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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.

Introduction to Deep Learning - Eugene Charniak 2019-01-29
A project-based guide to the basics of deep learning. This concise, project-driven guide to deep learning takes readers through a series of program-writing tasks that introduce them to the use of deep learning in such areas of artificial intelligence as computer vision, natural-language processing, and reinforcement learning. The author, a longtime artificial intelligence researcher specializing in natural-language processing, covers feed-forward neural nets, convolutional neural nets, word embeddings, recurrent neural nets, sequence-to-sequence learning, deep reinforcement learning, unsupervised models, and other fundamental concepts and techniques. Students and practitioners learn the basics of deep learning by working through programs in Tensorflow, an open-source machine learning framework. "I find I learn computer science material best by sitting down and writing programs," the author writes, and the book reflects this approach. Each chapter includes a programming project, exercises, and references for further reading. An early chapter is devoted to Tensorflow and its interface with Python, the widely used programming language. Familiarity with linear algebra, multivariate calculus, and probability and statistics is required, as is a rudimentary knowledge of programming in Python. The book can be used in both undergraduate and graduate courses; practitioners will find it an essential reference.

Twelve Tomorrows - Wade Roush 2018-05-25
Twelve visions of the future—by turns hilarious, frightening, and relevant—from new and established voices in science fiction. In this book, new and established voices in science fiction come together to offer original stories of the future. Ken Liu writes about a virtual currency that hijacks our empathy; Elizabeth Bear shows us a smart home tricked into kidnapping its owner; Clifford V. Johnson presents, in a graphic novella, the story of a computer scientist seeing a new side of the AIs she has invented; and J. M. Ledgard describes a 28,000-year-old AI who meditates on the nature of loneliness. We encounter metal-melting viruses, vegetable-based heart transplants, search-and-rescue drones, and semi-automated sailing ships. Sometimes hilarious, sometimes frightening, and always relevant, Twelve Tomorrows offers compelling visions of potential futures. Originally launched in 2011 by MIT Technology Review, the Twelve Tomorrows series explores the future implications of emerging technologies through the lens of fiction. Featuring a diverse collection of authors, characters, and stories rooted in contemporary real-world science, each volume in the series offers conceivable and inclusive stories of the future, celebrating and continuing the genre of "hard" science fiction pioneered by authors such as Isaac Asimov, Arthur C. Clarke, and Robert Heinlein. Twelve Tomorrows is the first volume of the series to be published in partnership with the MIT Press. Contributors Elizabeth Bear, SL Huang, Clifford V. Johnson, J. M. Ledgard, Liu Cixin, Ken Liu, Paul McAuley, Nnedi Okorafor, Malka Older, Sarah Pinsker, Alastair Reynolds

Mismatch - Kat Holmes 2020-09-01
How inclusive methods can build elegant design solutions that work for all. Sometimes designed objects reject their users: a computer mouse that doesn't work for left-handed people, for example, or a touchscreen payment system that only works for people who read English phrases, have 20/20 vision, and use a credit card. Something as simple as color choices can render a product unusable for millions. These mismatches are the building blocks of exclusion. In Mismatch, Kat Holmes describes how design can lead to exclusion, and how design can also remedy exclusion. Inclusive design methods—designing objects with rather than for excluded users—can create elegant solutions that work well and benefit all. Holmes tells stories of pioneers of inclusive design, many of whom were drawn to work on inclusion because of their own experiences of exclusion. A gamer and designer who depends on voice recognition shows Holmes his "Wall of Exclusion," which displays dozens of game controllers that require two hands to operate; an architect shares her firsthand knowledge of how design can fail communities, gleaned from growing up in Detroit's housing projects; an astronomer who began to lose her eyesight adapts a technique called "sonification" so she can "listen" to the stars. Designing for inclusion is not a feel-good sideline. Holmes shows how inclusion can be a source of innovation and growth, especially for digital technologies. It can be a catalyst for creativity and a boost for the bottom line as a customer base expands. And each time we remedy a mismatched interaction, we create an opportunity for more people to contribute to society in meaningful ways.

TRSF 2011 - Technology Review 2011-05-01
A diverse collection of science fiction authors, characters, and stories, featuring contributions by at Cadigan, Elizabeth Bear, Joe Haldeman, Ken Liu, Tobias Buckell and others, as well as color illustrations by Chris Foss. TRSF is the first iteration of the Twelve Tomorrows series. Published by MIT Technology Review, this volume brings together original stories by leading science fiction authors inspired by today's emerging technologies. Featuring a diverse collection of authors, characters, and stories rooted in contemporary real-world science, each volume in the series offers conceivable and inclusive stories of the future, celebrating and continuing the genre of "hard" science fiction pioneered by authors such as Isaac Asimov, Arthur C. Clarke, and Robert Heinlein. Pat Cadigan, Elizabeth Bear, Joe Haldeman, Ken Liu, Tobias Buckell and others offer stories about space flight, biocomputing, virtual reality, and filmmaking. Ranging from sad to hilarious, but always thought-provoking, the stories are interspersed with beautiful full-page color illustrations from the work of SF illustrator Chris Foss.

