

# Alan Turing His Work And Impact

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**A Mind at Play** Jimmy Soni 2017-07-18 Winner of the Neumann Prize for the History of Mathematics "We owe Claude Shannon a lot, and Soni & Goodman's book takes a big first step in paying that debt." —San Francisco Review of Books "Soni and Goodman are at their best when they invoke the wonder an idea can instill. They summon the right level of awe while stopping short of hyperbole." —Financial Times "Jimmy Soni and Rob Goodman make a convincing case for their subtitle while reminding us that Shannon never made this claim himself." —The Wall Street Journal "A charming account of one of the twentieth century's most distinguished scientists...Readers will enjoy this portrait of a modern-day Da Vinci." —Fortune In their second collaboration, biographers Jimmy Soni and Rob Goodman present the story of Claude Shannon—one of the foremost intellects of the twentieth century and the architect of the Information Age, whose insights stand behind every computer built, email sent, video streamed, and webpage loaded. Claude Shannon was a groundbreaking polymath, a brilliant tinkerer, and a digital pioneer. He constructed the first wearable computer, outfoxed Vegas casinos, and built juggling robots. He also wrote the seminal text of the digital revolution, which has been called "the Magna Carta of the Information Age." In this elegantly written, exhaustively researched biography, Soni and Goodman reveal Claude

Shannon's full story for the first time. With unique access to Shannon's family and friends, *A Mind at Play* brings this singular innovator and always playful genius to life.

**Alan M. Turing** Sara Turing 2012-03-22 Containing never-before-published material, this fascinating account sheds new light on one of the greatest figures of the twentieth century.

Alan Turing Andrew Hodges 1985

The Annotated Turing Charles Petzold 2008-06-16 Provides an expansion of Turing's original paper, a brief look at his life, and information on the Turing machine and computability topics.

Computability B. Jack Copeland 2013-06-07

Computer scientists, mathematicians, and philosophers discuss the conceptual foundations of the notion of computability as well as recent theoretical developments.

**Milestones in Analog and Digital Computing**

Herbert Bruderer 2021-01-04 This Third Edition is the first English-language edition of the award-winning *Meilensteine der Rechentechnik*; illustrated in full color throughout in two volumes. The Third Edition is devoted to both analog and digital computing devices, as well as the world's most magnificent historical automatons and select scientific instruments (employed in astronomy, surveying, time measurement, etc.). It also features detailed instructions for analog and digital mechanical calculating machines and instruments, and is the only such historical book with

comprehensive technical glossaries of terms not found in print or in online dictionaries. The book also includes a very extensive bibliography based on the literature of numerous countries around the world. Meticulously researched, the author conducted a worldwide survey of science, technology and art museums with their main holdings of analog and digital calculating and computing machines and devices, historical automata and selected scientific instruments in order to describe a broad range of masterful technical achievements. Also covering the history of mathematics and computer science, this work documents the cultural heritage of technology as well.

X, Y & Z Dermot Turing 2018-09-03 It's common knowledge that the Enigma cipher was broken at Bletchley Park, but less is known of the background: an exhilarating spy story of secret documents smuggled across borders, hair-raising escapes, Gestapo interrogations and betrayals. At the heart of it is the decisive role of Polish mathematicians and French spymasters who helped Britain's codebreakers change the course of the Second World War. X, Y & Z is the real story of how Enigma was broken.

Alan Turing: His Work and Impact S. Barry Cooper 2013-03-18 In this 2013 winner of the prestigious R.R. Hawkins Award from the Association of American Publishers, as well as the 2013 PROSE Awards for Mathematics and Best in Physical Sciences & Mathematics, also from the AAP, readers will find many of the most significant contributions from the four-volume set of the Collected Works of A. M. Turing. These contributions, together with commentaries from current experts in a wide spectrum of fields and backgrounds, provide insight on the significance and contemporary impact of Alan Turing's work. Offering a more modern perspective than anything currently available, Alan Turing: His Work and Impact gives wide coverage of the many ways in which Turing's scientific endeavors have impacted current research and

understanding of the world. His pivotal writings on subjects including computing, artificial intelligence, cryptography, morphogenesis, and more display continued relevance and insight into today's scientific and technological landscape. This collection provides a great service to researchers, but is also an approachable entry point for readers with limited training in the science, but an urge to learn more about the details of Turing's work. 2013 winner of the prestigious R.R. Hawkins Award from the Association of American Publishers, as well as the 2013 PROSE Awards for Mathematics and Best in Physical Sciences & Mathematics, also from the AAP Named a 2013 Notable Computer Book in Computing Milieux by Computing Reviews Affordable, key collection of the most significant papers by A.M. Turing Commentary explaining the significance of each seminal paper by preeminent leaders in the field Additional resources available online

