

Quantum Black Holes and pseudotelepathy in biological organisms

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Abstract

Superposed state of quantum registers can be used to describe inflationary universe. One can speak of a quantum superposition of universes during inflation. It has been proposed by Zizzi that a cosmic consciousness event happened at the end of inflation which acted as a blueprint for the future minds to come. The post inflationary universe organized itself into quantum and classical modes. I propose in this paper that biological organisms can be viewed as quantum computer and black hole quantum computers which organize themselves into quantum and classical modes. The biological organisms can be further subdivided into various subroutines. It is further suggested in this paper that the results of the computation by biological organisms are the universals which are partially similar to the universals obtained by quantum computation in the universe. This is reminiscent of the situation in the hologram. I also suggest that biological organisms are deSitter horizons of actual organisms which exist in multidimensional space. The biological networks may use quantum telepathy for co-coordinated activity.

Introduction

Quantum information can be used to describe the early inflationary universe. The inflationary universe can be envisaged as a superposed state of quantum registers. In fact during inflation, one can speak of a quantum superposition of universes. At the end of inflation, a single universe is selected by self-reduction mechanism which is analogous to the objective reduction (OR) model of Penrose. The quantum gravity threshold of Orchestrated Reduction (OR) is reached at the end of inflation, and is also equal to the number of qubits-the superposed tubulins in our brain, which undergo the orchestrated objective reduction (Orch OR) leading to a conscious event. Therefore an analogy can be visualized between the very early universe and the mind. It has been argued by Zizzi (Zizzi, 2006), that universe underwent a cosmic consciousness event, at the end of inflation which acted as an imprinting for the future minds to come. The universe, after inflation, organized itself into two distinct computational modes: quantum and classical, similar to the brain in Hameroff's model. In the quantum mode, the universe quantum evaluates recursive functions, i.e. the laws of physics in the abstract form. Towards this end, the universe uses black holes-quantum computers and quantum minds operating in parallel as subroutines.

Biological Organisms as quantum black hole computers

The universe has been viewed as a giant quantum computer. It has been argued that the results of measurements made in the universe are indistinguishable from the results of measurement processes in a quantum computer (Lloyd, 2006). The universe has also been viewed as one giant black hole quantum computer (Zizzi, 2006). The biological organism is a physical system. Therefore it could be simulated efficiently by a quantum computer which is exactly the same size as the biological organism itself. Since the biological organisms support quantum computation and can be efficiently simulated by a quantum computer, the biological organism is as computationally powerful as a quantum computer of similar size. Furthermore, the biological organism is indistinguishable from a quantum computer. Therefore the biological organism is a quantum computer because of the following facts:

A. The biological organisms possess the same information processing power as a quantum computer of same size.

B. A biological organism can be efficiently simulated by a quantum computer of the same size

C. The results of measurements made on the biological organisms are indistinguishable from the results of a measurement process in the quantum computer of the same size.

Since the biological organisms can be thought of as quantum computers, by using the analogy suggested by Zizzi (Zizzi, 2006) we can infer that biological organisms also behave as quantum black holes.

Further, biological organisms behave as black holes-quantum computers which contain various organs as subroutines which in turn contain tissues as subroutines, which in turn contain cells as subroutines, which in turn contains molecular networks as subroutines and the molecular networks contain atoms as subroutines.(Fig. 1) I also propose here that these biological black hole computers and the subroutines are also organized in two modes the quantum and the classical. An autopoietic quantum register like biological organisms cannot reproduce as inferred from the no-cloning theorem (Wooters and Zurek, 1982). However when the selected quantum gravity register collapses to classical bits, it is an autopoietic quantum register that is collapsing. The classical bits carry along the autopoiesis. The resulting classical automaton is then autopoietic and in principle can self reproduce.

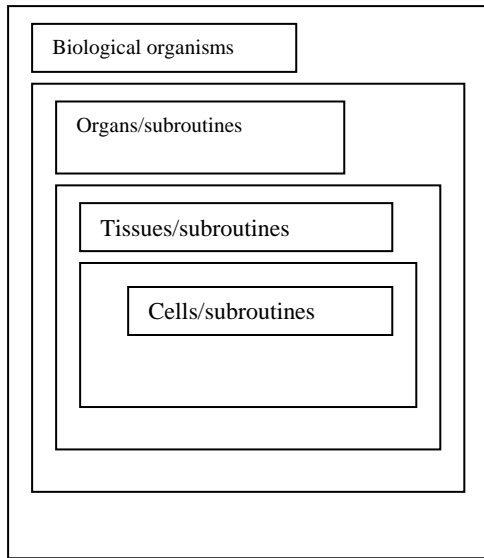


Fig.1 The biological organisms and their subroutines as quantum black holes

The produced classical automaton has the same amount of information and the same conscious experience as the quantum register. Thus using the no cloning theorem, the organizational invariance principle and the cybernetic principles, the principle of alternating computational modes is obtained. “A unit produced by an autopoietic classical computing system built up from the outcomes of a decohered quantum autopoietic system, shares the same organization, the same amount of information, and the same conscious experience as the producing unit. Moreover, in order to share the same conscious experience as the decohered quantum system, the produced unit must alternate quantum and classical computational modes at least once” (Zizzi, 2006).

The results of the overall quantum computation of the universe are the universals, which are the attributes of things in themselves. These universals are partially also obtained by the quantum minds, and are endowed with the subjective meaning. Using the analogy above I propose that these universals are also partially obtained by the biological subroutines described above. This may lead to the discovery of “software” laws as proposed by Paul Davies. Thus the study of biology can lead to discovery of some of the fundamental laws of the universe (Davies, 1987). This is also analogous to the hologram situation because of the fact that information about an image point is distributed throughout the hologram, such that each piece of the hologram contains some information about the entire image. Thus working of biological organisms and their parts may_reveal (at least partially) some clues about the working of universe.

