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COMPUTERS FOR SETI, KURZWEIL'S SINGULARITY AND EVO-SETI

Abstract

Computers for SETI are exploiting the most advanced technologies available nowadays: massive data handling, parallel computing, and advanced signal processing. In addition, understanding an alien message like the messages based on Lincos (Lingua Cosmica) might possibly require the use of Artificial Intelligence (A.I.) to an unprecedented scale. Thus, the role of computers in SETI is ever increasing, and one might wonder whether the time will come when "computers will take over".

Ray Kurzweil's famous 2006 book "The Singularity is Near" predicted that the Singularity (i.e. computers taking over humans) would occur around the year 2045.

In this paper we show that Kurzweil's prediction is in perfect numerical agreement with the "Evo-SETI" (Evolution and SETI) mathematical model that this author has developed over the last five years in a series of highly mathematical papers published in both *Acta Astronautica* and the *International Journal of Astrobiology*.

The key ideas of Evo-SETI Theory are:

1) Evolution of Life on Earth over the last 3.5 billion years is a Geometric Brownian Motion (GBM) in the number of the Living Darwinian Species. It thus increases exponentially in time, and is compatible with the Statistical Drake Equation of SETI.

2) The level of advancement of each Living Species is the (Shannon) ENTROPY of the b-lognormal probability density (i.e. a lognormal starting at the positive time b (birth)) corresponding to that Species (Peak-Locus Theorem of Evo-SETI Theory).

3) Humanity is now very close to the point of minimum radius of curvature of the GBM exponential, called "GBM's knee". This knee is precisely Kurzweil's SINGULARITY in that before it the exponential growth was very slow (i.e. animal and human Species made of flesh reproducing sexually over millions of years), whereas after the SINGULARITY the exponential growth is extremely rapid (computers reproducing technologically faster and faster).

4) We then prove mathematically the following Evo-SETI Singularity Theorem: if the Singularity occurs in 2045, then life on Earth MUST have started between 3.5 and 3.8 billion years ago, that is precisely what actually occurred in reality.

Therefore, our Evo-SETI Theory and Kurzweil's Singularity prediction match perfectly.

Above all, we now have a key to evaluate mathematically HOW MUCH an Alien Post-Biological Civilization will be MORE ADVANCED THAN HUMANS when SETI astronomers will for the first time detect one on nearby Exoplanets in the Milky Way.