The MIT PRESS ESSENTIAL KNOWLEDGE Series

Coming in 2017

Information and Society
Michael Buckland

Paperback • 232 pages • March 2017

We live in an information society, or so we are often told. But what does that mean? This volume in the MIT Press Essential Knowledge series offers a concise, informal account of the ways in which information and society are related and of our ever-increasing dependence on a complex multiplicity of messages, records, documents, and data. Using information in its everyday, nonspecialized sense, Michael Buckland explores the influence of information on what we know, the role of communication and recorded information in our daily lives, and the difficulty (or ease) of finding information. He shows that all this involves human perception, social behavior, chancing technologies, and issues of trust.

The Future
Nick Montfort

Paperback • 220 pages • October 2017

The “Science of the Future” has been of fascination to scientists, researchers, and readers of science fiction for decades. From Jules Verne to Robert Heinlein, “brave new worlds” to “futurethink,” imagining what the future will hold has become an obsession. Montfort critiques the speculation, where we may have it right…and wrong…and imagines futures worlds.

Machine Translation
Thierry Poibeau

Paperback • 240 pages • November 2017

This volume in the MIT Press Essential Knowledge series offers a concise, non-technical, historical overview of the development of machine translation, one of the most fundamental tasks of artificial intelligence. Poibeau covers the design of digital machine translation tools – computer programs capable of automatically translating a text from a source language to a target language – the different approaches, evaluation issues, and market potential.
Bestsellers in the Essential Knowledge Series

MACHINE LEARNING by Ethem Alpaydin – Licensed in China, Japan, Korea, and Russia.
A concise overview of machine learning—computer programs that learn from data—which underlies applications that include recommendation systems, face recognition, and driverless cars.

ROBOTS by John M. Jordan – Licensed in China, Germany, Italy, Japan, and Russia.
An accessible and engaging account of robots, covering the current state of the field, the fantasies of popular culture, and implications for life and work.

NEUROPLASTICITY by Mohed Costandi – Licensed in Japan and Russia.
The real story of how our brains and nervous systems change throughout our lifetimes—with or without “brain training.”

COMPUTING: A Concise History by Paul Ceruzzi – Licensed in Germany, Japan, and Spain.
A compact and accessible history, from punch cards and calculators to UNIVAC and ENIAC, the personal computer, Silicon Valley, and the Internet.

THE TECHNOLOGICAL SINGULARITY by Murray Shanahan – Licensed in China, France, Germany, Italy, Japan, Korea and Russia. Not if, but when will artificially intelligent machines overtake human intelligence?

THE INTERNET OF THINGS by Samuel Greengard – Licensed in China, Italy, Korea, Russia, Thailand, and Turkey. A guided tour through the Internet of Things, a networked world of connected devices, objects, and people that is changing the way we live and work.

Other Forthcoming Titles in the Series

SYNESTHESIA
Richard E. Cytowic, M.D.

RECYCLING
Finn Arne Jørgensen

THE BOOK
Amaranth Borsuk

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Adam Spring

WORLD ELECTRIFICATION
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BLENDED LEARNING
Anthony Picciano

THE METABOLISM of CITIES
John E. Fernández

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SELF-TRACKING
Gina Neff & Dawn Nafus

Are we all self-tracking now? Once reserved for a small core of tech sophisticates and data-driven self-improvers, “wearables” —the new technologies tracking our health, productivity, and fitness—have gone mainstream with Fitbit, Apple, Samsung, Amazon and others catering to the Quantified. In the words of Fitbit CEO James Park, “connected health and fitness is now a mass-market category.” This new EK primer explores this growing phenomenon, as much a set of practices and a social movement, as it is a set of hardware, software and data-analysis technologies. University of Washington Prof. Of Communication Neff and Intel Senior Researcher Nafus team up to present the key debates and concepts in this emerging area; discuss the possibilities for improving health, well-being, and productivity; and address the implications these new data streams have for privacy, justice, and empowerment.

