# Chapter 5 - Suggested Readings

## Books worth reading

### 5.1 - Introduction

The following is a list of fiction and nonfiction on artificial intelligence, from discussing its possibility, feasibility, desirability, and eventuality. Also included is a list of the top textbooks on some topics covered.

### 5.2 - Artificial Intelligence

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| [A picture containing text, different, various, several  Description automatically generated](https://www.amazon.com/Artificial-Intelligence-A-Modern-Approach/dp/0134610997) | Artificial Intelligence - A Modern ApproachStuart Russell and Peter Norvig The most comprehensive, up-to-date introduction to the theory and practice of artificial intelligence. The long-anticipated revision of Artificial Intelligence: A Modern Approach explores the full breadth and depth of the field of artificial intelligence (AI). The 4th edition brings readers up to date on the latest technologies, presents concepts in a more unified manner, and offers new or expanded coverage of machine learning, deep learning, transfer learning, multiagent systems, robotics, natural language processing, causality, probabilistic programming, privacy, fairness, and safe AI. |
| [Map  Description automatically generated](https://www.amazon.com/Artificial-Intelligence-Guide-Thinking-Humans/dp/0374257833) | Artificial Intelligence: A Guide for Thinking HumansMelanie Mitchell 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. 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 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. 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. |
| [Diagram  Description automatically generated with medium confidence](https://www.amazon.com/Deep-Medicine-Eric-Topol-audiobook/dp/B07PJ21V5N) | Deep MedicineEric Topol One of America's top doctors reveals how AI will empower physicians and revolutionize patient care. Medicine has become inhuman, to disastrous effect. The doctor-patient relationship - the heart of medicine - is broken. Doctors are too distracted and overwhelmed to truly connect with their patients, and medical errors and misdiagnoses abound. In Deep Medicine, leading physician Eric Topol reveals how artificial intelligence can help. AI has the potential to transform everything doctors do, from notetaking and medical scans to diagnosis and treatment, greatly cutting down the cost of medicine and reducing human mortality. By freeing physicians from the tasks that interfere with human connection, AI will create space for the real healing that takes place between a doctor who can listen and a patient who needs to be heard. Innovative, provocative, and hopeful, Deep Medicine shows us how the awesome power of AI can make medicine better, for all the humans involved. |
| [Text  Description automatically generated](https://www.amazon.com/You-Look-Like-Thing-Love/dp/B07ZRWH5YN/) | You Look like a thing, and I love YouJanelle Shane "You look like a thing, and I love you" is one of the best pickup lines ever...according to an artificial intelligence trained by scientist Janelle Shane, creator of the popular blog AI Weirdness. She creates silly AIs that learn how to name paint colors, create the best recipes, and even flirt (badly) with humans — all to understand the technology that governs so much of our daily lives. We rely on AI every day for recommendations, for translations, and to put cat ears on our selfie videos. We also trust AI with matters of life and death, on the road and in our hospitals. In this smart, often hilarious introduction to the most interesting science of our time, Shane shows how these programs learn, fail, and adapt — and how they reflect the best and worst of humanity. You Look Like a Thing and I Love You is the perfect book for anyone curious about what the robots in our lives are thinking. |

### 5.3 - Bias

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| [Diagram, schematic  Description automatically generated](https://www.amazon.com/Virtually-You-Elias-Aboujaoude-audiobook/dp/B004OWZL5E/) | Virtually You: The Dangerous Powers of the E-PersonalityElias Aboujaoude A penetrating examination of the insidious effects of the Internet on our personalities - online and off. Whether sharing photos or following financial markets, many of us spend a shocking amount of time online. While the Internet can enhance well-being, Elias Aboujaoude has spent years treating patients whose lives have been profoundly disturbed by it. Part of the danger lies in how the Internet allows us to act with exaggerated confidence, sexiness, and charisma. This new self, which Aboujaoude dubs our "e-personality", manifests itself in every curt email we send, Facebook "friend" we make, and "buy now" button we click. Too potent to be confined online, however, e-personality traits seep offline, too, making us impatient, unfocused, and urge-driven, even after we log off. Virtually You shows us how real life is being reconfigured in the image of a chat room, and how our identity increasingly resembles that of our avatar. |
| [Diagram, schematic  Description automatically generated](https://www.amazon.com/Weapons-Math-Destruction-Increases-Inequality/dp/0553418815/) | Weapons of Math DestructionCathy O'Neil We live in the age of the algorithm. Increasingly the decisions that affect our lives - where we go to school, whether we get a car loan, how much we pay for health insurance - are being made not by humans but by mathematical models. In theory this should lead to greater fairness: Everyone is judged according to the same rules, and bias is eliminated. But as Cathy O'Neil reveals in this urgent and necessary book, the opposite is true. The models being used today are opaque, unregulated, and uncontestable even when they're wrong. |

### 5.4 - Biology and Cancer

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| [Text, letter  Description automatically generated](https://www.amazon.com/Emperor-All-Maladies-Biography-Cancer/dp/1439107955/) | The Emperor of All MaladiesSiddhartha Mukherjee A magnificent, beautifully written "biography" of cancer - from its first documented appearances thousands of years ago through the epic battles to cure, control, and conquer it to a radical new understanding of its essence. The Emperor of All Maladies reveals the many faces of an iconic, shape-shifting disease that is the defining plague of our generation. The story of cancer is a story of human ingenuity, resilience, and perseverance but also of hubris, arrogance, paternalism, and misperception, all leveraged against a disease that, just three decades ago, was thought to be easily vanquished in an all-out "war against cancer". Mukherjee recounts centuries of discoveries, setbacks, victories, and deaths, told through the eyes of his predecessors and peers, training their wits against an infinitely resourceful adversary. |
| [A picture containing text, invertebrate, mollusk  Description automatically generated](https://www.amazon.com/Growth-Form-DArcy-Wentworth-Thompson-ebook/dp/B074LX3QDK) | On Growth and FormD'Arcy Wentworth Thompson Why do living things and physical phenomena take the form they do? D'Arcy Thompson's classic On Growth and Form looks at the way things grow and the shapes they take. Analyzing biological processes in their mathematical and physical aspects, this historic work, first published in 1917, has also become renowned for the sheer poetry of its descriptions. A great scientist sensitive to the fascinations and beauty of the natural world tells of jumping fleas and slipper limpets; of buds and seeds; of bees' cells and rain drops; of the potter's thumb and the spider's web; of a film of soap and a bubble of oil; of a splash of a pebble in a pond. |
| [Text  Description automatically generated](https://www.amazon.com/The-Epigenetics-Revolution-audiobook/dp/B072BQ37PG) | The Epigenetics RevolutionNessa Carey Epigenetics can potentially revolutionize our understanding of the structure and behavior of biological life on Earth. It explains why mapping an organism's genetic code is not enough to determine how it develops or acts and shows how nurture combines with nature to engineer biological diversity. Surveying the 20-year history of the field while also highlighting its latest findings and innovations, this volume provides a readily understandable introduction to the foundations of epigenetics. Reaching beyond biology, epigenetics now informs work on drug addiction, the long-term effects of famine, and the physical and psychological consequences of childhood trauma. |
| [Diagram  Description automatically generated with medium confidence](https://www.amazon.com/Epigenetics-Second-C-David-Allis/dp/1936113597) | Epigenetics, Second EditionDavid Allis (Editor) In many biological processes the regulation of gene expression involves epigenetic mechanisms. In this new edition of Epigenetics, 36 chapters written by experts in the field introduce and explain epigenetic effects from many perspectives. These include the varied molecular mechanisms underpinning epigenetic regulation, discussion of cellular processes that rely on this kind of regulation, and surveys of model organisms in which epigenetic effects have been most studied. |