In a previous work (Zizzi, 1999) the early inflationary universe was described in terms of quantum information using quantum deSitter horizons and by means of holographic principle and the spin networks. In this model time is quantized in Planck time units $t_n = (n+1)t_p$ $n=0,1,2,3...$ At each time step there is a deSitter horizon with the quantized area of $A_n = Nl_p^2$ where $N = (n+1)^2$ and l_p is approximately equal to the Planck length. The holographic principle posits that all the information enclosed in a region of space with volume V is encoded on surface S bounding V . Therefore, each pixel of area of S encodes one bit of information. In a quantum interpretation of the holographic principle (Zizzi, 2000) the information is encoded in the quantum mode and each pixel encodes one qubit of the information. According to the holographic principle each de Sitter horizon's quantized area A_n encodes N qubits. Thus every quantized horizon can be interpreted as a quantum register. Quantum gravity registers perform quantum computation in a particular way. The behavior of quantum gravity registers follows the principle of Autocatalytic growth, Autopoiesis, Self similarity and self reproduction. I propose that biological organisms also can be viewed as de Sitter Horizon with quantized area A_n encoding N qubits. This is an ancient idea since there is a story by Plato that some prisoners in a certain cave are chained in such a way that they identify themselves with their own shadows on the cave wall. Plato implied that the larger

reality is hyperdimensional- i.e., although we tend to identify ourselves with our 3d bodies, these are actually the shadows of the real higher dimensional being which we are. The 3d bodies are the mere shadows of the higher dimensional beings.

Pseudotelepathy and biological systems

As mentioned earlier I propose that the biological organisms and the constituent subroutines can be viewed as quantum black holes. The biological networks may use quantum communication complexity and due to entanglement, allow its constituents to accomplish a distributed task with several layers of communication. The “communication” (pseudo-communication) at the quantum level is one of them. This is because all the parts share a common quantum space time background, which is nonlocal since it is pointless (in a fuzzy sphere elementary cells replace the points). In this scenario, the fuzzy black holes which share prior quantum entanglement are the players of a quantum coordination game and do not need to communicate among themselves. This phenomenon is termed as pseudotelepathy (Brassard et al. 2005)

In detail, Pseudotelepathy is a phenomenon observed in quantum co-ordination games. The co-ordination games are defined as a class of games with multiple pure strategy Nash equilibria in which players choose the same or corresponding strategies. In co-ordination games all parties can realize mutual gains, but only by making mutually consistent decisions. Pseudotelepathy results in anomalously high rates of success, which suggests that there is communication between players in the quantum game. The game is however set in such a way that communication between the players is impossible. It is notable that quantum pseudotelepathy is not related to telepathy used in paranormal parlance. The quantum pseudotelepathy arises due to the fact that quantum laws of physics are subtly non local and allow violations of Bell inequalities. This means that prior to the start of the game the participants need to share a physical system which exists in an entangled state. During the game the participants need to execute a measurement on the entangled state. These games are also referred to as quantum non locality games. As mentioned above the biological organisms and the constituent subroutines exist in two states: the quantum and the classical. Thus in the quantum phase there is entanglement which disappears in the classical phase. In the classical phase the system may make measurements in the preceding quantum phase (backward time referral) and the following quantum phase (the forward time referral). The backward time referral is not new and it has been proposed by Libet and colleagues (Libet 2002, 2003) such that the perception of a stimulus in human beings is delayed for 500ms of brain activity but subjectively referred backward in time to the primary evoked potential 10 to 30 ms after the stimulus.

It has been shown that winning strategies can exist in quantum games, which would necessitate communication in the corresponding non quantum games. The prefix pseudo is used in the term pseudotelepathy as the quantum non locality effects obviate the need for any transfer of information between the players for achieving a mutual win in the game.

I propose the existence of quantum pseudotelepathy in biological networks. Let us take the example of gene networks. All the genes in the genome can be arranged in the form of a checkerboard (matrix). The genes must transcribe in such a way that each cell in the matrix (each gene) has to have a particular transcription (rate of transcription) level, transcript level (total transcript level), and protein level. The players are RNA polymerases, transcription factors, proteins involved in RNA stability, ribosomes and other factors involved in translation. The final transcript levels and protein levels are the output of this game. It is useful to view the entire genome as a single unit, in this case a matrix. Thus all the cells in the matrix are influenced by each other. I propose that the quantum pseudotelepathy plays an important role in the coordinated functioning of the genome besides the biomolecules or other physical factors.

Early universe, the brain and the biological organisms

It has been proposed by Zizzi (Zizzi, 2006) that our mind/brain owes its structure and organization to the early universe. I propose that not only the brain but all the biological organisms owe their structure/organization to the very early universe. This is in agreement with the Penrose-Hameroff hypothesis that consciousness is a fundamental property of the reality and has its roots in the space time structure at the Planck scale. The biological organisms exist both in the classical and quantum modes. This fact may be the result of a kind of imprinting we received from the quantum computing early universe.

Conclusions

I propose in this paper that biological organisms can be viewed as quantum computer and black hole quantum computers which organize themselves into quantum and classical modes. The biological organisms can be further subdivided into various subroutines which in turn are composed of further subroutines. It is further proposed in this paper that the results of the computation by biological organisms and their subroutines are the universals which are partially similar to the universals obtained by quantum computation in the universe. This is reminiscent of the situation in the hologram. I also suggest that biological organisms are deSitter

horizons of actual organisms which exist in multidimensional space. The biological networks may also use quantum telepathy for co-coordinated activity.

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