Can a human brain be a quantum computer?
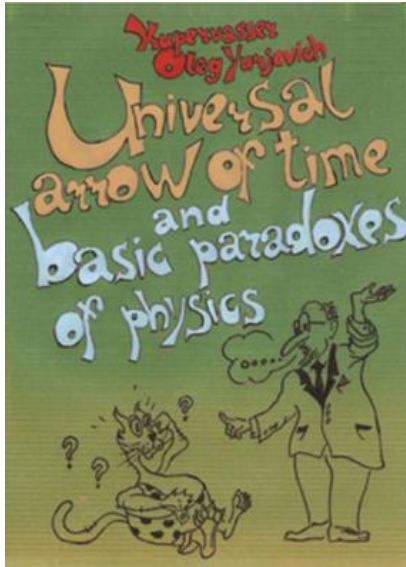
Kupervasser Oleg[1,2]**, Roman Yavich**[1]

[1]*Ariel University, Ariel, 40700, Israel*
[2]*Transist Video LLC, Skolkovo, Moscow, 119296, Russia*

Graphical Abstract

Abstract

This paper is based on the book [1]. Human brain has very powerful intellect. Indeed, it seems that its intellectual possibilities are much more than possibilities of usual computers using genetic algorithm and random search [2]. Our brain has also such especial property as consciousness. Some researchers suppose that these properties are a result of special structures of brain. Really, may be our brain is a quantum computer [3,4]? We know that a quantum computer is highly parallel device with principally insuperable protection from external observation. A quantum computer can resolve some tasks that are inaccessible for usual computers. However, it can be demonstrated that continuous unstable classical computer has the same properties as a quantum computer [1]. Moreover, it seems that the main properties of a brain (powerful intellect and consciousness) can be explained by invisible correlation with surround world. Similarly, clock's gear wheel very accurately operates in spite of absence of any intellect only because the gear wheel is a part of the highly correlated clock. We usually suppose that our world is some random set of low correlated events. However, the world, may be, is some highly correlated device [5]. And human beings are its "gear wheels". It seems that Big Bang theory suppose such point of view. This pure philosophical reasonings can lead to some practical conclusions. We suppose to use instead of usual random search for computers some random number generators which are in complex correlations with surround world. It can give to computers some prototype of the such especial "human intuition", described above.

Keywords: new cybernetics; quantum computer; consciousness; highly correlated device; complex correlations.

Reference

1. O. Kupervasser, *Application of New Cybernetics in Physics*, Elsevier, **2017**
2. A.S. Potapov, *Artificial Intellect and Universal Intelligence*, Polytechnics, Saint Petersburg, **2012** (in Russian).
3. R. Penrose, *The Emperor's New Mind*, Oxford University Press, New York, **1989**
4. R. Penrose, *Shadows of the Mind*, Oxford University Press, New York, **1994**
5. L. Susskind, J. Lindesay, *An Introduction to Black Holes, Information and the String Theory Revolution: The Holographic Universe*, World Scientific Publishing Company, **2004**

Correlations inside of living systems

- important properties of living systems is the high degree of inherent instability supported by their metabolism

- this instability can be caused by the presence of complex unstable correlations (entanglement in QM) between subsystems of the living system

- These correlations results in Poincare's returns (Poincare recurrence theorem)

Inside complex unstable correlations (entanglement in QM) is important for Consciousness
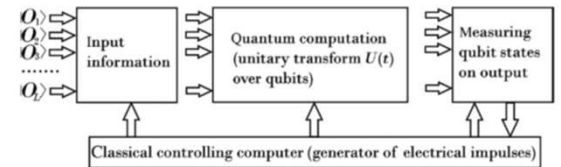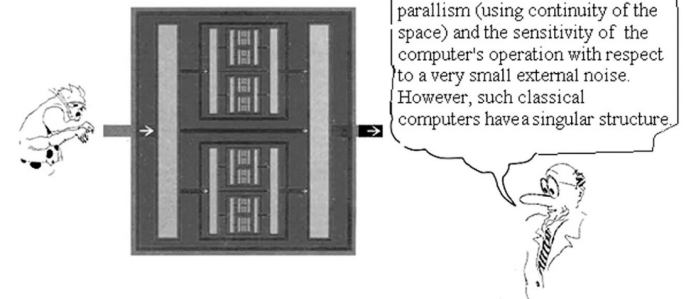
- For QM

Quantum computer

- For CM

Classical continuum computer

(fractal computer, for example)

Figure 5.7 Quantum computer.

A fractal computer solves problems This example demonstrates that classical computers can have properties similar to quantum computers: parallism (using continuity of the space) and the sensitivity of the computer's operation with respect to a very small external noise. However, such classical computers have a singular structure.

