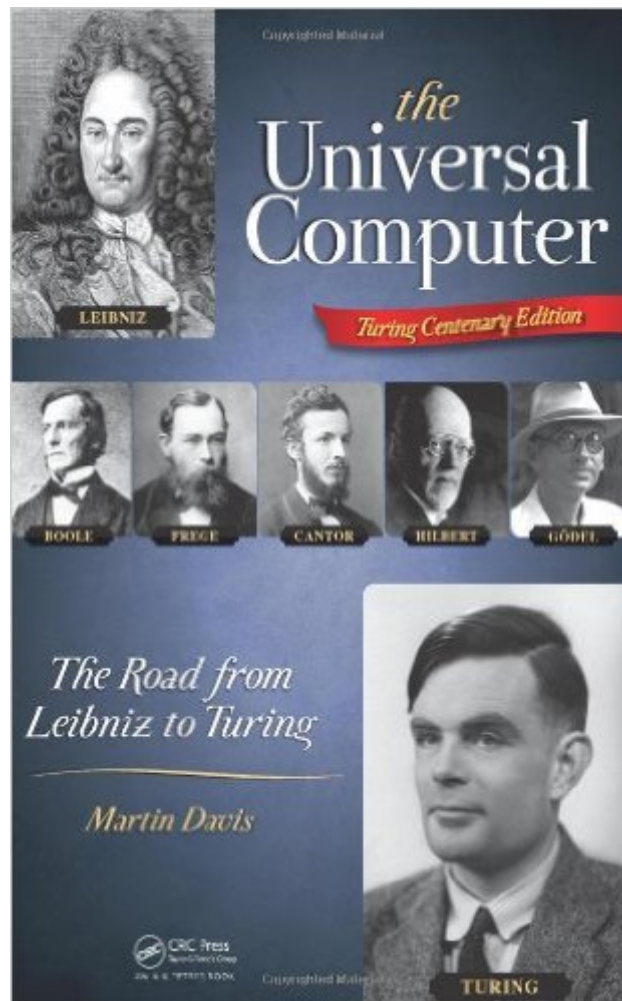# The Universal Computer: The Road From Leibniz To Turing

Synopsis

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 â " the logicians. The story begins with Leibniz in the 17th century and then focuses on Boole, Frege, Cantor, Hilbert, and GÃ¶del, before turning to Turing. Turingâ ™s analysis of algorithmic processes led to a single, all-purpose machine that could be programmed to carry out such processesâ •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.

Book Information

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Customer Reviews

This is one of the best popular books on computer science or mathematics in years. Most authors in this area (e.g., Berlinski) have no special expertise in the subject matter or its history; that doesn't

guarantee a bad book, but makes it hard to write a good one. Davis is a refreshing exception:* He is a brilliant researcher, who made fundamental contributions to areas such as computability (the Davis-Putnam- Robinson theorem, related to Hilbert's 10th problem) and algorithms (the Davis-Putnam algorithm for solving satisfiability problems).* He is a master expositor (his 1958 book "Computability and Unsolvability" was one of the very first textbooks in its area, yet it is still widely read today despite the many other books written on this subject over the past 42 years).* He has spent the last twenty years studying the history of logic and computation.Davis's book is all one would hope for given his qualifications. It is insightful and engaging, and full of fascinating information that is hard to find elsewhere. I cannot imagine a better book on this subject.

This popular treatment of the development of computing turned out to be a book that I simply couldn't put down. Martin Davis interlaces the lives of the people who laid the groundwork for computing (and what interesting lives they led!) with a very understandable treatment of the technical side of the underpinnings of computing. I've heartily recommended this to my friends--technical minded and not--as book I think they really want to read.

Dr. Martin Davis' book is excellent! It starts out to be biographies of seven great mathematicians/logicians, but is so much more. You get inside the heads of these great men, but you also learn about their lives, the world in which they lived, world history, and the mathematics that they developed. Dr. Davis has a way of presenting the math in a style that practically anyone can understand with a little effort. Also, Dr. Davis adds anecdotes about some of the men in his book because he knew them or heard them speak. Also, Dr. Davis is a math/logic professor with many years of experience. The book presents the material so the reader feels like he's reading an exciting story. The book is exciting and energetic. For anyone with an interest in science or math, computers, technology, this is a worthwhile read. Students entering college would especially benefit from the book as it might give their course of study some new meaning and provide additional motivation to learn and achieve.