The Robotics Review - John J. Craig 1989

Ada and the Galaxies - Alan Lightman 2021-09-07
Stargazers rejoice! In his first book for children, renowned physicist Alan Lightman and collaborators, with help from the Hubble telescope, light up the night sky. New York Times best-selling author Alan Lightman, in collaboration with Olga Pastuchiv, brings galaxies close in a stunning picture-book tribute to the interconnectedness of the natural world. Layering photographs taken from the Hubble telescope into charming and expressive art, illustrator Susanna Chapman zooms in on one child's

experiences: Ada knows that the best place for star-gazing is on the island in Maine where she vacations with her grandparents. By day, she tracks osprey in the trees, paddles a kayak, and hunts for shells. But she's most in her element when the sun goes down and the stars blink to life. Will the fog this year foil her plans, or will her grandfather find a way to shine a spotlight on the vast puzzle of the universe . . . until the weather turns?

Learning at Not-School - Julian Sefton-Green 2013
This book focuses on programs, organizations, and institutions that have developed in parallel to public schooling which offer education in a non-traditional, non-school setting.

Annotation - Remi H. Kalir 2021-04-06
An introduction to annotation as a genre--a synthesis of reading, thinking, writing, and communication--and its significance in scholarship and everyday life. Annotation--the addition of a note to a text--is an everyday and social activity that provides information, shares commentary, sparks conversation, expresses power, and aids learning. It helps mediate the relationship between reading and writing. This volume in the MIT Press Essential Knowledge series offers an introduction to annotation and its literary, scholarly, civic, and everyday significance across historical and contemporary contexts. It approaches annotation as a genre--a synthesis of reading, thinking, writing, and communication-- and offer examples of annotation that range from medieval rubrication and early book culture to data labeling and online reviews.

The Upstarts - Brad Stone 2017-01-31
ONE OF AMAZON'S BEST BOOKS OF 2017 A look deep inside the new Silicon Valley, from the New York Times bestselling author of The Everything Store Ten years ago, the idea of getting into a stranger's car, or a walking into a stranger's home, would have seemed bizarre and dangerous, but today it's as common as ordering a book online. Uber and Airbnb have ushered in a new era: redefining neighborhoods, challenging the way governments regulate business, and changing the way we travel. In the spirit of iconic Silicon Valley renegades like Steve Jobs and Bill Gates, another generation of entrepreneurs is using technology to upend convention and disrupt entire industries. These are the upstarts, idiosyncratic founders with limitless drive and an abundance of self-confidence. Led by such visionaries as Travis Kalanick of Uber and Brian Chesky of Airbnb, they are rewriting the rules of business and often sidestepping serious ethical and legal obstacles in the process. The Upstarts is the definitive story of two new titans of business and a dawning age of tenacity, conflict and wealth. In Brad Stone's riveting account of the most radical companies of the new Silicon Valley, we discover how it all happened and what it took to change the world.

Geek Girl Rising - Heather Cabot 2017-05-23
This book "isn't about the famous tech trailblazers you already know, like Sheryl Sandberg and Marissa Mayer. Instead, veteran journalists Heather Cabot and Samantha Walravens introduce readers to the ... female entrepreneurs and technologists fighting at the grassroots level for an ownership stake in the revolution that's changing the way we live, work and connect to each other"--Amazon.com.

Mind and Hand - Julius Adams Stratton 2005
The intellectual heritage of MIT: an account of "the flow of ideas" about science and education that shaped the Institute as it emerged and that inspires it today. The motto on the seal of the Massachusetts Institute of Technology, "Mens et Manus" -- "mind and hand" -- signals the Institute's dedication to what MIT founder William Barton Rogers called "the most earnest cooperation of intelligent culture with industrial pursuits." Mind and Hand traces the ideas about science and education that have shaped MIT and defined its mission -- from the new science of the Enlightenment era and the ideals of representative democracy spurred by the Industrial Revolution to new theories on the nature and role of higher education in nineteenth-century America. MIT emerged in mid-century as an experiment in scientific and technical education, with its origins in the tension between these old and new ideas. Mind and Hand was undertaken by Julius Stratton after his retirement from the presidency of MIT and continued by Loretta Mannix after his death; Philip N. Alexander, of the MIT Program in Writing and Humanistic Studies, stepped in to complete the project. The combined efforts of these three authors have given us what Julius Stratton envisioned -- "a coherent account of the flow of ideas" from which MIT emerged.

