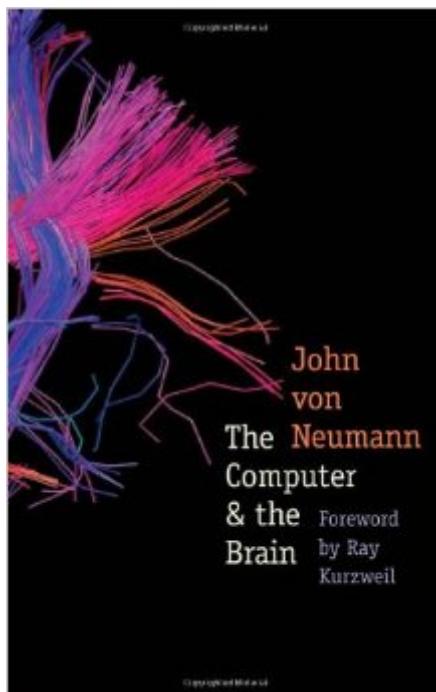


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The Computer And The Brain (The Silliman Memorial Lectures Series)



Synopsis

In this classic work, one of the greatest mathematicians of the twentieth century explores the analogies between computing machines and the living human brain. John von Neumann, whose many contributions to science, mathematics, and engineering include the basic organizational framework at the heart of today's computers, concludes that the brain operates both digitally and analogically, but also has its own peculiar statistical language. In his foreword to this new edition, Ray Kurzweil, a futurist famous in part for his own reflections on the relationship between technology and intelligence, places von Neumann's work in a historical context and shows how it remains relevant today.

Book Information

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Customer Reviews

John von Neumann was the principal architect (in 1945) of the design from which all subsequent electronic computers trace their lineage. As he was dying of bone cancer, this giant of 20th Century mathematics and physics wrote the last of his 150 research papers, "The Computer and the Brain". In 80 pages, von Neumann describes the key components and processes of computers and of brains and then analyzes their similarities and differences. Developments in both computer science and neuroscience during the intervening six decades have corroborated his overall analysis. Von Neumann had a better grasp in 1956 than proponents of AI have today of what differentiates artificial intelligence (computers) from biological intelligence (brains). In the last section

of "The Computer and the Brain", von Neumann goes to considerable lengths to explain exactly how computers differ from brains:"It should also be noted that the message-system used in the nervous system, as described in the above, is of an essentially statistical character. In other words, what matters are not the precise positions of definite markers, digits, but the statistical characteristics of their occurrence, i.e., frequencies of periodic or nearly periodic pulse-trains, etc."Thus the nervous system appears to be using a radically different system of notation from the ones we are familiar with in ordinary arithmetic and mathematics. Instead of the precise systems of markers where the position--and presence or absence--of every marker counts decisively in determining the meaning of the message, we have here a system of notations in which the meaning is conveyed by the statistical properties of the message.

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