

Once Upon An Algorithm How Stories Explain Computing

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The Pattern On The Stone W. Daniel Hillis 2014-12-09 Most people are baffled by how computers work and assume that they will never understand them. What they don't realize—and what Daniel Hillis's short book brilliantly demonstrates—is that computers' seemingly complex operations can be broken down into a few simple parts that perform the same simple procedures over and over again. Computer wizard Hillis offers an easy-to-follow explanation of how data is processed that makes the operations of a computer seem as straightforward as those of a bicycle. Avoiding technobabble or discussions of advanced hardware, the lucid explanations and colorful anecdotes in *The Pattern on the Stone* go straight to the heart of what computers really do. Hillis proceeds from an outline of basic logic to clear descriptions of programming languages, algorithms, and memory. He then takes readers in simple steps up to the most exciting developments in computing today—quantum computing, parallel computing, neural networks, and self-organizing systems. Written clearly and succinctly by one of the world's leading computer scientists, *The Pattern on the Stone* is an indispensable guide to understanding the workings of that most ubiquitous and important of machines: the computer.

Programming Pearls Jon Bentley 2016-04-21 When programmers list their favorite books, Jon Bentley's collection of programming pearls is commonly included among the classics. Just as natural pearls grow from grains of sand that irritate oysters, programming pearls have grown from real problems that have irritated real programmers. With origins beyond solid engineering, in the realm of insight and creativity, Bentley's pearls offer unique and clever solutions to those nagging problems. Illustrated by programs designed as much for fun as for instruction, the book is filled with lucid and witty descriptions of practical programming techniques and fundamental design principles. It is not at all surprising that *Programming Pearls* has been so highly valued by programmers at every level of experience. In this revision, the first in 14 years, Bentley has substantially updated his essays to reflect current programming methods and environments. In addition, there are three new essays on testing, debugging, and timing set representations string problems All the original programs have been rewritten, and an equal amount of new code has been generated. Implementations of all the programs, in C or C++, are now available on the Web. What remains the same in this new edition is Bentley's focus on the hard core of programming problems and his delivery of workable solutions to those problems. Whether you are new to Bentley's classic or are revisiting his work for some fresh insight, the book is sure to make your own list of favorites.

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

Data Feminism Catherine D'Ignazio 2020-03-31 A new way of thinking about data science and data ethics that is informed by the ideas of intersectional feminism. Today, data science is a form of power. It has been used to expose injustice, improve health outcomes, and topple governments. But it has also been used to discriminate, police, and surveil. This potential for good, on the one hand, and harm, on the other, makes it essential to ask: Data science by whom? Data science for whom? Data science with whose interests in mind? The narratives around big data and data science are overwhelmingly white, male, and techno-heroic. In *Data Feminism*, Catherine D'Ignazio and Lauren Klein present a new way of thinking about data science and data ethics—one that is informed by intersectional feminist thought. Illustrating data feminism in action, D'Ignazio and Klein show how challenges to the male/female binary can help challenge other hierarchical (and empirically wrong) classification systems. They explain how, for example, an understanding of emotion can expand our ideas about effective data visualization, and how the concept of invisible labor can expose the significant human efforts required by our automated systems. And they show why the data never, ever “speak for themselves.” *Data Feminism* offers strategies for data scientists seeking to learn how feminism can help them work toward justice, and for feminists who want to focus their efforts on the growing field of data science. But *Data Feminism* is about much more than gender. It is about power, about who has it and who doesn't, and about how those differentials of power can be challenged and changed.

Once Upon a Time . . . A Treasury of Classic Fairy Tale Illustrations Jeff A. Menges 2013-02-19 This collection gathers breathtaking art from early editions of "Sleeping Beauty," "Cinderella," and other classics. 180 elegant images — most in color — include works by Rackham, Dore, Dulac, Nielsen, and others.

Computer Science Distilled Wladston Ferreira Filho 2017-01-17 A foolproof walkthrough of must-know computer science concepts. A fast guide for those who don't need the academic formality, it goes straight to what differentiates pros from amateurs. First introducing discrete mathematics, then exposing the most common algorithm and data structure design elements, and finally the working principles of computers and programming languages, the book is indicated to all programmers.

The Bestseller Code Jodie Archer 2016-09-20 "When a story captures the imagination of millions, that's magic. Can you qualify magic? Archer and Jockers just may have done so."—Sylvia Day, *New York Times* bestselling author Ask most people about massive success in the world of fiction, and you'll typically hear that it's a game of hazy crystal balls. The sales figures of E. L. James or Dan Brown seem to be freakish—random occurrences in an unknowable market. But what if there were an algorithm that could reveal a secret DNA of bestsellers, regardless of their genre? What if it knew, just from analyzing the words alone, not just why genre writers like John Grisham and Danielle Steel belong on the lists, but also that authors such as Junot Diaz, Jodi Picoult, and Donna Tartt had telltale signs of success all over their pages? Thanks to Jodie Archer and Matthew Jockers, the algorithm exists, the code has been cracked, and the results bring fresh new insights into how fiction works and why we read. *The Bestseller Code* offers a new theory for why *Fifty Shades of Grey* sold so well. It sheds light on the current craze for dark heroines. It reveals which themes tend to sell best. And all with fascinating supporting data taken from a five-year study of twenty thousand novels. Then there is the hunt for “the one”—the paradigmatic example of bestselling writing according to a computer's analysis of thousands of points of data. The result is surprising, a bit ironic, and delightfully unorthodox. This book explains groundbreaking text-mining research in accessible terms and offers a new perspective on the *New York Times* bestseller list. It's a big-idea book about the relationship between creativity and technology that will be provocative to anyone interested in how analytics have already transformed the worlds of finance, medicine, and sports. But at heart it is a celebration of books for readers and writers—a compelling investigation into how successful writing works, and a fresh take on our intellectual and emotional response to stories.

