of the open-source Alchemy system.

The Ethical Algorithm - Michael Kearns 2019-10-04
Over the course of a generation, algorithms have gone from mathematical abstractions to powerful mediators of daily life. Algorithms have made our lives more efficient, more entertaining, and, sometimes, better informed. At the same time, complex algorithms are increasingly violating the basic rights of individual citizens. Allegedly anonymized datasets routinely leak our most sensitive personal information; statistical models for everything from mortgages to college admissions reflect racial and gender bias. Meanwhile, users manipulate algorithms to "game" search engines, spam filters, online reviewing services, and navigation apps. Understanding and improving the science behind the algorithms that run our lives is rapidly becoming one of the most pressing issues of this century. Traditional fixes, such as laws, regulations and watchdog groups, have proven woefully inadequate. Reporting from the cutting edge of scientific research, The Ethical Algorithm offers a new approach: a set of principled solutions based on the emerging and exciting science of socially aware algorithm design. Michael Kearns and Aaron Roth explain how we can better embed human principles into machine code - without halting the advance of data-driven scientific exploration. Weaving together innovative research with stories of citizens, scientists, and activists on the front lines, The Ethical

Algorithm offers a compelling vision for a future, one in which we can better protect humans from the unintended impacts of algorithms while continuing to inspire wondrous advances in technology.

The Master Algorithm - Pedro Domingos 2015-09-22
A thought-provoking and wide-ranging exploration of machine learning and the race to build computer intelligences as flexible as our own In the world's top research labs and universities, the race is on to invent the ultimate learning algorithm: one capable of discovering any knowledge from data, and doing anything we want, before we even ask. In The Master Algorithm, Pedro Domingos lifts the veil to give us a peek inside the learning machines that power Google, Amazon, and your smartphone. He assembles a blueprint for the future universal learner-- the Master Algorithm--and discusses what it will mean for business, science, and society. If data-ism is today's philosophy, this book is its bible.

The Genius Within - Frank T. Vertosick 2002
Argues that intelligence--an ability to react, change behavior, and survive--exists in all forms of life, including bacteria, insects, and animals, and presents evidence about the intelligence of the smallest living things. 25,000 first printing.

Army of None: Autonomous Weapons and the Future of War - Paul Scharre 2018-04-24
"The book I had been waiting for. I can't recommend it highly enough." —Bill Gates The era of autonomous weapons has arrived. Today around the globe, at least thirty nations have weapons that can search for and destroy enemy targets all on their own. Paul Scharre, a leading expert in next-generation warfare, describes these and other high tech weapons systems—from Israel's Harpy drone to the American submarine-hunting robot ship Sea Hunter—and examines the legal and ethical issues surrounding their use. "A smart primer to what's to come in warfare" (Bruce Schneier), Army of None engages military history, global policy, and cutting-edge science to explore the implications of giving weapons the freedom to make life and death decisions. A former soldier himself, Scharre argues that we must embrace technology where it can make war more precise and humane, but when the choice is life or death, there is no replacement for the human heart.

