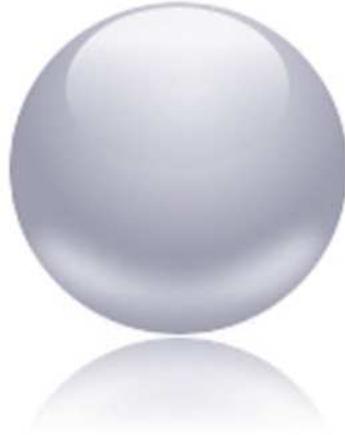


NONBIT



Technologies of artificial sensations (Emergence technologies)

Technologies based on emergence will allow to reproduce sensations on non-biological carriers by making devices feel. These technologies will change fundamentally not only the approach to the creation of artificial intelligence, but also create artificial worlds of a totally different level. Which, unlike virtual models, will really exist for themselves.

This approach differs completely from the methods currently used in digital technologies. Possibly the principles described herein will give a rise to many new trends.

Alexey S. Bakhirev

Table of contents:

| | | |
|-----------------------------|---------------------------------------|----|
| 01. | <u>Introduction</u> | 3 |
| 02. | <u>Background</u> | 7 |
| Definitions and logic | | |
| 03. | <u>Consciousness and intelligence</u> | 8 |
| 04. | <u>Mechanism of sensation</u> | 10 |
| 05. | <u>Notion of reality</u> | 13 |
| 06. | <u>Information and effect</u> | 14 |
| Technical principles | | |
| 07. | <u>Description of technology</u> | 18 |
| <u>Philosophic analysis</u> | | |
| 08. | <u>Articles and publications</u> | 26 |
| 09. | <u>Conclusion</u> | 30 |

01. Introduction

Relevancy of the research topic

This work is devoted to the examination of possibility of creation of technologies based on the emergence principle, when the system produces new relations which are absent in its constituent parts. Thanks to this principle it is possible to reproduce artificially the function of consciousness and sensations in an instrumental way. Also the possibility of modeling of artificial worlds differing from virtual reality, which is based on the same principle, is considered here.

Notwithstanding the development of the scientific and technological progress and the expansion of research in the field of artificial intelligence, there are practically no publications on the topic of creation in an instrumental way of artificial sensations, the subject of technologic reproduction of “soul” is still not developed, and our perceptions thereof have hardly changed over the past centuries. Often the reasoning thereof goes beyond the edge of its scientific character and rationality and slide into theology and mysticism.

There is still no clear definition of “who” or “what” feels within a living body, how this effect of “awareness” occurs, what nature our sensations are of, and how to reproduce it artificially. The conceptual understanding of “animateness” based on the technical approach is more important than the technical implementation itself. Which due to the present-day development of technologies will not involve any difficulty.

The author attempts to describe the basic principles of operation of consciousness and sensations, the possibility of their technical reproduction, and conducts a philosophic analysis of the new idea about consciousness as the main function of our perception of the aliveness.

Level of scientific development of the subject

The research relating to this topic may be classified into three basic approaches:

- functional, aimed at the duplication of functions of rational actions and used in the modelling of artificial intelligence;

- philosophic, studying logical regularities of mind and consciousness;
- biological and medical, describing psychological, biological, biochemical and biophysical instruments of operation of the brain.

The research in connection with the creation of artificial intelligence is sufficiently well described in the works by Norbert Wiener, Alan Turing, Claude Shannon, John von Neumann, Frank Rosenblatt, Warren McCulloch, Walter Pitts, Allen Newell, Herbert Simon, John McCarthy, Myron Krueger, David Rumelhart and many other scientists. In the 1950s to 60s the first analogues of artificial neural networks – perceptrons - were created. The development of artificial neural networks found application in the models by [Kohonen](#), [Word](#), [Hopfield](#), [Elman](#), [Jordan](#), [Kosko](#), in CAM-models.