First idea

Many properties that usually are concerned to quantum computer:

High parallelism (quantum sum), sensitivity to external interaction (decoherence), internal unstable correlations (entanglement)

are concerned also to classical continuum computer
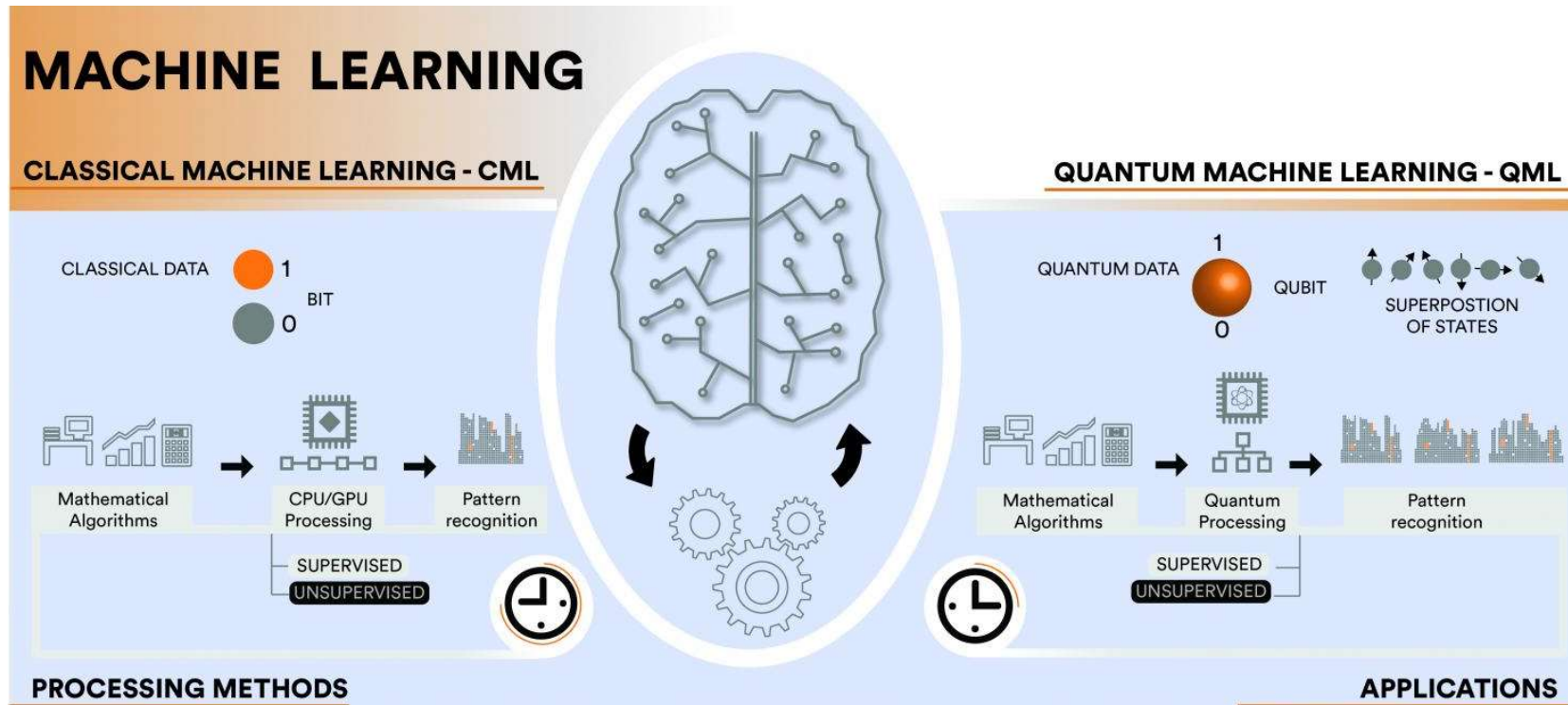
Second idea

