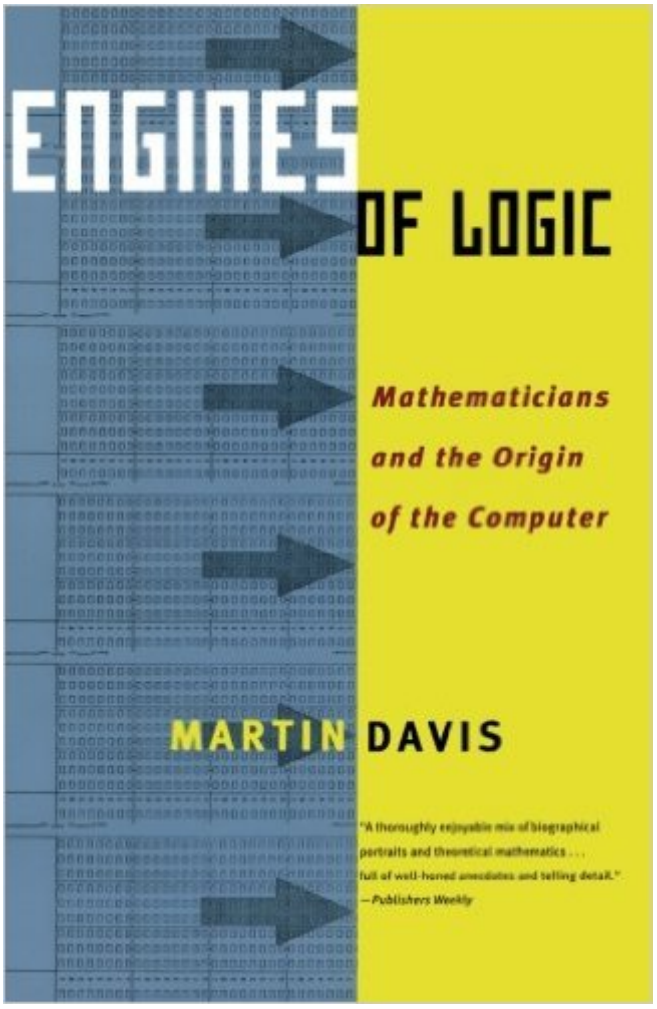
Engines Of Logic: Mathematicians And The Origin Of The Computer



Synopsis

Computers are ubiquitous yet to many they remain objects of irreducible mystery. This text looks at the question of how today's computers can perform such a variety of tasks if computing is just glorified arithmetic. The author illustrates how the answer lies in the fact that computers are essentially engines of logic and that their hardware and software embody concepts developed over centuries by logicians. "Engines of Logic" gives the reader a clear explanation of how and why computers work.

Book Information

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Customer Reviews

It may be initially hard to connect Leibniz's series or George Cantor's quest for infinite numbers to the modern computer, but Dr. Davis does a masterful job of showing this logical progression. The progression continues to Godel and Turing, and from Turing to the modern computer.Combining clear discussions of mathematical concepts with short biographical sketches, the intensity of some of these logical debates becomes clear. For the 20th century figures, Davis offers first hand accounts, such as seeing Godel and Einstein walking together at Princeton (and this picture is included in the book), or his own 1954 computer program of a mathematical proof.On the question of who invented the computer, Dr. Davis sides toward Turing and the influence of Turing on von Nuemann (contrast with Herman Goldstine: the Computer from Pascal to von Neumann). Davis points out that the difference in architecture between Turing and von Nuemann is still evident today in the difference between RISC and full instruction set computers. In the final chapter, Davis debates John Searle's understanding of the mind and consciousness. I hope Davis writes a book

about the logical connections after Turing. These include Maurice’s Karnaugh’s method of minimizing boolean expressions, Jay Forester’s memory and Industrial Dynamics, and perhaps Ted Codd and C.J. Dates database thinking.

A truly excellent book. Both as a ’history of ideas’ and in its consideration of the personal trials and tribulations faced by Leibniz, Frege, Boole, Hilbert, Cantor, Godel, and Turing. The book traces the development of the computer through the life and work of these logicians/mathematicians, from Leibniz’s dream of a language of symbolic logic and a machine capable of producing and testing true propositions in that language. This book is relevant not only to philosophers, mathematicians, and computer scientists, but to writers who seek understanding of the relations between language and logic in the contemporary electronic landscape. It will also be a good read for anyone wishing to understand the intellectual atmospheres from which the computer arose.And it is poignant in its reflections on the fate of some of the most gifted logicians in history. Cantor spent a lot of time in sanitoriums; Godel starved himself to death over paranoia that his food was being poisoned; Alan Turing probably committed suicide by eating a poisoned apple.Martin Davis is himself a renowned logician, and he approaches this writing with a depth of experience, knowledge, and human concern that makes this book a must-read.By the way, the hardcover and the softcover editions have different names. The hardcover edition is called "The Universal Computer: The Road from Leibniz to Turing".

This book has deservedly been reviewed in glowing 5-star terms in its hardcover version ("The Universal Computer"). This paperback edition is the same book. If you want to understand the ideas behind computers, this is the book for you!

This short, easy read is a great historical introduction to computers and some of the figures and concepts behind their origins. The reader should be aware that this book is very light on mathematics, which I saw as a drawback considering the author’s well known talents for exposition. Nevertheless, the narrative is interesting and he often touches on interesting philosophical questions. One particularly delightful passage discusses the fact that the real numbers outnumber numerical definitions -- something apparently known to Cantor and other mathematicians at the dawn of set theory. I’d never heard this and it has since set me off looking for some of these proofs. So, I tip my hat to Dr. Davis for sharing his insightful views. As far as pop-sci goes, this is grade A.Note: there is a dicussion of the the indefinability of real numbers in G. Chaitin’s Meta-Math.

Seems this result is still getting attention for it’s oddness.

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