### 5.5 - Complexity, Dynamical Systems Theory, Chaos Theory

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| [Text  Description automatically generated](https://www.amazon.com/Audible-Complexity-A-Guided-Tour/dp/B09SND3L5D) | Complexity: A Guided TourMelanie Mitchell What enables individually simple insects like ants to act with such precision and purpose as a group? How do trillions of neurons produce something as extraordinarily complex as consciousness? In this remarkably clear and companionable audiobook, leading complex systems scientist Melanie Mitchell provides an intimate tour of the sciences of complexity, a broad set of efforts that seek to explain how large-scale complex, organized, and adaptive behavior can emerge from simple interactions among myriad individuals. |
| [Text  Description automatically generated](https://www.amazon.com/Worlds-Hidden-Plain-Sight-Complexity-ebook/dp/B07ZDJPLD4) | Worlds Hidden in Plain Sight: The Evolving Idea of ComplexityDavid C. Krakauer Over the last three decades, the Santa Fe Institute and its network of researchers have been pursuing a revolution in science. Ignoring the boundaries of disciplines and schools and searching for novel fundamental ideas, theories, and practices, this international community integrates the full range of scientific inquiries that will help us to understand and survive on a complex planet. |
| [A picture containing text, compact disk  Description automatically generated](https://www.amazon.com/Chaos-James-Gleick-audiobook/dp/B004LQ5E82) | Chaos: Making a New ScienceJames Gleick Examines the new science of chaos--a scientific revolution that is dramatically altering established perceptions and understandings of the world--and reveals a new way of seeing order and pattern in the universe. |
| [A picture containing diagram  Description automatically generated](https://www.amazon.com/Signals-Boundaries-Building-Complex-Adaptive/dp/0262525933) | Signals and Boundaries: Building Blocks for Complex Adaptive SystemsJohn H. Holland An overarching framework for comparing and steering complex adaptive systems is developed through understanding the mechanisms that generate their intricate signal/boundary hierarchies. Complex adaptive systems (cas), including ecosystems, governments, biological cells, and markets, are characterized by intricate hierarchical arrangements of boundaries and signals. In ecosystems, for example, niches act as semi-permeable boundaries, and smells and visual patterns serve as signals; governments have departmental hierarchies with memoranda acting as signals; and so, it is with other cas. Holland lays out a path for developing the framework that emphasizes agents, niches, theory, and mathematical models. |

### 5.6 - Game Design and AI

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| [Timeline  Description automatically generated](https://www.amazon.com/AI-Games-Third-Ian-Millington/dp/0367670569) | AI for GamesIan Millington AI is an integral part of every video game, and this book helps game developers keep up with the constantly evolving technological advances to create robust AI. The authors draw on their considerable experience and uses case studies from real games to provide a complete reference. Also included are exercises so readers can test their comprehension and understanding of the concepts and practices presented. |
| [A picture containing logo  Description automatically generated](https://www.amazon.com/History-Video-Games-64-Objects/dp/B07BHW2XJQ) | A History of Video Games in 64 ObjectsWorld Video Game Hall of Fame Inspired by the groundbreaking A History of the World in 100 Objects, this book draws on the unique collections of The Strong Museum in Rochester, New York, to chronicle the evolution of video games, from Pong to first-person shooters, told through the stories of dozens of objects essential to the field’s creation and development. Sixty-four unique objects tell the story of the video game from inception to today. Pithy, in-depth essays examine each object’s significance to video game play - what it has contributed to the history of gaming - as well as the greater culture. A History of Video Games in 64 Objects explains how the video game has transformed over time. |
| [Logo  Description automatically generated](https://www.amazon.com/Making-Prince-Persia-Journals-1985/dp/B08NJ5C24B) | The Making of Prince of Persia: Journals 1985 - 1993Jordan Mechner The creator of one of the most innovative and best-selling video games of all time gives an unvarnished look into the process in this one-of-a-kind compilation. Before Prince of Persia was a best-selling video game franchise and a Disney movie, it was an Apple II computer game created and programmed by one person: Jordan Mechner. Mechner's candid and revealing journals from the time capture the journey from his parents’ basement to the forefront of the fast-growing 1980s video game industry, and the creative, technical, and personal struggles that brought the prince into being and ultimately into the homes of millions of people worldwide. Now, on the 30th anniversary of Prince of Persia’s release, Mechner looks back at the journals he kept from 1985 to 1993, offering new insights into the game that established him as a pioneer of cinematic storytelling in the industry. |

### 5.7 - Genetic Algorithms and ABM

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| [Text  Description automatically generated with medium confidence](https://www.amazon.com/Field-Guide-Genetic-Programming/dp/1409200736) | A Field Guide to Genetic ProgrammingRiccardo Poli, William B. Langdon, Nicholas Freitag, McPhee Genetic programming (GP) is a systematic, domain-independent method for getting computers to solve problems automatically starting from a high-level statement of what needs to be done. Using ideas from natural evolution, GP starts from an ooze of random computer programs, and progressively refines them through processes of mutation and sexual recombination, until high-fitness solutions emerge. All this without the user having to know or specify the form or structure of solutions in advance. GP has generated a plethora of human-competitive results and applications, including novel scientific discoveries and patentable inventions. This unique overview of this exciting technique is written by three of the most active scientists in GP. |
| [Text  Description automatically generated](https://www.amazon.com/Evolutionary-Computation-Approach-Kenneth-Jong/dp/0262529602) | Evolutionary Computation: A Unified ApproachKenneth A. De Jong Evolutionary computation, the use of evolutionary systems as computational processes for solving complex problems, is a tool used by computer scientists and engineers who want to harness the power of evolution to build useful new artifacts, by biologists interested in developing and testing better models of natural evolutionary systems, and by artificial life scientists for designing and implementing new artificial evolutionary worlds. In this clear and comprehensive introduction to the field, Kenneth De Jong presents an integrated view of the state of the art in evolutionary computation., Evolutionary Computation is noteworthy for considering these systems as specific instances of a more general class of evolutionary algorithms. |
| [A picture containing graphical user interface  Description automatically generated](https://www.amazon.com/Agent-Based-Individual-Based-Modeling-Practical-Introduction/dp/0691190836) | Agent-Based and Individual-Based Modeling: A Practical Introductionby Steven F. Railsback, Volker Grimm Agent-Based and Individual-Based Modeling has become the standard textbook on the subject for classroom use and self-instruction. Drawing on the latest version of NetLogo and fully updated with new examples, exercises, and an enhanced text for easier comprehension, this is the essential resource for anyone seeking to understand how the dynamics of biological, social, and other complex systems arise from the characteristics of the agents that make up these systems. This accessible and authoritative book focuses on modeling as a tool for understanding real complex systems. |
| [Text  Description automatically generated](https://www.amazon.com/Agent-Based-Modeling-Archaeology-Simulating-Complexity/dp/1947864254) | Agent-Based Modeling for Archaeology: Simulating the Complexity of SocietiesIza Romanowska, Colin D. Wren, Stefani A. Crabtree Agent-based modeling (ABM), which can create fine-scale models of behavior over time and space, may reveal important, general patterns of human activity. Agent-Based Modeling for Archaeology is the first ABM textbook designed for researchers studying the human past. Appropriate for scholars from archaeology, the digital humanities, and other social sciences, this book offers novices and more experienced ABM researchers a modular approach to learning ABM and using it effectively This textbook provides the foundations needed to simulate the complexity of past human societies, offering researchers a richer understanding of the past—and likely future—of our species. |

### 5.8 - Graphs and Networks

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| [Shape, polygon  Description automatically generated](https://www.amazon.com/Introduction-Graph-Theory-Dover-Mathematics/dp/0486678709) | Introduction to Graph TheoryRichard J. Trudeau This introduction to linear algebra features intuitive introductions and examples to motivate important ideas and to illustrate the use of results of theorems. |
| [A picture containing diagram  Description automatically generated](https://www.amazon.com/Social-Network-Analysis-Methods-Examples/dp/1483325210) | Social Network Analysis: Methods and ExamplesSong Yang, Franziska B Keller, Lu Zheng Social Network Analysis: Methods and Examples by Song Yang, Franziska B. Keller, and Lu Zheng prepares social science students to conduct their own social network analysis (SNA) by covering basic methodological tools along with illustrative examples from various fields. This innovative book takes a conceptual rather than a mathematical approach as it discusses the connection between what SNA methods have to offer and how those methods are used in research design, data collection, and analysis. Four substantive applications chapters provide examples from politics, work and organizations, mental and physical health, and crime and terrorism studies. |
| [A close up of water droplets  Description automatically generated with low confidence](https://www.amazon.com/Networks-Mark-Newman/dp/0198805098) | NetworksMark Newman The study of networks, including computer networks, social networks, and biological networks, has attracted enormous interest in the last few years. The rise of the Internet and the wide availability of inexpensive computers have made it possible to gather and analyze network data on an unprecedented scale, and the development of new theoretical tools has allowed us to extract knowledge from networks of many different kinds. The study of networks is broadly interdisciplinary and central developments have occurred in many fields, including mathematics, physics, computer and information sciences, biology, and the social sciences. This book brings together the most important breakthroughs in each of these fields and presents them in a coherent fashion, highlighting the strong interconnections between work in different areas. |
| [A picture containing chart  Description automatically generated](https://www.amazon.com/Graph-Machine-Learning-techniques-algorithms/dp/1800204493) | Graph Machine LearningClaudio Stamile, Aldo Marzullo, Enrico Deusebio Graph Machine Learning will introduce you to a set of tools used for processing network data and leveraging the power of the relation between entities that can be used for predictive, modeling, and analytics tasks. The first chapters will introduce you to graph theory and graph machine learning, as well as the scope of their potential use. You'll then learn all you need to know about the main machine learning models for graph representation learning: their purpose, how they work, and how they can be implemented in a wide range of supervised and unsupervised learning applications. You'll build a complete machine learning pipeline, including data processing, model training, and prediction in order to exploit the full potential of graph data |

