Fundamental Proof Methods in Computer Science: A Computer-Based Approach
Konstantin Arkoudas and David Musser
Hbk | 976pp | 9780262053538 | 4/01/2017
A$124 | NZ$146 | MIT Press
Proof is the primary vehicle for knowledge generation in mathematics. In computer science, proof has found an additional use: verifying that a particular system (or component, or algorithm) has certain desirable properties. This book teaches students to read and write proofs using Athena, a freely downloadable computer language. Athena proofs are machine-checkable and written in an intuitive natural-deduction style. The book contains more than 300 exercises, most with full solutions; by putting proofs into practice, it demonstrates the fundamental role of logic and proof in computer science as no other existing text does.

Information Retrieval: Implementing and Evaluating Search Engines
Stefan Butcher, Charles Clarke and Gordon
Pbk | 632pp | 9780262533812 | 13/12/2015
A$88 | NZ$104 | MIT Press
Information retrieval is the foundation for modern search engines. This textbook offers an introduction to the core topics underlying modern search technologies, including algorithms, data structures, indexing, retrieval, and evaluation. The emphasis is on implementation and experimentation; each chapter includes exercises and suggestions for student projects. Wumpus -- a multiuser open-source information retrieval system developed by one of the authors and available online -- provides model implementations and a basis for student work. The modular structure of the book allows instructors to

Machine Learning: A Probabilistic Perspective
Kevin P Murphy
Hbk | 1104pp | 9780262018029 | 7/09/2012
A$199 | NZ$233 | MIT Press
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, a unified, probabilistic approach.

Deep Learning
Ian Goodfellow, Yoshua Bengio and Aaron Co
Hbk | 800pp | 9780262035613 | 2/11/2016
A$149 | NZ$177 | MIT Press
Deep learning is a form of machine learning that enables computers to learn from experience and understand the world in terms of a hierarchy of concepts. Because the computer gathers knowledge from experience, there is no need for a human computer operator to formally specify all the knowledge that the computer needs. The hierarchy of concepts allows the computer to learn complicated concepts by building them out of simpler ones; a graph of these hierarchies would be many layers deep. This book introduces a broad range of topics in deep learning.

The Computational Brain (25th Anniversary Edition)
Patricia Churchland and Terrence Sejnowski
Pbk | 568pp | 9780262533393 | 1/12/2016
A$88 | NZ$104 | MIT Press
Before The Computational Brain was published in 1992, conceptual frameworks for brain function were based on the behaviour of single neurons, applied globally. In The Computational Brain, Patricia Churchland and Terrence Sejnowski developed a different conceptual framework, based on large populations of neurons. They did this by showing that patterns of activities among the units in trained artificial neural network models had properties that resembled those recorded from populations of neurons recorded one at a time. It is one of the first books to bring together computational concepts and behavioral data within a neurobiological approach.

Cyber Blockades
Alison Lawlor Russell
Pbk | 176pp | 9781626161122 | 5/11/2014
A$52.99 | NZ$61 | Georgetown University Press
Cyber Blockades is the first book to examine the phenomena of blockade operations in cyberspace, large-scale attacks on infrastructure or systems that aim to prevent an entire state from sending or receiving electronic data. Cyber blockades can take place through digital, physical, and/or electromagnetic means. Blockade operations have historically been considered acts of war, thus their emergence in cyberspace has significant implications for international law and for our understanding of cyber warfare. The author defines and explains the emerging concept of 'cyber blockades' and presents a unique comparison of blockade operations in

Introduction to Embedded Systems: A Cyber-Physical Systems Approach 2nd
Edward Lee and Sanjit Seshia
Pbk | 568pp | 9780262533812 | 1/12/2016
A$96 | NZ$113 | MIT Press
The most visible use of computers and software is processing information for human consumption. The vast majority of computers in use, however, are much less visible. They run the engine, brakes, seatbelts, airbag, and audio system in your car. They digitally encode your voice and construct a radio signal to send it from your cell phone to a base station. They command robots on a factory floor, power generation in a power plant, processes in a chemical plant, and traffic lights in a city. These less visible computers are called embedded systems, and the software they run is called embedded software.