Many different organizations, such as divisions and laboratories for artificial intelligence of many universities and research centers worldwide work on the problem of artificial intelligence and artificial neural networks - [Stanford University](#), [University of Cambridge](#), [Oxford](#), [University of California, BERKELEY](#), [Massachusetts Institute of Technology](#), and many other. There are international, national, branch-wise, business associations for artificial intelligence research, and consortiums thereof, for example [AAAI](#), [ECCAI](#), [ISAI](#), [etc.](#)

The creation of artificial intelligence does not pursue the aim of obtaining of the phenomenon of “animateness” and does not attempt to reproduce sensations and feelings in an artificial way. For the most part these are mathematical, and architectural and system models aimed at the information processing and calculation optimization.

Since the old days many philosophers and scientists attempt to describe consciousness using the philosophic approach. Gradually it turned into a separate line of philosophy – the philosophy of consciousness. In this connection the resource of Philosophy Professor David Chalmers from the Australian National University - [ONLINE PAPERS ON CONSCIOUSNESS](#) - is worth a particular mentioning, where many research papers devoted to this topic are collected.

Biological, medical and psychological approaches are represented in the works by different scientists and the work of [brain research institutes](#) studying its morphology, reflexes, using the methods of electrophysiology and electroencephalogram, brain tomography, MRT, the description of biochemical and biophysical processes in the brain, as well as based on the materials of clinical supervision of patients with brain damage and the experiments with animals, including the method of ablation.

This subject represents an interdisciplinary research concerning not only the sphere of artificial intelligence, but also neurobiology, neuromorphology, philosophy of consciousness, connectionism, combinatorial theory, graph theory, psychology, cognitive and other sciences. This work attempts to see in a new light the principle of sensation and animateness as a whole from the point of view of physics, logic, from the perspective of information theory and system theory.

Target and subject of research

The target of this research is the notions of consciousness and sensations, as well as the notions of reality and existence in general, as objectives of technical modelling.

The subject of the research is the technical and technological possibility of reproduction of the algorithm of sensations for the systems of artificial consciousness and the “reality of existence” in the systems of artificial worlds.

Aims and objectives of the research

The aim of the research is the logical analysis of ontological principles of creation of the “perceiving” in the system for which the effect of “existence” of sensations or processes in the systems of artificial consciousness will appear, as well as the definition of difference between this approach and the virtual information modelling.

The objectives of the research are to:

- give a definition of the notions of “intelligence” and “consciousness”, show the difference;
- describe the state of emergence by determining how additional attributes appear in the system which are not present in the system’s constituent parts. Determine how and for what purpose these attributes exist within the system. Draw an analogy between the existence of feelings for consciousness and attributes for the system;
- describe the algorithm of functioning of human sensations based on the difference between the sensations. Show how to achieve a similar effect using a physical condition;

- study the notion of reality by showing weak points of the ideal and the material approaches in philosophy;
- define the notions of physical effect and information by showing the difference between the real and the virtual;
- describe the spatial and energy approach which have additional attributes, unlike the spatial approach and the energy approach used separately.
- describe the principles of the proposed technology as a replacement for the programming method with the method of design feature, using the temporal degree of freedom instead of the spatial for the purpose of creation of a complex physical phenomenon, and not virtual information.
- explain why state-of-the-art technical resources, digital or analogue, can not be used for the modelling of artificial sensations;
- describe the conclusions giving a new look at the notions in connection with animateness.

Theoretical and methodological grounds for the research

The approach proposed by the author is based on the principle of emergence and the system attributes existing for the system itself, which can also be considered as the functional of consciousness and sensations. Unlike integral, phenomenological, ideal and other theories of consciousness the author claims that technically affordable physical conditions are sufficient for the duplication of functions of consciousness. Nevertheless the approach differs from the theory of materialism considering everything as the objective reality. The author uses the comparison with the basic notions of the information theory and the system theory, the methods of logical analysis, deduction and induction.

