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The Silicon Listener: How AI Is Rewriting Our Search for Cosmic Company

AI transforms the search for alien life by detecting non-human patterns in cosmic data, moving beyond our biased assumptions to listen for intelligence in unexpected forms.

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Introduction

For over fifty years, the Search for Extraterrestrial Intelligence (SETI) has been marked by eerie silence, challenging our views of the nature of life in the Universe. This essay will argue that Artificial Intelligence (AI) represents a paradigm shift from anthropocentric radio-based search towards the detection of generic "signatures of intelligence." Through the examination of foundational texts of astrobiology and SETI philosophy, this essay will demonstrate how AI is changing the game in techno signatures search, in detecting biosignatures in the atmosphere of exoplanets and even "weird life" in the proposed shadow biosphere of Earth.

"This is a compelling pull quote that highlights a key insight or striking statistic from the article."

The Conceptual Rut

Fifty years have already passed, during which people listened to the Universe without success with the patience of a fisherman waiting for one tug on a seemingly endless fishing line. As far back as 1960, Frank Drake turned his radio telescope towards Tau Ceti. But according to the opinion of physicist Paul Davies, "since then the silence has been eerie" (Davies, 2010, p. 2). However, the silence is not the answer to the posed question; it is only another limitation of our methods. We are trying to receive the telegraph message from a hurricane.

Traditional SETI had its own very specific supposition about the technology developed by aliens – narrow-band radio signals used for intergalactic broadcasting like a beacon. It was based on anthropocentrism, as explained by physicist Paul Davies in his book *The Eerie Silence*. Why do we assume that the technology created by a million-year-old civilization will be close to that of humans of the twentieth century? In-depth analysis and AI are the answer to the posed question. Astronomer Lisa Kaltenegger, in her book *Alien Earths*, notes that we should search not for life but for "signs of life" (Kaltenegger, 2024, p. 27).

The Great Data Flood

The number of exoplanets found is overwhelming. Thousands of planets have been discovered by the Kepler mission, TESS and the JWST provides us with the atmospheric spectra of these exoplanets. According to Kaltenegger, it would take humans lifetimes to analyse the data (Kaltenegger, 2024, p. 119).

AI-based algorithms are currently being trained on data related to the geological history of our very own Earth. From the sulphurous atmosphere of the Archaean eon to the oxygen-rich atmosphere of the Phanerozoic period. As described by David Catling in his book titled *"Astrobiology: A Very Short Introduction"*, the AI is taught to recognize the chemical disequilibrium in the atmosphere which he says is the characteristic of any habitable planet



(Catling, 2013, p. 118). When JWST analyses an exoplanet such as TRAPPIST-1e, then it will most likely be the machine in the server room which detects a biosignature.

The Shadow Biosphere on Earth

The most significant change could be right here on Earth. According to Davies in his book titled *The Eerie Silence*, there could be a "shadow biosphere", which is a form of microbial life that exists here on Earth, but has origins different from those of life as we know it (Davies, 2010, p. 43). No one knows what this weird life would look like biochemically speaking; it could be made up of arsenic instead of phosphorus as hypothesized by Wolfe-Simon (Davies, 2010, p. 55), or it could possess reversed chirality.

How do you go about looking for something unknown? AI models without any human intervention can examine metagenomic samples collected from extreme environments such as the arsenic-laden Mono Lake talked about by Kaltenegger and determine whether there is anything in the sample with different mathematical logic than our life forms (Kaltenegger, 2024, p. 63).

Discussion: The Post Biological Universe

The classic fear of the Fermi Paradox ("where is everybody?") assumes of a galaxy full of humanoid egos. But what if intelligent life is post-biological? Catling writes that the development of technological intelligence might be contingent upon the "Great Filter," while Davies argues that a civilization that was millions of years more advanced than us would have moved away from biological beings (Catling, 2013, p. 87; Davies, 2010, p. 160). These machines might have no reason to send messages to space.

This is where the advent of artificial intelligence could help us. We can use it to look beyond our biological limitations to find signs of order and complexity. Even if we do not understand the message, at least we will prove the existence of the whisper.

Conclusion

The shift from human-driven SETI to AI-assisted astrobiology represents an epistemological leap in our thinking. Both our understanding of what constitutes life ("self-sustaining chemical system capable of Darwinian evolution," according to Catling) and intelligence are put to the test through our own inventions (Catling, 2013, p. 9). We come to understand that the "eerie silence" is not necessarily a consequence of solitude but merely because we have been tuned to the wrong wavelength. The ability to listen to the eerie silence is not only a result of widening our scope; it is a lesson learned from AI. It is through that realization that we may find out life is no longer miraculous but cosmic necessity.

About the Author

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