**Prof: Alan Turing Decoded** Dermot Turing 2015-09-15 Alan Turing was an extraordinary man who crammed into a life of only 42 years the careers of mathematician, codebreaker, computer scientist and biologist. He is widely regarded as a war hero grossly mistreated by his unappreciative country and it has become hard to disentangle the real man from the story. It is easy to cast him as a misfit, the stereotypical professor. But actually Alan Turing was never a professor, and his nickname 'Prof' was given by his codebreaking friends at Bletchley Park. Now, Alan Turing's nephew, Dermot Turing, has taken a fresh look at the influences on Alan Turing's life and creativity, and the later creation of a legend. For the first time it is possible to disclose the real character behind the cipher-text: how did Alan's childhood experiences influence the man? Who were the influential figures in Alan's formative years? How did his creative ideas evolve? Was he really a solitary, asocial genius? What was his wartime work after 1942, and why was it kept even more secret than the Enigma story? What is the truth about Alan

Turing's conviction for gross indecency, and did he commit suicide? What is the significance of the Royal Pardon granted in 2013? In Dermot's own style he takes a vibrant and entertaining approach to the life and work of a true genius.

Turing's Vision Chris Bernhardt 2016-05-13 In 1936, when he was just twenty-four years old, Alan Turing wrote a remarkable paper in which he outlined the theory of computation, laying out the ideas that underlie all modern computers. This groundbreaking and powerful theory now forms the basis of computer science. In Turing's Vision, Chris Bernhardt explains the theory, Turing's most important contribution, for the general reader. Bernhardt argues that the strength of Turing's theory is its simplicity, and that, explained in a straightforward manner, it is eminently understandable by the nonspecialist. As Marvin Minsky writes, "The sheer simplicity of the theory's foundation and extraordinary short path from this foundation to its logical and surprising conclusions give the theory a mathematical beauty that alone guarantees it a permanent place in computer theory." Bernhardt begins with the foundation and systematically builds to the surprising conclusions. He also views Turing's theory in the context of mathematical history, other views of computation (including those of Alonzo Church), Turing's later work, and the birth of the modern computer. In the paper, "On Computable Numbers, with an Application to the Entscheidungsproblem," Turing thinks carefully about how humans perform computation, breaking it down into a sequence of steps, and then constructs theoretical machines capable of performing each step. Turing wanted to show that there were problems that were beyond any computer's ability to solve; in particular, he wanted to find a decision problem that he could prove was undecidable. To explain Turing's ideas, Bernhardt examines three well-known decision problems to explore the concept of undecidability; investigates theoretical computing machines, including Turing machines;

explains universal machines; and proves that certain problems are undecidable, including Turing's problem concerning computable numbers.

Turing B. Jack Copeland 2014 Alan Turing is regarded as one of the greatest scientists of the 20th century. But who was Turing, and what did he achieve during his tragically short life of 41 years? Best known as the genius who broke Germany's most secret codes during the war of 1939-45, Turing was also the father of the modern computer. Today, all who 'click-to-open' are familiar with the impact of Turing's ideas. Here, B. Jack Copeland provides an account of Turing's life and work, exploring the key elements of his life-story in tandem with his leading ideas and contributions. The book highlights Turing's contributions to computing and to computer science, including Artificial Intelligence and Artificial Life, and the emphasis throughout is on the relevance of his work to modern developments. The story of his contributions to codebreaking during the Second World War is set in the context of his thinking about machines, as is the account of his work in the foundations of mathematics.

Reflections of Alan Turing Dermot Turing 2021-04-22 Everyone knows the story of the codebreaker and computer science pioneer Alan Turing. Except When Dermot Turing is asked about his famous uncle, people want to know more than the bullet points of his life. They want to know everything was Alan Turing actually a codebreaker? What did he make of artificial intelligence? What is the significance of Alan Turing's trial, his suicide, the Royal Pardon, the £50 note and the film *The Imitation Game*? In Reflections of Alan Turing, Dermot strips off the layers to uncover the real story. Its time to discover a fresh legacy of Alan Turing for the twenty-first century.