Theoretical and practical importance of the research

By understanding the above principles and creating similar technologies, we will not only get the opportunity of construction of artificial systems and attributes existing within them at a totally new technical and conceptual level. The approaches proposed in this work have a broad range of potential use for scientific, industrial and other purposes.

02. Background

From the physical point of view a living brain can be described by the means of size, weight, temperature, pressure, etc. But in that same space occupied by the brain other attributes are present too – images, feelings, thoughts and everything we call animateness and what we are used to take out of the limits of the physical world. However for themselves they are equally real. Complex mutual values emerging within the space of the neural network exist at the present moment and participate in the energy exchange between the parts of the neural network. Can we claim in this event that these values really exist at the physical level as well?

It is pointless to negate them, but they exist differently than the manifestations of the objective physical world. These are system attributes resulting from the emergence and existing solely for the system itself. Using the principles of artificially created “real existence” it is possible to model a wide spectrum of systems fulfilling the functions of consciousness or subjective systems with their own internal laws and relations similar to artificial worlds.

- - - - -

It should be realized that in fact neither colour, nor taste, nor other characteristics of things with which our organs of senses endue them, exist in the world around us. These are subjective perception from physical and chemical stimulations impacting the receptors or immediately parts of the brain. These stimulations are transmitted inside the brain in electric way, which is thoroughly studied. Even if in the natural world some or other taste, colour or odour existed we can not perceive it directly. It only causes an electric signal at the receptors of the sense organs, and this characteristic of the outside world turns into electric current. What we see is not the authentic property of the world around us, but the electric signal of our brain which our memory attributes to the properties of the real world. It is of no significance what exists in reality. It is important how our brain processes and reproduces it.

Feelings, thinking, memory have physical nature behind them, and there is no mysticism here. As soon as we understand the principles and the logic of how electricity becomes some or another sensation and in relation to what this sensation is manifested it will become possible to artificially reproduce any sensation with any pre-set parameters, including those differing from the usual.

- - - - -

In order to reproduce the analogue of creation of living organisms the biological basis must not be necessarily copied. It is sufficient to duplicate the algorithm, the functions themselves at the physical level in an instrumental way. Along with the ability to feel the organism has a quite large package of evolutionary load. A living being must eat, reproduce itself, adapt, regenerate, sustain its life. The majority of these processes run automatically. Consciousness as a result of the higher nervous activity appeared only in the end of the evolutionary process, except that not for all living beings and not anywhere near as the most important factor. Perhaps, based on the necessity to use the biochemical structure the nature made the brain much more complicated than it is required for a simple reproduction of consciousness and sensations.

- - - - -

In a word, as for the objective of reproduction of sensations, the idea is to take the simplest natural perception – the perception of one charge by another charge, and using this ability of the electric field complicate it up to the level of human consciousness by breaking this consciousness down to functions and trying to reconstruct artificially its algorithms.

03. Consciousness and intelligence

First of all it is necessary to give clear definitions to the notions which we intend to reproduce. Intelligence and consciousness are two different notions. Technologically our perception of the world is divided into two components – perception of information (consciousness and sensations) and information processing (intelligence).

Definition of intelligence

Intelligence is the mechanism and principles of information processing by way of selection of an appropriate (stored in memory) result or action. Functions and objectives solved by artificial intelligence are the processing of information with the help of associative, logical and mathematical models. The areas of application are: calculations, comparison, identification, self-teaching, analysis, forecasting and reaction in accordance with the pre-set instruction.

Artificial intelligence is based on information; signal in digital technologies is a package of bits spread across time. In analogue technologies it is the change of voltage between wires also proceeding in the course of time. In principle, the creation of artificial intelligence similar to the human intelligence with the help of computer hardware is possible. It will be able to solve tasks or move like a living being. A computer will not feel and perceive itself, but for the repetition of such functional it is not required.