The Tides of Mind: Uncovering the Spectrum of Consciousness - David Gelernter 2016-02-22
A "rock star" (New York Times) of the computing world provides a radical new work on the meaning of human consciousness. The holy grail of psychologists and scientists for nearly a century has been to understand and replicate both human thought and the human mind. In fact, it's what attracted the now-legendary computer scientist and AI authority David Gelernter to the discipline in the first place. As a student and young researcher in the 1980s, Gelernter hoped to build a program with a dial marked "focus." At maximum "focus," the program would "think" rationally, formally, reasonably. As the dial was turned down and "focus" diminished, its "mind" would start to wander, and as you dialed even lower, this artificial mind would start to free-associate, eventually ignoring the user completely as it cruised off into the mental adventures we know as sleep. While the program was a only a partial success, it laid the foundation for The Tides of Mind, a groundbreaking new exploration of the human psyche that shows us how the very purpose of the mind changes throughout the day. Indeed, as Gelernter explains, when we are at our most alert, when reasoning and creating new memories is our main mental business, the mind is a computer-like machine that keeps emotion on a short leash and attention on our surroundings. As we gradually tire, however, and descend the "mental spectrum," reasoning comes unglued. Memory ranges more freely, the mind wanders, and daydreams grow more insistent. Self-awareness fades, reflection blinks out, and at last we are completely immersed in our own minds. With far-reaching implications, Gelernter's landmark "Spectrum of Consciousness" finally helps decode some of the most mysterious wonders of the human mind, such as the numinous light of early childhood, why dreams are so often predictive, and why sadism and masochism underpin some of our greatest artistic achievements. It's a theory that also challenges the very notion of the mind as a machine—and not through empirical studies or "hard science" but by listening to our great poets and novelists, who have proven themselves as humanity's most trusted guides to the subjective mind and inner self. In the great introspective tradition of Wilhelm Wundt and René Descartes, David Gelernter promises to not only revolutionize our understanding of what it means to be human but also to help answer many of our most fundamental questions about the origins of creativity, thought, and consciousness.

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.

Everything I Ever Needed to Know about Economics I Learned from Online Dating - Paul Oyer 2014-01-07
Conquering the dating market—from an economist's point of view After more than twenty years, economist Paul Oyer found himself back on the dating scene—but what a difference a few years made. Dating was now dominated by sites like Match.com, eHarmony, and OkCupid. But Oyer had a secret weapon: economics. It turns out that dating sites are no different than the markets Oyer had spent a lifetime studying. Monster.com, eBay, and other sites where individuals come together to find a match gave Oyer startling insight into the modern dating scene. The arcane language of economics—search, signaling, adverse selection, cheap talk, statistical discrimination, thick markets, and network externalities—provides a useful guide to finding a mate. Using the ideas that are central to how markets and economics and dating work, Oyer shows how you can apply these ideas to take advantage of the economics in everyday life, all around you, all the time. For all online daters—and for anyone else swimming in the vast sea of the information economy—this book uses Oyer's own experiences, and those of millions of others, to help you navigate the key economic concepts that drive the modern age.

Ensemble Methods in Data Mining - Giovanni Seni 2010
"Ensemble methods have been called the most influential development in Data Mining and Machine Learning in the past decade. They combine multiple models into one usually more accurate than the best of its components. Ensembles can provide a critical boost to industrial challenges -- from investment timing to drug discovery, and fraud detection to recommendation systems -- where predictive accuracy is more vital than model interpretability. Ensembles are useful with all modeling algorithms, but this book focuses on decision trees to explain them most clearly. After describing trees and their strengths and weaknesses, the authors provide an overview of regularization -- today understood to be a key reason for the superior performance of modern ensembling algorithms. The book continues with a clear description of two recent developments: Importance Sampling (IS) and Rule Ensembles (RE). IS reveals classic ensemble methods -- bagging, random forests, and boosting -- to be special cases of a single algorithm, thereby showing how to improve their accuracy and speed. REs are linear rule models derived from decision tree ensembles. They are the most interpretable version of ensembles, which is essential to applications such as credit scoring and fault diagnosis. Lastly, the authors explain the paradox of how ensembles achieve greater accuracy on new data despite their (apparently much greater) complexity."--Publisher's website.

Rebooting AI - Gary Marcus 2020-08-25
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.

Machine Learning and Data Science - Daniel D. Gutierrez 2015-11-01
A practitioner's tools have a direct impact on the success of his or her work. This book will provide the data scientist with the tools and techniques required to excel with statistical learning methods in the areas of data access, data munging, exploratory data analysis, supervised machine learning, unsupervised machine learning and model evaluation. Machine learning and data science are large disciplines, requiring years of study in order to gain proficiency. This book can be viewed as a set of essential tools we need for a long-term career in the data science field – recommendations are provided for further study in order to build advanced skills in tackling important data problem domains. The R statistical environment was chosen for use in this book. R is a growing phenomenon worldwide, with many data scientists using it exclusively for their project work. All of the code examples for the book are written in R. In addition, many popular R packages and data sets will be used.

