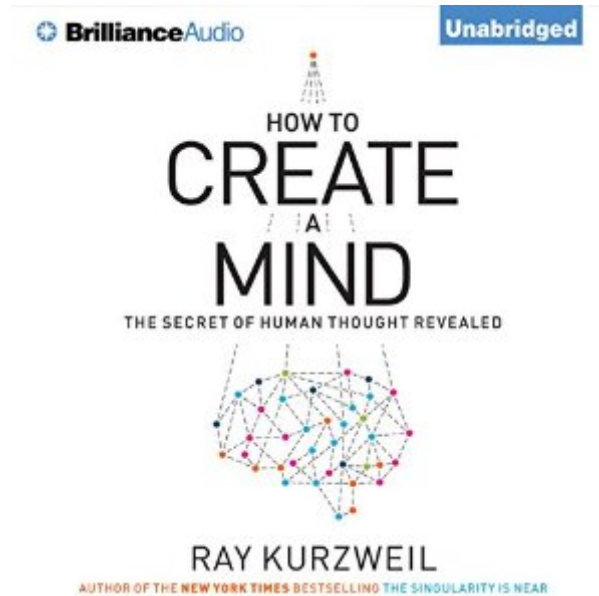# How To Create A Mind: The Secret Of Human Thought Revealed

Synopsis

Ray Kurzweil, the bold futurist and author of the New York Times best seller The Singularity Is Near, is arguably today's most influential technological visionary. A pioneering inventor and theorist, he has explored for decades how artificial intelligence can enrich and expand human capabilities. Now, in his much-anticipated How to Create a Mind, he takes this exploration to the next step: reverse-engineering the brain to understand precisely how it works, then applying that knowledge to create vastly intelligent machines. Drawing on the most recent neuroscience research, his own research and inventions in artificial intelligence, and compelling thought experiments, he describes his new theory of how the neocortex (the thinking part of the brain) works: as a self-organizing hierarchical system of pattern recognizers. Kurzweil shows how these insights will enable us to greatly extend the powers of our own mind and provides a road map for the creation of super-intelligence - humankind's most exciting next venture. We are now at the dawn of an era of radical possibilities in which merging with our technology will enable us to effectively address the world's grand challenges. How to Create a Mind is certain to be one of the most widely discussed and debated science books in many years - a touchstone for any consideration of the path of human progress.

Book Information

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Customer Reviews

How to Create a Mind: The Secret of Human Thought Revealed by Ray Kurzweil"How to Create a Mind" is a very interesting book that presents the pattern recognition theory of mind (PRTM), which

describes the basic algorithm of the neocortex (the region of the brain responsible for perception, memory, and critical thinking). It is the author's contention that the brain can be reverse engineered due to the power of its simplicity and such knowledge would allow us to create true artificial intelligence. The one and only, futurist, prize-winning scientist and author Ray Kurzweil takes the reader on a journey of the brain and the future of artificial intelligence. This enlightening 352-page book is composed of the following eleven chapters: 1. Thought Experiments on the World, 2. Thought Experiments on Thinking, 3. A Model of the Neocortex: The Pattern Recognition Theory of Mind, 4. The Biological Neocortex, 5. The Old Brain, 6. Transcendent Abilities, 7. The Biologically Inspired Digital Neocortex, 8. The Mind as Computer, 9. Thought Experiments on the Mind, 10. The Law of Accelerating Returns Applied to the Brain, and 11. Objections.Positives:1. Well researched and well-written book. The author's uncanny ability to make very difficult subjects accessible to the masses.2. A great topic in the "mind" of a great thinker.3. Great use of charts and diagrams.4. A wonderful job of describing how thinking works.5. Thought-provoking questions and answers based on a combination of sound science and educated speculation.6. The art of recreating brain processes in machines. "There is more parallel between brains and computers than may be apparent." Great stuff!7. Great information on how memories truly work.8. Hierarchies of units of functionality in natural systems.9. How the neocortex must work. The Pattern Recognition Theory of Mind (PRTM). The main thesis of this book. The importance of redundancy. Plenty of details.10. Evolution...it does a brain good. Legos will never be the same for me again.11. The neocortex as a great metaphor machine. Projects underway to simulate the human brain such as Markram's Blue Brain Project.12. Speech recognition and Markov models. Author provides a lot of excellent examples.13. The four key concepts of the universality and feasibility of computation and its applicability to our thinking.14. A fascinating look at split-brain patients. The "society of mind." The concept of free will, "We are apparently very eager to explain and rationalize our actions, even when we didn't actually make the decisions that led to them." Profound with many implications indeed.15. The issue of identity.16. The brain's ability to predict the future. The author's own predictive track record referenced.17. The laws of accelerating returns (LOAR), where it applies and why we should train ourselves to think exponentially.18. The author provides and analyzes objections to his thesis. In defense of his ideas. Going after Allen's "scientist's pessimism."19. The evolution of our knowledge.20. Great notes and links beautifully.Negatives:1. The book is uneven. That is, some chapters cover certain topics with depth while others suffer from lack of depth. Some of it is understandable as it relates to the limitations of what we currently know but I feel that the book could have been reformatted into smaller chapters or subchapters. The book bogs down a little in