Problems on Algorithms Ian Parberry 1995-01-01 With approximately 600 problems and 35 worked examples, this supplement provides a collection of practical problems on the design, analysis and verification of algorithms. The book focuses on the important areas of algorithm design and analysis: background material; algorithm design techniques; advanced data structures and NP-completeness; and miscellaneous problems. Algorithms are expressed in Pascal-like pseudocode supported by figures, diagrams, hints, solutions, and comments.

Hello World Hannah Fry 2019-03-28 'One of the best books yet written on data and algorithms. . .deserves a place on the bestseller charts.' (The Times) You are accused of a crime. Who would you rather determined your fate - a human or an algorithm? An algorithm is more consistent and less prone to error of judgement. Yet a human can look you in the eye before passing sentence. Welcome to the age of the algorithm, the story of a not-too-distant future where machines rule supreme, making important decisions - in healthcare, transport, finance, security, what we watch, where we go even who we send to prison. So how much should we rely on them? What kind of future do we want? Hannah Fry takes us on a tour of the good, the bad and the downright ugly of the algorithms that surround us. In *Hello World* she lifts the lid on their inner workings, demonstrates their power, exposes their limitations, and examines whether they really are an improvement on the humans they are replacing. A BBC RADIO 4- BOOK OF THE WEEK SHORTLISTED FOR THE 2018 BAILLIE GIFFORD PRIZE AND 2018 ROYAL SOCIETY SCIENCE BOOK PRIZE

Once Upon a Sunset Tif Marcelo 2020-03-03 The author of *The Key to Happily Ever After*—“a true gem filled with heart, laughs, and a cast of delightful characters” (Nina Bocci, *USA TODAY* bestselling author)—returns with a heartwarming and charming novel about a woman who travels to the Philippines to reconnect with her long-lost family...and manages to find herself along the way. Diana Gallagher-Cary is at a tipping point. As a Washington, DC, OB/GYN at a prestigious hospital, she uses her career to distract herself from her grief over her granny's death and her breakup from her long-term boyfriend after her free-spirited mother moves in with her. But when she makes a medical decision that disparages the hospital, she is forced to go on a short sabbatical. Never one to wallow, Diana decides to use the break to put order in her life, when her mother, Margo, stumbles upon a box of letters from her grandfather, Antonio Cruz, to her grandmother from the 1940s. The two women always believed that Antonio died in World War II, but the letters reveal otherwise. When they learn that he lived through the war, and that they have surviving relatives in the Philippines, Diana becomes determined to connect with the family that she never knew existed, though Margo refuses to face her history. But Diana pushes on, and heads on a once-in-a-lifetime trip that challenges her identity, family history, and her idea of romantic love that could change her life forever. Infused with Tif Marcelo's signature “sexy, adorable, and heartfelt” (Kate Meader, *USA TODAY* bestselling author) voice, *Once Upon a Sunset* is a moving and lyrical celebration of love, family, and second chances.

Algorithms of Oppression Safiya Umoja Noble 2018-02-20 A revealing look at how negative biases against women of color are embedded in search engine results and algorithms Run a Google search for “black girls”—what will you find? “Big Booty” and other sexually explicit terms are likely to come up as top search terms. But, if you type in “white girls,” the results are radically different. The suggested porn sites and un-moderated discussions about “why black women are so sassy” or “why black women are so angry” presents a disturbing portrait of black womanhood in modern society. In *Algorithms of Oppression*, Safiya Umoja Noble challenges the idea that search engines like Google offer an equal playing field for all forms of ideas, identities, and activities. Data discrimination is a real social problem; Noble argues that the combination of private interests in promoting certain sites, along with the monopoly status of a relatively small number of Internet search engines, leads to a biased set of search algorithms that privilege whiteness and discriminate against people of color, specifically women of color. Through an analysis of textual and media searches as well as extensive research on paid online advertising, Noble exposes a culture of racism and sexism in the way discoverability is created online. As search engines and their related companies grow in importance—operating as a source for email, a major vehicle for primary and secondary school learning, and beyond—understanding and reversing these disquieting trends and discriminatory practices is of utmost importance. An original, surprising and, at times, disturbing account of bias on the internet, *Algorithms of Oppression* contributes to our understanding of how racism is created, maintained, and disseminated in the 21st century.

The CS Detective Jeremy Kubica 2016-08-16 Meet Frank Runtime. Disgraced ex-detective. Hard-boiled private eye. Search expert. When a robbery hits police headquarters, it's up to Frank Runtime and his extensive search skills to catch the culprits. In this detective story, you'll learn how to use algorithmic tools to solve the case. Runtime scours smugglers' boats with binary search, tails spies with a search tree, escapes a prison with depth-first search, and picks locks with priority queues. Joined by know-it-all rookie Officer Notation and inept tag-along Socks, he follows a series of leads in a best-first search that unravels a deep conspiracy. Each chapter introduces a thrilling twist matched with a new algorithmic concept, ending with a technical recap. Perfect for computer science students and amateur sleuths alike, *The CS Detective* adds an entertaining twist to learning algorithms. Follow Frank's mission and learn: –The algorithms behind best-first and depth-first search, iterative deepening, parallelizing, binary search, and more –Basic computational concepts like strings, arrays, stacks, and queues –How to adapt search algorithms to unusual data structures –The most efficient algorithms to use in a given situation, and when to apply common-sense heuristic methods