Deep Learning Illustrated - Jon Krohn 2019-08-05
"The authors' clear visual style provides a comprehensive look at what's currently possible with artificial neural networks as well as a glimpse of the magic that's to come." –Tim Urban, author of Wait But Why Fully Practical, Insightful Guide to Modern Deep Learning Deep learning is transforming software, facilitating powerful new artificial intelligence capabilities, and driving unprecedented algorithm performance. Deep Learning Illustrated is uniquely intuitive and offers a complete introduction to the discipline's techniques. Packed with full-color figures and easy-to-follow code, it sweeps away the complexity of building deep learning models, making the subject approachable and fun to learn. World-class instructor and practitioner Jon Krohn–with visionary content from Grant Beyleveld and beautiful illustrations by Aglaé Bassens–presents straightforward analogies to explain what deep learning is, why it has become so popular, and how it relates to other machine learning approaches. Krohn has created a practical reference and tutorial for developers, data scientists, researchers, analysts, and students who want to start applying it. He illuminates theory with hands-on Python code in accompanying Jupyter notebooks. To help you progress quickly, he focuses on the versatile deep learning library Keras to nimbly construct efficient TensorFlow models; PyTorch, the leading alternative library, is also covered. You'll gain a pragmatic understanding of all major deep learning approaches and their uses in applications ranging from machine vision and natural language processing to image generation and game-playing algorithms. Discover what makes deep learning systems unique, and the implications for practitioners Explore new tools that make deep learning models easier to build, use, and improve Master essential theory: artificial neurons, training, optimization, convolutional nets, recurrent nets, generative adversarial networks (GANs), deep reinforcement learning, and more Walk through building interactive deep learning applications, and move forward with your own artificial intelligence projects Register your book for convenient access to downloads, updates, and/or corrections as they become available. See inside book for details.

The Master Algorithm - Pedro Domingos 2015-09-22
A thought-provoking and wide-ranging exploration of machine learning and the race to build computer intelligences as flexible as our own In the world's top research labs and universities, the race is on to invent the ultimate learning algorithm: one capable of discovering any knowledge from data, and doing anything we want, before we even ask. In The Master Algorithm, Pedro Domingos lifts the veil to give us a peek inside the learning machines that power Google, Amazon, and your smartphone. He assembles a blueprint for the future universal learner--the Master Algorithm--and discusses what it will mean for business, science, and society. If data-ism is today's philosophy, this book is its bible.

Nine Algorithms That Changed the Future - John MacCormick 2020-09-15
Nine revolutionary algorithms that power our computers and smartphones Every day, we use our computers to perform remarkable feats. A simple web search picks out a handful of relevant needles from the world's biggest haystack. Uploading a photo to Facebook transmits millions of pieces of information over numerous error-prone network links, yet somehow a perfect copy of the photo arrives intact. Without even knowing it, we use public-key cryptography to transmit secret information like credit card numbers, and we use digital signatures to verify the identity of the websites we visit. How do our computers perform these tasks with such ease? John MacCormick answers this question in language anyone can understand, using vivid examples to explain the fundamental tricks behind nine computer algorithms that power our PCs, tablets, and smartphones.

We Are Data - John Cheney-Lippold 2017-05-02
What identity means in an algorithmic age: how it works, how our lives are controlled by it, and how we can resist it Algorithms are everywhere, organizing the near limitless data that exists in our world. Derived from our every search, like, click, and purchase, algorithms determine the news we get, the ads we see, the information accessible to us and even who our friends are. These complex configurations not only form knowledge and social relationships in the digital and physical world, but also determine who we are and who we can be, both on and offline. Algorithms create and recreate us, using our data to assign and reassign our gender, race, sexuality, and citizenship status. They can recognize us as celebrities or mark us as terrorists. In this era of ubiquitous surveillance, contemporary data collection entails more than gathering information about us. Entities like Google, Facebook, and the NSA also decide what that information means, constructing our worlds and the identities we inhabit in the process. We have little control over who we algorithmically are. Our identities are made useful not for us—but for someone else. Through a series of entertaining and engaging examples, John Cheney-Lippold draws on the social constructions of identity to advance a new understanding of our algorithmic identities. We Are Data will educate and inspire readers who want to wrest back some freedom in our increasingly surveilled and algorithmically-constructed world.