There is an example with the so called [Chinese Room of John Searle](#) which shows a purely mechanical nature of operation of a computer. But there is a simpler example. Imagine a wooden sieve with meshes of different form - circles, triangles, polyhedrons – and similar wooden parts. When the parts matching the meshes are delivered to the sieve and each part goes through different meshes one by one starting with the smallest ones, in the end each part will fall through its mesh. The whole computer logic is based on this principle – the comparison of the signal with the result pre-set in the memory, and causing of respective actions. But again – such way of operation does not give sensation. Neither the sieve, nor the computer know or understand what they do. They simply sort the information.

Definition of consciousness

Consciousness in its technical functional definition is a condition for the displaying of sensations, the environment, the background in relation to which they emerge and for whom they exist. Both of these parameters – sensation and consciousness – are inseparable parts and do not exist without one another. Both consciousness and sensation are of not substantial but functional nature. If there is no consciousness, there is nothing in relation to which sensation could emerge. If there is no sensation consciousness does not exist functionally. Sensation is the attribute of consciousness. In one consciousness there might be a variety of sensations, but one and the same sensation can not exist in a number of consciousnesses. They might be qualitatively identical, but quantitatively they are different.

Consciousness, the definition of “Ego” – from the technical point of view – is not memory, not personality and not the whole complex of the human life. A human being may get memory damage and forget everything: who he or she is, where they are from, loose habits, forget the language and forget how to think. They may be put into the environment which does not give any signals to the receptors. But they can be considered animate, alive as long as the ability to perceive alone remains. Consciousness is what they perceive at the moment. The perception itself might be simple or complex depending on the structure delivering values to

consciousness, whereas the parameters of even a complex consciousness might significantly differ from the format which we are used to.

Natural intelligence is based on sensation. First the human being perceives some tint of feeling, and intelligence works with these sensations – thoughts, images, emotions. It is sensations that serve as processing signals.

This is just what the developers of artificial intelligence leave out of account. In order to create intelligence similar to that of a human being it is necessary to create sensations and something in relation to which these sensations are manifested, i.e. consciousness. First we feel a thought. This is the main difference between the technologies described herein and any other developments concerning artificial intelligence, artificial neural networks, expert systems and other spheres.

Intelligence may operate without consciousness and perception and self-perception connected with it, like state-of-the-art computer models of artificial intelligence.

Also consciousness may exist without intelligence. For example, in people with memory damages or other brain damages who perceive a sensation but can not process and understand it.

Only in the event of combination of these two functions a result similar to the result of operation of our brain can be achieved. The simplest perception exists everywhere in the natural and physical world. On the perception and interaction with each other of carriers of fundamental physical links any process in the inanimate nature is based. Without it the world would never exist. The possibility of use of the most available interaction – electric interaction – and the complication of these simplest perceptions of one signal by another signal up to the level of our feelings, as well as the definition of difference between the notion of the virtual and the real – this is described in subsequent chapters.

04. Mechanism of sensation

All our sensations are perceived by us as a difference between one and another. Consciousness determines the difference of one type of sensations from the other – blue from red, sweet from sour, visual sensations from taste or tactile sensations. If this difference did not

exist everything would coalesce into a single monotonous background. In this event consciousness would not exist functionally. Even for a small, simplest feeling the minimum of a dual difference – when there is a feeling, and when there is no feeling – is required.

The difference is pre-set by way of delivery of signals from the changing world, where each receptor reacts only on its well-defined sensation and sends the signal to its part of the brain. The variations of combinations of these stimuli give different tints of sensations. A sensation emerges in the brain, in its functional part of the “analyzer” of this sense organ. Before it the stimulus in the receptor and the nerve is only an electric signal and has a transporting function.