**Mathematical Logic** R.O. Gandy 2001-12-05 *Mathematical Logic* is a collection of the works of one of the leading figures in 20th-century science. This collection of A.M. Turing's works is intended

to include all his mature scientific writing, including a substantial quantity of unpublished material. His work in pure mathematics and mathematical logic extended considerably further; the work of his last years, on morphogenesis in plants, is also of the greatest originality and of permanent importance. This book is divided into three parts. The first part focuses on computability and ordinal logics and covers Turing's work between 1937 and 1938. The second part covers type theory; it provides a general introduction to Turing's work on type theory and covers his published and unpublished works between 1941 and 1948. Finally, the third part focuses on enigmas, mysteries, and loose ends. This concluding section of the book discusses Turing's Treatise on the Enigma, with excerpts from the Enigma Paper. It also delves into Turing's papers on programming and on minimum cost sequential analysis, featuring an excerpt from the unpublished manuscript. This book will be of interest to mathematicians, logicians, and computer scientists.

The Imitation Game Jim Ottaviani 2016-03-22

Award winning authors Jim Ottaviani and Leland Purvis present a historically accurate graphic novel biography of English mathematician and scientist Alan Turing in *The Imitation Game*. English mathematician and scientist Alan Turing (1912-1954) is credited with many of the foundational principles of contemporary computer science. *The Imitation Game* presents a historically accurate graphic novel biography of Turing's life, including his groundbreaking work on the fundamentals of cryptography and artificial intelligence. His code breaking efforts led to the cracking of the German Enigma during World War II, work that saved countless lives and accelerated the Allied defeat of the Nazis. While Turing's achievements remain relevant decades after his death, the story of his life in post-war Europe continues to fascinate audiences today. Award-winning duo Jim Ottaviani (the #1 New York Times bestselling author of *Feynman* and *Primates*)

and artist Leland Purvis (an Eisner and Ignatz Award nominee and occasional reviewer for the *Comics Journal*) present a factually detailed account of Turing's life and groundbreaking research--as an unconventional genius who was arrested, tried, convicted, and punished for his openly gay lifestyle, and whose innovative work still fuels the computing and communication systems that define our modern world. Computer science buffs, comics fans, and history aficionados will be captivated by this riveting and tragic story of one of the 20th century's most unsung heroes.

**A Madman Dreams of Turing Machines** Janna Levin 2009-02-19 Kurt Gödel's Incompleteness Theorems sent shivers through Vienna's intellectual circles and directly challenged Ludwig Wittgenstein's dominant philosophy. Alan Turing's mathematical genius helped him break the Nazi Enigma Code during WWII. Though they never met, their lives strangely mirrored one another—both were brilliant, and both met with tragic ends. Here, a mysterious narrator intertwines these parallel lives into a double helix of genius and anguish, wonderfully capturing not only two radiant, fragile minds but also the zeitgeist of the era.

**Alan Turing** S. Barry Cooper 2013 "The fact remains that everyone who taps at a keyboard, opening a spreadsheet or a word-processing program, is working on an incarnation of a Turing machine." - Time This new and exciting book, scheduled to publish for the 2012 centenary of Alan Turing's birth in London, includes a large number of the most significant contributions from the 4-volume set of the *Collected Works of A. M. Turing*. These contributions, together with a wide spectrum of accompanying commentaries from current world-leading experts in many different fields and backgrounds, provide insight on the significance and contemporary impact of A.M. Turing's work. Offering a more modern perspective than anything currently available, this unique work gives wide coverage of the many ways in which Turing's

scientific endeavours have impacted current research and understanding of the world. It provides a great service to researchers, and at the same time is an approachable entry-point for the large number of people who have limited training in the science, but would like to learn more about the details of Turing's work. Affordable, key collection of the most significant papers by A.M. Turing. Commentary explaining the significance of each seminal paper by preeminent leaders in the field. Additional resources available online.