Machinehood - S.B. Divya 2022-03-22
Baksidestext: "Welga Ramirez, executive bodyguard and ex-special forces, is about to retire early when her client is killed in front of her. It's, 2095 and people don't usually die from violence. Humanity is entirely dependent on pills that not only help them stay alive but allow them to compete with artificial intelligence in an increasingly competitive gig economy. Machinehood is a thrilling and thought-provoking novel that asks: if we won't see machines as human, will we instead see humans as machines?"

The Kill Chain - Christian Brose 2020-04-21
From a former senior advisor to Senator John McCain comes an urgent wake-up call about how new technologies are threatening America's military might. For generations of Americans, our country has been the world's dominant military power. How the US military fights, and the systems and weapons that it fights with, have been uncontested. That old reality, however, is rapidly deteriorating. America's traditional sources of power are eroding amid the emergence of new technologies and the growing military threat posed by rivals such as China. America is at grave risk of losing a future war. As Christian Brose reveals in this urgent wake-up call, the future will be defined by artificial intelligence, autonomous systems, and other emerging technologies that are revolutionizing global industries and are now poised to overturn the model of American defense. This fascinating, if disturbing, book confronts the existential risks on the horizon, charting a way for America's military to adapt and succeed with new thinking as well as new technology. America must build a battle network of systems that

enables people to rapidly understand threats, make decisions, and take military actions, the process known as "the kill chain." Examining threats from China, Russia, and elsewhere, The Kill Chain offers hope and, ultimately, insights on how America can apply advanced technologies to prevent war, deter aggression, and maintain peace.

Human + Machine - Paul R. Daugherty 2018-03-20
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.

The Death Algorithm and Other Digital Dilemmas - Roberto Simanowski 2018-12-04
Provocative takes on cyberbullshit, smartphone zombies, instant gratification, the traffic school of the information highway, and other philosophical concerns of the Internet age. In The Death Algorithm and Other Digital Dilemmas, Roberto Simanowski wonders if we are on the brink of a society that views social, political, and ethical challenges as technological problems that can be fixed with the right algorithm, the best data, or the fastest computer. For example, the "death algorithm" is programmed into a driverless car to decide, in an emergency, whether to plow into a group of pedestrians, a mother and child, or a brick wall. Can such life-and-death decisions no longer be left to the individual human? In these incisive essays, Simanowski asks us to consider what it means to be living in a time when the president of the United States declares the mainstream media to be an enemy of the people—while Facebook transforms the people into the enemy of mainstream media. Simanowski describes smartphone zombies (or "smombies") who remove themselves from the physical world to the parallel universe of social media networks; calls on Adorno to help parse Trump's tweeting; considers transmedia cannibalism, as written text is transformed into a postliterate object; compares the economic and social effects of the sharing economy to a sixteen-wheeler running over a plastic bottle on the road; and explains why philosophy mat become the most important element in the automotive and technology industries.

The Digital Mind - Arlindo Oliveira 2017-03-17
The Red Queen's race -- The exponential nature of technology -- From Maxwell to the Internet -- The universal machine -- The quest for intelligent machines -- Cells, bodies, and brains -- Biology meets computation -- How the brain works -- Understanding the brain -- Brains, minds, and machines -- Challenges and promises -- Speculations