Vision perceives the visible world view as a difference between colors and brightness. Due to this we can see the outline and the colour of things which are later analyzed by the intelligence and reproduce in our consciousness conceptual blocks and emotionally coloured images. A strong or a weak impact do not give any difference and are not perceived by us as sensations. We sense a weak impact on the eye receptors which is lower than the threshold of perception of the difference between the receptors as darkness. A strong impact on the whole eye in a bright light also causes the maximum impact on each receptor, which also eliminates the difference between them and causes a blinding effect. The impact of all colors at a time leads to the white noise caused by the impossibility of distinction and converging to the white colour.

Hearing works in a similar way: the brain perceives the sound as a difference between the signals of the receptors. The coming signal is compared as to its intensity, tonality and direction with the signal which has just come contained in the short-term memory. After that the brain gives a conceptual and emotional colouring to the blocks of auditory sensations. A continuous sound causes habituation, a gradual change is imperceptible, a weak or a very strong impact cause deafness, a contemporaneous inflow of all tones and intensities leads to the white noise caused by the impossibility of distinction between one affected receptor and another.

Other organs of senses – taste, odour, tactile sensations – have a similar algorithm of operation.

We know thinking as handling of unique sensations of letters, words, notions forming the language in which we think. Unlike receptor feelings these sensations are reproduced from the memory. Our memory stores not only words and meaning, but sensations too. Each tint has its

meaning. Without any difference between the tints it would be impossible to think. Thinking is a process of operation of intelligence, but the process of thinking is almost beyond our control and it is difficult for us to stop it, although we can perceive other feelings without thoughts. Often thinking does not bear any logical or other functions of intelligence, but goes in a fragmentary, illogical background mixed with emotions, and does not follow any goal. In the event of an attempt to think all words and notions at a time we will receive that same white noise. It will result in the absence of distinction, like in the event of stopping thinking.

Emotions work based on the same principle of distinction, as all feelings and sensations. Emotions may be divided into several blocks in each of which the principle of comparative operation works. For example, a human being may be hungry and tired. But being simultaneously hungry and full, or tired and fresh is impossible. Emotions also start more complex processes calling from the memory complete blocks of interconnected feelings. All impulses, psychological and physiological motivation sensations - interest, appetite, fear, hunger, pain etc. – can be expressed at the drop of the energy state of brain parts and the urge for their balancing with the help of certain actions. The stronger the feeling, the bigger the energy jump and the urge of the system for a balance. These drops inside the brain determine our whole conscious life, all other impulses and urges, and are based on three main biological motives – to eat, to reproduce and to sustain own life and the life of near species. They are united in their urge for dominance as a guarantee of implementation of these tasks. Without these motivations the human life would be impossible – a human being would simply stay motionless until he died of hunger. In the event of elimination of impulse motives the satisfaction comes which technically looks like the termination of energy distortion between parts of the neural network. There are many feelings and impulses, but the principle of satisfaction is the same for everyone.

We may say the feeling is a comparative characteristic of signals from different receptors. All sensations - exteroceptive, interoceptive, proprioceptive – are built on a contrast. A constant impact causes habituation, a smooth and gradual impact might not come to perception. A weak but contrast impact draws attention first of all. The sensation of everything at a time does not cause distinction in consciousness and results in the white noise.

Let us return to the thesis that in the natural world there are no such notions as sweet, blue, terrible, beautiful and so on. These are our subjective perceptions of stimuli which react on one or another chemical or physical impact, or psychological stereotypes, and the signal from any receptor to the analyzer exists in form of electricity. If we close the nerve from tongue receptors onto the analyzer of vision we will perceive taste as optical sensations. This is why we

do not need to try to understand the essence of one or another feeling. The characteristics which we attribute to the world around us belong not to it, but to our brain. This is our subjective reaction. This is why we are able to imagine them, see in our dreams, hallucinations and in the event of psychiatric disorders. It is just enough to duplicate the relations based on the difference and emerging in the structures of the brain at the time of the signal.