### 5.9 - Innovation

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| [Text  Description automatically generated](https://www.amazon.com/How-to-Build-Car-Adrian-Newey-audiobook/dp/B07R9R137Y) | How to Build a CarAdrian Newey How to Build a Car explores the story of Adrian's unrivalled 35-year career in Formula One through the prism of the cars he has designed, the drivers he has worked alongside and the races in which he's been involved. A true engineering genius, even in adolescence Adrian's thoughts naturally emerged in shape and form - he began sketching his own car designs at the age of 12 and took a welding course in his school summer holidays. From his early career in IndyCar racing and on to his unparalleled success in Formula One, we learn in comprehensive, engaging and highly entertaining detail how a car works. How to Build a Car encapsulates, through Adrian's remarkable life story, precisely what makes Formula One so thrilling - its potential for the total synchronicity of man and machine, the perfect combination of style, efficiency and speed. |
| [Diagram  Description automatically generated](https://www.amazon.com/Street-Gang-Michael-Davis-audiobook/dp/B001P1XERO) | Street Gang: The Complete History of Sesame StreetMichael Davis Street Gang is the compelling and often comical story of the creation and history of this media masterpiece and pop culture landmark, told with the cooperation of one of the show's co-founders, Joan Ganz Cooney. Sesame Street was born as the result of a discussion at a dinner party at Conney's home about poor children's programming and hit the air as a big bang of creative fusion from Jim Henson and company, quickly rocketing to success. This audio is narrated by Caroll Spinney, the voice of Big Bird and Oscar the Grouch. |

### 5.10 - Machine Learning

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| [A picture containing text, balloon, aircraft  Description automatically generated](https://www.amazon.com/Machine-Learning-Probabilistic-Perspective-Computation/dp/0262018020) | Machine Learning: A Probabilistic PerspectiveKevin P. Murphy A comprehensive introduction to machine learning that uses probabilistic models and inference as a unifying approach. Today's Web-enabled deluge of electronic data calls for automated methods of data analysis. Machine learning provides these, developing methods that can automatically detect patterns in data and then use the uncovered patterns to predict future data. This textbook offers a comprehensive and self-contained introduction to the field of machine learning, based on a unified, probabilistic approach. |
| [Text  Description automatically generated](https://www.amazon.com/Pattern-Recognition-Learning-Information-Statistics/dp/0387310738) | Pattern Recognition and Machine LearningChristopher M. Bishop This is the first textbook on pattern recognition to present the Bayesian viewpoint. The book presents approximate inference algorithms that permit fast approximate answers in situations where exact answers are not feasible. It uses graphical models to describe probability distributions when no other books apply graphical models to machine learning. No previous knowledge of pattern recognition or machine learning concepts is assumed. Familiarity with multivariate calculus and basic linear algebra is required, and some experience in the use of probabilities would be helpful though not essential as the book includes a self-contained introduction to basic probability theory. |
| [A picture containing text, salamander, yellow  Description automatically generated](https://www.amazon.com/Hands-Machine-Learning-Scikit-Learn-TensorFlow/dp/1492032646) | Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlowAurélien Géron Through a series of recent breakthroughs, deep learning has boosted the entire field of machine learning. Now, even programmers who know close to nothing about this technology can use simple, efficient tools to implement programs capable of learning from data. This practical book shows you how. By using concrete examples, minimal theory, and two production-ready Python frameworks—Scikit-Learn and Tensor Flow—author Aurélien Géron helps you gain an intuitive understanding of the concepts and tools for building intelligent systems. You’ll learn a range of techniques, starting with simple linear regression and progressing to deep neural networks. With exercises in each chapter to help you apply what you’ve learned, all you need is programming experience to get started. |
| [A picture containing graphical user interface  Description automatically generated](https://www.amazon.com/Deep-Reinforcement-Learning-Fundamentals-Applications/dp/9811540942) | Deep Reinforcement LearningHao Dong, Zihan Ding Deep reinforcement learning (DRL) is the combination of reinforcement learning (RL) and deep learning. It has been able to solve a wide range of complex decision-making tasks that were previously out of reach for a machine, and famously contributed to the success of AlphaGo. Furthermore, it opens numerous new applications in domains such as healthcare, robotics, smart grids and finance. The book is intended for computer science students, both undergraduate and postgraduate, who would like to learn DRL from scratch, practice its implementation, and explore the research topics. It also appeals to engineers and practitioners who do not have strong machine learning background but want to quickly understand how DRL works and use the techniques in their applications. |
| [A picture containing text  Description automatically generated](https://www.amazon.com/AI-Healthcare-Keras-Tensorflow-2-0/dp/1484270851) | AI for Healthcare with Keras and TensorFlow 2.0Anshik Learn how AI impacts the healthcare ecosystem through real-life case studies with TensorFlow 2.0 and other machine learning (ML) libraries. You also will try to predict ICD-9 codes using the same data. You will study transformer models. And you will be exposed to the challenges of applying modern ML techniques to highly sensitive data in healthcare using federated learning. You will look at semi-supervised approaches that are used in a low training data setting, a case very often observed in specialized domains such as healthcare. You will be introduced to applications of advanced topics such as the graph convolutional network and how you can develop and optimize image analysis pipelines when using 2D and 3D medical images. The concluding section shows you how to build and design a closed-domain Q&A system with paraphrasing, re-ranking, and strong Q&A setup. |