How Smart Machines Think - Sean Gerrish 2019-10-22
Everything you've always wanted to know about self-driving cars, Netflix recommendations, IBM's Watson, and video game-playing computer programs. The future is here: Self-driving cars are on the streets, an algorithm gives you movie and TV recommendations, IBM's Watson triumphed on Jeopardy over puny human brains, computer programs can

be trained to play Atari games. But how do all these things work? In this book, Sean Gerrish offers an engaging and accessible overview of the breakthroughs in artificial intelligence and machine learning that have made today's machines so smart. Gerrish outlines some of the key ideas that enable intelligent machines to perceive and interact with the world. He describes the software architecture that allows self-driving cars to stay on the road and to navigate crowded urban environments; the million-dollar Netflix competition for a better recommendation engine (which had an unexpected ending); and how programmers trained computers to perform certain behaviors by offering them treats, as if they were training a dog. He explains how artificial neural networks enable computers to perceive the world—and to play Atari video games better than humans. He explains Watson's famous victory on Jeopardy, and he looks at how computers play games, describing AlphaGo and Deep Blue, which beat reigning world champions at the strategy games of Go and chess. Computers have not yet mastered everything, however; Gerrish outlines the difficulties in creating intelligent agents that can successfully play video games like StarCraft that have evaded solution—at least for now. Gerrish weaves the stories behind these breakthroughs into the narrative, introducing readers to many of the researchers involved, and keeping technical details to a minimum. Science and technology buffs will find this book an essential guide to a future in which machines can outsmart people.

Futureproof - Kevin Roose 2022-02-08
"A concise, insightful and sophisticated guide to maintaining humane values in an age of new machines."—The New York Times Book Review "While we need to rewrite the rules of the twenty-first-century economy, Kevin's book is a great look at how people can do this on a personal level to always put humanity first."—Andrew Yang With a new afterword by the author You are being automated. After decades of hype and sci-fi fantasies, artificial intelligence is leaping out of research labs and into the center of our lives. Automation doesn't just threaten our jobs. It shapes our entire human experience, with AI and algorithms influencing the TV shows we watch, the music we listen to, the beliefs we hold, and the relationships we form. And while the age-old debate over whether automation will destroy jobs rages on, an even more important question is being ignored: How can we be happy, successful humans in a world that is increasingly built by and for machines? In Futureproof: 9 Rules for Humans in the Age of Automation, New York Times technology columnist Kevin Roose lays out a hopeful, pragmatic vision for how we can thrive in the age of AI and automation. He shares the secrets of people and organizations that have survived previous waves of technological change, and explains what skills are necessary to stay ahead of today's intelligent machines, with lessons like • Be surprising, social, and scarce. • Resist machine drift. • Leave handprints. • Demote your devices. • Treat AI like a chimp army. Roose rejects the conventional wisdom that in order to succeed in the AI age, we have to become more like machines ourselves—hyper-efficient, data-driven workhorses. Instead, he says, we should focus on being more human, and doing the kinds of creative, inspiring, and meaningful things even the most advanced robots can't do.

The Fourth Age - Byron Reese 2020-03-17
As we approach a great turning point in history when technology is poised to redefine what it means to be human, The Fourth Age offers fascinating insight into AI, robotics, and their extraordinary implications for our species. "If you only read just one book about the AI revolution, make it this one" (John Mackey, cofounder and CEO, Whole Foods Market). In The Fourth Age, Byron Reese makes the case that technology has reshaped humanity just three times in history: 100,000 years ago, we harnessed fire, which led to language; 10,000 years ago, we developed agriculture, which led to cities and warfare; 5,000 years ago, we invented the wheel and writing, which lead to the nation state. We are now on the doorstep of a fourth change brought about by two technologies: AI and robotics. "Timely, highly informative, and certainly optimistic" (Booklist), The Fourth Age provides an essential background on how we got to this point, and how—rather than what—we should think about the topics we'll soon all be facing: machine consciousness, automation, changes in employment, creative computers, radical life extension, artificial life, AI ethics, the future of warfare, superintelligence, and the implications of extreme prosperity. By asking questions like "Are you a machine?" and "Could a computer feel anything?", Reese leads you through a discussion along the cutting edge in robotics and AI, and provides a framework by which we can all understand, discuss, and act on the issues of the Fourth Age and how they'll transform humanity.