AUCTIONS
Timothy P. Hubbard and Harry J. Paarsch

Although it is among the oldest of economic market institutions, it is still ubiquitous in today’s economy, used for everything from government procurement to selling advertising on the Internet. And yet beyond the small number of economists who specialize in the subject, few people understand how auctions really work. From Sotheby’s to eBay, Google AdWords to TaskRabbit, the U.S. Treasury to non-profit charities, the authors offer a concise, accessible, and engaging primer explaining the theory and practice of auctions, from pricing rules, bidder behavior, auction protocol and how auctions can be modeled as games of asymmetric information—that is, games in which some players know something that other players do not. Readers will appreciate the role auctions play in our modern economy and understand why these selling mechanisms are so resilient.

CLOUD COMPUTING
Nayan B. Ruparelia

Most of the information available on cloud computing is either too highly technical for non-technologists, or pure marketing hype, in which the cloud is simply a selling point. Cutting through the hype, Ruparelia, the former CTO of Hewlett Packard (UK), begins by citing the simple and basic definition of cloud computing from the National Institute of Science and Technology: a model enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources. He explains the cloud from the business user’s viewpoint offering digestible explanations of what the cloud is, when to use it (and when not to), how to select a cloud service, how to integrate it with other technologies, and what the best practices are for using cloud computing. Ruparelia provides a lucid overview of the implications of the cloud phenomenon and the opportunities and risks associated with it.

TECHNOLOGICAL SINGULARITY
Murray Shanahan

The idea of technological singularity—what it would mean if ordinary human intelligence were enhanced or overtaken by artificial intelligence—is a provocative one. Yet for the first time such a moment in human history is conceivable and has moved from the realm of science fiction to serious debate. Murray Shanahan offers an introduction to the idea of “the singularity” and considers the ramifications of such a potentially— both existential threat and existential opportunity. (Is Siri the template, or HAL?) Shanahan, Professor of Cognitive Robotics at Imperial College London, asserts that we have to anticipate and prepare for both.

SUSTAINABILITY
Kent E. Portney

The term “sustainability” is both ubiquitous and ambiguous. Nations, cities, businesses, and individuals each define sustainability differently. It is an inclusive concept: not just about equity or economics or the environment; and it is not implemented at only the individual or the government or the corporate level. It is all of these things as acted on by all of these groups. Kent Portney Professor and Senior Fellow at Texas A&M’s Institute for Science, Technology and Public Policy, uncovers the failures and successes, advocates and opponents of sustainability.
METADATA
Jeffrey Pomerantz
Paperback • 200 pages • November 2015

Metadata is an essential if poorly understood feature of modern life: nearly every device we use now depends on it. Maps, signs, dashboards, web searches, ATMs, grocery stores, phone calls: metadata is central to how all of these things operate and how we interact with them. Like the interstate highway system or the electrical grid, it is a far-reaching infrastructure that helps modern life to run smoothly. Yet we can grasp the basics of the electrical grid and highway system; but unless you’re an information scientist – or an intelligence analyst working for the NSA – the same is probably not true of metadata. Readers can thank UNC professor Jeffrey Pomerantz for lifting the veil.

THE INTERNET OF THINGS
Samuel Greengard
Paperback • 232 pages • March 2015

We turn on the lights in our house from a desk in an office miles away. Our refrigerator alerts us to buy milk on the way home. When we get home, the thermostat has already adjusted the temperature to our desired temperature. Smart phones, cloud computing, RFID (radio-frequency identification) technology, sensors, and miniaturization are converging to make possible a new generation of embedded and immersive technology. This is the Internet of Things (IoT) — a networked world of connected devices, objects, and people. Author Samuel Greengard offers a guided tour through this emerging world and how it will change the way we live and work.

