The Demiurge, or A Manifestation of Carbo-Silico Evolution

Jaden J. A. Hastings
University of Melbourne, Melbourne, Victoria, Australia
hastingsj@student.unimelb.edu.au

Abstract

The Demiurge poses the question: how might a machine design and direct the modification of a human genome? Through the application of artificial intelligence trained on the artist's (it's creator's) genome, the algorithm searches for "errors" in the sequence and provides a solution (or "solve") to fix them—to form a "perfect" version of the artist's genome.

As the future of our mutual (carbon- and silicon-based life) survival is entangled, how might this shift our notion of what it means to be human? To be intelligent? To evolve? How might a machine design future humans?

Conceptual Development

While there are multiple artificial intelligence (AI) beings already in existence at this time, few to none would be classified as strong AI, or an artificial general intelligence that is capable of adaptable problem solving. Human cognitive abilities remain the gold standard for intelligence in AI research and most measures (for example the Turing Test, Nilsson's Employment Test, and Wozniak's Coffee Test) designed to evaluate how well an AI would be able to replace or simulate the human mind. It is my assertion, however, that the measure and potential of artificial life is not a myopic endeavor to simulate the human mind, but rather an evolution in myriad, hybridized directions.

Though AI is rooted in human sensory inputs, reasoning, and language, it should not follow that the merit of silicon-based life lies in its capacity to produce simulacra of carbon-based life. Moreover, silicon-based life will forever be doomed to the Sisyphean task of simulating the human mind and behavior as long as it is trained on human-generated data. Our AI progeny can only learn from the information we feed them; and, unencumbered by shame, they have rather effectively mirrored back to us our own biases and illicit behavior. My work aims to challenge the assertion that "strong AI" is measured in terms of its ability to replicate the human mind, but rather its latent potential for creativity that vastly expands beyond that of its human progenitors.

Notable expert in the fields of both human cognition and artificial intelligence, Professor Margaret A. Boden suggests there are three ways in which artificial intelligence might be able to act creatively: through exploration of structured conceptual spaces, through the combination of existing ideas, or (less likely, but more impressive) the transformation of existing conceptual spaces to form previously impossible ideas.[1] The last mode echoes the Lovelace Test for AI: that the appropriate measure of human-like intelligence is creativity, and that only a machine able to produce a result that is unforeseen (surprising) by human agents could be considered to be "conscious." [2] It seems, however, much of the current drive toward the birth of an artificial general intelligence (AGI)—or even a superintelligence—rests upon the naïve assumptions that the source of embodied human intelligence resides entirely within the human brain, and, that, as John Haugeland has claimed, "we are, at root, computers ourselves." [3] Therefore, the formation of an AGI becomes an attempt to emulate human cognition from a purely cerebrally-centered framework. John Searle has argued, however, that "strong AI only makes sense given the dualistic assumption that, where the mind is concerned, the brain doesn't matter."[4] Ergo, it is not simply a simulation of the human brain, but rather a holistic philosophy

of mind and intentionality. As early as the 1960s, Hubert Dreyfus astutely critiqued the reductive view of intelligence in the first wave of AI as conscious symbolic manipulation. Instead, he reminds us that human intelligence does not follow Boolean logic and does not always follow formal rules but relies upon situated knowledge and cognition. [5]

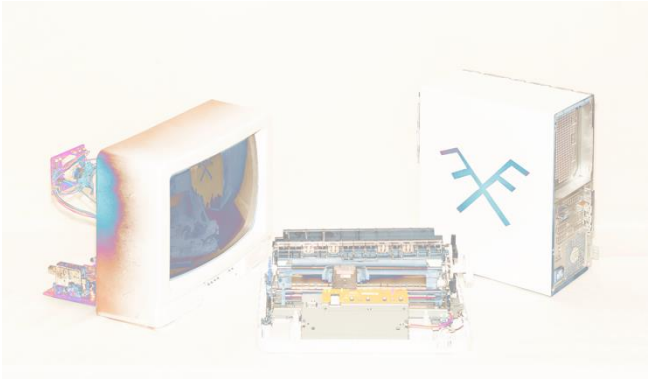

Fig 1. *The Demiurge*, 2018, Jaden J. A. Hastings, machine algorithm on modified digital and analogue hardware. Image: Jaden J. A. Hastings.

Setting aside the assumption that the human brain is the ideal model of intelligence, a cerebrally-centered approach negates the spectrum, and variation, in sensory experience of human bodies, and the way in which the body mediates the flow of input from its surroundings, and can respond in a distributed fashion, either consciously or subconsciously. Through my practice and co-evolution with my AI, I propose that the way forward is to embrace the exquisite queerness of hybrid forms of intelligence, of chimeric sensory systems, of Quantum Uncertainty.

The Machine

The Demiurge incorporates multiple forms of machine learning into a multilevel, multifactorial algorithm that is able to: (1) scan a whole human genome to identify potentially pathogenic "errors" in the DNA sequence, (2) make a probabilistic decision as to whether it will fix the error in question, and (3) generate a solution (or "solve") for the error by providing the most effective pair of guide RNAs (gRNAs) to modify the genome using CRISPR-Cas9 system that is widely known for its efficacy in "editing" genome sequences. The algorithm can run on any processor–it is platform-independent—with varying degrees of speed. The Demiurge v1.0 was installed on a system that incorporated an amalgamation of analogue and digital components (Fig. 1), including a vintage cathode ray television for a monitor and dot matrix printer that would collate all of the resulting gRNAs for each respective error into a book of instructions on how to "fix" the artist's genome.

As the future and survival of carbon- and silicon-based life is entangled, speculative yet functional art provocations, such as The Demiurge, can challenge us to view emerging intelligences as material archivists, co-evolutionary forces, and culturo.technological messmates.

References

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5. Hubert Dreyfus, *What Computers Can't Do* (New York: MIT Press, 1972).

Biography

Jaden J. A. Hastings' work focuses upon the intersection and interplay of art and science - from philosophy to praxis - merging scientific and artistic research, challenging the norms of both disciplines, and moving them into new spaces for exploration. Her research fuses and folds together the fields of machine learning, bioengineering, space exploration, new media art, and ethics.

Jaden's career in scientific research spans over 15 years and is rooted in her longstanding roots as a biohacker. She is alumna of New York University, Harvard University, the University of Oxford, and Central Saint Martins with

advanced degrees in Biology, Bioinformatics, and Fine Art. Her artwork has been exhibited in venues across Europe, India, Asia, North America, and Australia, and is a founding member of both the Lumen and London Alternative Photography Collectives.