05. Notion of reality

Let us imagine a man looking at a valley. He sees a forest, mountains, a river, hears their sounds, senses odours that reach him and feels a fresh wind. Does everything exist only in his consciousness or constitutes the objective reality? An interminable controversy of idealists who believe that everything is produced by consciousness, and materialists who claim that the valley exists on its own without taking into account whether anybody is looking at it or not.

In fact both approaches are wrong. Their falsity is conditional upon the clichés of our thinking. How and for whom the valley can exist when the man is looking at it? The valley is a collective image. Different animals, birds, fish, micro-organisms live in it which reproduce it in their consciousness in their own way. The format of their sense organs is different. In their perception it is real as well, but is quite different than for the man. Nobody perceives the valley in the same way as the man. The valley itself consists of parts - mountains, rivers, trees. The mountain is a collective image too. It is ground and rocks the physical existence of which perceives only pressure and temperature. Without it the perception by the matter of itself and the outside impact the rocks would simply pass through one another. Water in the river can be considered both in a comprehensive way as an environment impacting the valley shores, flora or climate, and discretely in form of molecules. The whole valley can be split into elementary particles which perceive one another too, by determining the charge, energy, weight, distance and other parameters. They form various systems - physical, chemical, biological, geological, ecological, climatic, spatial, mental and so on.

Each system has its own existence, its own reality differing from other systems. There is no existence and reality "in general". Reality exists only at the moment of interaction, and the interaction is impossible without mutual perception of the interacting parts. The attributes of one system do not exist for other systems. In the nature radiation is a reality, but we do not sense it directly with our sense organs. For our perception real are: the blue color, a thought, or the

sense of hunger. But immediately for the physical world these notions do not exist.

The whole existence can be split into virtual, potential and real which is expressed at the present moment. Any really existing physical phenomenon occurs at the present time and is due to the energy exchange. The complexity and the combinations of this exchange create emergence when in the system additional subjective attributes and effects appear which the constituent parts of the system do not have and which exist only for the system as a whole. The systems can have a different nesting and hierarchy. The attributes of the higher level system will be objective for its constituent systems, and the attributes of two systems of the same level will be subjective.

Such approach can also wash out the border between the “animate” and the “inanimate” world. The perception by a rock of another rock is of the same nature as the perception of one neuron by another, which subsequently ties into a complex systemic effect of our sensations. But in the inanimate nature there can be enough systems in which complex subjective relations emerge – from chemical substances with complex relations between electronic clouds, to stellar systems in which complex overflows of gravity fields may appear. Both resemble neural networks, which however do not have a certain standard, memory, habitat and other necessary conditions.

The understanding of reality in the systems will enable us to simulate not only sensations really existing for the consciousness, but also artificial worlds. As such world any subjective system can be considered having its individual, emergent properties which can be called real for one another, i.e. existing spontaneously and not requiring information processing. These models may look similar to our world, or use instead of space and time different degrees of freedom, have different characteristics, dimensions, complexity.

06. Information and effect

It is necessary to clearly understand one thing – all sensations and thoughts in our perception, physical phenomena and energy exchange in the natural world – everything exists at the present time, in the short eyewink of the present. They constitute not information, but effect. We sense only NOW. And every approach in connection with the modeling of sensation must take it into account.

Information – this notion can be considered in two aspects:

- from the technical point of view information can be considered as a determinacy of certain pre-conditioned symbols or actions towards one or another signal or condition. This determinacy does not have sense for a technical information medium or processing device – book, picture, computer, television. For the reading of the sense an aware observer is required who understands the meaning of the information.

- from the philosophic and conceptual point of view information can be considered as a certain sense confined in physical phenomena put together in a certain way and expressed in form of a difference of the reflecting property due to which we perceive symbols, letters, image, or voltage drop in analogue and digital technologies.

Without an aware observer perceiving the meaning information does not exist immediately in the physical world, this is why information can be deemed virtual.