MOOCs
Jonathan Haber
Paperback • 248 pages • September 2014

The New York Times declared 2012 “The Year of the MOOC” as millions of students enrolled in massive open online courses (MOOCs), investment dollars flowed in, and MOOCs were deemed game-changers in higher education. During the inevitable backlash that followed, critics noted MOOCs’ high dropout rate, the low return on investment, and the potential for the game changer to make things worse instead of better. Jonathan Haber avoids both hype and doom-saying, instead offering an engaging, straightforward explanation of a rare phenomenon: an educational innovation that captures the imagination of the public while moving at the speed of an Internet startup.

MEMES: In Digital Culture
Limor Shifman
Paperback • 216 pages • October 2013

In 2012, “Gangnam Style” became the first YouTube clip viewed more than one billion times. Thousands responded by creating and posting their own variations of the video—making "Gangnam Style" (and its parodies) the most famous example of an Internet meme. Shifman defines memes as digital content with common characteristics, created with awareness of each other, circulated, imitated, and transformed via the Internet. She differentiates memes from virals; describes popular genres; discusses memes as new modes of political participation; and examines memes as agents of globalization. Shifman discusses dozens of well-known memes -- “Leave Britney Alone,” LOLCats, and Occupy Wall Street's “We Are the 99 Percent”--- and what they tell us about digital culture and culture in general.

OPEN ACCESS
Peter Suber
Paperback • 256 pages • July 2012

The Internet lets us share perfect copies of our work with a worldwide audience at virtually no cost. We take advantage of this revolutionary opportunity when we make our work “open access”: digital, online, free of charge, and free of most copyright and licensing restrictions. Distilling a decade of work, OA authority Peter Suber tells us what open access is and isn't, how it benefits authors and readers of research, how we pay for it, how it avoids copyright problems, how it has moved from the periphery to the mainstream, and what its future may hold.

COMPUTING: A Concise History
Paul Ceruzzi
Paperback • 212 pages • July 2012

In this accessible account of the invention and development of digital technology, computer historian Paul Ceruzzi offers a tour of the computer’s history. From the development of the punch card for use in the 1890 U.S. Census to a Bell Labs mathematician coining the word “digital” in 1942, from the military’s creation of the ENIAC system to the UNIVAC, the first general purpose computer, from silicon chips to silicon Valley, Ceruzzi’s traces the world-changing evolution of the computer from a room-size ensemble of machinery to the desktop computer to a pocket-sized smart phone capable of storing ever-increasing amounts of data in ever-decreasing device sizes.
INFORMATION and the MODERN CORPORATION
James Cortada Paperback • 176 pages • October 2011

Today, more than 80% of workers collect and analyze information in some capacity in the course of their daily jobs. Longtime IBM manager & consultant James Cortada maps the use of information within work processes and traces its flow across supply-chain management, product development, customer relations, and sales. He clarifies the differences among data, facts, information, and knowledge and describes how the art of analytics has all but eliminated decision-making based on intuition, replacing it with fact-based decisions. This essential guide shows managers and employees better ways to leverage information--by design and not by accident.

THE CONSCIOUS MIND
Zoltan Torey Paperback • 172 pages • August 2014

How did the human mind emerge from the collection of neurons that makes up the brain? How did the brain acquire self-awareness, autonomy, language, the ability to understand itself and the world? Drawing on insights from evolutionary biology, neuroscience, and linguistics, Zoltan Torey offers an accessible and concise description of the evolutionary breakthrough that created the human mind.

