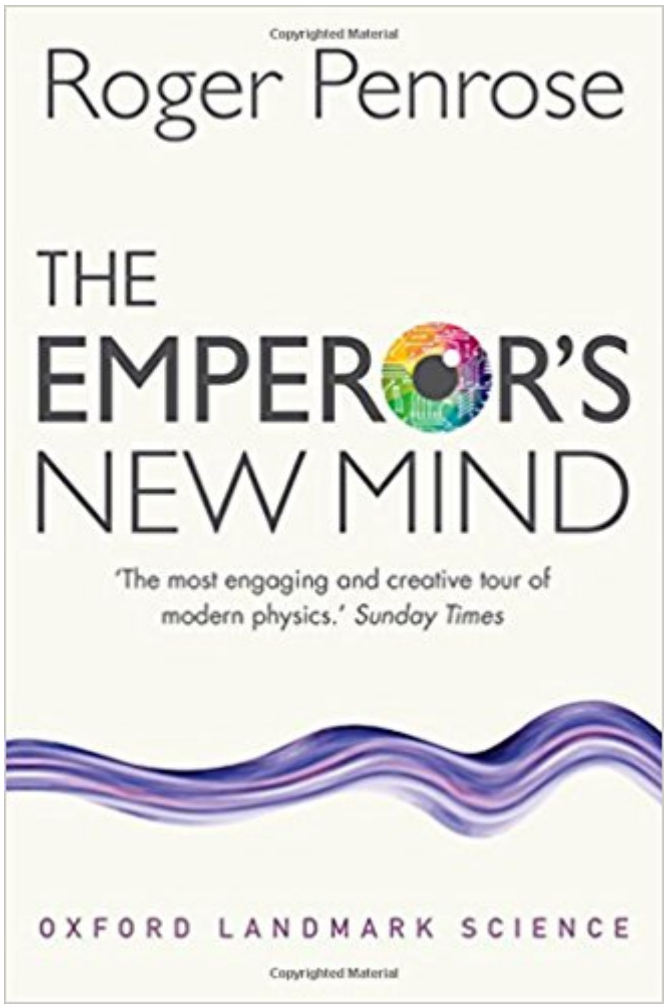
The Emperor's New Mind: Concerning Computers, Minds, And The Laws Of Physics (Oxford Landmark Science)



Synopsis

For many decades, the proponents of `artificial intelligence' have maintained that computers will soon be able to do everything that a human can do. In his bestselling work of popular science, Sir Roger Penrose takes us on a fascinating tour through the basic principles of physics, cosmology, mathematics, and philosophy to show that human thinking can never be emulated by a machine.Oxford Landmark Science books are 'must-read' classics of modern science writing which have crystallized big ideas, and shaped the way we think.

Book Information

Series: Oxford Landmark Science

Paperback: 640 pages

Publisher: Oxford University Press; Revised edition (July 1, 2016)

Language: English

ISBN-10: 0198784929

ISBN-13: 978-0198784920

Product Dimensions: 7.7 x 1.5 x 5 inches

Shipping Weight: 1 pounds (View shipping rates and policies)

Average Customer Review: 4.2 out of 5 stars 116 customer reviews

Best Sellers Rank: #249,504 in Books (See Top 100 in Books) #74 inÃ Â Books > Textbooks > Computer Science > Artificial Intelligence #200 inÃ Â Books > Computers & Technology > Computer Science > AI & Machine Learning > Intelligence & Semantics #880 inÃ Â Books > Textbooks > Science & Mathematics > Physics

Customer Reviews

"perhaps the most engaging and creative tour of modern physics that has ever been written" --Sunday Times"A superb book... provocative and absorbing" --Physics Today"A bold, brilliant, groundbreaking work... When Mr Penrose talks, scientists listen" --New York Time Book Review". . One cannot imagine a more revealing self-portrait than this enchanting, tantalising book... Roger Penrose reveals himself as an eloquent protagonist, not only of the wonders of mathematics, but also of the uniqueness of people." --Nature"I fail to see how anybody can remain unmoved by the book's central theme, which concerns the nature of human beings... His style is relaxed and entertaining, There are nuggets on almost every page." --Financial Times