Algorithmic Life Louise Amoore 2015-12-22 This book critically explores forms and techniques of calculation that emerge with digital computation, and their implications. The contributors demonstrate that digital calculative devices matter beyond their specific functions as they progressively shape, transform and govern all areas of our life. In particular, it addresses such questions as: How does the drive to make sense of, and productively use, large amounts of diverse data, inform the development of new calculative devices, logics and techniques? How do these devices, logics and techniques affect our capacity to decide and to act? How do mundane elements of our physical and virtual existence become data to be analysed and rearranged in complex ensembles of people and things? In what ways are conventional notions of public and private, individual and population, certainty and probability, rule and exception transformed and what are the consequences? How does the search for 'hidden' connections and patterns change our understanding of social relations and associative life? Do contemporary modes of calculation produce new thresholds of calculability and computability, allowing for the improbable or the merely possible to be embraced and acted upon? As contemporary approaches to governing uncertain futures seek to anticipate future events, how are calculation and decision engaged anew? Drawing together different strands of cutting-edge research that is both theoretically sophisticated and empirically rich, this book makes an important contribution to several areas of scholarship, including the emerging social science field of software studies, and will be a vital resource for students and scholars alike.

Best Practices of Spell Design Jeremy Kubica 2013-01-21 "The Best Practices of Spell Design introduces practical aspects of software development that are often learned through painful experience. Through Marcus and Shelly's quest, the story encourages readers to think about how to write readable, well-tested and maintainable programs."--P. [4] of cover.

Computational Fairy Tales Jeremy Kubica 2012 Have you ever thought that computer science should include more dragons and wizards? *Computational Fairy Tales* introduces principles of computational thinking, illustrating high-level computer science concepts, the motivation behind them, and their application in a non-computer—fairy tale—domain. It's a quest that will take you from learning the basics of programming in a blacksmith's forge to fighting curses with recursion. Fifteen seers delivered the same prophecy, without so much as a single minstrel to lighten the mood: an unknown darkness threatens the kingdom. Suddenly, Princess Ann finds herself sent forth alone to save the kingdom. Leaving behind her home, family, and pet turtle Fido, Princess Ann must face goblin attacks, magical curses, arrogant scholars, an unpleasant oracle, and rude Boolean waiters. Along the way she must build a war chest of computational knowledge to survive the coming challenge.

Cloud Cuckoo Land (Large Print Edition) Anthony Doerr 2021-09-28 From the Pulitzer Prize-winning author of *All the Light We Cannot See*, perhaps the most bestselling and beloved literary fiction of our time, comes a triumph of imagination and compassion, a soaring novel about children on the cusp of adulthood in a broken world, who find resilience, hope, and story. The heroes of *Cloud Cuckoo Land* are trying to figure out the world around them: Anna and Omeir, on opposite sides of the formidable city walls during the 1453 siege of Constantinople; teenage idealist Seymour in an attack on a public library in present day Idaho; and Konstance, on an interstellar ship bound for an exoplanet, decades from now. Like Marie-Laure and Werner in *All the Light We Cannot See*, Anna, Omeir, Seymour, and Konstance are dreamers and

outsiders who find resourcefulness and hope in the midst of peril. An ancient text—the story of Aethon, who longs to be turned into a bird so that he can fly to a utopian paradise in the sky—provides solace and mystery to these unforgettable characters. Doerr has created a tapestry of times and places that reflects our vast interconnectedness—with other species, with each other, with those who lived before us and those who will be here after we're gone. Dedicated to "the librarians then, now, and in the years to come," *Cloud Cuckoo Land* is a hauntingly beautiful and redemptive novel about stewardship—of the book, of the Earth, of the human heart.

Building a StoryBrand Donald Miller 2017-10-10 More than half-a-million business leaders have discovered the power of the StoryBrand Framework, created by New York Times best-selling author and marketing expert Donald Miller. And they are making millions. If you use the wrong words to talk about your product, nobody will buy it. Marketers and business owners struggle to effectively connect with their customers, costing them and their companies millions in lost revenue. In a world filled with constant, on-demand distractions, it has become near-impossible for business owners to effectively cut through the noise to reach their customers, something Donald Miller knows first-hand. In this book, he shares the proven system he has created to help you engage and truly influence customers. The StoryBrand process is a proven solution to the struggle business leaders face when talking about their companies. Without a clear, distinct message, customers will not understand what you can do for them and are unwilling to engage, causing you to lose potential sales, opportunities for customer engagement, and much more. In *Building a StoryBrand*, Donald Miller teaches marketers and business owners to use the seven universal elements of powerful stories to dramatically improve how they connect with customers and grow their businesses. His proven process has helped thousands of companies engage with their existing customers, giving them the ultimate competitive advantage. Building a StoryBrand does this by teaching you: The seven universal story points all humans respond to; The real reason customers make purchases; How to simplify a brand message so people understand it; and How to create the most effective messaging for websites, brochures, and social media. Whether you are the marketing director of a multibillion-dollar company, the owner of a small business, a politician running for office, or the lead singer of a rock band, *Building a StoryBrand* will forever transform the way you talk about who you are, what you do, and the unique value you bring to your customers.