- Outside complex unstable correlations (entanglement in QM) computer (observer, living system) with outside world (Universe) are also important for Consciousness
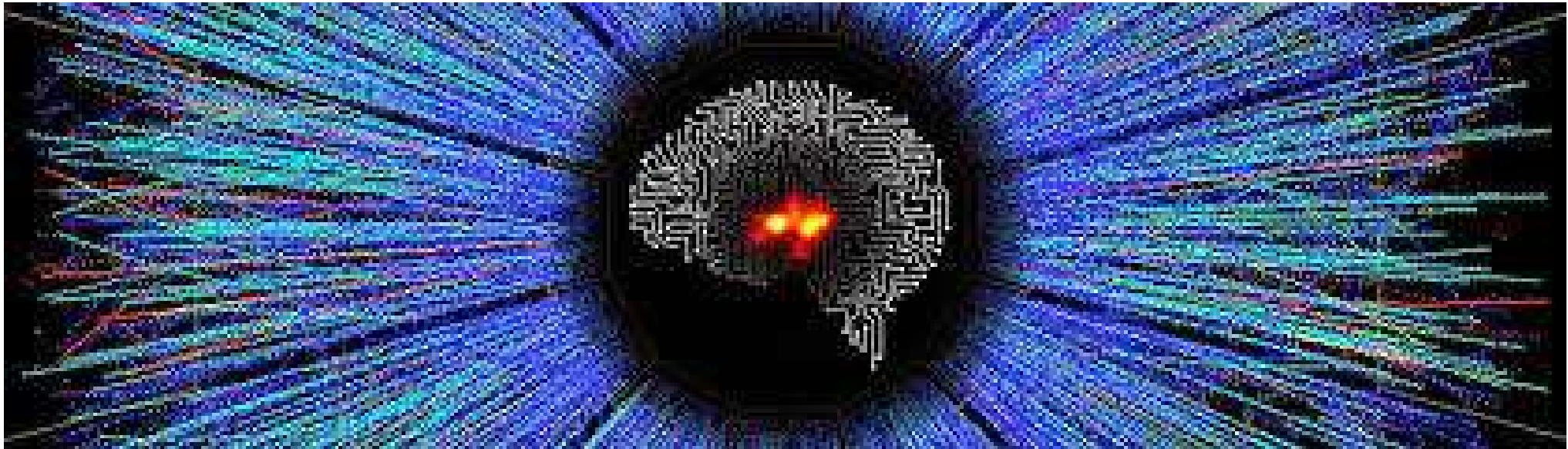
- Clock's gear

The third idea

- Unobservability and unpredictability of Consciousness is a result of unobservability and unpredictability of interaction (including gravity interaction) of a observer with surround world (Universe)
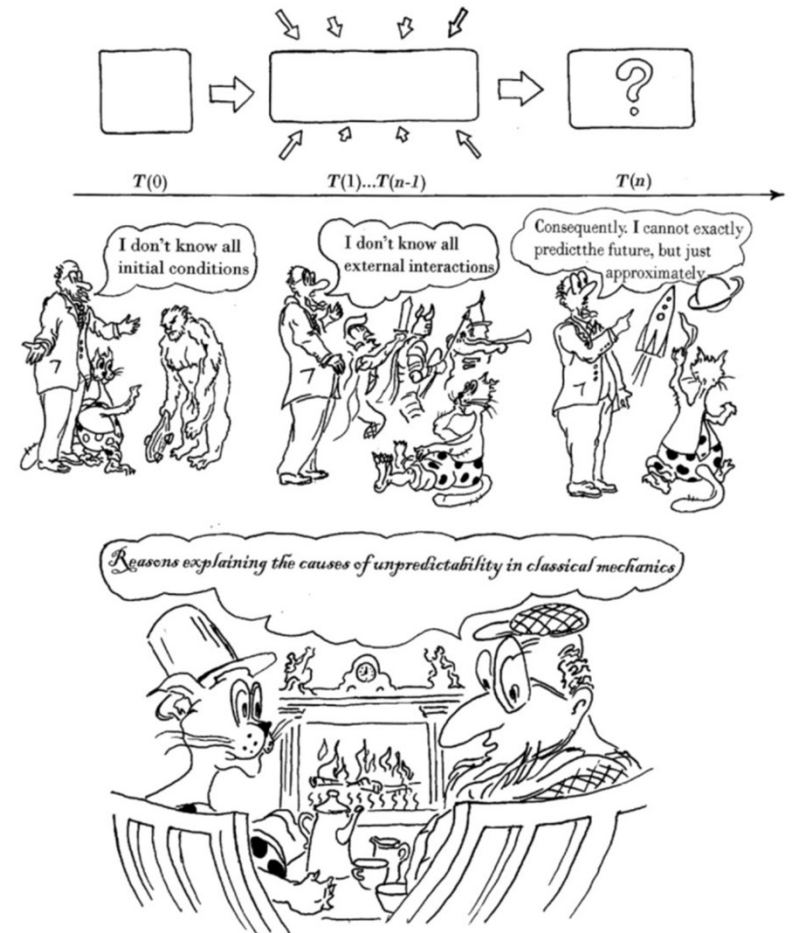
Practical conclusion

• Quantum (or continuum classical) computer must be correlated with surround world (Universe)

Detailed analysis in book