Roger Penrose, University of OxfordSir Roger Penrose OM FRS is the Emeritus Rouse Ball

Professor of Mathematics at the Mathematical Institute of the University of Oxford, as well as an Emeritus Fellow of Wadham College. He is known for his work in mathematical physics, in particular for his contributions to general relativity and cosmology. His books include Shadows Of The Mind (Vintage, 1995); The Road to Reality (Vintage, 2006); and The Nature of Space and Time, co-authored with Stephen Hawking (Princeton University Press, 2015). He has received several prizes and awards, including the 1988 Wolf Prize for physics, which he shared with Stephen Hawking for their contribution to our understanding of the universe.

As a junior Ph.D. student who hopes to have a career in the research of artificial intelligence (machine learning or deep learning more precisely), I was reading this book as a touch on the opposite of the belief that intelligence is achievable by machines. Apart from several of his dramatic tones towards mocking A.I. (what was that story in the pro- and epi-logue about?), this book has been a very enjoyable experience for me.Roger Penrose is definitely one scientist that holds a very strong opinion on this opposite, and I do have to say that he is undoubtedly good at explaining his arguments. This book did a good job at disseminating a set of fundamental ideas from a physics perspective in relation to some very philosophical and mathematical issues. From my reading, there are two streams of ideas in the book. The first one is from mathematics, including the introduction of algorithms, Turing machines and logical proof systems. The second one is from physics, from classical mechanics to relativity and quantum mechanics and beyond. The interaction of these two streams by itself is worth reading by anyone who is pondering on the fundamental doubts of the mind, intelligence and conciousness.From the first stream, the bookÃƒÂ¢Ã â ¬Ã â„¢s main argument rests on the Turing halting problem and GÃƒÂ¶delÃƒÂ¢Ã â ¬Ã â„¢s incompleteness theorems. From these theorems, he argues that machines could not be like humans since it could not know the truthness of these self-referencing statements. I am not yet convinced by this seemingly sound argument, because it rests on the fact that there is certain statement about the system itself that it could not know true or false. We humans could perceive that these incomplete statements are true, because we are not these systems therefore they are not self-referencing statements for ourselves. We do not have an answer to whether we ourselves are free from these incomplete limitations, since if we had the answer it would violate the incompleteness theorems. Who knows, maybe some aliens would think of us as no difference from we think of the machines, and apply a form of CantorÃƒÂ¢Ã â ¬Ã â„¢s diagonalization to say that ÃƒÂ¢Ã â ¬Ã Å“look, humans cannot have mind because they cannot understand these true statements that are obvious to usÃƒÂ¢Ã â ¬Ã Â•! As a result, the presumption that humans are free from incompleteness is

one most ridiculous hidden idea in the book.In the second stream, the book became much more constructive. It is a great journey to explore the searching of an explanation for the mind through the vast space of knowledge in physics. However, throughout the arguments, the ideas could only belong to a set of speculations. This is not a surprise since he argues for the necessity of a correct quantum gravity (CQG) theory to explain the human mind, which should ultimately unify quantum mechanics and general relativity under a single mathematical framework. It is the fact that no such theory yet exists that shakes down many of his arguments and made them merely speculations. As a result, this book in my opinion does a very bad job at opposing artificial intelligence in both streams.In general, the book is still very much enjoyable just because it contains a grand set of fundamental knowledge. It is particularly so reading from a critic point of view. Roger Penrose also has two later books in the same string of thought, which undoubtedly may explain his ideas better and may resolve some of this bookÃƒÂ¢Ã â ¬Ã â„¢s issues. I am looking forward to reading them as valuable thought excercises, but may be after a few books from some other human endeavors.