### 5.11 - Mathematics

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| [A picture containing text, book, orange  Description automatically generated](https://www.amazon.com/Math-Without-Numbers/dp/B086DFFDVZ) | Math Without NumbersMilo Beckman This is an audiobook about math, but it contains no numbers. Math Without Numbers is a vivid, conversational, and wholly original guide to the three main branches of abstract math - topology, analysis, and algebra - which turn out to be surprisingly easy to grasp. This book upends the conventional approach to math, inviting you to think creatively about shape and dimension, the infinite and infinitesimal, symmetries, proofs, and how these concepts all fit together. Milo Beckman shows why math is mostly just pattern recognition and how it keeps on surprising us with unexpected, useful connections to the real world. |
| [Text  Description automatically generated](https://www.amazon.com/New-Kind-Science-Stephen-Wolfram/dp/1579550088) | A New Kind of ScienceStephen Wolfram Starting from a collection of simple computer experiments illustrated by striking computer graphics Stephen Wolfram shows in this landmark book how their unexpected results force a whole new way of looking at the operation of our universe. Wolfram uses his approach to tackle a remarkable array of fundamental problems in science, from the origins of apparent randomness in physical systems, to the development of complexity in biology, the ultimate scope and limitations of mathematics, the possibility of a truly fundamental theory of physics, the interplay between free will and determinism, and the character of intelligence in the universe. |
| [Diagram  Description automatically generated](https://www.amazon.com/Linear-Algebra-Kunze-Hoffman/dp/9332550077) | Linear Algebra PaperbackKunze Hoffman This introduction to linear algebra features intuitive introductions and examples to motivate important ideas and to illustrate the use of results of theorems. |
| [Diagram  Description automatically generated](https://www.amazon.com/Shape-Geometry-Information-Democracy-Everything/dp/B08RRQS2MW) | Shape: The Hidden Geometry of InformationJordan Ellenberg Shape reveals the geometry underneath some of the most important scientific, political, and philosophical problems we face. Geometry asks: Where are things? Which things are near each other? How can you get from one thing to another thing? Those are important questions. The word "geometry", from the Greek for "measuring the world". If anything, that's an undersell. Geometry doesn't just measure the world - it explains it. Shape shows us how. |
| [Shape  Description automatically generated](https://www.amazon.com/Fundamental-Concepts-Geometry-Dover-Mathematics/dp/0486634159) | Fundamental Concepts of GeometryBruce E. Meserve Fundamental Concepts of Geometry demonstrates in a clear and lucid manner the relationships of several types of geometry to one another. This highly regarded work is a superior teaching text, especially valuable in teacher preparation, as well as providing an excellent overview of the foundations and historical evolution of geometrical concepts. Professor Meserve (University of Vermont) offers students and prospective teachers the broad mathematical perspective gained from an elementary treatment of the fundamental concepts of mathematics. The clearly presented text is written on an undergraduate (or advanced secondary school) level and includes numerous exercises and a brief bibliography. |
| [Diagram  Description automatically generated](https://www.amazon.com/Causal-Inference-Mixtape-Scott-Cunningham/dp/0300251688) | Causal Inference: The MixtapeScott Cunningham Causal inference encompasses the tools that allow social scientists to determine what causes what. In a messy world, causal inference is what helps establish the causes and effects of the actions being studied—for example, the impact (or lack thereof) of increases in the minimum wage on employment, the effects of early childhood education on incarceration later in life, or the influence on economic growth of introducing malaria nets in developing regions. Scott Cunningham introduces students and practitioners to the methods necessary to arrive at meaningful answers to the questions of causation, using a range of modeling techniques and coding instructions for both the R and the Stata programming languages. |
| [Shape  Description automatically generated](https://www.amazon.com/Flatland-Romance-Dimensions-Edwin-Abbott/dp/B0875SRH84) | Flatland: A Romance of Many DimensionsEdwin Abbott Flatland: A Romance of Many Dimensions is a satirical novella by the English schoolmaster Edwin Abbott, first published in 1884. Written pseudonymously by "A Square”, the book used the fictional two-dimensional world of Flatland to comment on the hierarchy of Victorian culture, but the novella's more enduring contribution is its examination of dimensions. Physicists and science popularizers Carl Sagan and Stephen Hawking have both commented on and postulated about the effects of Flatland. Sagan recreates the thought experiment as a set-up to discussing the possibilities of higher dimensions of the physical universe in both the book and television series Cosmos, whereas Hawking notes the peculiarity of life in two-dimensional space. |

### 5.12 - Neural Networks

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| [A picture containing text, tree, plant  Description automatically generated](https://www.amazon.com/Deep-Learning-Adaptive-Computation-Machine/dp/0262035618) | Deep LearningIan Goodfellow, Yoshua Bengio, Aaron Courville This book introduces a broad range of topics in deep learning. The text offers mathematical and conceptual background, covering relevant concepts in linear algebra, probability theory and information theory, numerical computation, and machine learning. It describes deep learning techniques used by practitioners in industry, including deep feedforward networks, regularization, optimization algorithms, convolutional networks, sequence modeling, and practical methodology; and it surveys such applications as natural language processing, speech recognition, computer vision, online recommendation systems, bioinformatics, and videogames. |
| [Diagram  Description automatically generated](https://www.amazon.com/Make-Your-Own-Neural-Network/dp/1530826608) | Make Your Own Neural NetworkTariq Rashid A step-by-step gentle journey through the mathematics of neural networks and making your own using the Python computer language. Neural networks are a key element of deep learning and artificial intelligence, which today is capable of some truly impressive feats. Yet too few really understand how neural networks work. This guide will take you on a fun and unhurried journey, starting from very simple ideas, and gradually building up an understanding of how neural networks work. |
| [A picture containing text, athletic game, sport  Description automatically generated](https://www.amazon.com/Deep-Learning-John-D-Kelleher-audiobook/dp/B07X56PZTJ) | Deep Learning: MIT Press Essential Knowledge SeriesJohn D. Kelleher Kelleher explains some of the basic concepts in deep learning, presents a history of advances in the field, and discusses the current state of the art. He describes the most important deep learning architectures, including autoencoders, recurrent neural networks, and long short-term networks, as well as such recent developments as Generative Adversarial Networks and capsule networks. He also provides a comprehensive introduction to the two fundamental algorithms in deep learning: gradient descent and backpropagation. Finally, Kelleher considers the future of deep learning-major trends, possible developments, and significant challenges. |
| [A picture containing text  Description automatically generated](https://www.amazon.com/TensorFlow-Pocket-Reference-Building-Deploying/dp/1492089184) | TensorFlow 2 Pocket ReferenceKC Tung This easy-to-use reference for TensorFlow 2 design patterns in Python will help you make informed decisions for various use cases. Author KC Tung addresses common topics and tasks in enterprise data science and machine learning practices rather than focusing on TensorFlow itself. When and why would you feed training data as using NumPy or a streaming dataset? How would you set up cross-validations in the training process? How do you leverage a pretrained model using transfer learning? How do you perform hyperparameter tuning? Pick up this pocket reference and reduce the time you spend searching through options for your TensorFlow use cases. |
|  | Learning TensorFlow.jsGant Laborde Given the demand for AI and the ubiquity of JavaScript, TensorFlow.js was inevitable. With this Google framework, seasoned AI veterans and web developers alike can help propel the future of AI-driven websites. In this guide, author Gant Laborde (Google Developer Expert in machine learning and the web) provides a hands-on end-to-end approach to TensorFlow.js fundamentals for a broad technical audience that includes data scientists, engineers, web developers, students, and researchers. You'll begin by working through some basic examples in TensorFlow.js before diving deeper into neural network architectures, Data Frames, TensorFlow Hub, model conversion, transfer learning, and more. Once you finish this book, you'll know how to build and deploy production-ready deep learning systems with TensorFlow.js. |
| [A picture containing text, reptile, lizard  Description automatically generated](https://www.amazon.com/Building-Machine-Learning-Pipelines-Automating/dp/1492053198) | Building Machine Learning PipelinesHannes Hapke, Catherine Nelson Companies are spending billions on machine learning projects, but its money wasted if the models can't be deployed effectively. In this practical guide, Hannes Hapke and Catherine Nelson walk you through the steps of automating a machine learning pipeline using the TensorFlow ecosystem. You'll learn the techniques and tools that will cut deployment time from days to minutes, so that you can focus on developing new models rather than maintaining legacy systems. Data scientists, machine learning engineers, and DevOps engineers will discover how to go beyond model development to successfully productize their data science projects, while managers will better understand the role they play in helping to accelerate these projects. |
| [A group of people  Description automatically generated with low confidence](https://www.amazon.com/Grokking-Deep-Learning-Andrew-Trask/dp/1617293709) | Grokking Deep LearningAndrew Trask Grokking Deep Learning teaches you to build deep learning neural networks from scratch! In his engaging style, seasoned deep learning expert Andrew Trask shows you the science under the hood, so you grok for yourself every detail of training neural networks. Deep learning, a branch of artificial intelligence, teaches computers to learn by using neural networks, technology inspired by the human brain. Online text translation, self-driving cars, personalized product recommendations, and virtual voice assistants are just a few of the exciting modern advancements possible thanks to deep learning. Grokking Deep Learning teaches you to build deep learning neural networks from scratch! In his engaging style, seasoned deep learning expert Andrew Trask shows you the science under the hood, so you grok for yourself every detail of training neural networks. |