*The International Encyclopedia of Communication Theory and Philosophy, 4 Volume Set* Robert T. Craig 2016-10-31 The International Encyclopedia of Communication Theory and Philosophy is the definitive single-source reference work on the subject, with state-of-the-art and in-depth scholarly reflection on key issues from leading international experts. It is available both online and in print. A state-of-the-art and in-depth scholarly reflection on the key issues raised by communication, covering the history, systematics, and practical potential of communication theory Articles by leading experts offer an unprecedented level of accuracy and balance Provides comprehensive, clear entries which are both cross-national and cross-disciplinary in nature The Encyclopedia presents a truly international perspective with authors and positions representing not just Europe and North America, but also Latin America and Asia Published both online and in print Part of The Wiley Blackwell-ICA International Encyclopedias of Communication series, published in conjunction with the International Communication Association

**Alan Turing's Electronic Brain** others 2012-05-24 The mathematical genius Alan Turing, now well known for his crucial wartime role in breaking the ENIGMA code, was the first to conceive of the fundamental principle of the modern computer-the idea of controlling a computing machine's operations by means of a program of coded instructions, stored in the machine's 'memory'. In 1945 Turing drew up his revolutionary design for an electronic

computing machine-his Automatic Computing Engine ('ACE'). A pilot model of the ACE ran its first program in 1950 and the production version, the 'DEUCE', went on to become a cornerstone of the fledgling British computer industry. The first 'personal' computer was based on Turing's ACE. Alan Turing's Automatic Computing Engine describes Turing's struggle to build the modern computer. The first detailed history of Turing's contributions to computer science, this text is essential reading for anyone interested in the history of the computer and the history of mathematics. It contains first hand accounts by Turing and by the pioneers of computing who worked with him. As well as relating the story of the invention of the computer, the book clearly describes the hardware and software of the ACE-including the very first computer programs. The book is intended to be accessible to everyone with an interest in computing, and contains numerous diagrams and illustrations as well as original photographs. The book contains chapters describing Turing's path-breaking research in the fields of Artificial Intelligence (AI) and Artificial Life (A-Life). The book has an extensive system of hyperlinks to The Turing Archive for the History of Computing, an on-line library of digital facsimiles of typewritten documents by Turing and the other scientists who pioneered the electronic computer. Turing's Cathedral George Dyson 2012 Presents the history of the invention of computers, describing the collaboration of John von Neumann and his colleagues as they worked together to create the first computer, an event which led to the hydrogen bomb and the birth of the digital age.

**Natural Wonders Every Child Should Know**

Edwin Tenney Brewster 1912

**Alan Turing** Maria Isabel Sanchez Vegara

2020-04-07 In this book from the critically acclaimed Little People, BIG DREAMS series, discover the life of Alan Turing, the genius code cracker and father of theoretical computer science and artificial intelligence. Alan grew up in England, where his

best friends were numbers and a little boy called Christopher. When his young friend died, Alan retreated to the world of numbers and codes, where he discovered how to crack the code of the Nazi Enigma machine. This moving book features stylish and quirky illustrations and extra facts at the back, including a biographical timeline with historical photos and a detailed profile of the brilliant mathematician's life. Little People, BIG DREAMS is a best-selling series of books and educational games that explore the lives of outstanding people, from designers and artists to scientists and activists. All of them achieved incredible things, yet each began life as a child with a dream. This empowering series offers inspiring messages to children of all ages, in a range of formats. The board books are told in simple sentences, perfect for reading aloud to babies and toddlers. The hardcover versions present expanded stories for beginning readers. Boxed gift sets allow you to collect a selection of the books by theme. Paper dolls, learning cards, matching games, and other fun learning tools provide even more ways to make the lives of these role models accessible to children. Inspire the next generation of outstanding people who will change the world with Little People, BIG DREAMS!

*How the World Computes* Barry S. Cooper

2012-05-28 This book constitutes the refereed proceedings of the Turing Centenary Conference and the 8th Conference on Computability in Europe, CiE 2012, held in Cambridge, UK, in June 2012. The 53 revised papers presented together with 6 invited lectures were carefully reviewed and selected with an acceptance rate of under 29,8%. The CiE 2012 Turing Centenary Conference will be remembered as a historic event in the continuing development of the powerful explanatory role of computability across a wide spectrum of research areas. The papers presented at CiE 2012 represent the best of current research in the area, and forms a fitting tribute to the short but brilliant trajectory of Alan Mathison Turing. Both the conference series and the association promote the development of

computability-related science, ranging over mathematics, computer science and applications in various natural and engineering sciences such as physics and biology, and also including the promotion of related non-scientific fields such as philosophy and history of computing.