This book traces the contributions of mathematical logicians to the development of modern day computers. Its cast of characters begins with Gottfried Leibnitz in the 17th century, continues with George Boole in the 19th century, Gottlob Frege and David Hilbert straddling the 19th and 20th centuries, and ends with Kurt Goedel, Alan Turing and John von Neumann in the 20th century. The author brings these great scientists to life by describing their works in the context of their lives and

times. He shows that despite their exceptional intellects, they often had difficult obstacles to overcome, both in their own frailties as well as in their adversaries.The book's main theme is that although modern computers were born out of the need to do heavy number crunching during WWII, their foundation is in logic, the very logic by which our own brains work. It tells a compelling story of how the quest for understanding of the very foundations of mathematics led to the development of the machines that we have come to depend on so heavily in our daily lives.There are a few places where the reading becomes a bit difficult as the author outlines the work of Goedel and Turing in the early part of the 20th century. Nevertheless, this book is quite readable overall and very enjoyable (as soon as I finished reading it the first time, I immediately started reading it again). I recommend it to general reader who would like to know more about the theoretical underpinnings of computers.The only comment I have is that all of the mathematicians covered were from Germany, England and the United States. I was left wondering if there might be contributors from other countries that were overlooked.

An entertaining book that will be enjoyed by anyone interested in mathematical logic or computation theory. Davis weaves history, anecdote, and mathematics into an exciting sketch of the major developments in mathematical logic and their role in the development of the computer. He does a commendable job in explaining the mathematics in an accessible fashion, without distorting it by over-simplification. A good book for people new to the field as well as those already familiar with these stories.

I thought that this book was an excellent overview of the development of logical thought and it's relevance to the modern computer. Davis does a superior job of energizing a subject that is admittedly a little dull. I found myself rereading several of the sections to try to better understand some of the math involved, but overall, I think Davis found a nice balance between the complexity of the math and the history of logic. My one serious criticism of the book is that I found the chronology to be tough to follow, and I often found myself referring back to previous chapters to try and get a better sense of when events were happening. It is natural to assume that a book like this is presented in chronological fashion. The Universal Computer generally is presented that way, but there are some events that happen more or less simultaneously. This is important to the overview of the history of the field. I think the book could actually use a graphical timeline with the birth dates of the mathematicians and the significant events (i.e. 1902 - Russell's letter to Frege, etc.) that are involved. Other than that, the book is informative and enjoyable for those interested in the origins of

the modern computer.

The Universal Computer: The Road from Leibniz to Turing The Man Who Knew Too Much: Alan Turing and the Invention of the Computer (Great Discoveries) HACKING: Beginner's Crash Course - Essential Guide to Practical: Computer Hacking, Hacking for Beginners, & Penetration Testing (Computer Systems, Computer Programming, Computer Science Book 1) Alan Turing: The Enigma Man Mechanical Intelligence, Volume 1 (Collected Works of A.M. Turing) El Tono Universal [The Universal Tone]: Mi Historia en la Luz [My History in the Light] Historia universal / 23 / America Latina. III: De la independencia a la segunda guerra mundial (Historia Universal Siglo XXI) (Spanish Edition) The BaZi Road To Success: Take The Road To Success In Search of Captain Zero: A Surfer's Road Trip Beyond the End of the Road The Road In Is Not the Same Road Out: Poems Jack Kerouac: Road Novels 1957-1960: On the Road / The Dharma Bums / The Subterraneans / Tristessa / Lonesome Traveler / Journal Selections (Library of America) Rand McNally 2017 EasyFinder® Midsize Road Atlas (Rand Mcnally Road Atlas Midsize Easy to Read) Rand McNally 2017 Gift Road Atlas (Durable vinyl cover) (Rand Mcnally Road Atlas United States/ Canada/Mexico (Gift Edition)) Collins Ireland: Handy Road Atlas 2015*** (International Road Atlases) The Bicycling Guide to Complete Bicycle Maintenance & Repair:Â For Road & Mountain Bikes (Bicycling Guide to Complete Bicycle Maintenance & Repair for Road & Mountain Bikes) MYSQL Programming Professional Made Easy 2nd Edition: Expert MYSQL Programming Language Success in a Day for any Computer User! (MYSQL, Android programming, ... JavaScript, Programming, Computer Software) SQL Handbook: Learning The Basics Of SQL Programming (Computer Science Programming) (Computer Programming For Beginners) Computer Architecture, Fifth Edition: A Quantitative Approach (The Morgan Kaufmann Series in Computer Architecture and Design) Computer Organization and Design, Fourth Edition: The Hardware/Software Interface (The Morgan Kaufmann Series in Computer Architecture and Design) Computer Architecture: A Quantitative Approach (The Morgan Kaufmann Series in Computer Architecture and Design)