My Journey Into AI - Kai-Fu Lee 2019-01-02
In this autobiography, Dr. Kaifu Lee recounts all his career experiences with Apple, Microsoft and Google as well as his own technological achievements. Follow Dr. Lee on his personal life's journey. Enjoy the masterfully spun stories that Dr. Lee shares from two decades of experience working with the most prominent high tech leaders. In this book, you will get up close with Steve Jobs, Bill Gates, Steve Balmer, Eric Schmidt, Larry Page, and Sergey Brin.

The Sentient Machine - Amir Husain 2017-11-21
The future is now. Acclaimed technologist and inventor Amir Husain explains how we can live amidst the coming age of sentient machines and artificial intelligence—and not only survive, but thrive. Artificial "machine" intelligence is playing an ever-greater role in our society. We are already using cruise control in our cars, automatic checkout at the drugstore, and are unable to live without our smartphones. The discussion around AI is polarized; people think either machines will solve all problems for everyone, or they will lead us down a dark, dystopian path into total human irrelevance. Regardless of what you believe, the idea that we might bring forth intelligent creation can be intrinsically frightening. But what if our greatest role as humans so far is that of creators? Amir Husain, a brilliant inventor and computer scientist, argues that we are on the cusp of writing our next, and greatest, creation myth. It is the dawn of a new form of intellectual diversity, one that we need to embrace in order to advance the state of the art in many critical fields, including security, resource management, finance, and energy. "In The Sentient Machine, Husain prepares us for a brighter future; not with hyperbole about right and wrong, but with serious arguments about risk and potential" (Dr. Greg Hyslop, Chief Technology Officer, The Boeing Company). He addresses broad existential questions surrounding the coming of AI: Why are we valuable? What can we create in this world? How are we intelligent? What constitutes progress for us? And how might we fail to progress? Husain boils down complex computer science and AI concepts into clear, plainspoken language and draws from a wide variety of cultural and historical references to illustrate his points. Ultimately, Husain challenges many of our societal norms and upends assumptions we hold about "the good life."

Superpower Showdown - Bob Davis 2020-06-09
This is the inside story of the US–China trade war, how relations between these superpowers unraveled, darkening prospects for global peace and prosperity, as told by two Wall Street Journal reporters, one based in Washington, D.C., the other in Beijing, who have had more access to the decision makers in the White House and in China's Zhongnanhai leadership compound than anyone else. The trade battle between China and the U.S. didn't start with Trump and won't end with him, argue Bob Davis and Lingling Wei. The two countries have a long and fraught political and economic history which has become more contentious over the past three years—an escalation that has negatively impacted both countries' economies and the world at large—and holds the potential for even more uncertainty and disruption. How did this stand-off happen? How much are U.S. presidents and officials who haven't effectively confronted or negotiated with China to blame? What role have Chinese leaders, and U.S. business leaders who for decades acted as Beijing's lobbyists in Washington, played in driving tensions between the two countries? Superpower Showdown is the story of a romance gone bad. Uniquely positioned to tell the story, Davis and Wei have conducted hundreds of interviews with government and business officials in both nations over the seven years they have worked together writing for the Wall Street Journal. Analyzing U.S.–China relations, they explain how we have reached this tipping point, and look at where we could be headed. Vivid and provocative, Superpower Showdown will help readers understand the context of the trade war and prepare them for what may come next.

Stealth Democracy - John R. Hibbing 2002-08-29
Americans often complain about the operation of their government, but scholars have never developed a complete picture of people s preferred type of government. In this provocative and timely book, Hibbing and Theiss-Morse, employing an original national survey and focus groups, report the governmental procedures Americans desire. Contrary to the prevailing view that people want greater involvement in politics, most citizens do not care about most policies and therefore are content to turn over decision-making authority to someone else. People s wish for the political system is that decision makers be empathetic and, especially, non-self-interested, not that they be responsive and accountable to the people s largely nonexistent policy preferences or, even worse, that the people be obligated to participate directly in decision making. Hibbing

and Theiss-Morse conclude by cautioning communitarians, direct democrats, social capitalists, deliberation theorists, and all those who think that greater citizen involvement is the solution to society s problems.