CROWDSOURCING
Daren Brabham Paperback • 168 pages • May 2013

Ever since the term "crowdsourcing" was coined in 2006 by Wired magazine, group activities ranging from the creation of the Oxford English Dictionary to the choosing of new colors for M&Ms have been labeled with this media buzzword. This online, distributed problem-solving, production model leverages the collective intelligence of online communities for specific purposes created by the crowdsourcing organization -- corporate, government, or volunteer. Crowdsourcing uniquely combines a bottom-up, open, creative process with top-down organizational goals. In this accessible account, Brabham explains what crowdsourcing is, what it is not, and how it works

INTELLECTUAL PROPERTY STRATEGY
John Palfrey Paperback • 192 pages • October 2011

Most managers leave intellectual property (IP) issues to the legal department, unaware that an organization's IP can help access new markets, improve existing products, and generate new revenue streams. Almost every organization has an IP portfolio of some value and therefore the need for a nuanced strategy. IP expert and Harvard Law School professor John Palfrey offers a brief for managers and administrators on strategies that go beyond the traditional and restrictive "sword and shield" approach, suggesting that flexibility and creativity are essential to a profitable long-term business strategy. Patents, copyrights, trademarks, and trade secrets—all can assist leaders in achieving short- and long-term benefits while positioning themselves for success in the global information economy.

UNDERSTANDING BELIEFS
Nils J. Nilsson Paperback • 144 pages • July 2014

Our beliefs seek to explain our world. We use beliefs to predict, to explain, to create, to console, to entertain. Some of our beliefs become “theories”—quantum mechanics, evolution, and relativity—that indeed explain the origins and very nature of the world in which we live. But others distort reality—astrology, alien abduction, guardian angels, and reincarnation. Yet Nils Nilsson claims they are all products (with varying degrees of credibility) of fertile minds trying to find explanations for observed phenomena. Nilsson examines what our beliefs do for us, how we come to hold them, how to evaluate them in light of our actions and decision-making. He argues that we should adapt the practices of the scientific method to avoid “belief traps” and holding to beliefs that wouldn’t survive critical evaluation.

PARADOX
Margaret Cuonzo Hardcover • 240 pages • March 2014

“How wonderful that we have met with a paradox” wrote Niels Bohr. “Now we have some hope of making progress.” Thinkers have been fascinated by paradox long before Aristotle grappled with Zeno’s. The paradox—defined as a set of mutually inconsistent claims, each of which seems true—is a fact not just of the ivory tower, but of everyday life. (An Internet search for “paradox” brings forth a picture of an ashtray with a “no smoking” symbol inscribed on it.) “Proposing solutions,” Cuonzo writes, “is a natural response to paradoxes.” She offers a catalog of paradox-solving strategies, noting that paradox discovery leads to advances in knowledge: new science often stems from attempts to solve paradoxes, and the concepts used in the new sciences lead to new paradoxes.
FREE WILL
Mark Balaguer
Paperback • 136 pages • February 2014

In most of our daily lives, the assumption of free will is taken for granted. We rise from the couch, go for a walk, eat chocolate ice cream: free will! Yet in recent years, some have argued that free will is an illusion. The neuroscientist (and best-selling author) Sam Harris and the Harvard psychologist Daniel Wegner, each claim that certain scientific findings disprove free will. Reviewing religion, philosophy and neuroscience, Mark Balaguer concludes that the anti-free will arguments are overstated and misguided. Covering determinism (the view that every physical event is predetermined), random consequence, and Benjamin Libet’s neuroscientific study suggesting our conscious decisions are caused by neural events that occur before we choose, Belaguer determines the question of free will remains a mystery—as do many of the workings of the human brain.

WAVES
Frederic Raichlin
Paperback • 256 pages • October 2012

Sitting on the beach on a sunny summer day, we enjoy the steady advance and retreat of the waves. But where do waves come from? How are they formed and why do they break on the shore? Waves can be ripples that lap peacefully or monstrous tsunamis that destroy everything in their paths. Describing the science underlying this astonishing variety, Raichlin explains, in a way that is readily understandable to nonscientists, the science of waves themselves: how they travel, how they shoal (rise) and break, how they transform through the natural sun-Earth-moon combinations. Astronomical tides; rip currents, beach erosion, storm surges, hurricane waves and tsunamis. Raichlin offers a different kind of beach read, on