Understanding the Digital World: What You Need to Know about Computers, the Internet, Privacy, and Security
Brian Kernighan
Hbk | 256pp | 9780691176543 | 1/12/2016
A$43.99 | NZ$51.99 | Princeton University Press
Understanding the Digital World explains how computer hardware, software, networks, and systems work. Topics include how computers are built and how they compute; what programming is and why it is difficult; how the Internet and the web operate; and how all of these affect our security, privacy, property, and other important social, political, and economic issues. This book also touches on fundamental ideas from computer science and some of the inherent limitations of computers. It includes numerous color illustrations, notes on sources for further exploration, and a glossary to explain technical terms and buzzwords.
GAMING

Connected Gaming: What Making Video Games Can Teach Us about Learning and Literacy
Yasmin Kafai and Quinn Burke
Hbk | 224pp | 9780262035378 | 1/01/2017
AS63 | NZ257 | MIT Press
Over the last decade, video games designed to teach academic content have multiplied. Students can learn about Newtonian physics from a game or prep for entry into the army. An emphasis on the constructionist approach to gaming, however, has overshadowed the constructionist approach, in which students learn by designing their own games themselves. In this book, Yasmin Kafai and Quinn Burke discuss the educational benefits of constructionist gaming—coding, collaboration, and creativity—and the move from “computational thinking” toward “computational participation.”

Debugging Game History: A Critical Lexicon
Henry Lowood and Raiford Guins
Hbk | 464pp | 9780262034197 | 27/05/2016
AS92 | NZ2107 | MIT Press
Even as the field of game studies has flourished, critical historical studies of games have lagged behind other areas of research. Histories have generally been fact-by-fact chronicles; fundamental terms of game design and development, technology, and play have rarely been examined in the context of their historical, etymological, and conceptual underpinnings. This volume attempts to “debug” the flawed historiography of video games. It offers original essays on key concepts in game studies, arranged as in a lexicon—from “Amusement Arcade” to “Embodiment” and “Game Art” to “Simulation” and “World Building.”

Knowledge Games: How Playing Games Can Solve Problems, Create Insight, and Make Change
Karen Schrier
Hbk | 280pp | 97812421419206 | 1/06/2016
AS66 | NZ257 | Johns Hopkins University Press
Imagine if new knowledge and insights came not just from research centers, think tanks, and universities but also from games, of all things. Video games have been viewed as causing social problems, but what if they actually helped solve them? This question drives Karen Schrier’s Knowledge Games, which seeks to uncover the potentials and pitfalls of using games to make discoveries, solve real-world problems, and better understand our world.

MACHINE LEARNING

Fundamentals of Machine Learning for Predictive Data Analytics
John D Kelleher, Brian Mac Namee and Aoife
Hbk | 624pp | 9780262029445 | 31/07/2015
AS146 | NZ2169 | MIT Press
Machine learning is often used to build predictive models by extracting patterns from large datasets. These models are used in predictive data analytics applications including price prediction, risk assessment, predicting customer behaviour, and document classification. This introductory textbook offers a detailed and focused treatment of the most important machine learning approaches used in predictive data analytics, covering both theoretical concepts and practical applications.

NEW MEDIA

Disconnected: Youth, New Media, and the Ethics Gap
Carrie James
Pbk | 198pp | 9780262529419 | 1/08/2016
Fresh from a party, a teen posts a photo on Facebook of a friend drinking a beer. A college student repurposes an article from Wikipedia for a paper. A group of players in a multiplayer online game routinely cheat new players by selling them worthless virtual accessories for high prices. In Disconnected, Carrie James examines how young people and the adults in their lives think about these sorts of online dilemmas, describing ethical blind spots and disconnects.

Quantum Algorithms via Linear Algebra: A Primer
Richard J Lipton and Kenneth W Regan
Hbk | 208pp | 9780262028394 | 5/12/2014
AS78 | NZ289 | MIT Press
This introduction to quantum algorithms is concise but comprehensive, covering many key algorithms. It is mathematically rigorous but requires minimal background and assumes no knowledge of quantum theory or quantum mechanics. The book explains quantum computation in terms of elementary linear algebra; it assumes thereader will have some familiarity with vectors, matrices, and their basic properties, but offers a review of all the relevant material from linear algebra. By emphasizing computation and algorithms rather than physics, this primer makes quantum algorithms accessible to students.

Programming

Using Geodata and Geolocation in the Social Sciences
David Abernathy
Pbk | 344pp | 9781473908185 | 5/11/2016
A572 | NZ284 | Sage Publications Ltd
Big data is upon us. With the internet of things now a reality, social scientists must get to grips with the complex network of location-based data in order to ask questions and address problems in an increasingly networked, globalizing world.

