Review of: "Artificial Life from Talos to Qubit"

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Potential competing interests: No potential competing interests to declare.

The text delves into humanity's ancient aspiration to replicate life through mechanical means, stretching back to the era of the ancient Greeks. Despite numerous innovations over time, the machines of the industrial revolution lacked the crucial capacity for evolution, prompting a continuous quest for solutions. The advent of artificial intelligence in the 20th century represented a significant leap forward, yet machines remained limited in their ability to evolve autonomously. This limitation sparked exploration into the realm of quantum mechanics, despite the formidable challenges posed by issues such as measurement, decoherence, and environmental interaction. As the narrative transitions into the historical trajectory of artificial life, it illuminates the journey from ancient myths to contemporary laboratory creations. The text meticulously elaborates on the evolution of the electronics industry, which paved the way for the concept of digital artificial life. It pays homage to the visionary contributions of figures like von Neumann, whose seminal work in the formulation of automata theory and exploration of self-replication laid crucial groundwork. Additionally, it sheds light on Conway's Game of Life, an emblematic example of how digital entities can exhibit emergent behaviors through simple rules. However, the narrative takes a particularly captivating turn as it delves into the realm of quantum computing. Here, the text elucidates the profound differences between classical and quantum computers, emphasizing the revolutionary concepts of quantum superposition and entanglement. With meticulous detail, it explores recent breakthroughs in the nascent field of quantum artificial life. Leveraging sophisticated quantum information protocols, researchers are now able to simulate biological processes with unprecedented fidelity. Notably, an experiment conducted at the University of the Basque Country serves as a testament to this progress, where a twenty-qubit IBM quantum computer was employed to model the intricate dynamics of biological evolution. In conclusion, while the pursuit of artificial life remains an enduring ambition, the advent of quantum computing presents an unprecedented opportunity for advancement. Despite the formidable challenges inherent in harnessing quantum phenomena, the promise of quantum artificial life offers a tantalizing glimpse into a future where synthetic entities may evolve and thrive in ways previously unimaginable.

The paper presents some conceptual errors and inaccuracies:

1) Misinterpretation of Quantum Computers: The original article fails to provide an accurate understanding of quantum computers and their operations. It inadequately explains the differences between quantum and classical computers and does not fully clarify the concept of "quantum supremacy."

2) Confusion about Quantum Artificial Life:

Although the experimental implementation of a model for quantum artificial life on a quantum computer has been done,

the paper seems to confuse concepts such as simulating artificial life with mimicking biological processes in the quantum realm.

3) Inaccuracy in Terminology Usage: The original article employs imprecise and ambiguous terms, such as "quantum supremacy," without providing a clear explanation of the concepts involved.