The Handbook of Attention - Jonathan Fawcett 2015-11-27
An authoritative overview of current research on human attention, emphasizing the relation between cognitive phenomena observed in the laboratory and in the real world. Laboratory research on human attention has often been conducted under conditions that bear little resemblance to the complexity of our everyday lives. Although this research has yielded interesting discoveries, few scholars have truly connected these findings to natural experiences. This book bridges the gap between "laboratory and life" by bringing together cutting-edge research using traditional methodologies with research that focuses on attention in everyday contexts. It offers definitive reviews by both established and rising research stars on foundational topics such as visual attention and cognitive control, underrepresented domains such as auditory and temporal attention, and emerging areas of investigation such as mind wandering and embodied attention. The contributors discuss a range of approaches and methodologies, including psychophysics, mental chronometry, stationary and mobile eye-tracking, and electrophysiological and functional brain imaging. Chapters on everyday attention consider such diverse activities as driving, shopping, reading, multitasking, and playing videogames. All chapters present their topics in the same overall format: historical context, current research, the possible integration of laboratory and real-world approaches, future directions, and key and outstanding issues. Contributors Richard A. Abrams, Lewis Baker, Daphne Bavelier, Virginia Best, Adam B. Blake, Paul W. Burgess, Alan D. Castel, Karen Collins, Mike J. Dixon, Sidney K. D'Mello, Julia Föcker, Charles L. Folk, Tom Foulsham, Jonathan A. Fugelsang, Bradley S. Gibson, Matthias S. Gobel, Davood G. Gozli, Arthur C. Graesser, Peter A. Hancock, Kevin A. Harrigan, Simone G. Heideman, Cristy Ho, Roxane J. Itier, Gustav Kuhn, Michael F. Land, Mallorie Leinenger, Daniel Levin, Steven J. Luck, Gerald Matthews, Daniel Memmert, Stephen Monsell, Meeneley Nazarian, Anna C. Nobre, Andrew M. Olney, Kerri Pickel, Jay Pratt, Keith Rayner, Daniel C. Richardson, Evan F. Risko, Barbara Shinn-Cunningham, Vivian Siu, Jonathan Smallwood, Charles Spence, David Strayer, Pedro Sztybel, Benjamin W. Tatler, Eric T. Taylor, Jeff Templeton, Robert Teszka, Michel Wedel, Blaire J. Weidler, Lisa Wojtowicz, Jeremy M. Wolfe, Geoffrey F. Woodman

Active Defense - M. Taylor Fravel 2020-12-08
What changes in China's modern military policy reveal about military organizations and strategySince the 1949 Communist Revolution, China has devised nine different military strategies, which the People's Liberation Army (PLA) calls "strategic guidelines." What accounts for these numerous changes? Active Defense offers the first systematic look at China's military strategy from the mid-twentieth century to today. Exploring the range and intensity of threats that China has faced, M. Taylor Fravel illuminates the nation's past and present military goals and how China sought to achieve them, and offers a rich set of cases for deepening the study of change in military organizations.Drawing from diverse Chinese-language sources, including memoirs of leading generals, military histories, and document collections that have become available only in the last two decades, Fravel shows why transformations in military strategy were pursued at certain times and not others. He focuses on the military strategies adopted in 1956, 1980, and 1993-when the PLA was attempting to wage war in a new kind of way-to show that China has pursued major change in its strategic guidelines when there has been a significant shift in the conduct of warfare in the international system and when China's Communist Party has been united.Delving into the security threats China has faced over the last seven decades, Active Defense offers a detailed investigation into how and why states alter their defense policies.

What's Your Digital Business Model? - Peter Weill 2018-04-17
Digital transformation is not about technology--it's about change. In the rapidly changing digital economy, you can't succeed by merely tweaking management practices that led to past success. And yet, while many leaders and managers recognize the threat from digital--and the potential opportunity--they lack a common language and compelling framework to help them assess it and guide them in responding. They don't know how to think about their digital business model. In this concise, practical book, MIT digital research leaders Peter Weill and Stephanie Woerner provide a powerful yet straightforward framework that has been field-tested globally with dozens of senior management teams. Based on years of study at the MIT Center for Information Systems Research (CISR), the authors find that digitization is moving companies' business models on two dimensions: from value chains to digital ecosystems, and from a fuzzy understanding of the needs of end customers to a sharper one. Looking at these dimensions in combination results in four distinct business models, each with different capabilities. The book then sets out six driving questions, in separate chapters, that help managers and executives clarify where they are currently in an increasingly digital business landscape and highlight what's needed to move toward a higher-value digital business model. Filled with

straightforward self-assessments, motivating examples, and sharp financial analyses of where profits are made, this smart book will help you tackle the threats, leverage the opportunities, and create winning digital strategies.

Teaching Computational Thinking - Maureen D. Neumann 2021-12-21
A guide for educators to incorporate computational thinking—a set of cognitive skills applied to problem solving—into a broad range of subjects. Computational thinking—a set of mental and cognitive tools applied to problem solving—is a fundamental skill that all of us (and not just computer scientists) draw on. Educators have found that computational thinking enhances learning across a range of subjects and reinforces students' abilities in reading, writing, and arithmetic. This book offers a guide for incorporating computational thinking into middle school and high school classrooms, presenting a series of activities, projects, and tasks that employ a range of pedagogical practices and cross a variety of content areas. As students problem solve, communicate, persevere, work as a team, and learn from mistakes, they develop a concrete understanding of the abstract principles used in computer science to create code and other digital artifacts. The book guides students and teachers to integrate computer programming with visual art and geometry, generating abstract expressionist–style images; construct topological graphs that represent the relationships between characters in such literary works as Harry Potter and the Sorcerer's Stone and Romeo and Juliet; apply Newtonian physics to the creation of computer games; and locate, analyze, and present empirical data relevant to social and political issues. Finally, the book lists a variety of classroom resources, including the programming languages Scratch (free to all) and Codesters (free to teachers). An accompanying website contains the executable programs used in the book's activities.