the middle sections of the book.2. Technically I disagree with the notion that evolution always leads to more complexity. Yes on survival but not necessarily on complexity.3. The author has a tendency to cross-market his products a tad much. It may come across as look at me...4. A bit repetitive.5. Sometimes leaves you with more questions than answers but that may not be a bad thing...6. No formal separate bibliography.In summary, overall I enjoyed this book. Regardless of your overall stance on the feasibility of artificial intelligence no one brings it like Ray Kurzweil. His enthusiasm and dedication is admirable. The author provides his basic thesis of how the brain works and a path to achieve true artificial intelligence and all that it implies. Fascinating in parts, bogs down in other sections but ultimately satisfying. I highly recommend it!Further suggestions: "Subliminal: How Your Unconscious Mind Rules Your Behavior" by Leonard Mlodinow, "The Believing Brain: From Ghosts and Gods to Politics and Conspiracies---How We Construct Beliefs and Reinforce Them as Truths" by Michael Shermer, "The Scientific American Brave New Brain: How Neuroscience, Brain-Machine Interfaces, Neuroimaging, Psychopharmacology, Epigenetics, the Internet, and ... and Enhancing the Future of Mental Power" by Judith Horstman, "The Blank Slate: The Modern Denial of Human Nature" by Steven Pinker, "Who's in Charge?: Free Will and the Science of the Brain" and "Human: The Science Behind What Makes Us Unique", by Michael S. Gazzaniga, "Hardwired Behavior: What Neuroscience Reveals about Morality 1st Edition by Tancredi, Laurence published by Cambridge University Press Paperback" by Laurence Tancredi, "Braintrust: What Neuroscience Tells Us about Morality" by Patricia S. Churchland, "The Myth of Free Will" by Cris Evatt, "SuperSense" by Bruce M. Hood and "The Brain and the Meaning of Life" by Paul Thagard.

Like a news commentator explaining a bad day on Wall Street,the cortex has an explanation for everything -it generates our subjective universe. To paraphrase George Box,all our brain's models of the world are wrong,but some are useful, generative, and simple (but not too simple).In How to Create a Mind acclaimed inventor Ray Kurzweilputs forth a model of how the brain works:the pattern recognition theory of mind (PRTM).The brain successively interiorizes the world as a set of patterns.Kurzweil's framework uses hierarchical hidden Markov models (HHMMs)as its main stock in trade. HHMMs add to the PRTM model the notionthat those patterns are arranged into a hierarchy of nodes,where each node is an ordered sequence of probabilistically matched lower nodes.So, the key question for me is this: are HHMMsreally the key to understanding and building a mind?Ray has been on this track since the sixties,when he and I were classmates at MIT. In a spectacularcareer spanning decades, Ray invented systems for OmniPage OCR,text to speech (famously for Stevie Wonder), andautomated speech recognition as in Dragon Naturally

Speaking.Nuance bought Ray's precursor company.All automatic speech recognition nowadays is done using HHMMs,and the results are astounding. For example, see Microsoft ResearchChief Rick Rashid's YouTube "Speech Recognition Breakthrough."A computer transcription of Rick's talk appears inreal time and is quite accurate.The amazing success of HHMMs in handling speech and language isa story that needs to be understood by AI aficionados, andKurzweil presents this topic in a beautifully comprehensible exposition.Kurzweil elaborates a story here that 1) the cortex isthe key to thought; 2) it is hierarchically organized into300 million pattern recognizers; 3) each pattern recognizerconsists of a 100 neurons in a vertical minicolumn, and4) those pattern recognizers communicate with one anothervia a Manhattan-like grid (similar to an FPGA) -end of story for the neocortex.This is a story similar to the one told by entrepreneur Jeff Hawkins inOn Intelligence, and one that Hawkins, his former associate Dileep George(now at Vicarious), and Kurzweil himself are trying to capitalize onin cortex-engineering startups. I eagerly follow their results.So, HHMMs work well and are a required part of a computationalneuroscience curriculum, but ARE THEY THE MASTER KEY that will unlockthe doors not only to a full understanding of the mindbut also to a future of superintelligent AIs? How to Create a Mindis a good story but IS IT FICTION or nonfiction?While HHMMs are required reading for automatic speech recognition,they DO NOT DO all the brain's heavy-lifting. Rather, the brain employsMANY mechanisms (which robots that aspire to humanitymay need to incorporate or emulate.)Five stars for HHMM exposition. Subtract one star for giving short shriftto the following pivotal neuroscience principles: 1) attentional mechanisms,2) brain-wide dynamical networks, 3) gamma oscillations and inhibitory networksand also 5) the role of insula and brain stem in emotion, 6) reward based learningincluding the essential role of basal ganglia and midbrain,and 7) hippocampus and memory.Despite its corticocentric focus, Kurzweil's impressive engineeringsuccesses make this an important story; furthermore, it is engagingly told.I cover neuroscience and AI at bobblum.com . Below are two recent 'DO NOT MISS'FIVE STAR stories.)Addendum: 30 Nov 2012 - Today's issue of SCIENCE (and Ray K's newsletter)features a story about a new 2.5M spiking neuron model (SPAUN) thatperforms 8 tasks and outputs to a physically modeled arm.See the videos at NENGO > Videos > Collection of Spaun.That is the state of the art!Addendum: Jan 2013: Want to know where the brain stores meaning? (YOU DO!)See Alex Huth's 5 min YouTube from Jack Gallant's lab. Search:Alex Huth, gallantlabucb "Perceptual Object and Action Maps in the Human Brain."

How to Create a Mind: The Secret of Human Thought Revealed Hold That Thought For Kids: Capturing Precious Memories through Fun Questions, Images, & Conversations (Hold That Thought

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