Once Upon an Algorithm Martin Erwig 2022-08-09 How Hansel and Gretel, Sherlock Holmes, the movie *Groundhog Day*, Harry Potter, and other familiar stories illustrate the concepts of computing. Picture a computer scientist, staring at a screen and clicking away frantically on a keyboard, hacking into a system, or perhaps developing an app. Now delete that picture. In *Once Upon an Algorithm*, Martin Erwig explains computation as something that takes place beyond electronic computers, and computer science as the study of systematic problem solving. Erwig points out that many daily activities involve problem solving. Getting up in the morning, for example: You get up, take a shower, get dressed, eat breakfast. This simple daily routine solves a recurring problem through a series of well-defined steps. In computer science, such a routine is called an algorithm. Erwig illustrates a series of concepts in computing with examples from daily life and familiar stories. Hansel and Gretel, for example, execute an algorithm to get home from the forest. The movie *Groundhog Day* illustrates the problem of unsolvability; Sherlock Holmes manipulates data structures when solving a crime; the magic in Harry Potter's world is understood through types and abstraction; and Indiana Jones demonstrates the complexity of searching. Along the way, Erwig also discusses representations and different ways to organize data; "intractable" problems; language, syntax, and ambiguity; control structures, loops, and the halting problem; different forms of recursion; and rules for finding errors in algorithms. This engaging book explains computation accessibly and shows its relevance to daily life. Something to think about next time we execute the algorithm of getting up in the morning.

Grokking Algorithms Aditya Bhargava 2016-05-12 Summary Grokking Algorithms is a fully illustrated, friendly guide that teaches you how to apply common algorithms to the practical problems you face every day as a programmer. You'll start with sorting and searching and, as you build up your skills in thinking algorithmically, you'll tackle more complex concerns such as data compression and artificial intelligence. Each carefully presented example includes helpful diagrams and fully annotated code samples in Python. Learning about algorithms doesn't have to be boring! Get a sneak peek at the fun, illustrated, and friendly examples you'll find in *Grokking Algorithms* on Manning Publications' YouTube channel. Continue your journey into the world of algorithms with *Algorithms in Motion*, a practical, hands-on video course available exclusively at Manning.com (www.manning.com/livevideo/algorithms-?in-motion). Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology An algorithm is nothing more than a step-by-step procedure for solving a problem. The algorithms you'll use most often as a programmer have already been discovered, tested, and proven. If you want to understand them but refuse to slog through dense multipage proofs, this is the book for you. This fully illustrated and engaging guide makes it easy to learn how to use the most important algorithms effectively in your own programs. About the Book *Grokking Algorithms* is a friendly take on this core computer science topic. In it, you'll learn how to apply common algorithms to the practical programming problems you face every day. You'll start with tasks like sorting and searching. As you build up your skills, you'll tackle more complex problems like data compression and artificial intelligence. Each carefully presented example includes helpful diagrams and fully annotated code samples in Python. By the end of this book, you will have mastered widely applicable algorithms as well as how and when to use them. What's Inside Covers search, sort, and graph algorithms Over 400 pictures with detailed walkthroughs Performance trade-offs between algorithms Python-based code samples About the Reader This easy-to-read, picture-heavy introduction is suitable for self-taught programmers, engineers, or anyone who wants to brush up on algorithms. About the Author Aditya Bhargava is a Software Engineer with a dual background in Computer Science and Fine Arts. He blogs on programming at adit.io. Table of Contents Introduction to algorithms Selection sort Recursion Quicksort Hash tables Breadth-first search Dijkstra's algorithm Greedy algorithms Dynamic programming K-nearest neighbors

Algorithmic Thinking Daniel Zingaro 2020-12-15 A hands-on, problem-based introduction to building algorithms and data structures to solve problems with a computer. Algorithmic Thinking will teach you how to solve challenging programming problems and design your own algorithms. Daniel Zingaro, a master teacher, draws his examples from world-class programming competitions like USACO and IOI. You'll learn how to classify problems, choose data structures, and identify appropriate algorithms. You'll also learn how your choice of data structure, whether a hash table, heap, or tree, can affect runtime and speed up your algorithms; and how to adopt powerful strategies like recursion, dynamic programming, and binary search to solve challenging problems. Line-by-line breakdowns of the code will teach you how to use algorithms and data structures like:

- The breadth-first search algorithm to find the optimal way to play a board game or find the best way to translate a book
- Dijkstra's algorithm to determine how many mice can exit a maze or the number of fastest routes between two locations
- The union-find data structure to answer questions about connections in a social network or determine who are friends or enemies
- The heap data structure to determine the amount of money given away in a promotion
- The hash-table data structure to determine whether snowflakes are unique or identify compound words in a dictionary

NOTE: Each problem in this book is available on a programming-judge website. You'll find the site's URL and problem ID in the description. What's better than a free correctness check?

Bad Choices Ali Almosawi 2017-04-04 A relatable, interactive, and funny exploration of algorithms, those essential building blocks of computer science—and of everyday life—from the author of the wildly popular *Bad Arguments Algorithms*—processes that are made up of unambiguous steps and do something useful—make up the very foundations of computer science. But they also inform our choices in approaching everyday tasks, from managing a pile of clothes fresh out of the dryer to deciding what music to listen to. With *Bad Choices*, Ali Almosawi presents twelve scenes from everyday life that help demonstrate and demystify the fundamental algorithms that drive computer science, bringing these seemingly elusive concepts into the understandable realms of the everyday. Readers will discover how:

- Matching socks can teach you about search and hash tables
- Planning trips to the store can demonstrate the value of stacks
- Deciding what music to listen to shows why link analysis is all-important
- Crafting a succinct Tweet draws on ideas from compression
- Making your way through a grocery list helps explain priority queues and traversing graphs
- And more

As you better understand algorithms, you'll also discover what makes a method faster and more efficient, helping you become a more nimble, creative problem-solver, ready to face new challenges. *Bad Choices* will open the world of algorithms to all readers, making this a perennial go-to for fans of quirky, accessible science books.