Technology Review - 1916

21: Bringing Down the House - Movie Tie-In - Ben Mezrich 2008-02
Recounts the story of how a notorious gang of MIT blackjack savants devised and received backing for a system for winning at the world's most sophisticated casinos, an endeavor that earned them more than three million dollars. Originally published as Bringing Down the House. Reissue. (A Columbia Pictures film, written by Peter Steinfeld & Allan Loeb, directed by Robert Luketic, releasing March 2008, starring Kevin Spacey, Kate Bosworth, Laurence Fishburne, Jim Sturgess, & others) (Current Affairs)

The Book - Amaranth Borsuk 2018-05-04
The book as object, as content, as idea, as interface. What is the book in a digital age? Is it a physical object containing pages encased in covers? Is it a portable device that gives us access to entire libraries? The codex, the book as bound paper sheets, emerged around 150 CE. It was preceded by clay tablets and papyrus scrolls. Are those books? In this volume in the MIT Press Essential Knowledge series, Amaranth Borsuk considers the history of the book, the future of the book, and the idea of the book. Tracing the interrelationship of form and content in the book's development, she bridges book history, book arts, and electronic literature to expand our definition of an object we thought we knew intimately. Contrary to the many reports of its death (which has been blamed at various times on newspapers, television, and e-readers), the book is alive. Despite nostalgic paeans to the codex and its printed pages, Borsuk reminds us, the term "book" commonly refers to both medium and content. And the medium has proved to be malleable. Rather than pinning our notion of the book to a single form, Borsuk argues, we should remember its long history of transformation. Considering the book as object, content, idea, and interface, she shows that the physical form of the book has always been the site of experimentation and play. Rather than creating a false dichotomy between print and digital media, we should appreciate their continuities.

The Next Age of Disruption - MIT Sloan Management Review 2021-02-16
Management experts discuss the innovation challenges that lie ahead, building on Clayton Christensen's famous theory of "disruptive innovation." Clayton Christensen's groundbreaking theory of "disruptive innovation" has proven to be one of the most influential management ideas of the last several decades. In this book, business and management experts--many of them Christensen's colleagues and former students--discuss the innovation challenges that lie ahead. Building on Christensen's work, they offer companies a guide for navigating a new world of disruption--a future in which artificial intelligence is a business tool, the speed of innovation increases dramatically, and capital is more

easily accessible. The book also includes one of the last interviews with Christensen before his death in January 2020.

Art in the Age of Machine Learning - Sofian Audry 2021-11-23
An examination of machine learning art and its practice in new media art and music. Over the past decade, an artistic movement has emerged that draws on machine learning as both inspiration and medium. In this book, transdisciplinary artist-researcher Sofian Audry examines artistic practices at the intersection of machine learning and new media art, providing conceptual tools and historical perspectives for new media artists, musicians, composers, writers, curators, and theorists. Audry looks at works from a broad range of practices, including new media installation, robotic art, visual art, electronic music and sound, and electronic literature, connecting machine learning art to such earlier artistic practices as cybernetics art, artificial life art, and evolutionary art. Machine learning underlies computational systems that are biologically inspired, statistically driven, agent-based networked entities that program themselves. Audry explains the fundamental design of machine learning algorithmic structures in terms accessible to the nonspecialist while framing these technologies within larger historical and conceptual spaces. Audry debunks myths about machine learning art, including the ideas that machine learning can create art without artists and that machine learning will soon bring about superhuman intelligence and creativity. Audry considers learning procedures, describing how artists hijack the training process by playing with evaluative functions; discusses trainable machines and models, explaining how different types of machine learning systems enable different kinds of artistic practices; and reviews the role of data in machine learning art, showing how artists use data as a raw material to steer learning systems and arguing that machine learning allows for novel forms of algorithmic remixes.

The Technology Fallacy - Gerald C. Kane 2019-04-16
Why an organization's response to digital disruption should focus on people and processes and not necessarily on technology. Digital technologies are disrupting organizations of every size and shape, leaving managers scrambling to find a technology fix that will help their organizations compete. This book offers managers and business leaders a guide for surviving digital disruptions—but it is not a book about technology. It is about the organizational changes required to harness the power of technology. The authors argue that digital disruption is primarily about people and that effective digital transformation involves changes to organizational dynamics and how work gets done. A focus only on selecting and implementing the right digital technologies is not likely to lead to success. The best way to respond to digital disruption is by changing the company culture to be more agile, risk tolerant, and experimental. The authors draw on four years of research, conducted in partnership with MIT Sloan Management Review and Deloitte, surveying more than 16,000 people and conducting interviews with managers at such companies as Walmart, Google, and Salesforce. They introduce the concept of digital maturity—the ability to take advantage of opportunities offered by the new technology—and address the specifics of digital transformation, including cultivating a digital environment, enabling intentional collaboration, and fostering an experimental mindset. Every organization needs to understand its "digital DNA" in order to stop "doing digital" and start "being digital." Digital disruption won't end anytime soon; the average worker will probably experience numerous waves of disruption during the course of a career. The insights offered by The Technology Fallacy will hold true through them all. A book in the Management on the Cutting Edge series, published in cooperation with MIT Sloan Management Review.

