International Journal of Swarm Intelligence and Evolutionary Computation

OPEN ACCESS Freely available online

Editorial

Biocomputing: A Brief Note

Rajkumar Hossain*

Department of Information Technology, Northumbria University, Newcastle upon Tyne, UK

DESCRIPTION

Computation is often broadly defined because the formal procedure by which input information is processed consistent with pre-defined rules and became output data. Since this definition doesn't specify the sort of data and rules involved within the process, it's applicable to electronic devices also on biological systems. In other words, biological systems do perform computations. While the computational ability of biological matter has been explicitly described variety of times along the 20 th century. Although the discussion on what would be the equivalent of computer hardware and software in biological systems is still largely open, the term hardware in this article identifies any physical, tangible component (e.g., nucleic acids or metabolites) during a cell. A bacterial computer (i.e., an *in vivo* computer), would solve an instance of an equivalent problem 15 years later. By the top of last century, it's been showed that synthetic regulatory networks might be conceptualized *in vivo* as a series of Boolean logic gates–the key device of cellular computers. This novel conceptual framework set the start of a frantic wave of electronic-inspired bioengineering in synthetic biology. Additionally, these seminal works also shifted the inspiration within the biocomputing community drastically, from mathematics and computing to electronic engineering.

The development of biocomputers has been made possible by the expanding new science of nanobiotechnology. The term nanobiotechnology are often defined in multiple ways; during a more general sense, nanobiotechnology are often defined as any sort of technology that uses both nano-scale materials (i.e. materials having characteristic dimensions of 1-100 nanometers) and biologically based material. A more restrictive definition views nanobiotechnology more specifically because the design and engineering of proteins which will then be assembled into larger, functional structures. The implementation of nanobiotechnology, as defined during this narrower sense, provides scientists with the power to engineer biomolecular systems specifically in order that they interact during a fashion which will ultimately end in the computational functionality of a computer.

ADVANCEMENTS IN BIOCOMPUTING

Currently, biocomputers exist with various functional capabilities that include operations of "binary" logic and mathematical calculations. Tom Knight of the MIT AI Laboratory first suggested a biochemical computing scheme during which protein concentrations are used as binary signals that ultimately serve to perform logical operations. At or above a specific concentration of a particular biochemical product during a biocomputer chemical pathway indicates a sign that's either a 1 or a 0. A concentration below this level indicates the opposite , remaining signal. Using this method as computational analysis, biochemical computers can perform logical operations during which the acceptable binary output will occur only under specific logical constraints on the initial conditions. In other words, the acceptable binary output is a logically derived conclusion from a group of initial conditions that function premises from which the logical conclusion are often made. In addition to those sorts of logical operations, biocomputers have also been shown to demonstrate other functional capabilities, like mathematical computations. One such example was provided by W.L. Ditto, who in 1999 created a biocomputer composed of leech neurons at Georgia Tech which was capable of performing simple addition. These are just a couple of of the notable uses that biocomputers have already been engineered to perform, and therefore the capabilities of biocomputers are getting increasingly sophisticated. Because of the supply and potential economic efficiency related to producing biomolecules and biocomputers as noted above the advancement of the technology of biocomputers may be a popular, rapidly growing subject of research that's likely to ascertain much progress within the future.

Parallel biological computing with networks, where bio-agent movement corresponds to arithmetical addition was demonstrated in 2016 on a SUBSET SUM instance with 8 candidate solutions.

Correspondence to: Rajkumar Hossain, Department of Information Technology, Northumbria University, Newcastle upon Tyne, UK, E-mail: rhossain@gmail.com

Received date: May 7, 2021; **Accepted date:** May 21, 2021; **Published date:** May 28, 2021

Citation: Hossain R (2021) Biocomputing: A Brief Note. Int J Swarm Evol Comput.10: e217

FUTURE POTENTIAL OF BIOCOMPUTERS

Many samples of simple biocomputers are designed, but the capabilities of those biocomputers are very limited as compared to commercially available non-bio computers. Some people believe that biocomputers have great potential, but this has yet to be demonstrated. The potential to unravel complex mathematical problems using far less energy than standard electronic supercomputers, also on perform more reliable calculations simultaneously instead of sequentially, motivates the further development of "scalable" biological computers, and several funding agencies are supporting these efforts.