Python and Algorithmic Thinking for the Complete Beginner (2nd Edition) Aristides S Bouras 2019-06-16 Thoroughly revised for the latest version of Python, this book explains basic concepts in a clear and explicit way that takes very seriously one thing for granted—that the reader knows nothing about computer programming. Addressed to anyone who has no prior programming knowledge or experience, but a desire to learn programming with Python, it teaches the first thing that every novice programmer needs to learn, which is Algorithmic Thinking. Algorithmic Thinking involves more than just learning code. It is a problem-solving process that involves learning how to code. This edition contains all the popular features of the previous edition and adds a significant number of exercises, as well as extensive revisions and updates. Apart from Python's lists, it now also covers dictionaries, while a brand new section provides an effective introduction to the next field that a programmer needs to work with, which is Object Oriented Programming (OOP). This book has a class course structure with questions and exercises at the end of each chapter so you can test what you have learned right away and improve your comprehension. With 250 solved and 450 unsolved exercises, 475 true/false, about 150 multiple choice, and 200 review questions and crosswords (the solutions and the answers to which can be found on the Internet), this book is ideal for novices or average programmers, for self-study high school students first-year college or university students teachers professors anyone who wants to start learning or teaching computer programming using the proper conventions and techniques

Bits to Bitcoin Mark Stuart Day 2018-08-28 An accessible guide to our digital infrastructure, explaining the basics of operating systems, networks, security, and other topics for the general reader. Most of us feel at home in front of a computer; we own smartphones, tablets, and laptops; we look things up online and check social media to see what our friends are doing. But we may be a bit fuzzy about how any of this really works. In *Bits to Bitcoin*, Mark Stuart Day offers an accessible guide to our digital infrastructure, explaining the basics of operating systems, networks, security, and related topics for the general reader. He takes the reader from a single process to multiple processes that interact with each other; he explores processes that fail and processes that overcome failures; and he examines processes that attack each other or defend themselves against attacks. Day tells us that steps are digital but ramps are analog; that computation is about "doing something with stuff" and that both the "stuff" and the "doing" can be digital. He explains timesharing, deadlock, and thrashing; virtual memory and virtual machines; packets and networks; resources and servers; secret keys and public keys; Moore's law and Thompson's hack. He describes how building in redundancy guards against failure and how endpoints communicate across the Internet. He explains why programs crash or have other bugs, why they are attacked by viruses, and why those problems are hard to fix. Finally, after examining secrets, trust, and cheating, he explains the mechanisms that allow the Bitcoin system to record money transfers accurately while fending off attacks.

A Human's Guide to Machine Intelligence Kartik Hosanagar 2020-03-10 A Wharton professor and tech entrepreneur examines how algorithms and artificial intelligence are starting to run every aspect of our lives, and how we can shape the way they impact us Through the technology embedded in almost every major tech platform and every web-enabled device, algorithms and the artificial intelligence that underlies them make a staggering number of everyday decisions for us, from what products we buy, to where we decide to eat, to how we consume our news, to whom we date, and how we find a job. We've even delegated life-and-death decisions to algorithms—decisions once made by doctors, pilots, and judges. In his new book, Kartik Hosanagar surveys the brave new world of algorithmic decision-making and reveals the potentially dangerous biases they can give rise to as they increasingly run our lives. He makes the compelling case that we need to arm ourselves with a better, deeper, more nuanced understanding of the phenomenon of algorithmic thinking. And he gives us a route in, pointing out that algorithms often think a lot like their creators—that is, like you and me. Hosanagar draws on his experiences designing algorithms professionally—as well as on history, computer science, and psychology—to explore how algorithms work and why they occasionally go rogue, what drives our trust in them, and the many ramifications of algorithmic decision-making. He examines episodes like Microsoft's chatbot Tay, which was designed to converse on social media like a teenage girl, but instead turned sexist and racist; the fatal accidents of self-driving cars; and even our own common, and often frustrating, experiences on services like Netflix and Amazon. *A Human's Guide to Machine Intelligence* is an entertaining and provocative look at one of the most important developments of our time and a practical user's guide to this first wave of practical artificial intelligence.

Sensemaking Christian Madsbjerg 2017-03-21 A Financial Times "Business Book of the Month" Based on his work at some of the world's largest companies, including Ford, Adidas, and Chanel, Christian Madsbjerg's *Sensemaking* is a provocative stand against the tyranny of big data and scientism, and an urgent, overdue defense of human intelligence. Humans have become subservient to algorithms. Every day brings a new Moneyball fix—a math whiz who will crack open an industry with clean fact-based analysis rather than human intuition and experience. As a result, we have stopped thinking. Machines do it for us. Christian Madsbjerg argues that our fixation with data often masks stunning deficiencies, and the risks for humankind are enormous. Blind devotion to number crunching imperils our businesses, our educations, our governments, and our life savings. Too many companies have lost touch with the humanity of their customers, while marginalizing workers with liberal arts-based skills. Contrary to popular thinking, Madsbjerg shows how many of today's biggest success stories stem not from "quant" thinking but from deep, nuanced engagement with culture, language, and history. He calls his method sensemaking. In this landmark book, Madsbjerg lays out five principles for how business leaders, entrepreneurs, and individuals can use it to solve their thorniest problems. He profiles companies using sensemaking to connect with new customers, and takes readers inside the work process of sensemaking "connoisseurs" like investor George Soros, architect Bjarke Ingels, and others. Both practical and philosophical, *Sensemaking* is a powerful rejoinder to corporate groupthink and an indispensable resource for leaders and innovators who want to stand out from the pack.