How AI Is Transforming the Organization - MIT Sloan Management Review 2020-02-18
A clear-eyed look at how AI can complement (rather than eliminate) human jobs, with real-world examples from companies that range from Netflix to Walmart. Descriptions of AI's possible effects on businesses and their employees cycle between utopian hype and alarmist doomsaying. This book from MIT Sloan Management Review avoids both these extremes, providing instead a clear-eyed look at how AI can complement (rather than eliminate) human jobs, with real-world examples from companies that range from Netflix to Walmart. The contributors show that organizations can create business value with AI by cooperating with it rather than relinquishing control to it. The smartest companies know that they don't need AI that mimics humans because they already have access to resources with human capability—actual humans. The book acknowledges the prominent role of such leading technology companies as Facebook, Apple, Amazon, Netflix,

and Google in applying AI to their businesses, but it goes beyond the FAANG cohort to look at AI applications in many nontechnology companies, including DHL and Fidelity. The chapters address such topics as retraining workers (who may be more ready for change than their companies are); the importance of motivated and knowledgeable leaders; the danger that AI will entrench less-than-ideal legacy processes; ways that AI could promote gender equality and diversity; AI and the global loneliness epidemic; and the benefits of robot–human collaboration. Contributors Cynthia M. Beath, Megan Beck, Joe Biron, Erik Brynjolfsson, Jacques Bughin, Rumman Chowdhury, Paul R. Daugherty, Thomas H. Davenport, Chris DeBrusk, Berkeley J. Dietvorst, Janet Foutty, James R. Freeland, R. Edward Freeman, Julian Friedland, Lynda Gratton, Francis Hintermann, Vivek Katyal, David Kiron, Frieda Klotz, Jonathan Lang, Barry Libert, Paul Michelman, Daniel Rock, Sam Ransbotham, Jeanne W. Ross, Eva Sage-Gavin, Chad Syverson, Monideepa Tarafdar, Gregory Unruh, Madhu Vazirani, H. James Wilson

Work without Jobs - Ravin Jesuthasan 2022-03-29
Why the future of work requires the deconstruction of jobs and the reconstruction of work. Work is traditionally understood as a "job," and workers as "jobholders." Jobs are structured by titles, hierarchies, and qualifications. In Work without Jobs, Ravin Jesuthasan and John Boudreau propose a radically new way of looking at work. They describe a new "work operating system" that deconstructs jobs into their component parts and reconstructs these components into more optimal combinations that reflect the skills and abilities of individual workers. In a new normal of rapidly accelerating automation, demands for organizational agility, efforts to increase diversity, and the emergence of alternative work arrangements, the old system based on jobs and jobholders is cumbersome and ungainly. Jesuthasan and Boudreau's new system lays out a roadmap for the future of work. Work without Jobs presents real-world cases that show how leading organizations are embracing work deconstruction and reinvention. For example, when a robot, chatbot, or artificial intelligence takes over parts of a job while a human worker continues to do other parts, what is the "job"? DHL found some answers when it deployed social robotics at its distribution centers. Meanwhile, the biotechnology company Genentech deconstructed jobs to increase flexibility, worker engagement, and retention. Other organizations achieved agility with internal talent marketplaces, worker exchanges, freelancers, crowdsourcing, and partnerships. It's time for organizations to reboot their work operating system, and Work without Jobs offers an essential guide for doing so.

A Biography of the Pixel - Alvy Ray Smith 2021-08-03
The pixel as the organizing principle of all pictures, from cave paintings to Toy Story. The Great Digital Convergence of all media types into one universal digital medium occurred, with little fanfare, at the recent turn of the millennium. The bit became the universal medium, and the pixel--a particular packaging of bits--conquered the world. Henceforward, nearly every picture in the world would be composed of pixels--cell phone pictures, app interfaces, Mars Rover transmissions, book illustrations, videogames. In A Biography of the Pixel, Pixar cofounder Alvy Ray Smith argues that the pixel is the organizing principle of most modern media, and he presents a few simple but profound ideas that unify the dazzling varieties of digital image making. Smith's story of the pixel's development begins with Fourier waves, proceeds through Turing machines, and ends with the first digital movies from Pixar, DreamWorks, and Blue Sky. Today, almost all the pictures we encounter are digital--mediated by the pixel and irretrievably separated from their media; museums and kindergartens are two of the last outposts of the analog. Smith explains, engagingly and accessibly, how pictures composed of invisible stuff become visible--that is, how digital pixels convert to analog display elements. Taking the special case of digital movies to represent all of Digital Light (his term for pictures constructed of pixels), and drawing on his decades of work in the field, Smith approaches his subject from multiple angles--art, technology, entertainment, business, and history. A Biography of the Pixel is essential reading for anyone who has watched a video on a cell phone, played a videogame, or seen a movie.

The Alchemy of Us - Ainissa Ramirez 2020-03-03
In the bestselling tradition of Stuff Matters and The Disappearing Spoon: a clever and engaging look at materials, the innovations they made possible, and how these technologies changed us. In The Alchemy of Us, scientist and science writer Ainissa Ramirez examines eight inventions—clocks, steel rails, copper communication cables, photographic film, light bulbs, hard disks, scientific labware, and silicon chips—and reveals how they shaped the human experience. Ramirez tells the stories of the woman who sold time, the inventor who inspired Edison, and the hotheaded undertaker whose invention pointed the way to the computer. She describes, among other things, how our pursuit of precision in timepieces changed how we sleep; how the railroad helped commercialize Christmas; how the necessary brevity of the telegram influenced Hemingway's writing style; and how a young chemist exposed the use of Polaroid's cameras to create passbooks to track black citizens in apartheid South Africa. These fascinating and inspiring stories offer new perspectives on our relationships with technologies. Ramirez shows not only how materials were shaped by inventors but also how those materials shaped culture, chronicling each invention and its consequences—intended and unintended. Filling in the gaps left by other books about technology, Ramirez showcases little-known inventors—particularly people of color and women—who had a significant impact but whose accomplishments have been hidden by mythmaking, bias, and convention. Doing so, she shows us the power of telling inclusive stories about technology. She also shows that innovation is universal—whether it's splicing beats with two turntables and a microphone or splicing genes with two test tubes and CRISPR.