### 5.13 - Neuroscience and Psychology

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| [Text  Description automatically generated](https://www.amazon.com/Principles-Neural-Science-Sixth-Kandel/dp/1259642232) | Principles of Neural ScienceEric Kandel, John D. Koester, Sarah H. Mack, Steven Siegelbaum For more than 40 years, Principles of Neural Science has helped readers understand the link between the human brain and behavior. As the renowned text has shown, all behavior is an expression of neural activity, and the future of both clinical neurology and psychiatry is dependent on the progress of neural science. Fully updated, this sixth edition of the landmark reference reflects the latest research, clinical perspectives, and advances in the field. It offers an unparalleled perspective on the current state and future of neural science. |
| [Text  Description automatically generated](https://www.amazon.com/Thinking-Fast-Slow-Daniel-Kahneman-ebook/dp/B00555X8OA) | Thinking, Fast and SlowDaniel Kahneman In his mega bestseller, Thinking, Fast and Slow, Daniel Kahneman, the renowned psychologist and winner of the Nobel Prize in Economics, takes us on a groundbreaking tour of the mind and explains the two systems that drive the way we think. System 1 is fast, intuitive, and emotional; System 2 is slower, more deliberative, and more logical. The impact of overconfidence on corporate strategies, the difficulties of predicting what will make us happy in the future, the profound effect of cognitive biases on everything from playing the stock market to planning our next vacation—each of these can be understood only by knowing how the two systems shape our judgments and decisions. |
| [Schematic  Description automatically generated with medium confidence](https://www.amazon.com/Vision-Computational-Investigation-Representation-Information/dp/0262514621) | Vision: A Computational Investigation into the Human Representation and Processing of Visual InformationDavid Marr Vision (1982) influenced a generation of brain and cognitive scientists, inspiring many to enter the field. In Vision, Marr describes a general framework for understanding visual perception and touches on broader questions about how the brain and its functions can be studied and understood. Researchers from a range of brain and cognitive sciences have long valued Marr's creativity, intellectual power, and ability to integrate insights and data from neuroscience, psychology, and computation. In Marr's framework, the process of vision constructs a set of representations, starting from a description of the input image and culminating with a description of three-dimensional objects in the surrounding environment. |
| [A picture containing text, indoor, ape, mammal  Description automatically generated](https://www.amazon.com/Evolutionary-Psychology-New-Science-Mind/dp/1138088617) | Evolutionary Psychology: The New Science of the MindDavid M Buss Where did we come from? What is our connection with other life forms? What are the mechanisms of mind that define what it means to be a human being? Evolutionary psychology is a revolutionary new science, a true synthesis of modern principles of psychology and evolutionary biology. Since the publication of the award-winning first edition of Evolutionary Psychology, there has been an explosion of research within the field. In this book, David M. Buss examines human behavior from an evolutionary perspective, providing students with the conceptual tools needed to study evolutionary psychology and apply them to empirical research on the human mind. |
| [Text  Description automatically generated with medium confidence](https://www.amazon.com/Organization-Behavior-Neuropsychological-Theory/dp/041565453X) | The Organization of Behavior: A Neuropsychological TheoryD.O. Hebb Since its publication in 1949, D.O. Hebb's, The Organization of Behavior has been one of the most influential books in the fields of psychology and neuroscience. D.O. Hebb was also the first to examine the mechanisms by which environment and experience can influence brain structure and function, and his ideas formed the basis for work on enriched environments as stimulants for behavioral development. References to Hebb, the Hebbian cell assembly, the Hebb synapse, and the Hebb rule increase each year. These forceful ideas of 1949 are now applied in engineering, robotics, and computer science, as well as neurophysiology, neuroscience, and psychology--a tribute to Hebb's foresight in developing a foundational neuropsychological theory of the organization of behavior. |
| [Text, letter  Description automatically generated](https://www.amazon.com/Senses-Considered-Perceptual-Systems/dp/0313239614) | The Senses Considered as Perceptual SystemsJames Gibson Gibson does not treat of the different senses as mere producers of visual, auditory, tactual, or other sensations. Rather, he regards them as active seeking mechanisms for looking, listening, touching, and the like. This means that the emphasis is on explanations of how we can have the constant perceptions that we need for effective action and avoidance of physical harm in our everyday lives. The author clearly supports his view that the perception of reality is not something assembled or computed by the brain from an ever-varying kaleidoscope of sensations. He emphasizes the importance of regarding the different perceptual systems not only as active, but also interrelated. |

### 5.14 - Natural Language Processing

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| [Text  Description automatically generated](https://www.amazon.com/Introduction-Language-Processing-Adaptive-Computation/dp/0262042843) | Introduction to Natural Language ProcessingJacob Eisenstein A survey of computational methods for understanding, generating, and manipulating human language, which offers a synthesis of classical representations and algorithms with contemporary machine learning techniques. This textbook provides a technical perspective on natural language processing—methods for building computer software that understands, generates, and manipulates human language. It emphasizes contemporary data-driven approaches, focusing on techniques from supervised and unsupervised machine learning. |
| [A picture containing text, bird  Description automatically generated](https://www.amazon.com/Natural-Language-Processing-PyTorch-Applications/dp/1491978236) | Natural Language Processing with PyTorchDelip Rao, Brian McMahan Natural Language Processing (NLP) provides boundless opportunities for solving problems in artificial intelligence, making products such as Amazon Alexa and Google Translate possible. If you’re a developer or data scientist new to NLP and deep learning, this practical guide shows you how to apply these methods using PyTorch, a Python-based deep learning library. Authors Delip Rao and Brian McMahon provide you with a solid grounding in NLP and deep learning algorithms and demonstrate how to use PyTorch to build applications involving rich representations of text specific to the problems you face. Each chapter includes several code examples and illustrations. |