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

Ten Arguments for Deleting Your Social Media Accounts Right Now Jaron Lanier 2018-05-29 "You might have trouble imagining life without your social media accounts, but virtual reality pioneer Jaron Lanier insists that we're better off without them. In *Ten Arguments for Deleting Your Social Media Accounts Right Now*, Lanier, who participates in no social media, offers powerful and personal reasons for all of us to leave these dangerous online platforms"--

Responsible Data Science Peter C. Bruce 2021-04-13 Explore the most serious prevalent ethical issues in data science with this insightful new resource The increasing popularity of data science has resulted in numerous well-publicized cases of bias, injustice, and discrimination. The widespread deployment of "Black box" algorithms that are difficult or impossible to understand and explain, even for their developers, is a primary source of these unanticipated harms, making modern techniques and methods for manipulating large data sets seem sinister, even dangerous. When put in the hands of authoritarian governments, these algorithms have enabled suppression of political dissent and persecution of minorities. To prevent these harms, data scientists everywhere must come to understand how the algorithms that they build and deploy may harm certain groups or be unfair. *Responsible Data Science* delivers a comprehensive, practical treatment of how to implement data science solutions in an even-handed and ethical manner that minimizes the risk of undue harm to vulnerable members of society. Both data science practitioners and managers of analytics teams will learn how to: Improve model transparency, even for black box models Diagnose bias and unfairness within models using multiple metrics Audit projects to ensure fairness and minimize the possibility of unintended harm Perfect for data science practitioners, *Responsible Data Science* will also earn a spot on the bookshelves of technically inclined managers, software developers, and statisticians.

Race After Technology Ruha Benjamin 2019-07-09 From everyday apps to complex algorithms, Ruha Benjamin cuts through tech-industry hype to understand how emerging technologies can reinforce White

supremacy and deepen social inequity. Benjamin argues that automation, far from being a sinister story of racist programmers scheming on the dark web, has the potential to hide, speed up, and deepen discrimination while appearing neutral and even benevolent when compared to the racism of a previous era. Presenting the concept of the "New Jim Code," she shows how a range of discriminatory designs encode inequity by explicitly amplifying racial hierarchies; by ignoring but thereby replicating social divisions; or by aiming to fix racial bias but ultimately doing quite the opposite. Moreover, she makes a compelling case for race itself as a kind of technology, designed to stratify and sanctify social injustice in the architecture of everyday life. This illuminating guide provides conceptual tools for decoding tech promises with sociologically informed skepticism. In doing so, it challenges us to question not only the technologies we are sold but also the ones we ourselves manufacture. Visit the book's free Discussion Guide [here](#).

The Art of Failure Jesper Juul 2013-02-22 An exploration of why we play video games despite the fact that we are almost certain to feel unhappy when we fail at them. We may think of video games as being "fun," but in *The Art of Failure*, Jesper Juul claims that this is almost entirely mistaken. When we play video games, our facial expressions are rarely those of happiness or bliss. Instead, we frown, grimace, and shout in frustration as we lose, or die, or fail to advance to the next level. Humans may have a fundamental desire to succeed and feel competent, but game players choose to engage in an activity in which they are nearly certain to fail and feel incompetent. So why do we play video games even though they make us unhappy? Juul examines this paradox. In video games, as in tragic works of art, literature, theater, and cinema, it seems that we want to experience unpleasantness even if we also dislike it. Reader or audience reaction to tragedy is often explained as catharsis, as a purging of negative emotions. But, Juul points out, this doesn't seem to be the case for video game players. Games do not purge us of unpleasant emotions; they produce them in the first place. What, then, does failure in video game playing do? Juul argues that failure in a game is unique in that when you fail in a game, you (not a character) are in some way inadequate. Yet games also motivate us to play more, in order to escape that inadequacy, and the feeling of escaping failure (often by improving skills) is a central enjoyment of games. Games, writes Juul, are the art of failure: the singular art form that sets us up for failure and allows us to experience it and experiment with it. *The Art of Failure* is essential reading for anyone interested in video games, whether as entertainment, art, or education.

Algorithms to Live By Brian Christian 2016-04-19 A fascinating exploration of how insights from computer algorithms can be applied to our everyday lives, helping to solve common decision-making problems and illuminate the workings of the human mind All our lives are constrained by limited space and time, limits that give rise to a particular set of problems. What should we do, or leave undone, in a day or a lifetime? How much messiness should we accept? What balance of new activities and familiar favorites is the most fulfilling? These may seem like uniquely human quandaries, but they are not: computers, too, face the same constraints, so computer scientists have been grappling with their version of such issues for decades. And the solutions they've found have much to teach us. In a dazzlingly interdisciplinary work, acclaimed author Brian Christian and cognitive scientist Tom Griffiths show how the algorithms used by computers can also untangle very human questions. They explain how to have better hunches and when to leave things to chance, how to deal with overwhelming choices and how best to connect with others. From finding a spouse to finding a parking spot, from organizing one's inbox to understanding the workings of memory, *Algorithms to Live By* transforms the wisdom of computer science into strategies for human living.