The Signals Are Talking - Amy Webb 2016-12-06
A Fast Company best book of the yearA Washington Post bestsellerWinner of the 2017 Axiom Business Book Award in Business Technology How do you tell a real trend from the merely trendy? How, for example, will a technology--like artificial intelligence, machine learning, self-driving cars, biohacking, bots, and the Internet of Things--affect us, our businesses, and workplaces? How will it eventually change the way we live, work, play, and think--and how should we prepare for it now? In The Signals Are Talking, noted futurist Amy Webb shows us how to analyze the "true signals"--those patterns that will coalesce into a trend with the potential to change everything-and land on the right side of disruption. The future, Webb shows, isn't something that happens to us passively. Using a proven, tested methodology, she enables us to see ahead and forecast what's to come--challenging us to create our own preferred futures.

The Empathy Diaries - Sherry Turkle 2022-03-01
"A beautiful book… an instant classic of the genre." —Dwight Garner, New York Times • A New York Times Critics' Top Book of 2021 • A New York Times Book Review Editors' Choice • Named a Best Nonfiction Book of 2021 by Kirkus • Winner of the 2021 National Jewish Book Award in Autobiography & Memoir • Winner of the New England Society Book Award in Nonfiction MIT psychologist and bestselling author of Reclaiming Conversation and Alone Together, Sherry Turkle's intimate memoir of love and work For decades, Sherry Turkle has shown how we remake ourselves in the mirror of our machines. Here, she illuminates our present search for authentic connection in a time of uncharted challenges. Turkle has spent a career composing an intimate ethnography of our digital world; now, marked by insight, humility, and compassion, we have her own. In this vivid and poignant narrative, Turkle ties together her coming-of-age and her pathbreaking research on technology, empathy, and ethics. Growing up in postwar Brooklyn,Turkle searched for clues to her identity in a house filled with mysteries. She mastered the codes that governed her mother's secretive life. She learned never to ask about her absent scientist father--and never to use his name, her name. Before empathy became a way to find connection, it was her strategy for survival. Turkle's intellect and curiosity brought her to worlds on the threshold of change. She learned friendship at a Harvard-Radcliffe on the cusp of coeducation during the antiwar movement, she mourned the loss of her mother in Paris as students returned from the 1968 barricades, and she followed her ambition while fighting for her place as a woman and a humanist at MIT. There, Turkle found turbulent love and chronicled the wonders of the new computer culture, even as she warned of its threat to our most essential human connections. The Empathy Diaries captures all this in rich detail--and offers a master class in finding meaning through a life's work.

Data Science - John D. Kelleher 2018-04-13
A concise introduction to the emerging field of data science, explaining its evolution, relation to machine learning, current uses, data infrastructure issues, and ethical challenges. The goal of data science is to improve decision making through the analysis of data. Today data science determines the ads we see online, the books and movies that are recommended to us online, which emails are filtered into our spam folders, and even how much we pay for health insurance. This volume in the MIT Press Essential Knowledge series offers a concise introduction to the emerging field of data science, explaining its evolution, current uses, data infrastructure issues, and ethical challenges. It has never been

easier for organizations to gather, store, and process data. Use of data science is driven by the rise of big data and social media, the development of high-performance computing, and the emergence of such powerful methods for data analysis and modeling as deep learning. Data science encompasses a set of principles, problem definitions, algorithms, and processes for extracting non-obvious and useful patterns from large datasets. It is closely related to the fields of data mining and machine learning, but broader in scope. This book offers a brief history of the field, introduces fundamental data concepts, and describes the stages in a data science project. It considers data infrastructure and the challenges posed by integrating data from multiple sources, introduces the basics of machine learning, and discusses how to link machine learning expertise with real-world problems. The book also reviews ethical and legal issues, developments in data regulation, and computational approaches to preserving privacy. Finally, it considers the future impact of data science and offers principles for success in data science projects.

Visualization and Interpretation - Johanna Drucker 2020-11-10
An analysis of visual epistemology in the digital humanities, with attention to the need for interpretive digital tools within humanities contexts. In the several decades since humanists have taken up computational tools, they have borrowed many techniques from other fields, including visualization methods to create charts, graphs, diagrams, maps, and other graphic displays of information. But are these visualizations actually adequate for the interpretive approach that distinguishes much of the work in the humanities? Information visualization, as practiced today, lacks the interpretive frameworks required for humanities-oriented methodologies. In this book, Johanna Drucker continues her interrogation of visual epistemology in the digital humanities, reorienting the creation of digital tools within humanities contexts. Drucker examines various theoretical understandings of visual images and their relation to knowledge and how the specifics of the graphical are to be engaged directly as a primary means of knowledge production for digital humanities. She draws on work from aesthetics, critical theory, and formal study of graphical systems, addressing them within the specific framework of computational and digital activity as they apply to digital humanities. Finally, she presents a series of standard problems in visualization for the humanities (including time/temporality, space/spatial relations, and data analysis), posing the investigation in terms of innovative graphical systems informed by probabilistic critical hermeneutics. She concludes with a final brief sketch of discovery tools as an additional interface into which modeling can be worked.