Effect is a physical phenomenon existing at the present time and accompanied by the energy exchange. The existence of effect is due to fundamental physical interactions. At the deep level the physical effect can be considered as a manifestation of the laws of nature under certain conditions.

Parts of the nature perceive one another and know how and in what events they must react. As a rule this is connected with spatial and temporal, and energy relations of the matter, one of which is, in particular, the electric field. We may say that effect exists for itself, as it is present at the present time and happens with the participation of the energy exchange. In physics the energy exchange is described as a process. In our case we must not muddle together effect and process. Process is a chain of effects occurring in the course of time. Effect is a time slice of process. Effect is an impulsion existing in the present, an urge for this exchange. For the energy exchange it is necessary to perceive at least two parts between which the exchange, the identification of their energy states occurs, the knowing of the scale of the process which must occur. A simultaneous perception of one another by global invariables under certain conditions determines effect as a result of their interaction and determines the notion of the immediate “existence for itself”. In this sense effect is real.

Information consists of effects put together in a certain way. Without the use of a physical basis information will not be expressed, transferred, saved, reproduced. As such basis paint on paper may serve with the help of which symbols are written, voltage in the mains and any other physically existing differences in which information is encoded. The reading of these effects is possible due to the physical interaction – the imbalance of the energy equilibrium in the vision analyzer based on a different reflecting capacity of the paint and the background due to which we see symbols on paper or screen, a voltage drop due to which the recognition of the bit and the start of certain actions is possible, as well as other manifestations of the physical world. Even the meaning exists as a certain interrelation of physical phenomena of the inanimate world or electric signals in the human brain. In a dead brain the meaning will not be manifested.

In modern technologies the effects of which information consists are based on the drop of the energy potential between two wires. They are extremely simple inside themselves and do not have complex relations. These drops in analogue technologies and bits in digital ones are distinguished in the course of time, not connected with one another in any way and do not impact one another. When one of them exists, the previous one is already gone, and the future one has not yet come.

It is impossible to compare effects isolated in the course of time. There is no comparing component. The discrete, spread over time information of state-of-the-art technologies does not work here. One individual bit (binary digit) does not have sense at the present time. It is necessary to put to consciousness existing just now the information which simultaneously comes from different receptors and which will be manifested in relation to the general equilibrium as a difference between one and another. In the short eyewink of the present time, at the time of operation of consciousness also meanings from the memory must be present there, as well as the present situation and the meaning of the future view for the purpose of planning. But all this must exist now. Otherwise we would immediately forget the past.

For the purpose of solving of this problem it is necessary to create instead of many simplest effects in form of a voltage drop between two wires a single complex uninterrupted effect occurring between many interacting parts in which a variety of simultaneous drops will represent meanings connected into sense.

In this way we will create complex relations which are manifested for it as information and existing at the present time. Technically it is possible to increase the complexity of effect by

way of increasing of the number of conductors and elements in which the electric field is contained and on which it will deflect. Such approach can express quite complex values existing for the system itself.

Comparison which is the basis for sensations (please refer to Chapter 4) is physically possible only at the present time. The observer in relation to whom this deviation, difference is manifested and exists is the state of the energy equilibrium. The differences having certain values will exist in this event in form of electric distortions, an imbalance of the system. These distortions will be sensations for this particular observer.

Everything in the natural world exists and occurs only at the present time and simultaneously. This is some sort of a flexible effect of our world in which there are many other effects of different systems. As a system a set of elements can be considered here with energy interconnections which the exterior impacts do not affect. This creates emergence and subjectivity in the event of which the system perceives itself.

This is what determines the difference between virtual and real. A book does not understand the text contained in it, a machine does not understand or perceive what it produces. However the field perceives its condition and reacts, equalizes energy distortions across the whole its volume. The equalization of such distortion is current – the movement of the field from the higher potential to the lower one. If there are not two but millions of wires, and they are interconnected in a certain way, and the potentials can swap places, the effect can be very complex and really existing, whereas the distortions will completely fulfill the function of information.