Predictive Analytics - Eric Siegel 2016-01-12

"Mesmerizing & fascinating..." —The Seattle Post-Intelligencer "The Freakonomics of big data." —Stein Kretsinger, founding executive of Advertising.com Award-winning | Used by over 30 universities | Translated into 9 languages An introduction for everyone. In this rich, fascinating — surprisingly accessible — introduction, leading expert Eric Siegel reveals how predictive analytics (aka machine learning) works, and how it affects everyone every day. Rather than a "how to" for hands-on techies, the book serves lay readers and experts alike by covering new case studies and the latest state-of-the-art techniques. Prediction is booming. It reinvents industries and runs the world. Companies, governments, law enforcement, hospitals, and universities are seizing upon the power. These institutions predict whether you're going to click, buy, lie, or die. Why? For good reason: predicting human behavior combats risk, boosts sales, fortifies healthcare, streamlines manufacturing, conquers spam, optimizes social networks, toughens crime fighting, and wins elections. How? Prediction is powered by the world's most potent, flourishing unnatural resource: data. Accumulated in large part as the by-product of routine tasks, data is the unsalted, flavorless residue deposited en masse as organizations churn away. Surprise! This heap of refuse is a gold mine. Big data embodies an extraordinary wealth of experience from which to learn. Predictive analytics (aka machine learning) unleashes the power of data. With this technology, the computer literally learns from data how to predict the future behavior of individuals. Perfect prediction is not possible, but putting odds on the future drives millions of decisions more effectively, determining whom to call, mail, investigate, incarcerate, set up on a date, or medicate. In this lucid, captivating introduction — now in its Revised and Updated edition — former Columbia University professor and Predictive Analytics World founder Eric Siegel reveals the power and perils of prediction: What type of mortgage risk Chase Bank predicted before the recession. Predicting which people will drop out of school, cancel a subscription, or get divorced before they even know it themselves. Why early retirement predicts a shorter life expectancy and vegetarians miss fewer flights. Five reasons why organizations predict death — including one health insurance company. How U.S. Bank and Obama for America calculated the way to most strongly persuade each individual. Why the NSA wants all your data: machine learning supercomputers to fight terrorism. How IBM's Watson computer used predictive modeling to answer questions and beat the human champs on TV's Jeopardy! How companies ascertain untold, private truths — how Target figures out you're pregnant and Hewlett-Packard deduces you're about to quit your job. How judges and parole boards rely on crime-predicting computers to decide how long convicts remain in prison. 182 examples from Airbnb, the BBC, Citibank, ConEd, Facebook, Ford, Google, the IRS, LinkedIn, Match.com, MTV, Netflix, PayPal, Pfizer, Spotify, Uber, UPS, Wikipedia, and more. How does predictive analytics work? This jam-packed book satisfies by demystifying the intriguing science under the hood. For future hands-on practitioners pursuing a career in the field, it sets a strong foundation, delivers the prerequisite knowledge, and whets your appetite for more. A truly omnipresent science, predictive analytics constantly affects our daily lives. Whether you are a

The Power of Algorithms - Giorgio Ausiello 2013-11-08

To examine, analyze, and manipulate a problem to the point of designing an algorithm for solving it is an exercise of fundamental value in many fields. With so many everyday activities governed by algorithmic principles, the power, precision, reliability and speed of execution demanded by users have transformed the design and construction of algorithms from a creative, artisanal activity into a full-fledged science in its own right. This book is aimed at all those who exploit the results of this new science, as designers and as consumers. The first chapter is an overview of the related history, demonstrating the long development of ideas such as recursion and more recent formalizations such as computability. The second chapter shows how the design of algorithms requires appropriate techniques and sophisticated organization of data. In the subsequent chapters the contributing authors present examples from diverse areas – such as routing and networking problems, Web search, information security, auctions and games, complexity and randomness, and the life sciences – that show how algorithmic thinking offers practical solutions and also deepens domain knowledge. The

contributing authors are top-class researchers with considerable academic and industrial experience; they are also excellent educators and communicators and they draw on this experience with enthusiasm and humor. This book is an excellent introduction to an intriguing domain and it will be enjoyed by undergraduate and postgraduate students in computer science, engineering, and mathematics, and more broadly by all those engaged with algorithmic thinking.