A Human Algorithm Flynn Coleman 2019-10-01 A groundbreaking narrative on the urgency of ethically designed AI and a guidebook to reimagining life in the era of intelligent technology. The Age of Intelligent Machines is upon us, and we are at a reflection point. The proliferation of fast-moving technologies, including forms of artificial intelligence akin to a new species, will cause us to confront profound questions about ourselves. The era of human intellectual superiority is ending, and we need to plan for this monumental shift. *A Human Algorithm: How Artificial Intelligence Is Redefining Who We Are* examines the immense impact intelligent technology will have on humanity. These machines, while challenging our personal beliefs and our socioeconomic world order, also have the potential to transform our health and well-being, alleviate poverty and suffering, and reveal the mysteries of intelligence and consciousness. International human rights attorney Flynn Coleman deftly argues that it is critical that we instill values, ethics, and morals into our robots, algorithms, and other forms of AI. Equally important, we need to develop and implement laws, policies, and oversight mechanisms to protect us from tech's insidious threats. To realize AI's transcendent potential, Coleman advocates for inviting a diverse group of voices to participate in designing our intelligent machines and using our moral imagination to ensure that human rights, empathy, and equity are core principles of emerging technologies. Ultimately, *A Human Algorithm* is a clarion call for building a more humane future and moving conscientiously into a new frontier of our own design. "[Coleman] argues that the algorithms of machine learning—if they are instilled with human ethics and values—could bring about a new era of enlightenment." —San Francisco Chronicle

The Algorithm Design Manual Steven S Skiena 2009-04-05 This newly expanded and updated second edition of the best-selling classic continues to take the "mystery" out of designing algorithms, and analyzing their efficacy and efficiency. Expanding on the first edition, the book now serves as the primary textbook of choice for algorithm design courses while maintaining its status as the premier practical reference guide to algorithms for programmers, researchers, and students. The reader-friendly *Algorithm Design Manual* provides straightforward access to combinatorial algorithms technology, stressing design over analysis. The first part, *Techniques*, provides accessible instruction on methods for designing and analyzing computer algorithms. The second part, *Resources*, is intended for browsing and reference, and comprises the catalog of algorithmic resources, implementations and an extensive bibliography. NEW to the second edition: • Doubles the tutorial material and exercises over the first edition • Provides full online support for lecturers, and a completely updated and improved website component with lecture slides, audio and video • Contains a unique catalog identifying the 75 algorithmic problems that arise most often in practice, leading the reader down the right path to solve them • Includes several NEW "war stories" relating experiences from real-world applications • Provides up-to-date links leading to the very best algorithm implementations available in C, C++, and Java

Algorithm Design Jon Kleinberg 2012-02-28 This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. *Algorithm Design* introduces algorithms by looking at the real-world problems that motivate them. The book teaches students a range of design and analysis techniques for problems that arise in computing applications. The text encourages an understanding of the algorithm design process and an appreciation of the role of algorithms in the broader field of computer science. August 6, 2009 Author, Jon Kleinberg, was recently cited in the New York Times for his statistical analysis research in the Internet age.

If... Then Taina Bucher 2018 We live in a world in which Google's search algorithms determine how we access information, Facebook's News Feed algorithms shape how we socialize, and Netflix collaborative filtering algorithms choose the media products we consume. As such, we live algorithmic lives. Life, however, is not blindly controlled or determined by algorithms. Nor are we simply victims of an ever-expanding artificial intelligence. Rather than looking at how technologies shape or are shaped by political institutions, this book is concerned with the ways in which informational infrastructure may be considered political in its capacity to shape social and cultural life. It looks specifically at the conditions of algorithmic life -- how algorithms work, both materially and discursively, to create the conditions for sociality and connectivity. The book argues that the most important aspect of algorithms is not what they are in terms of their specific technical details but rather how they become part of social practices and how different people enlist them as powerful brokers of information, communication and society. If we truly want to engage with the promises of automation and predictive analytics entailed by the promises of "big data", we also need to understand the contours of algorithmic life that condition such practices. Setting out to explore both the specific uses of algorithms and the cultural forms they generate, this book offers a novel understanding of the power and politics of algorithmic life as grounded in case studies that explore the material-discursive dimensions of software.

Where the Crawdads Sing Delia Owens 2018-08-14 NOW A MAJOR MOTION PICTURE—The #1 New York Times bestselling worldwide sensation with more than 15 million copies sold, hailed by The New York Times Book Review as "a painfully beautiful first novel that is at once a murder mystery, a coming-of-age narrative and a celebration of nature." For years, rumors of the "Marsh Girl" have haunted Barkley Cove, a quiet town on the North Carolina coast. So in late 1969, when handsome Chase Andrews is found dead, the locals immediately suspect Kya Clark, the so-called Marsh Girl. But Kya is not what they say. Sensitive and intelligent, she has survived for years alone in the marsh that she calls home, finding friends in the gulls and lessons in the sand. Then the time comes when she yearns to be touched and loved. When two young men from town become intrigued by her wild beauty, Kya opens herself to a new life—until the unthinkable happens. *Where the Crawdads Sing* is at once an exquisite ode to the natural world, a heartbreaking coming-of-age story, and a surprising tale of possible murder. Owens reminds us that we are forever shaped by the children we once were, and that we are all subject to the beautiful and violent secrets that nature keeps.