### 5.15 - Non-Fiction

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| [Diagram, schematic  Description automatically generated](https://www.amazon.com/Snow-Crash-Neal-Stephenson-audiobook/dp/B00005NZJA) | Snow CrashNeal Stephenson In reality, Hiro Protagonist delivers pizza for Uncle Enzo’s CosoNostra Pizza Inc., but in the Metaverse he’s a warrior prince. Plunging headlong into the enigma of a new computer virus that’s striking down hackers everywhere, he races along the neon-lit streets on a search-and-destroy mission for the shadowy virtual villain threatening to bring about infocalypse. Snow Crash is a mind-altering romp through a future America so bizarre, so outrageous, you’ll recognize it immediately. |
| [Logo  Description automatically generated](https://www.amazon.com/Stranger-in-Strange-Land-audiobook/dp/B00005QTH2) | Stranger in a Strange LandRobert A. Heinlein Valentine Michael Smith, an earthling born and educated on Mars, arrives on Earth with superhuman powers and a total ignorance of the mores of man. On his new planet, Smith is destined to become a freak, a media commodity, a scam artist, a searcher, a sexual pioneer, a neon evangelist, a martyr, and, finally, a messiah. Stranger in a Strange Land is the most famous science fiction novel ever written. It became the bible of the "love generation" and transcended the genre to achieve the status of a modern classic. |
| [A red book cover  Description automatically generated with medium confidence](https://www.amazon.com/Ready-Player-One-Ernest-Cline-audiobook/dp/B005HG7BWC) | Ready Player OneErnest Cline It’s the year 2044, and the real world is an ugly place. Like most of humanity, Wade Watts escapes his grim surroundings by spending his waking hours jacked into the OASIS, a sprawling virtual utopia that lets you be anything you want to be, a place where you can live and play and fall in love on any of 10,000 planets. And like most of humanity, Wade dreams of being the one to discover the ultimate lottery ticket that lies concealed within this virtual world. For somewhere inside this giant networked playground, OASIS creator James Halliday has hidden a series of fiendish puzzles that will yield massive fortune - and remarkable power - to whoever can unlock them. A world at stake. A quest for the ultimate prize. Are you ready? |
| [A picture containing chart  Description automatically generated](https://www.amazon.com/Solaris-audiobook/dp/B0054N6KH0) | SolarisStanislaw Lem In Solaris, Kris Kelvin arrives on an orbiting research station to study the remarkable ocean that covers the planet’s surface. But his fellow scientists appear to be losing their grip on reality, plagued by physical manifestations of their repressed memories. When Kelvin’s long-dead wife suddenly reappears, he is forced to confront the pain of his past - while living a future that never was. Can Kelvin unlock the mystery of Solaris? Does he even want to? |
| [Logo, company name  Description automatically generated](https://www.amazon.com/Klara-Sun-Novel/dp/B08BCPV1G7) | Klara and the Sun: A NovelKazuo Ishiguro Here is the story of Klara, an Artificial Friend with outstanding observational qualities, who, from her place in the store, watches carefully the behavior of those who come in to browse, and of those who pass on the street outside. She remains hopeful that a customer will soon choose her. Klara and the Sun is a thrilling book that offers a look at our changing world through the eyes of an unforgettable narrator, and one that explores the fundamental question: What does it mean to love? |
| [A picture containing text, container, can  Description automatically generated](https://www.amazon.com/I-Robot-Isaac-Asimov-audiobook/dp/B0002P0F2G) | I, RobotIsaac Asimov The three laws of Robotics: 1) A robot may not injure a human being or, through inaction, allow a human being to come to harm 2) A robot must obey orders given to it by human beings except where such orders would conflict with the First Law. 3) A robot must protect its own existence if such protection does not conflict with the First or Second Law. With these three, simple directives, Isaac Asimov changed our perception of robots forever when he formulated the laws governing their behavior. In I, Robot, Asimov chronicles the development of the robot through a series of interlinked stories: from its primitive origins in the present to its ultimate perfection in the not-so-distant future - a future in which humanity itself may be rendered obsolete. |
| [Company name  Description automatically generated with low confidence](https://www.amazon.com/Hitchhikers-Guide-Galaxy/dp/B0009JKV9W) | The Hitchhiker's Guide to the GalaxyDouglas Adams Seconds before the Earth is demolished to make way for a galactic freeway, Arthur Dent is plucked off the planet by his friend Ford Prefect. Together this dynamic pair begin a journey through space aided by quotes from The Hitchhiker's Guide and a galaxy full of fellow travelers: Zaphod Beeblebrox, the two-headed, three-armed ex-hippie and totally out-to-lunch president of the galaxy; Trillian, Zaphod's girlfriend (formally Tricia McMillan), whom Arthur tried to pick up at a cocktail party once upon a time zone; Marvin, a paranoid, brilliant, and chronically depressed robot; and Veet Voojagig, a former graduate student who is obsessed with the disappearance of all the ballpoint pens he bought over the years. Don't forget to bring a towel! |
| [Map  Description automatically generated](https://www.amazon.com/Frankenstein-original-Mary-Wollstonecraft-Shelley-ebook/dp/B09Z2KB4S1) | FrankensteinMary Wollstonecraft Shelley Frankenstein tells the story of gifted scientist Victor Frankenstein who succeeds in giving life to a being of his own creation. However, this is not the perfect specimen he imagines that it will be, but rather a hideous creature who is rejected by Victor and mankind in general. |
| [A picture containing text, electronics  Description automatically generated](https://www.amazon.com/Do-Androids-Dream-Electric-Sheep/dp/1407230026) | Do Androids Dream of Electric Sheep?Philip K. Dick San Francisco lies under a cloud of radioactive dust. The World War has killed millions, driving entire species to extinction and sending mankind off-planet. Those who remain covet any living creature, and for people who can't afford one, companies build incredibly realistic fakes: horses, birds, cats, sheep...even humans. Rick Deckard is an officially sanctioned bounty hunter tasked to find six rogue androids. They're machines, but look, sound, and think like humans |
| [A picture containing text, outdoor  Description automatically generated](https://www.amazon.com/The-Windup-Girl-Paolo-Bacigalupi-audiobook/dp/B002P9T7ZI) | The Windup GirlPaolo Bacigalupi Anderson Lake is a company man, AgriGen's Calorie Man in Thailand. Under cover as a factory manager, Anderson combs Bangkok's street markets in search of foodstuffs thought to be extinct, hoping to reap the bounty of history's lost calories. There, he encounters Emiko...Emiko is the Windup Girl, a strange and beautiful creature. One of the New People, Emiko is not human; instead, she is an engineered being, creche-grown and programmed to satisfy the decadent whims of a Kyoto businessman, but now abandoned to the streets of Bangkok. Regarded as soulless beings by some, devils by others, New People are slaves, soldiers, and toys of the rich in a chilling near future in which calorie companies rule the world, the oil age has passed, and the side effects of bio-engineered plagues run rampant across the globe. |
| [Text  Description automatically generated](https://www.amazon.com/Ancillary-Justice-Ann-Leckie-audiobook/dp/B07JMX3ND2) | Ancillary JusticeAnn Leckie On a remote, icy planet, the soldier known as Breq is drawing closer to completing her quest. Once, she was the Justice of Toren, a colossal starship with an artificial intelligence linking thousands of soldiers in the service of the Radch, the empire that conquered the galaxy. Now, an act of treachery has ripped it all away, leaving her with one fragile human body, unanswered questions, and a burning desire for vengeance |
| [Text  Description automatically generated](https://www.amazon.com/Collected-Fictions-Jorge-Luis-Borges/dp/0140286802) | Collected FictionsJorge Luis Borges From Jorge Luis Borges’s 1935 debut with The Universal History of Iniquity, through his immensely influential collections Ficciones and The Aleph, these enigmatic, elaborate, imaginative inventions display his talent for turning fiction on its head by playing with form and genre and toying with language. Together these incomparable works comprise the perfect one-volume compendium for all those who have long loved Borges, and a superb introduction to the master's work for those who have yet to discover this singular genius. |
| [Diagram  Description automatically generated](https://www.amazon.com/Hyperion-Dan-Simmons-audiobook/dp/B001OC2W04) | HyperionDan Simmons On the world called Hyperion, beyond the law of the Hegemony of Man, there waits the creature called the Shrike. There are those who worship it. There are those who fear it. And there are those who have vowed to destroy it. In the Valley of the Time Tombs, where huge, brooding structures move backward through time, the Shrike waits for them all. On the eve of Armageddon, with the entire galaxy at war, seven pilgrims set forth on a final voyage to Hyperion seeking the answers to the unsolved riddles of their lives. Each carries a desperate hope - and a terrible secret. And one may hold the fate of humanity in his hands. |