The Turing Guide Jack Copeland 2017-02-16 Alan Turing has long proved a subject of fascination, but following the centenary of his birth in 2012, the code-breaker, computer pioneer, mathematician (and much more) has become even more celebrated with much media coverage, and several meetings, conferences and books raising public awareness of Turing's life and work. This volume will bring together contributions from some of the leading experts on Alan Turing to create a comprehensive guide to Turing that will serve as a useful resource for researchers in the area as well as the increasingly interested general reader. The book will cover aspects of Turing's life and the wide range of his intellectual activities, including mathematics, code-breaking, computer science, logic, artificial intelligence and mathematical biology, as well as his subsequent influence.

Alan Turing Ted Gottfried 1996 Describes the life and work of the founder of computer science

**Alan Turing: The Enigma** Andrew Hodges 2014-11-10 A NEW YORK TIMES BESTSELLER

The official book behind the Academy Award-winning film *The Imitation Game*, starring Benedict Cumberbatch and Keira Knightley It is only a slight exaggeration to say that the British mathematician Alan Turing (1912-1954) saved the Allies from the Nazis, invented the computer and artificial intelligence, and anticipated gay liberation by decades--all before his suicide at age forty-one. This New York Times--bestselling biography of the founder of computer science, with a new preface by the author that addresses Turing's royal pardon in 2013, is the definitive account of an extraordinary mind and life. Capturing both the inner and outer drama of Turing's life, Andrew Hodges tells how Turing's revolutionary idea of 1936--the concept of

a universal machine--laid the foundation for the modern computer and how Turing brought the idea to practical realization in 1945 with his electronic design. The book also tells how this work was directly related to Turing's leading role in breaking the German Enigma ciphers during World War II, a scientific triumph that was critical to Allied victory in the Atlantic. At the same time, this is the tragic account of a man who, despite his wartime service, was eventually arrested, stripped of his security clearance, and forced to undergo a humiliating treatment program--all for trying to live honestly in a society that defined homosexuality as a crime. The inspiration for a major motion picture starring Benedict Cumberbatch and Keira Knightley, *Alan Turing: The Enigma* is a gripping story of mathematics, computers, cryptography, and homosexual persecution.

**Turing Computability** Robert I. Soare 2016-06-20 Turing's famous 1936 paper introduced a formal definition of a computing machine, a Turing machine. This model led to both the development of actual computers and to computability theory, the study of what machines can and cannot compute. This book presents classical computability theory from Turing and Post to current results and methods, and their use in studying the information content of algebraic structures, models, and their relation to Peano arithmetic. The author presents the subject as an art to be practiced, and an art in the aesthetic sense of inherent beauty which all mathematicians recognize in their subject. Part I gives a thorough development of the foundations of computability, from the definition of Turing machines up to finite injury priority arguments. Key topics include relative computability, and computably enumerable sets, those which can be effectively listed but not necessarily effectively decided, such as the theorems of Peano arithmetic. Part II includes the study of computably open and closed sets of reals and basis and nonbasis theorems for effectively closed sets. Part III covers minimal

Turing degrees. Part IV is an introduction to games and their use in proving theorems. Finally, Part V offers a short history of computability theory. The author has honed the content over decades according to feedback from students, lecturers, and researchers around the world. Most chapters include exercises, and the material is carefully structured according to importance and difficulty. The book is suitable for advanced undergraduate and graduate students in computer science and mathematics and researchers engaged with computability and mathematical logic.

Don't fear AI Robert Atkinson 2019-01-25 Over the last decade, Europe and most advanced economies experienced a decline in productivity, leading to political unrest and rising uncertainty about the future. A new production revolution, enabled in part by artificial intelligence (AI), is now emerging, bringing a new wave of technologies, but there are widespread fears that these changes also will bring a big rise in unemployment as machines replace human beings in big numbers. History tells us that we should not be afraid of industrial change. AI will take over some tasks, but this will not happen all of a sudden and there will be plenty of work left for humans. Restricting or slowing down new technology will not help the world economy. Instead, nations need to help people adjust to more technically advanced jobs, while education should focus more on "21st century skills" such as teamwork and critical thinking. These are our next real challenges. This is the second essay in the Big Ideas series created by the European Investment Bank.

