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IMPLEMENTING FUZZY SETS THROUGH MOLECULES AND DETERMINING THEIR ENTROPIES

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ABSTRACT

Fuzzy logic is a good model of the human ability to compute with words [1]. It has been defined as a rigorous logic of vague and approximate reasoning. It is based on the theory of Fuzzy sets proposed by the engineer Lotfi Zadeh in 1965 [2]. Fuzzy logic is a valid model of the human capacity to make decisions using natural language because there are structural and functional analogies between the human nervous system and Fuzzy logic systems [3-5]. Fuzzy logic is widely used in the field of Artificial Intelligence [6]. In Chemical Artificial Intelligence [7], molecular, supramolecular, and systems chemistries are employed to mimic some human intelligence performances and process Fuzzy logic [4].

In this contribution, we present a strategy for implementing Fuzzy sets through molecules and an algorithm for determining their entropy [8]. This study will promote the development of Chemical Artificial Intelligence, but it could also spark new ideas about the origin of life on Earth. The appearance of life on Earth was like a "phase transition" [9]. Roughly 4.0 billion years ago, there was a transition from inanimate chemical systems, unable to encode, process, communicate and store information, to the living chemical systems, able to exploit the matter and energy to encode, process, send, and store information. The development of Chemical Artificial Intelligence could unveil how that unique "phase transition" happened.

Keywords: entropy, fuzzy logic, molecules, conformations, artificial intelligence, the origin of life.

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