Using Geodata and Geolocation in the Social Sciences: Mapping our Connected World provides an engaging and accessible introduction to the Geoweb with clear, step-by-step guides for:

- Capturing Geodata from sources including GPS, sensor
**Probabilistic Graphical Models: Principles and Techniques**

Daphne Koller and Nir Friedman

Hbk | 1270pp | 9780262013152 | 31/08/2009
A$228 | NZ$511 | MIT Press

Most tasks require a person or an automated system to reason - to reach conclusions based on available information. The framework of probabilistic graphical models, presented in this book, provides a general approach for this task. The approach is model-based, allowing interpretable models to be constructed and then manipulated by reasoning algorithms. These models can also be learned automatically from data, allowing the approach to be used in cases where manually constructing a model is difficult or even impossible. Because uncertainty is an inescapable aspect of most real-world applications, the book focuses on

**Processing: A Programming Handbook**

Casey Reas and Ben Fry

Pbk | 216pp | 9780262599575 | 1/04/2016
A$55.99 | NZ$56 | MIT Press

This third edition of *Java Precisely* provides a concise description of the Java programming language, version 8.0. It offers a quick reference for the reader who has already learned (or is learning) Java from a standard textbook and who wants to know the language in more detail. The book presents the entire Java programming language and essential parts of the class libraries: the collection classes, the input-output classes, the stream libraries and Java 8's facilities for parallel programming, and the functional interfaces used for that.

Though written informally, the book describes the
Software Abstractions: Logic, Language, and Analysis 2ed
Daniel Jackson
Pbk | 376pp | 9780262528900 | 12/01/2016
AS65 | NZ57 | MIT Press

In *Software Abstractions* Daniel Jackson introduces an approach to software design that draws on traditional formal methods but exploits automated tools to find flaws as early as possible. This approach -- which Jackson calls “lightweight formal methods” or “agile modeling” -- takes from formal specification the idea of a precise and expressive notation based on a tiny core of simple and robust concepts but replaces conventional analysis based on theorem proving with a fully automated analysis that gives designers immediate feedback. Jackson has developed Alloy, a language that captures the essence of software abstractions simply.

Principles of Cyber-Physical Systems
Rajeev Alur
Hbk | 464pp | 9780262029117 | 17/04/2015
AS125 | NZ146 | MIT Press

A cyber-physical system consists of a collection of computing devices communicating with one another and interacting with the physical world via sensors and actuators in a feedback loop. Increasingly, such systems are everywhere, from smart buildings to medical devices to automobiles. This textbook offers a rigorous and comprehensive introduction to the principles of design, specification, modeling, and analysis of cyber-physical systems. The book draws on a diverse set of subdisciplines, including model-based design, concurrency theory, distributed algorithms, formal methods of specification and verification, control.

GIS Algorithms
Ningchuan Xiao
Pbk | 336pp | 9781446274330 | 9/01/2016
AS599 | NZ5117 | Sage Publications Ltd

Geographic information systems (GIS) have become increasingly important in helping us understand complex social, economic, and natural dynamics where spatial components play a key role. The critical algorithms used in GIS, however, are notoriously difficult to both teach and understand, in part due to the lack of a coherent representation. GIS Algorithms attempts to address this problem by combining rigorous formal language with example case studies and student exercises. Using Python code throughout, Xiao breaks the subject down into three fundamental areas: Geometric Algorithms, Spatial Indexing, Spatial Analysis and Modelling With

Evolutionary Computation: A Unified Approach
Kenneth De Jong
Pbk | 260pp | 9780262629600 | 25/02/2016
AS51.99 | NZ561 | MIT Press

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. Although other books have described such particular areas of the field as genetic algorithms, genetic programming, evolution strategies, and evolutionary programming, Evolutionary Computation is noteworthy for considering these systems as specific instances of a more general class of evolutionary algorithms.

Introduction to Algorithms 3ed
Thomas H Cormen, Charles E Leiserson, Ron Rivest, Clifford Stein
Pbk | 1312pp | 9780262033848 | 30/09/2009
AS165 | NZ195 | MIT Press

Some books on algorithms are rigorous but incomplete; others cover masses of material but lack rigor. *Introduction to Algorithms* uniquely combines rigor and comprehensiveness. The book covers a broad range of algorithms in depth, yet makes their design and analysis accessible to all levels of readers. Each chapter is relatively self-contained and can be used as a unit of study. The algorithms are described in English and in a pseudocode designed to be readable by anyone who has done a little programming. The explanations have been kept elementary without sacrificing depth of coverage or mathematical rigor.

Effective Coding with VHDL: Principles and Best Practice
Ricardo Janinski
Hbk | 624pp | 9780262034227 | 3/04/2016
AS102 | NZ119 | MIT Press

This book addresses an often-neglected aspect of the creation of VHDL designs. A VHDL description is also source code, and VHDL designers can use the best practices of software development to write high-quality code and to organize it in a design. This book presents this unique set of skills, teaching VHDL designers of all experience levels how to apply the best design principles and coding practices from the software world to the world of hardware. The concepts introduced here will help readers write code that is easier to understand and more likely to be correct, with improved readability, maintainability, and overall quality.