**Philosophical Explorations of the Legacy of Alan Turing** Juliet Floyd 2017-05-30 Chapters "Turing and Free Will: A New Take on an Old Debate" and "Turing and the History of Computer Music" are available open access under a Creative Commons Attribution 4.0 International License via [link.springer.com](https://link.springer.com).

The Story of Computing Dermot Turing 2018-05-11 'I do not see why it [the machine] should not enter

any one of the fields normally covered by the human intellect, and eventually compete on equal terms.' Alan Turing, 1949 Today computers shape every aspect of our lives. In our pockets, we carry mobile phones with computing power that was unimaginable just 50 years ago. Every workplace has its array of desktops, servers, and laptops, and a selection of specially designed software. Many industries are embracing the promises - and the risks - of artificial intelligence. The world is changing faster than ever, and computing is at the heart of technological development. While computers themselves are modern phenomena, for centuries people have been attempting to solve complex problems, often with the aid of machines. The first computers were not machines at all, but people armed with mathematical tables and infinite patience. They were replaced by heavy, cumbersome machines that sprawled over multiple rooms. Over the course of half a century, they were transformed from an obscure tool for scientists into the quintessential consumer product. The Story of Computing takes you on an incredible journey through the ideas, the discoveries, and the personalities that shaped the modern technology on which we have come to rely. Topics include: • the birth of the computer • codebreaking in World War II • innovations in hardware and software • artificial intelligence • the internet • the challenges of cybersecurity.

*The Book of Why* Judea Pearl 2018-05-15 A Turing Award-winning computer scientist and statistician shows how understanding causality has revolutionized science and will revolutionize artificial intelligence "Correlation is not causation." This mantra, chanted by scientists for more than a century, has led to a virtual prohibition on causal talk. Today, that taboo is dead. The causal revolution, instigated by Judea Pearl and his colleagues, has cut through a century of confusion and established causality -- the study of cause and effect -- on a firm scientific basis. His work explains how we can know easy things, like whether it was

rain or a sprinkler that made a sidewalk wet; and how to answer hard questions, like whether a drug cured an illness. Pearl's work enables us to know not just whether one thing causes another: it lets us explore the world that is and the worlds that could have been. It shows us the essence of human thought and key to artificial intelligence. Anyone who wants to understand either needs *The Book of Why*.

### **The Man Who Knew Too Much: Alan Turing and the Invention of the Computer (Great Discoveries)**

David Leavitt 2006-11-17 Outlines the Bletchley Park mathematician's efforts to launch artificial intelligence innovations, describing his thwarted attempts to gain support for a programmable calculating machine, his contributions to cracking the Nazi Enigma code during World War II, and how the revelation of his homosexuality led to his tragic imprisonment and suicide. Reprint.

### **Turing's Revolution** Giovanni Sommaruga

2016-01-21 This book provides an overview of the confluence of ideas in Turing's era and work and examines the impact of his work on mathematical logic and theoretical computer science. It combines contributions by well-known scientists on the history and philosophy of computability theory as well as on generalised Turing computability. By looking at the roots and at the philosophical and technical influence of Turing's work, it is possible to gather new perspectives and new research topics which might be considered as a continuation of Turing's working ideas well into the 21st century.

### **The Man Who Knew Too Much Illustrated** G K

Chesterton 2021-06-04 *The Man Who Knew Too Much* and other stories (1922) is a book of detective stories by English writer G. K. Chesterton, published in 1922 by Cassell and Company in the United Kingdom, and Harper Brothers in the United States.[1][2][3][4] The book contains eight connected short stories about "The Man Who Knew Too Much", and additional unconnected stories featuring separate heroes/detectives. The United States edition contained one of these additional

stories: "The Trees of Pride", while the United Kingdom edition contained "Trees of Pride" and three more, shorter stories: "The Garden of Smoke", "The Five of Swords" and "The Tower of Treason".

### **Alan Turing: Life and Legacy of a Great Thinker**

Christof Teuscher 2013-06-29 Written by a distinguished cast of contributors, Alan Turing: Life and Legacy of a Great Thinker is the definitive collection of essays in commemoration of the 90th birthday of Alan Turing. This fascinating text covers the rich facets of his life, thoughts, and legacy, but also sheds some light on the future of computing science with a chapter contributed by visionary Ray Kurzweil, winner of the 1999 National Medal of Technology. Further, important contributions come from the philosopher Daniel Dennett, the Turing biographer Andrew Hodges, and from the distinguished logician Martin Davis, who provides a first critical essay on an emerging and controversial field termed "hypercomputation".