### 5.16 - Philosophy

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| [A picture containing diagram  Description automatically generated](https://www.amazon.com/The-Structure-of-Scientific-Revolutions/dp/B002AHYJQC) | The Structure of Scientific RevolutionsThomas S. Kuhn The Structure of Scientific Revolutions is a landmark in intellectual history which has attracted attention far beyond its own immediate field. It is written with a combination of depth and clarity that make it an almost unbroken series of aphorisms. Science is not the steady, cumulative acquisition of knowledge that is portrayed in the textbooks. Rather, it is a series of peaceful interludes punctuated by intellectually violent revolutions . . . in each of which one conceptual world view is replaced by another. |
| [A picture containing company name  Description automatically generated](https://www.amazon.com/The-Case-Against-Reality-audiobook/dp/B07VL5TCVF) | The Case Against Reality: Why Evolution Hid the Truth from Our EyesDonald Hoffman Can we trust our senses to tell us the truth? Challenging leading scientific theories that claim that our senses report back objective reality, cognitive scientist Donald Hoffman argues that while we should take our perceptions seriously, we should not take them literally. From examining why fashion designers create clothes that give the illusion of a more “attractive” body shape to studying how companies use color to elicit specific emotions in consumers, and even dismantling the very notion that spacetime is objective reality, The Case Against Reality dares us to question everything we thought we knew about the world we see. |
| [A picture containing text  Description automatically generated](https://www.amazon.com/The-Singularity-Is-Near-audiobook/dp/B07XPFT63D) | The Singularity Is Near: When Humans Transcend BiologyRay Kurzweil 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. |
| [A picture containing text  Description automatically generated](https://www.amazon.com/The-Emperors-New-Mind-audiobook/dp/B07YBJJJQ5) | The Emperor's New Mind: Concerning Computers, Minds, and the Laws of PhysicsRoger Penrose For decades, proponents of artificial intelligence have argued that computers will soon be doing everything that a human mind can do. Admittedly, computers now play chess at the grandmaster level, but do they understand the game as we do? Can a computer eventually do everything a human mind can do? In this absorbing and frequently contentious book, Roger Penrose puts forward his view that there are some facets of human thinking that can never be emulated by a machine. The book's central concern is what philosophers call the "mind-body problem". Penrose examines what physics and mathematics can tell us about how the mind works, what they can't, and what we need to know to understand the physical processes of consciousness. operation of a mind. |
| [Text  Description automatically generated](https://www.amazon.com/Consciousness-Explained-audiobook/dp/B00HZ3FT7E) | Consciousness ExplainedDaniel C. Dennett Advances a new theory of consciousness based on insights gleaned from the fields of neuroscience, psychology, and artificial intelligence, and clears away obsolete myths about the process of thinking in conscious beings |
| [A close-up of a leaf  Description automatically generated with low confidence](https://warwick.ac.uk/fac/cross_fac/iatl/study/%20%20ugmodules/humananimalstudies/lectures/32/nagel_bat.pdf) | What Is It Like to Be a Bat?Thomas Nagel The paper presents several difficulties posed by consciousness, including the possible insolubility of the mind-body problem owing to "facts beyond the reach of human concepts", the limits of objectivity and reductionism, the "phenomenological features" of subjective experience, the limits of human imagination, and what it means to be a conscious thing. |
| [Calendar  Description automatically generated](https://www.amazon.com/Minds-Sky-Intelligence-Cosmic-Context/dp/0553371339) | The Mind's Sky: Human Intelligence in a Cosmic ContextTimothy Ferris How can we understand, interpret, and ultimately reconcile the mysterious realms of the mind and the universe? Solving this eternal riddle has long been the goal of philosophers, poets, and scientists. Timothy Ferris tackles the mystery anew, tracing the "dance between minds and cosmos," to show how the mind is part of the universe - and what we know as the universe is partly a construct of the mind itself. Filled with the stimulating combination of science, anecdote, and shining insight that has become his trademark, Ferris offers a rare, life-enhancing perception of our world, our cosmos, and ourselves. |
| [A picture containing text, orange, sign  Description automatically generated](https://www.amazon.com/Logic-Scientific-Discovery-Routledge-Classics/dp/0415278449) | The Logic of Scientific DiscoveryKarl Popper This book by one of the world's foremost philosophers of science presented a striking new picture of the logical character of scientific discovery--a picture which does full justice to the liberating effect of the Einsteinian revolution in physics and its immense impact upon scientific thought in general. For this new English edition Dr. Popper did his own translation and has written 150 pages of entirely new text. Ernest Nagel considered this work "a first-rate contribution to the logic of scientific method. The book contains a very interesting chapter on quantum mechanics, which performs one of the few sensible analyses of the Indeterminacy Principle which I have seen in print... The book is highly stimulating and contains much that is bedrock for future work. |
| [A picture containing text, device, dark, gauge  Description automatically generated](https://www.amazon.com/G%C3%B6del-Escher-Bach-Eternal-Golden/dp/0465026567) | Gödel, Escher, Bach: An Eternal Golden BraidDouglas R Hofstadter A metaphorical fugue on minds and machines in the spirit of Lewis Carroll. Douglas Hofstadter's book is concerned directly with the nature of "maps" or links between formal systems. However, according to Hofstadter, the formal system that underlies all mental activity transcends the system that supports it. If life can grow out of the formal chemical substrate of the cell, if consciousness can emerge out of a formal system of firing neurons, then so too will computers attain human intelligence. Gödel, Escher, Bach is a wonderful exploration of fascinating ideas at the heart of cognitive science: meaning, reduction, recursion, and much more. |
| [Text  Description automatically generated with medium confidence](https://www.amazon.com/Artificial-Life-Frontier-Computers-Biology/dp/0679743898) | Artificial Life: A Report from the Frontier Where Computers Meet BiologySteven Levy Artificial Life examines its subject's dizzying philosophical implications: Is a self-replicating computer program any less alive than a flu virus? Are carbon-and-water-based entities merely part of the continuum of living things? And is it possible that one day "a-life" will look back at human beings and dismiss us as an evolutionary way station -- or, worse still, a dead end? |
| [A picture containing indoor, decorated  Description automatically generated](https://www.law.upenn.edu/live/files/3413-searle-j-minds-brains-and-programs-1980pdf) | Minds, brains, and programsJohn R. Searle In a now classic paper published in 1980, “Minds, Brains, and Programs,” Searle developed a provocative argument to show that artificial intelligence is indeed artificial. |

### 5.17 - Programming

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| [Diagram, logo  Description automatically generated](https://www.amazon.com/Introduction-Algorithms-Eastern-Economy-Thomas/dp/8120340078) | Introduction to AlgorithmsCormen, Thomas H., Leiserson, Charles E., Rivest, Ronald L, Stein, Clifford A comprehensive update of the leading algorithms text, with new material on matchings in bipartite graphs, online algorithms, machine learning, and other topics. Some books on algorithms are rigorous but incomplete; others cover masses of material but lack rigor. Introduction to Algorithms uniquely combines rigor and comprehensiveness. It covers a broad range of algorithms in depth yet makes their design and analysis accessible to all levels of readers, with self-contained chapters and algorithms in pseudocode. Since the publication of the first edition, Introduction to Algorithms has become the leading algorithms text in universities worldwide as well as the standard reference for professionals. This fourth edition has been updated throughout. |
| [A bird with a long beak  Description automatically generated with low confidence](https://www.amazon.com/JavaScript-Cookbook-Programming-Adam-Scott/dp/1492055751) | JavaScript Cookbook: Programming the WebAdam D. Scott, Matthew MacDonald, Shelley Powers Why reinvent the wheel every time you run into a problem with JavaScript? This cookbook is chock-full of code recipes for common programming tasks, along with techniques for building apps that work in any browser. You'll get adaptable code samples that you can add to almost any project--and you'll learn more about JavaScript in the process. The recipes in this book take advantage of the latest features in ECMAScript 2020 and beyond and use modern JavaScript coding standards |
| [A picture containing logo  Description automatically generated](https://www.amazon.com/iOS-Swift-Game-Development-Cookbook-ebook/dp/B07HYGFFW8) | iOS Swift Game Development CookbookJonathon Manning, Paris Buttfield-Addison Ready to make amazing games for the iPhone and iPad? With Apple’s Swift programming language, it’s never been easier. This updated cookbook provides detailed recipes for managing a wide range of common iOS game-development issues, ranging from 2D and 3D math, SpriteKit, and OpenGL to augmented reality with ARKit.  You get simple, direct solutions to common problems found in iOS game programming. Need to figure out how to give objects physical motion, or want a refresher on gaming-related math problems? This book provides sample projects and straightforward answers. All you need to get started is some familiarity with iOS development in Swift. |
| [A picture containing text, bird, gallinaceous bird  Description automatically generated](https://www.amazon.com/dp/1492072583) | Java CookbookIan F. Darwin Java continues to grow and evolve, and this cookbook continues to evolve in tandem. With this guide, you’ll get up to speed right away with hundreds of hands-on recipes across a broad range of Java topics. You’ll learn useful techniques for everything from string handling and functional programming to network communication. Each recipe includes self-contained code solutions that you can freely use, along with a discussion of how and why they work. If you’re familiar with Java basics, this cookbook will bolster your knowledge of the language and its many recent changes, including how to apply them in your day-to-day development. |
| [A picture containing text  Description automatically generated](https://www.amazon.com/Cookbook-Modern-Recipes-Professional-Developers/dp/1492093696) | C# Cookbook: Modern Recipes for Professional DevelopersJoe Mayo Even if you're familiar with C# syntax, knowing how to combine various language features is a critical skill when you're building applications. This cookbook is packed full of recipes to help you solve issues for C# programming tasks you're likely to encounter. You'll learn tried-and-true techniques to help you achieve greater productivity and improve the quality of your code. Author and independent consultant Joe Mayo shares some of the most important practices you'll need to be successful as a C# developer. |
| [A porcupine with text above it  Description automatically generated with low confidence](https://www.amazon.com/Scala-Cookbook-Object-Oriented-Functional-Programming/dp/1492051543) | Scala CookbookAlvin Alexander Save time and trouble building object-oriented, functional, and concurrent applications with Scala. Scala changes the way you think about programming--and that's a good thing. Whether you're working on web, big data, or distributed applications, this cookbook provides recipes based on real-world scenarios for both experienced Scala developers and programmers just learning to use this JVM language. Author Alvin Alexander includes practical solutions from his experience using Scala for component-based, highly scalable applications that support concurrency and distribution. |
| [A picture containing text, mammal, domestic cat  Description automatically generated](https://www.amazon.com/Python-Cookbook-Third-David-Beazley/dp/1449340377) | Python CookbookDavid Beazley, Brian Jones Packed with practical recipes written and tested with Python 3.3, this unique cookbook is for experienced Python programmers who want to focus on modern tools and idioms. Inside, you’ll find complete recipes for more than a dozen topics, covering the core Python language as well as tasks common to a wide variety of application domains. Each recipe contains code samples you can use in your projects right away, along with a discussion about how and why the solution works. |