The Little Prover
Daniel P Friedman and Carl Eastlund
Pbk | 248pp | 9780262529758 | 10/07/2015
AS68 | NZ579 | MIT Press

The Little Prover introduces inductive proofs as a way to determine facts about computer programs. It is written in an approachable, engaging style of question-and-answer, with the characteristic humor of The Little Schemer (fourth edition, MIT Press). Sometimes the best way to learn something is to sit down and do it; the book takes readers through step-by-step examples showing how to write inductive proofs.

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Exploratory Programming for the Arts and Humanities
Nick Montfort
Hbk | 328pp | 9780262634203 | 25/03/2016
AS73 | NZ586 | MIT Press
This book introduces programming to readers with a background in the arts and humanities; there are no prerequisites, and no knowledge of computation is assumed. In it, Nick Montfort reveals programming to be not merely a technical exercise within given constraints but a tool for sketching, brainstorming, and inquiring about important topics. He emphasizes programming’s exploratory potential - its facility to create new kinds of artworks and to probe data for new ideas.

The book is designed to be read alongside the computer, allowing readers to program while making their way

Introduction to Computation and Programming Using Python 2nd
John V Guttag
Pbk | 320pp | 9780262525008 | 9/08/2013
AS56.99 | NZ567 | MIT Press
This book introduces students with little or no prior programming experience to the art of computational problem solving using Python and various Python libraries, including PyLab. It provides students with the skills that will enable them to make productive use of computational techniques, including some of the tools and techniques of 'data science' for using computation to model and interpret data. Students are introduced to Python and the basics of programming in the context of such computational concepts and techniques as exhaustive enumeration, bisection search, and efficient approximation algorithms. The book does not require

The Stack: On Software and Sovereignty
Benjamin H Bratton
Hbk | 528pp | 9780262029575 | 1/03/2016
AS79 | NZ259 | MIT Press
What has planetary-scale computation done to our geopolitical realities? In The Stack, Benjamin Bratton proposes that smart grids, cloud computing, mobile software and smart cities, universal addressing systems, ubiquitous computing, and other types of apparently unrelated planetary-scale computation can be viewed as forming a coherent whole - an accidental megastucture called The Stack that is both a computational apparatus and a new geopolitical architecture.

Multiagent Systems 2ed
Gerhard Weiss
Pbk | 920pp | 9780262533874 | 28/09/2016
AS138 | NZ5163 | MIT Press
Multiagent systems are made up of multiple interacting intelligent agents - computational entities to some degree autonomous and able to cooperate, compete, communicate, act flexibly, and exercise control over their behavior within the frame of their objectives. They are the enabling technology for a wide range of advanced applications relying on distributed and parallel processing of data, information, and knowledge relevant in domains ranging from industrial manufacturing to e-commerce to healthcare. This book offers a state-of-the-art introduction to multiagent systems, covering the field in both breadth and depth, and treating both

Modeling and Simulating Software Architectures: The Palladio Approach
Ralf Reussner, Steffen Becker, Jens Happe,
Hbk | 400pp | 9780262034760 | 7/09/2016
AS106 | NZ5123 | MIT Press
Too often, software designers lack an understanding of the effect of design decisions on such quality attributes as performance and reliability. This necessitates costly trial-and-error testing cycles, delaying or complicating rollout. This book presents a new, quantitative architecture simulation approach to software design, which allows software engineers to model quality of service in early design stages. It presents the first simulator for software architectures, Palladio, and shows students and professionals how to model reusable, parametrized components and configuring, deployed systems in order to analyze service attributes.

Introduction to Computational Science: Modeling and Simulation for the Sciences 2ed
Angela B Shiflet and George W Shiflet
Hbk | 856pp | 9780691160719 | 23/03/2014
AS192 | NZ224 | Princeton University Press
Computational science is an exciting new field at the intersection of the sciences, computer science, and mathematics because much scientific investigation now involves computing as well as theory and experiment. This textbook provides students with a versatile and accessible introduction to the subject. It assumes only a background in high school algebra, enables instructors to follow tailored pathways through the material, and is the only textbook of its kind designed specifically for an introductory course in the computational science and engineering curriculum.

Structure and Interpretation of Computer Programs 2ed
Harold Abelson and Gerald Jay Sussman
Pbk | 688pp | 9780262510875 | 1/08/1996
AS107 | NZ5127 | MIT Press
Structure and Interpretation of Computer Programs has had a dramatic impact on computer science curricula over the past decade. This long-awaited revision contains changes throughout the text. There are new implementations of most of the major programming systems in the book, including the interpreters and compilers, and the authors have incorporated many small changes that reflect their experience teaching the course at MIT since the first edition was published.