Who Wins in a Digital World? - MIT Sloan Management Review 2019-03-19
How organizations can adapt to a constantly changing business environment by being flexible but focused, embracing change, and moving fast. In the new digital world, the unknowns are never-ending. Our ability to embrace the demands of change has become a prerequisite for success. It's not easy. We don't work the way we did last year. Next year, it will all change again. If an organization doesn't embrace the realities of change, it will be under siege from those that do. Who Wins in a Digital World explains how organizations can adapt to a constantly changing business environment by being flexible but focused, embracing change in all its messiness, and moving fast. In articles that originally appeared in MIT Sloan Management Review, experts from business and academia discuss digital adaptability, explaining how both organizations and individuals need the ability to excel in what their roles will become as technology and their competitive ecosystem evolve. They highlight strategies and mindsets that can foster change, including boldness in the face of digitization, a focus on collaboration, and an artificial intelligence game plan. And they explore the need for speed, with one contributor declaring: "Implement first, ask questions later (or not at all)." Once an organization accepts the fact that technological change is ongoing and inevitable, it becomes more about opportunity and less about challenge. This book shows that change can be stimulating, exhilarating, and something to be welcomed. Contributors Stephen J. Andriole, Jacques Bughin, Thomas H. Davenport, Nathan Furr, Lynn J. Good, David Kiron, Edward E. Lawler III, Vikram Mahidhar, Paul Michelman, Jeanne Ross, Paul J. H. Schoemaker, Andrew Shipilov, Charles Sull, Donald Sull, Philip E. Tetlock, Stefano Turconi, Nicolas van Zeebroeck, Peter Weill, Thomas Williams, Stephanie L. Woerner, Christopher G. Worley, James Yoder

The Dalai Lama at MIT - Anne Harrington 2008-04-30
Their meeting captured headlines; the waiting list for tickets was nearly 2000 names long. If you were unable to attend, this book will take you

there. Including both the papers given at the conference, and the animated discussion and debate that followed, The Dalai Lama at MIT reveals scientists and monks reaching across a cultural divide, to share insights, studies, and enduring questions. Is there any substance to monksÕ claims that meditation can provide astonishing memories for words and images? Is there any neuroscientific evidence that meditation will help you pay attention, think better, control and even eliminate negative emotions? Are Buddhists right to make compassion a fundamental human emotion, and Western scientists wrong to have neglected it? The Dalai Lama at MIT shows scientists finding startling support for some Buddhist claims, Buddhists eager to participate in neuroscientific experiments, as well as misunderstandings and laughter. Those in white coats and those in orange robes agree that joining forces could bring new light to the study of human minds.

10 PRINT CHR$(205.5+RND(1)); : GOTO 10 - Nick Montfort 2014-08-29
A single line of code offers a way to understand the cultural context of computing. This book takes a single line of code—the extremely concise BASIC program for the Commodore 64 inscribed in the title—and uses it as a lens through which to consider the phenomenon of creative computing and the way computer programs exist in culture. The authors of this collaboratively written book treat code not as merely functional but as a text—in the case of 10 PRINT, a text that appeared in many different printed sources—that yields a story about its making, its purpose, its assumptions, and more. They consider randomness and regularity in computing and art, the maze in culture, the popular BASIC programming language, and the highly influential Commodore 64 computer.

Linear Algebra and Learning from Data - Gilbert Strang 2019-01-31
Linear algebra and the foundations of deep learning, together at last! From Professor Gilbert Strang, acclaimed author of Introduction to Linear Algebra, comes Linear Algebra and Learning from Data, the first textbook that teaches linear algebra together with deep learning and neural nets. This readable yet rigorous textbook contains a complete course in the linear algebra and related mathematics that students need to know to get to grips with learning from data. Included are: the four fundamental subspaces, singular value decompositions, special matrices, large matrix computation techniques, compressed sensing, probability and statistics, optimization, the architecture of neural nets, stochastic gradient descent and backpropagation.

Innovation and Its Enemies - Calestous Juma 2016-06-06
It is a curious situation that technologies we now take for granted have, when first introduced, so often stoked public controversy and concern for public welfare. At the root of this tension is the perception that the benefits of new technologies will accrue only to small sections of society, while the risks will be more widely distributed. Drawing from nearly 600 years of technology history, Calestous Juma identifies the tension between the need for innovation and the pressure to maintain continuity, social order, and stability as one of today's biggest policy challenges. He reveals the extent to which modern technological controversies grow out of distrust in public and private institutions and shows how new technologies emerge, take root, and create new institutional ecologies that favor their establishment in the marketplace. Innovation and Its Enemies calls upon public leaders to work with scientists, engineers, and entrepreneurs to manage technological change and expand public engagement on scientific and technological matters.

