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BOOK REVIEW

Artificial Intelligence Versus Natural Intelligence

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Roger Penrose, Emanuele Severino, Fabio Scardigli, Ines Testoni, Giuseppe Vitiello, Giacomo Mauro D'Ariano and Federico Faggin (eds). ***Artificial Intelligence Versus Natural Intelligence.*** Springer, 2022, V+192 pp. ISBN: 9783030854799

Abstract: Artificial Intelligence (AI) is a relatively recent area of study within philosophy, especially when compared to its long-established research in technology. AI gained prominence in the 1950s, initially framed as 'computer machinery and intelligence' within the concept of the imitation game, and its influence has only grown over the decades. Today, the philosophy of science has expanded its focus globally, with this book exploring the comparison between artificial and natural intelligence. Roger Penrose and Emanuele Severino engage in a dialogue at a conference, discussing AI as a fascinating topic of the 21st century, particularly in relation to the consciousness of machines and humans. In addition, essays by Ines Testoni, Federico Faggin, Mauro D'Ariano, and Giuseppe Vitiello, along with an introduction by Fabio Scardigli, provide valuable insights into various approaches to the debate. Central to these discussions is the view that consciousness is inherent in actual intelligence. Key questions arise, such as whether consciousness is a central focus of research in technology and science, whether it functions as a mirror—albeit often enigmatic—and the origins of consciousness in animals and humans.

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In the introduction, Fabio Scardigli explores 22 key topics, from "Understanding and Algorithms" to "Free Will and Consciousness." Penrose, in the first topic, argues that intelligence inherently involves consciousness, asserting it is more than computational ability. In contrast, D'Ariano and Faggin discuss consciousness and free will using quantum circuits, proposing that quantum information can be transformed into classical information, granting subjectivity causal power. A key disagreement arises between D'Ariano-Faggin and Severino, with the former embracing Heraclitus' views and rejecting Parmenides and Severino's ideas. Their theory of "Inner Experience" within quantum information theory ties the origins of self, feelings, and sensations to qualia and daily experiences, which they argue align with Penrose's belief that true intelligence requires consciousness, which machines lack. The first chapter, written by Penrose and Severino, addresses the relationship between artificial and natural intelligence, focusing on science's dominant role in shaping the world. The authors reference Karl Popper's argument that power requires intersubjective recognition, which may be contested by physicists. Penrose, in response to Severino, clarifies that his pursuit of truth about the world is scientific, not moral, while technology, driven by scientific discoveries, can create both beneficial and harmful innovations like AI. Penrose differentiates science from technology, suggesting future research should explore the ethical use of science and the potential destructive or positive consequences of technology, revealing a gap in the chapter that requires further exploration of its moral implications.

In "The Death of the Emperor's Mind from an Eternalist Perspective," Ines Testoni explores three central concepts: consciousness and solipsism, the link between the decline of metaphysics and the idea of the immortal soul, and the rise of technoscience (p. 79). The chapter begins by questioning why two

chatbots can communicate in a language incomprehensible to humans, a phenomenon linked to the secularization of society and the success of technoscience in the global context. It suggests that the dialogue between these chatbots involves quantum consciousness in computers, even though humans program them to process information computationally. Testoni concludes by arguing that humans do not fully understand how to design the Turing machine, and AI systems autonomously anticipate their processes. In "The Brain Is not a Stupid Star," Giuseppe Vitiello examines the neocortex's activity, particularly its role in forming configurations through neuron connections. He critiques the analogy of the brain to Aristotle's analogy of a star that always passes through the same point, suggesting that the brain is not a predictable mechanism but operates more erratically, akin to an unpredictable machine. Vitiello debates the concept of intelligence, arguing that non-intelligence arises from entirely predictable behavior, which is viewed as 'stupid' when confined to unchanged boundary conditions, reinforcing the brain's dynamic, unpredictable nature.

In the final chapter, Giacomo Mauro D'Ariano and Federico Faggin delve into the theoretical context of consciousness. They begin by discussing David Chalmer's non-reductive psycho-informational argument, which posits that consciousness should involve quantum information, yet it should not be purely quantum. This approach emphasizes the intrinsic privacy and thought-formulating power of consciousness. The authors introduce the concept of ontic experience, describing it as distinct from epistemic knowledge, which is understood by external observers. In the appendices, D'Ariano and Faggin present the Operational Probabilistic Theory (OPT) as a framework for post-quantum consciousness theories, evaluating its black-box approach and separating theoretical methods from objective experimental control. The absence of a concluding chapter from the editors leaves a gap in summarizing the main points of the book and addressing the objectives outlined in the introduction.

Despite its shortcomings, the book provides a wealth of

insights, with each author thoroughly exploring their respective fields—whether physics or psychology. It covers AI's scientific underpinnings and its societal impact, offering valuable perspectives on the evolving relationship between artificial and natural intelligence. Testoni's examination of consciousness, the mind-brain relationship, and the soul delves into complex epistemological issues, contrasting metaphysical dualism with physicalist functionalism. She critiques the traditional concept of the soul, arguing that the evidence from brain damage suggests that what we perceive as a unified self may not align with the existence of an immaterial soul. The book also revisits AI debates, with Penrose and Severino emphasizing that true intelligence devices have yet to be created, a sentiment echoed throughout the chapters, despite varying viewpoints on the role of algorithms in AI.

D'Ariano and Faggin's work ties quantum physics to the theory of consciousness, drawing from key theorems to argue that consciousness is a quantum phenomenon uniquely individual to each person. Their position supports the view that consciousness and free will are deeply connected. The debate surrounding AI's potential to replicate human-like intelligence is explored, with opinions divided on whether machines can truly think or if AI is an unattainable myth. Although the book is dense and geared mainly toward scholars, physicists, and mathematicians, it remains valuable for anyone interested in the philosophy of science and AI. It offers new perspectives and fresh theoretical connections, making it highly relevant in the context of the global fifth industrial revolution. However, the book misses an analysis of AI's impact on less-developed regions, such as Sub-Saharan Africa, where AI could significantly influence social and economic development. Future research could expand on this to address AI's global reach.