Panos Louridas
Hbk | 528pp | 9780262035705 | 24/02/2017
AS87 | NZ5102 | MIT Press
Algorithms are what we do in order not to have to do something. Algorithms consist of instructions to carry out tasks - usually dull, repetitive ones. Starting from simple building blocks, computer algorithms enable machines to recognize and produce speech, translate texts, categorize and summarize documents, describe images, and predict the weather. A task that would take hours can be completed in virtually no time by using a few lines of code in a modern scripting program. This book offers an introduction to algorithms through the real-world problems they solve. The algorithms are presented in pseudocode and can readily be

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Elements of Causal Inference: Foundations and Learning Algorithms
Jonas Peters, Dominik Janzing and Bernhard
Hbk | 288pp | 9780262037310 | 3/10/2017
A$129 | NZ$195 | MIT Press
This book offers a self-contained and concise introduction to causal models and how to learn them from data. After explaining the need for causal models and discussing some of the principles underlying causal inference, the book teaches readers how to use causal models: how to compute intervention distributions, how to infer causal models from observational and interventional data, and how causal ideas could be exploited for classical machine learning problems. All of these topics are discussed first in terms of two variables and then in the more general multivariate case.

Probabilistic Robotics
Sebastian Thrun, Wolfram Burgard and Diet
Hbk | 672pp | 9780262016829 | 1/09/2005
A$155 | NZ$219 | MIT Press
Probabilistic robotics is a new and growing area in robotics, concerned with perception and control in the face of uncertainty. Building on the field of mathematical statistics, probabilistic robotics endows robots with a new level of robustness in real-world situations. This book introduces the reader to a wealth of techniques and algorithms in the field. All algorithms are based on a single overarching mathematical foundation. Each chapter provides example implementations in pseudo code, detailed mathematical derivations, discussions from a practitioner’s perspective, and extensive lists of references.

Robots 2ed
George Bekey
Hbk | 416pp | 9780262534185 | 10/02/2017
A$149 | NZ$211 | MIT Press
After installing a robot, its owner faces a range of challenges, using the robot to perform a task, learn from its experiences. This book introduces people to the world of robots, spanning the fundamentals of mobile robotics, from simple robots like Roomba, the robot vacuum cleaner, to sophisticated robots such as the Mars Pathfinder mission’s Sojourner. This book offers students and other interested readers an introduction to the fundamentals of mobile robotics, spanning the mechanical, motor, sensory, perceptual, and cognitive layers the field comprises. The text focuses on mobility itself, offering an overview of the mechanisms that allow a mobile robot to move through a real world environment to perform its tasks, including locomotion, sensing, localisation, and motion planning. It synthesises material from such fields as kinematics, control theory, and mechanical systems. The book offers a systematic introduction to mobile robotics, designed for students and professionals alike.

Workflow Patterns: The Definitive Guide
Nick Russell, Wil M. van der Aalst and Ar
Hbk | 384pp | 9780262029827 | 1/02/2016
A$123 | NZ$179 | MIT Press
The study of business processes has emerged as a highly effective approach to co-ordinating an organisation’s complex service- and knowledge-based activities. The growing field of business process management (BPM) focuses on methods and tools for designing, enacting, and analysing business processes. This volume offers a definitive guide to the use of patterns, which synthesise the wide range of approaches to modelling business processes.

Digital Wars: Apple, Google, Microsoft and the Battle for the Internet 2ed
Charles Arthur
Pbk | 344pp | 9780749472030 | 3/05/2014
A$38.99 | NZ$54.99 | Kogan Page Ltd
The first time that Apple, Google and Microsoft found themselves sharing the same digital space was 1998. They were radically different companies and they would subsequently fight a series of pitched battles for control of different parts of the digital landscape. They could not know of the battles to come. But they would be world-changing. This new edition of Digital Wars looks at each of these battles in turn.

Workflow Management: Models, Methods, and Systems
Wil Van Der Aalst and Kees van Hee
Pbk | 384pp | 9780262320465 | 1/03/2004
A$67 | NZ$92 | MIT Press
This book offers a comprehensive introduction to workflow management, the management of business processes with information technology. By defining, analyzing, and redesigning an organization’s resources and operations, workflow management systems ensure that the right information reaches the right person or computer application at the right time. The book provides a basic overview of workflow terminology and organization, as well as detailed coverage of workflow modeling with Petri nets.