Weapons of Math Destruction Cathy O'Neil 2016 Longlisted for the National Book Award New York Times Bestseller A former Wall Street quant sounds an alarm on the mathematical models that pervade modern life -- and threaten to rip apart our social fabric 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. Most troubling, they reinforce discrimination: If a poor student can't get a loan because a lending model deems him too risky (by virtue of his zip code), he's then cut off from the kind of education that could pull him out of poverty, and a vicious spiral ensues. Models are propping up the lucky and punishing the downtrodden, creating a "toxic cocktail for democracy." Welcome to the dark side of Big Data. Tracing the arc of a person's life, O'Neil exposes the black box models that shape our future, both as individuals and as a society. These "weapons of math destruction" score teachers and students, sort resumes, grant (or deny) loans, evaluate workers, target voters, set parole, and monitor our health. O'Neil calls on modelers to take more responsibility for their algorithms and on policy makers to regulate their use. But in the end, it's up to us to become more savvy about the models that govern our lives. This important book empowers us to ask the tough questions, uncover the truth, and demand change. -- Longlist for National Book Award (Non-Fiction) -- Goodreads, semi-finalist for the 2016 Goodreads Choice Awards (Science and Technology) -- Kirkus, Best Books of 2016 -- Kirkus, Best Books of 2016 -- New York Times, 100 Notable Books of 2016 (Non-Fiction) -- The Guardian, Best Books of 2016 -- WBUR's "On Point," Best Books of 2016: Staff Picks -- Boston Globe, Best Books of 2016, Non-Fiction

Programming Collective Intelligence Toby Segaran 2007-08-16 Want to tap the power behind search rankings, product recommendations, social bookmarking, and online matchmaking? This fascinating book demonstrates how you can build Web 2.0 applications to mine the enormous amount of data created by people on the Internet. With the sophisticated algorithms in this book, you can write smart programs to access interesting datasets from other web sites, collect data from users of your own applications, and analyze and understand the data once you've found it. *Programming Collective Intelligence* takes you into the world of machine learning and statistics, and explains how to draw conclusions about user experience, marketing, personal tastes, and human behavior in general -- all from information that you and others collect every day. Each algorithm is described clearly and concisely with code that can immediately be used on your web site, blog, Wiki, or specialized application. This book explains: Collaborative filtering techniques that enable online retailers to recommend products or media Methods of clustering to detect groups of similar items in a large dataset Search engine features -- crawlers, indexers, query engines, and the PageRank algorithm Optimization algorithms that search millions of possible solutions to a problem and choose the best one Bayesian filtering, used in spam filters for classifying documents based on word types and other features Using decision trees not only to make predictions, but to model the way decisions are made Predicting numerical values rather than classifications to build price models Support vector machines to match people in online dating sites Non-negative matrix factorization to find the independent features in a dataset Evolving intelligence for problem solving -- how a computer develops its skill by improving its own code the more it plays a game Each chapter includes exercises for extending the algorithms to make them more powerful. Go beyond simple database-backed applications and put the wealth of Internet data to work for you. "Bravo! I cannot think of a better way for a developer to first learn these algorithms and methods, nor can I think of a better way for me (an old AI dog) to reinvigorate my knowledge of the details." -- Dan Russell, Google "Toby's book does a great job of breaking down the complex subject matter of machine-learning algorithms into practical, easy-to-understand examples that can be directly applied to analysis of social interaction across the Web today. If I had this book two years ago, it would have saved precious time going down some fruitless paths." -- Tim Wolters, CTO, Collective Intellect

Data Structures and Algorithms in Java Michael T. Goodrich 2014-01-28 The design and analysis of efficient data structures has long been recognized as a key component of the Computer Science curriculum. Goodrich, Tomassia and Goldwasser's approach to this classic topic is based on the object-oriented paradigm as the framework of choice for the design of data structures. For each ADT presented in the text, the authors provide an associated Java interface. Concrete data structures realizing the ADTs are provided as Java classes implementing the interfaces. The Java code implementing fundamental data structures in this book is organized in a single Java package, `net.datastructures`. This package forms a coherent library of data structures and algorithms in Java specifically designed for educational purposes in a way that is complementary with the Java Collections Framework.

Algorithmic Puzzles Anany Levitin 2011-10-14 Algorithmic puzzles are puzzles involving well-defined procedures for solving problems. This book will provide an enjoyable and accessible introduction to algorithmic puzzles that will develop the reader's algorithmic thinking. The first part of this book is a tutorial on algorithm design strategies and analysis techniques. Algorithm design strategies — exhaustive search, backtracking, divide-and-conquer and a few others — are general approaches to designing step-by-step instructions for solving problems. Analysis techniques are methods for investigating such procedures to answer questions about the ultimate result of the procedure or how many steps are executed before the procedure stops. The discussion is an elementary level, with puzzle examples, and requires neither programming nor mathematics beyond a secondary school level. Thus, the tutorial provides a gentle and entertaining introduction to main ideas in high-level algorithmic problem solving. The second and main part of the book contains 150 puzzles, from centuries-old classics to newcomers often asked during job interviews at computing, engineering, and financial companies. The puzzles are divided into three groups by their difficulty levels. The first fifty puzzles in the Easier Puzzles section require only middle school mathematics. The sixty puzzle of average difficulty and forty harder puzzles require just high school mathematics plus a few topics such as binary numbers and simple recurrences, which are reviewed in the tutorial. All the puzzles are provided with hints, detailed solutions, and brief comments. The comments deal with the puzzle origins and design or analysis techniques used in the solution. The book should be of interest to puzzle lovers, students and teachers of algorithm courses, and persons expecting to be given puzzles during job interviews.