Flesh and Machines - Rodney Brooks 2003-02-04

Are we really on the brink of having robots to mop our floors, do our dishes, mow our lawns, and clean our windows? And are researchers that close to creating robots that can think, feel, repair themselves, and even reproduce? Rodney A. Brooks, director of the MIT Artificial Intelligence Laboratory believes we are. In this lucid and accessible book, Brooks vividly depicts the history of robots and explores the ever-changing relationships between humans and their technological brethren, speculating on the growing role that robots will play in our existence. Knowing the moral battle likely to ensue, he posits a clear philosophical argument as to why we should not fear that change. What results is a fascinating book that offers a deeper understanding of who we are and how we can control what we will become.

Applied Artificial Intelligence - Mariya Yao 2018-04-30

This bestselling book gives business leaders and executives a foundational education on how to leverage artificial intelligence and machine learning solutions to deliver ROI for your business.

The Master Algorithm - Pedro Domingos 2015-09-22

A spell-binding quest for the one algorithm capable of deriving all knowledge from data, including a cure for cancer Society is changing, one learning algorithm at a time, from search engines to online dating, personalized medicine to predicting the stock market. But learning algorithms are not just about Big Data - these algorithms take raw data and make it useful by creating more algorithms. This is something new under the sun: a technology that builds itself. In The Master Algorithm, Pedro Domingos reveals how machine learning is remaking business, politics, science and war. And he takes us on an awe-inspiring quest to find 'The Master Algorithm' - a universal learner capable of deriving all knowledge from data.

Everything is Obvious - Duncan J. Watts 2011-07-01

Why is the Mona Lisa the most famous painting in the world? Why did Facebook succeed when other social networking sites failed? Did the surge in Iraq really lead to less violence? And does higher pay incentivize people to work harder? If you think the answers to these questions are a matter of common sense, think again. As sociologist and network science pioneer Duncan Watts explains in this provocative book, the explanations that we give for the outcomes that we observe in life-explanations that seem obvious once we know the answer-are less useful than they seem. Watts shows how commonsense reasoning and history conspire to mislead us into thinking that we understand more about the world of human behavior than we do; and in turn, why attempts to predict, manage, or manipulate social and economic systems so often go awry. Only by understanding how and when common sense fails can we improve how we plan for the future, as well as understand the present-an argument that has important implications in politics, business, marketing, and even everyday life.

Algorithms Unlocked - Thomas H. Cormen 2013-03-01

For anyone who has ever wondered how computers solve problems, an engagingly written guide for nonexperts to the basics of computer algorithms. Have you ever wondered how your GPS can find the fastest way to your destination, selecting one route from seemingly countless possibilities in mere seconds? How your credit card account number is protected when you make a purchase over the Internet? The answer is algorithms. And how do these mathematical formulations translate themselves into your GPS, your laptop, or your smart phone? This book offers an engagingly written guide to the basics of computer algorithms. In Algorithms Unlocked, Thomas Cormen—coauthor of the leading college textbook on the subject—provides a general explanation, with limited mathematics, of how algorithms enable computers to solve problems. Readers will learn what computer algorithms are, how to describe them, and how to evaluate them. They will discover simple ways to search for information in a computer; methods for rearranging information in a computer into a prescribed order ("sorting"); how to solve basic problems that can be modeled in a computer with a mathematical structure called a "graph" (useful for modeling road networks, dependencies among tasks, and financial relationships); how to solve problems that ask questions about strings of characters such as DNA structures; the basic principles behind cryptography; fundamentals

of data compression; and even that there are some problems that no one has figured out how to solve on a computer in a reasonable amount of time.