**The Essential Turing** B. Jack. Copeland 2004-09-09 Alan Turing, pioneer of computing and WWII codebreaker, is one of the most important and influential thinkers of the twentieth century. In this volume for the first time his key writings are made available to a broad, non-specialist readership. They make fascinating reading both in their own right and for their historic significance: contemporary computational theory, cognitive science, artificial intelligence, and artificial life all spring from this ground-breaking work, which is also rich in philosophical and logical insight. An introduction by leading Turing expert Jack Copeland provides the background and guides the reader through the selection. About Alan Turing Alan Turing FRS OBE, (1912-1954) studied mathematics at King's College, Cambridge. He was elected a Fellow of King's in March 1935, at the age of only 22. In the same year he invented the abstract computing machines - now known simply as Turing machines - on which all subsequent stored-program digital computers are modelled. During 1936-1938 Turing continued his studies,

now at Princeton University. He completed a PhD in mathematical logic, analysing the notion of 'intuition' in mathematics and introducing the idea of oracular computation, now fundamental in mathematical recursion theory. An 'oracle' is an abstract device able to solve mathematical problems too difficult for the universal Turing machine. In the summer of 1938 Turing returned to his Fellowship at King's. When WWII started in 1939 he joined the wartime headquarters of the Government Code and Cypher School (GC&CS) at Bletchley Park, Buckinghamshire. Building on earlier work by Polish cryptanalysts, Turing contributed crucially to the design of electro-mechanical machines ('bombes') used to decipher Enigma, the code by means of which the German armed forces sought to protect their radio communications. Turing's work on the version of Enigma used by the German navy was vital to the battle for supremacy in the North Atlantic. He also contributed to the attack on the cyphers known as 'Fish'. Based on binary teleprinter code, Fish was used during the latter part of the war in preference to morse-based Enigma for the encryption of high-level signals, for example messages from Hitler and other members of the German High Command. It is estimated that the work of GC&CS shortened the war in Europe by at least two years. Turing received the Order of the British Empire for the part he played. In 1945, the war over, Turing was recruited to the National Physical Laboratory (NPL) in London, his brief to design and develop an electronic computer - a concrete form of the universal Turing machine. Turing's report setting out his design for the Automatic Computing Engine (ACE) was the first relatively complete specification of an electronic stored-program general-purpose digital computer. Delays beyond Turing's control resulted in NPL's losing the race to build the world's first working electronic stored-program digital computer - an honour that went to the Royal Society Computing Machine Laboratory at Manchester University, in June 1948. Discouraged

by the delays at NPL, Turing took up the Deputy Directorship of the Royal Society Computing Machine Laboratory in that year. Turing was a founding father of modern cognitive science and a leading early exponent of the hypothesis that the human brain is in large part a digital computing machine, theorising that the cortex at birth is an 'unorganised machine' which through 'training' becomes organised 'into a universal machine or something like it'. He also pioneered Artificial Intelligence. Turing spent the rest of his short career at Manchester University, being appointed to a specially created Readership in the Theory of Computing in May 1953. He was elected a Fellow of the Royal Society of London in March 1951 (a high honour).

The Most Human Human Brian Christian 2012  
Explores how computers are reshaping ideas about what it means to be human profiling the annual Turing Test to assess a computer's capacity for thought while analyzing related philosophical, biological, and moral issues.

**Charles Babbage and Alan Turing** Charles River 2020-07-27 \*Includes pictures \*Includes a bibliography for further reading Today, the world is in the midst of the transformative and ever-developing Digital Age, otherwise referred to as the "Age of Information." It has been an unprecedented, remarkable, and explosive era marked by social media and computer-generated imagery (and with it, deep fakes), among other novel, previously unimaginable concepts. The bulky monitors and blocky towers of personal computers and laptops, which were once upon a time considered fashionable, futuristic contraptions, have since been replaced with a sleek and stylish array - both multi-functional and specialized - of aerodynamic, minimalistic devices, ranging from smartphones and tablets to lightweight laptops and full-fledged gaming set-ups packed with powerhouse processors. While many are familiar with those facts, and a recent movie revived interest in Alan Turing's achievements with computing during World War