### 5.18 - Quantum Computing

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| [Diagram, schematic  Description automatically generated](https://www.amazon.com/Helgoland-Making-Sense-Quantum-Revolution/dp/B08MQYRVRX) | Helgoland: Making Sense of the Quantum RevolutionCarlo Rovelli One of the world's most renowned theoretical physicists, Carlo Rovelli has entranced millions of readers with his singular perspective on the cosmos. In Helgoland, he examines the enduring enigma of quantum theory. The quantum world Rovelli describes is as beautiful as it is unnerving. Helgoland is a treeless island in the North Sea where the 23-year-old Werner Heisenberg made the crucial breakthrough for the creation of quantum mechanics, setting off a century of scientific revolution. Full of alarming ideas (ghost waves, distant objects that seem to be magically connected, cats that appear both dead and alive), quantum physics has led to countless discoveries and technological advancements. |
| [Diagram  Description automatically generated](https://www.amazon.com/Programming-Quantum-Computers-Essential-Algorithms/dp/1492039683) | Programming Quantum ComputersEric R. Johnston, Nic Harrigan, Mercedes Gimeno-Segovia Quantum computers are poised to kick-start a new computing revolution—and you can join in right away. If you’re in software engineering, computer graphics, data science, or just an intrigued computerphile, this book provides a hands-on programmer’s guide to understanding quantum computing. Rather than labor through math and theory, you’ll work directly with examples that demonstrate this technology’s unique capabilities. You’ll understand what quantum computers can do and learn how to identify the types of problems they can solve. |
| [Diagram  Description automatically generated](https://www.amazon.com/Through-Two-Doors-at-Once-audiobook/dp/B07FF83323) | Through Two Doors at OnceAnil Ananthaswamy The intellectual adventure story of the "double-slit" experiment, showing how a sunbeam split into two paths first challenged our understanding of light and then the nature of reality itself - and continues to almost 200 years later. How can a single particle behave both like a particle and a wave? Does a particle exist before we look at it, or does the very act of looking create reality? Are there hidden aspects to reality missing from the orthodox view of quantum physics? Is there a place where the quantum world ends and the familiar classical world of our daily lives begins, and if so, can we find it? And if there's no such place, then does the universe split into two each time a particle goes through the double slit? |
| [Text  Description automatically generated](https://www.amazon.com/Q-Quantum-Terry-Rudolph/dp/0999063502) | Q is for QuantumTerry Rudolph "Q is for Quantum" teaches a theory at the forefront of modern physics to an audience presumed to already know only basic arithmetic. Topics covered range from the practical (new technologies we can expect soon) to the foundational (old ideas that attempt to make sense of the theory). The theory is built up precisely and quantitatively. |
| [Text  Description automatically generated](https://www.amazon.com/Reality-Is-Not-What-It-Seems-audiobook/dp/B01N49GVM1) | Reality Is Not What It SeemsCarlo Rovelli What are the elementary ingredients of the world? Do time and space exist? And what exactly is reality? In elegant and accessible prose, Rovelli takes us on a wondrous journey from Democritus to Albert Einstein, from Michael Faraday to gravitational waves, and from classical physics to his own work in quantum gravity. As he shows us how the idea of reality has evolved over time, Rovelli offers deeper explanations of the theories he introduced so concisely in Seven Brief Lessons in Physics. |

### 5.19 - Robotics

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| [Text  Description automatically generated](https://www.amazon.com/Biologically-Inspired-Cognitive-Architectures-Scientists/dp/3319639390) | Biologically Inspired Cognitive Architectures (BICA)Alexei V. Samsonovich (Editor) This book includes papers from the second year of the prestigious First International Early Research Career Enhancement School (FIERCES) series: a successful, new format that puts a school in direct connection with a conference and a social program, all dedicated to young scientists. As a result, the book fosters lively discussions on today’s hot topics in science and technology, and stimulates the emergence of new cross-disciplinary, cross-generation and cross-cultural collaboration. |
| [Text  Description automatically generated](https://www.amazon.com/Programming-Robots-ROS-Practical-Introduction/dp/1449323898) | Programming Robots with ROSMorgan Quigley, Brian Gerkey, William D. Smart Want to develop novel robot applications, but don’t know how to write a mapping or object-recognition system? You’re not alone, but you’re certainly not without help. By combining real-world examples with valuable knowledge from the Robot Operating System (ROS) community, this practical book provides a set of motivating recipes for solving specific robotics use cases. You’ll learn how to complete tasks described in the recipes, as well as how to configure and recombine components for other tasks. |

### 5.20 - Smart Buildings and IoTs

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| [Chart  Description automatically generated with medium confidence](https://www.amazon.com/Artificial-Intelligence-IoT-Cookbook-industrial/dp/1838981985) | Artificial Intelligence for IoT CookbookMichael Roshak Artificial intelligence (AI) is rapidly finding practical applications across a wide variety of industry verticals, and the Internet of Things (IoT) is one of them. Developers are looking for ways to make IoT devices smarter and to make users' lives easier. With this AI cookbook, you'll be able to implement smart analytics using IoT data to gain insights, predict outcomes, and make informed decisions, along with covering advanced AI techniques that facilitate analytics and learning in various IoT applications. By the end of this book, you'll be able to package and deploy end-to-end AI apps and apply best practice solutions to common IoT problems. |
| [A picture containing text, sport  Description automatically generated](https://www.amazon.com/New-Science-Cities-MIT-Press/dp/0262534568) | The New Science of CitiesMichael Batty In The New Science of Cities, Michael Batty suggests that to understand cities we must view them not simply as places in space but as systems of networks and flows. To understand space, he argues, we must understand flows, and to understand flows, we must understand networks—the relations between objects that compose the system of the city. Drawing on the complexity sciences, social physics, urban economics, transportation theory, regional science, and urban geography, and building on his own previous work, Batty introduces theories and methods that reveal the deep structure of how cities function. |
| [Diagram  Description automatically generated](https://www.amazon.com/IoT-Edge-Computing-Architects-communication/dp/1839214805) | IoT and Edge Computing for ArchitectsPerry Lea Industries are embracing IoT technologies to improve operational expenses, product life, and people's well-being. An architectural guide is needed if you want to traverse the spectrum of technologies needed to build a successful IoT system, whether that's a single device or millions of IoT devices. With the data now in internet form, you'll get an understanding of cloud and fog architectures, including the OpenFog standards. The book wraps up the analytics portion with the application of statistical analysis, complex event processing, and deep learning models. The book then concludes by providing a holistic view of IoT security, cryptography, and shell security in addition to software-defined perimeters and blockchains. |

### 5.21 - Virtual Reality

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| [A picture containing company name  Description automatically generated](https://www.amazon.com/Reality-Virtual-Worlds-Problems-Philosophy/dp/B09FR6Z6Z6) | Reality+: Virtual Worlds and the Problems of PhilosophyDavid J. Chalmers Virtual reality is genuine reality; that’s the central thesis of Reality+. In a highly original work of “technophilosophy,” David J. Chalmers gives a compelling analysis of our technological future. He argues that virtual worlds are not second-class worlds, and that we can live a meaningful life in virtual reality. We may even be in a virtual world already. Reality+ is a major statement that will shape discussion of philosophy, science, and technology for years to come. |
| [A screenshot of a video game  Description automatically generated](https://www.amazon.com/VRx-Virtual-Therapeutics-Revolutionize-Medicine/dp/1541699769) | VRx: How Virtual Therapeutics Will Revolutionize MedicineBrennan Spiegel Brennan Spiegel has spent years studying the medical power of the mind, and in VRx he reveals a revolutionary new kind of care: virtual medicine. It offers the possibility of treating illnesses without solely relying on intrusive surgeries or addictive opioids. VRx is a revelatory account of the connection between our bodies and ourselves. In an age of overmedication and depersonalized care, it offers no less than a new way to heal. |