This book reads like an early draft of Penrose's "Shadows of the Mind." The reader coming afresh to Penrose's ideas would be tempted to skip this earlier book and going straight to Shadows, where the ideas are much more fully developed. The interesting aspect of the earlier work, however, is to see how Penrose's thinking was evolving, purely along physical lines, before he teamed up with the medico and neuroscientist, Stuart Hameroff. It would be a mistake to skip this book, because it is far more readable than "Shadows," the later work being so detailed and technical that many will simply give up on it.The Emperor's New Mind concentrates on the limitations of formal mathematical logic , and how human consciousness can stretch past these limitations. Much of this argument is based on Godel's theorems about the limitations of formal systems of logic. Penrose concludes that Artificial Intelligence programs will never, no matter how far computer science develops, be able to produce the kind of conceptual understanding which is characteristic of human consciousness. In a metaphysical leap, he proposes that consciousness is an essentially quantum phenomenon. He gives the "collapse of the wave-function," familiar from conventional interpretations of quantum mechanics, an enhanced status as a real physical effect, and proposes that it is mediated by some effect in Quantum Gravity.Granted that a conscious observer has featured prominently in discussions of the "measurement problem" from the very beginnings of quantum theory, and that no agreed position has emerged in nearly a century of debate, Penrose's proposal to make the collapse of the wave-function an objective process, and to tie consciousness to it, has more merit than the metaphysical flavour might at first suggest.

The Emperor’s New Mind is an interesting take on the concept of Artificial Intelligence. The basic premise is that, contrary to what AI supporters have been insisting for decades, the idea that any machine could somehow become capable of actual thinking is a completely unfounded concept based on flawed reasoning.Penrose’s main argument is that all computers must necessarily run according to algorithms. Even if someone could somehow construct a "quantum computer" (which is doubtful) this would still be operating in an algorithmic manner. The mind, on the other hand, operates non-algorithmically. As such, no computer nor any machine could ever hope to replicate a mind no matter how advanced said machine may be.Of course, this is a rather simplified overview of Penrose’s argument. To get a better idea of the points he makes, one can do no better than read the book, where the arguments are presented in a good and convincing way.One criticism I have of the book is that it takes a LONG time to get to the point. In fact, despite being a book about why "strong AI" is implausible, most of the book seems to be about mathematics and theoretical physics. Granted, maths and physics does tie in to Penrose’s arguments against "strong AI", but he seems to go into excessive detail. Surely just a brief overview of the maths and physics underlying his arguments would have been sufficient.As a consequence of all the detail put into all the maths and physics info, the actual arguments about AI don’t go into nearly as much detail as they could. This is unfortunate, as I had been hoping for a more detailed set of arguments showing the flaws of "strong AI" claims. Still, what was presented was still pretty well argued.Overall, an interesting book and a good source of info for understanding why claims about thinking machines don’t hold up even close to as well as the claims’ proponents would try to have one believe.

Guide (Landmark Visitors Guides) (Landmark Visitors Guide Riga & the Beaches) Landmark Visitors Guide Iceland (Landmark Visitors Guides) St. Lucia (Landmark Visitors Guides Series) (Landmark Visitors Guide St. Lucia) Master Your Mind: Achieve Greatness by Powering Your Subconscious Mind [mental power, mind control, thought control] (brain power, subconcious mind power, NLP, Neuro Linguistic Programming) Speaking Our Minds: Conversations With the People Behind Landmark First Amendment Cases (Routledge Communication Series) Friction and the Laws of Motion - Physics Made Simple - 4th Grade | Children's Physics Books 100 Instructive Calculus-based Physics Examples: The Laws of Motion (Calculus-based Physics Problems with Solutions) Essential Calculus-based Physics Study Guide Workbook: The Laws of Motion (Learn Physics with Calculus Step-by-Step Book 1) Six Ideas That Shaped Physics: Unit R - Laws of Physics are Frame-Independent Six Ideas That Shaped Physics: Unit C - Conservation Laws Constrain Interactions (WCB Physics)