II, it was Charles Babbage who was the first to conceive the notion of a programmable and automatic universal computer, which, on top of its ability to calculate any mathematical equation at an unmatched speed, could also be used for a seemingly infinite number of other applications. In other words, he envisioned the precursor to the modern computer. At first blush, Babbage hardly seemed the type, because in many ways, Babbage was the antithesis of the debonair, silver-tongued, and effortlessly charismatic CEOs of present-day tech giants. Babbage was a quirky individual to say the least. He was highly observant, but was in the same breath a habitual daydreamer, often caught in a trance of deep thought. He spoke with a stutter, cared little about his appearance, often sporting stained collars and rumpled coats, and in his later years became something of an agoraphobe, developing a disdain for crowds and music. In 1930, the West was still freshly reeling from the cataclysmic stock market crash previous October, and British Prime Minister Ramsay MacDonald was struggling himself to prevail over a reality that is as irremediable as it is inextricable: preserving the Gold Standard and providing adequate aid to the poor and unemployed, the latter of which there were reportedly two million of by year's end. It was amidst this bleak atmosphere that a peerlessly profound young mind in South West England first envisioned a concept so momentous that it ultimately led to the creation of what is now considered the world's first computer. This young man was none other than Alan Turing, who was far from the suave, pipe-puffing dandy that many might associate with such a grand and futuristic idea. At the same time, Turing was hardly the kind of two-dimensional, stereotypically bookish character whose light bulb suddenly went off during an experiment binge either. On the contrary, Alan was a gauche and grief-stricken 17-year-old schoolboy who would channel all the pain and confusion from his poignant heartbreak into his tireless research, paving the path for the deeply

transformative Computer Age. Charles Babbage and Alan Turing: The Lives and Careers of the English Mathematicians Who Revolutionized Modern Computer Science chronicles both polymaths' stories and their impact on computing. Along with pictures depicting important people, places, and events, you will learn about Charles Babbage and Alan Turing like never before.

**Faster Than Thought** B. V. Bowden 1957

**The Universal Computer** Martin Davis 2018-10-08

The breathtakingly rapid pace of change in computing makes it easy to overlook the pioneers who began it all. Written by Martin Davis, respected logician and researcher in the theory of computation, *The Universal Computer: The Road from Leibniz to Turing* explores the fascinating lives, ideas, and discoveries of seven remarkable mathematicians. It tells the stories of the unsung heroes of the computer age – the logicians. The story begins with Leibniz in the 17th century and then focuses on Boole, Frege, Cantor, Hilbert, and Gödel, before turning to Turing. Turing's analysis of algorithmic processes led to a single, all-purpose machine that could be programmed to carry out such processes—the computer. Davis describes how this incredible group, with lives as extraordinary as their accomplishments, grappled with logical reasoning and its mechanization. By investigating their achievements and failures, he shows how these pioneers paved the way for modern

computing. Bringing the material up to date, in this revised edition Davis discusses the success of the IBM Watson on Jeopardy, reorganizes the information on incompleteness, and adds information on Konrad Zuse. A distinguished prize-winning logician, Martin Davis has had a career of more than six decades devoted to the important interface between logic and computer science. His expertise, combined with his genuine love of the subject and excellent storytelling, make him the perfect person to tell this story.

**The Once and Future Turing** S. Barry Cooper 2016-03-24 Alan Turing (1912–1954) made seminal contributions to mathematical logic, computation, computer science, artificial intelligence, cryptography and theoretical biology. In this volume, outstanding scientific thinkers take a fresh look at the great range of Turing's contributions, on how the subjects have developed since his time, and how they might develop still further. The contributors include Martin Davis, J. M. E. Hyland, Andrew R. Booker, Ueli Maurer, Kanti V. Mardia, S. Barry Cooper, Stephen Wolfram, Christof Teuscher, Douglas Richard Hofstadter, Philip K. Maini, Thomas E. Woolley, Eamonn A. Gaffney, Ruth E. Baker, Richard Gordon, Stuart Kauffman, Scott Aaronson, Solomon Feferman, P. D. Welch and Roger Penrose. These specially commissioned essays will provoke and engross the reader who wishes to understand better the lasting significance of one of the twentieth century's deepest thinkers.