The Age of Living Machines: How Biology Will Build the Next Technology Revolution - Susan Hockfield 2019-05-07
From the former president of MIT, the story of the next technology revolution, and how it will change our lives. A century ago, discoveries in physics came together with engineering to produce an array of astonishing new technologies: radios, telephones, televisions, aircraft, radar, nuclear power, computers, the Internet, and a host of still-evolving digital tools. These technologies so radically reshaped our world that we can no longer conceive of life without them. Today, the world's population is projected to rise to well over 9.5 billion by 2050, and we are currently faced with the consequences of producing the energy that fuels, heats, and cools us. With temperatures and sea levels rising, and large portions of the globe plagued with drought, famine, and drug-resistant diseases, we need new technologies to tackle these problems. But we are on the cusp of a new convergence, argues world-renowned neuroscientist Susan Hockfield, with discoveries in biology coming together with engineering to produce another array of almost inconceivable technologies—next-generation products that have the potential to be every bit as paradigm shifting as the twentieth century's digital wonders. The Age of Living Machines describes some of the most

exciting new developments and the scientists and engineers who helped create them. Virus-built batteries. Protein-based water filters. Cancer-detecting nanoparticles. Mind-reading bionic limbs. Computer-engineered crops. Together they highlight the promise of the technology revolution of the twenty-first century to overcome some of the greatest humanitarian, medical, and environmental challenges of our time.

The Work of the Future - David H. Autor 2022-06-21
Why the United States lags behind other industrialized countries in sharing the benefits of innovation with workers and how we can remedy the problem. The United States has too many low-quality, low-wage jobs. Every country has its share, but those in the United States are especially poorly paid and often without benefits. Meanwhile, overall productivity increases steadily and new technology has transformed large parts of the economy, enhancing the skills and paychecks of higher paid knowledge workers. What's wrong with this picture? Why have so many workers benefited so little from decades of growth? The Work of the Future shows that technology is neither the problem nor the solution. We can build better jobs if we create institutions that leverage technological innovation and also support workers though long cycles of technological transformation. Building on findings from the multiyear MIT Task Force on the Work of the Future, the book argues that we must foster institutional innovations that complement technological change. Skills programs that emphasize work-based and hybrid learning (in person and online), for example, empower workers to become and remain productive in a continuously evolving workplace. Industries fueled by new technology that augments workers can supply good jobs, and federal investment in R&D can help make these industries worker-friendly. We must act to ensure that the labor market of the future offers benefits, opportunity, and a measure of economic security to all.

Becoming MIT - David Kaiser 2012-09-14
The evolution of MIT, as seen in a series of crucial decisions over the years. How did MIT become MIT? The Massachusetts Institute of Technology marks the 150th anniversary of its founding in 2011. Over the years, MIT has lived by its motto, "Mens et Manus" ("Mind and Hand"), dedicating itself to the pursuit of knowledge and its application to real-world problems. MIT has produced leading scholars in fields ranging from aeronautics to economics, invented entire academic disciplines, and transformed ideas into market-ready devices. This book examines a series of turning points, crucial decisions that helped define MIT. Many of these issues have relevance today: the moral implications of defense contracts, the optimal balance between government funding and private investment, and the right combination of basic science, engineering, and humanistic scholarship in the curriculum. Chapters describe the educational vison and fund-raising acumen of founder William Barton Rogers (MIT was among the earliest recipients of land grant funding); MIT's relationship with Harvard—its rival, doppelgänger, and, for a brief moment, degree-conferring partner; the battle between pure science and industrial sponsorship in the early twentieth century; MIT's rapid expansion during World War II because of defense work and military training courses; the conflict between Cold War gadgetry and the humanities; protests over defense contracts at the height of the Vietnam War; the uproar in the local community over the perceived riskiness of recombinant DNA research; and the measures taken to reverse years of institutionalized discrimination against women scientists.

The Ethics of Invention: Technology and the Human Future - Sheila Jasanoff 2016-08-30
We live in a world increasingly governed by technology—but to what end? Technology rules us as much as laws do. It shapes the legal, social, and ethical environments in which we act. Every time we cross a street, drive a car, or go to the doctor, we submit to the silent power of technology. Yet, much of the time, the influence of technology on our lives goes unchallenged by citizens and our elected representatives. In The Ethics of Invention, renowned scholar Sheila Jasanoff dissects the ways in which we delegate power to technological systems and asks how we might regain control. Our embrace of novel technological pathways, Jasanoff shows, leads to a complex interplay among technology, ethics, and human rights. Inventions like pesticides or GMOs can reduce hunger but can also cause unexpected harm to people and the environment. Often, as in the case of CFCs creating a hole in the ozone layer, it takes decades before we even realize that any damage has been done. Advances in biotechnology, from GMOs to gene editing, have given us tools to tinker with life itself, leading some to worry that human dignity and even human nature are under threat. But despite many reasons for caution, we continue to march heedlessly into ethically troubled waters. As Jasanoff ranges across these and other themes, she challenges the common assumption that technology is an apolitical and amoral force. Technology, she masterfully demonstrates, can warp the meaning of democracy and citizenship unless we carefully consider how to direct its power rather than let ourselves be shaped by it. The Ethics of Invention makes a bold argument for a future in which societies work together—in open, democratic dialogue—to debate not only the perils but even more the promises of technology.

Windows Into the Soul - Gary T. Marx 2016-05-31
In Windows into the Soul, Gary T. Marx sums up a lifetime of work on issues of surveillance and social control by disentangling and parsing the empirical richness of watching and being watched. Ultimately, Marx argues, recognizing complexity and asking the right questions is essential to bringing light and accountability to the darker, more iniquitous corners of our emerging surveillance society.