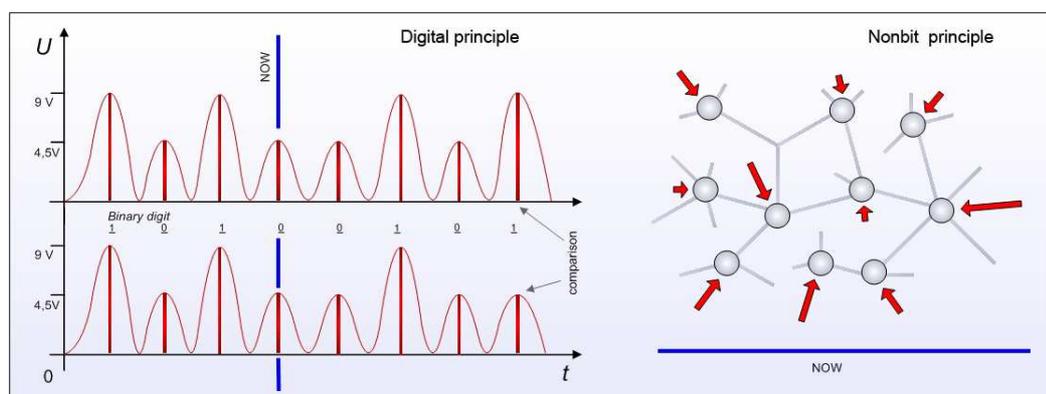
One of indirect proofs of the correctness of such approach in the event of attempt to reproduce the analogue of our consciousness is the fact that nature did not have any opportunity to use the computer logic in order to create consciousness for living beings, or programs, double-wire power sources and other technologies. There was no initial observer in the natural world, and everything happening there had to be real, and not virtual. Nature used structural capacities of chemical substances and physical effects which originally did not require an observer and meaning, and enabled to develop the brain functions in an evolutionary way, by way of searching through structures and variants of connection which over hundreds of millions of years turned into neural networks.

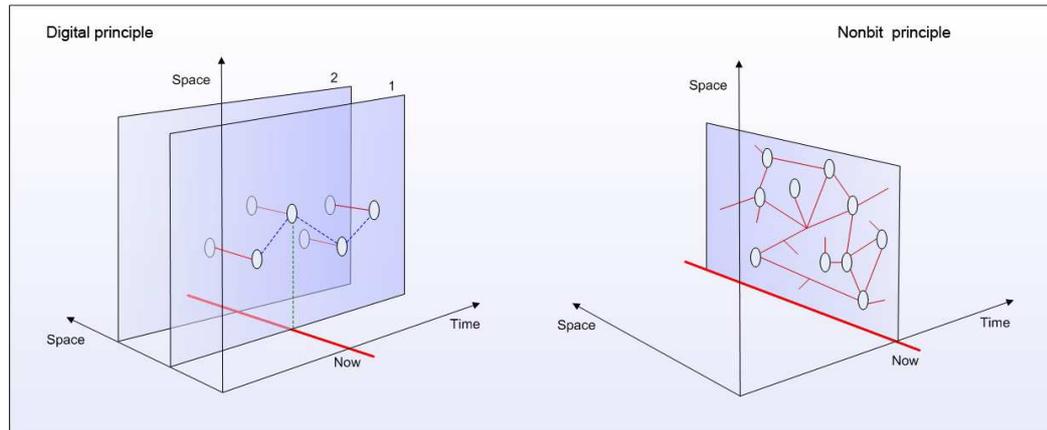
07. Description of technology

Based on the above logic we suggest the following solution – replacement of information consisting of simplest physical effects of the voltage drop between two wires with one complex effect between many wires where the information will exist at the present time as distortions in the energy state of the field. This can be done if we replace the temporal freedom for the signal with the spatial one.

The technology consists of the creation of the effect of perception by the electric field of differences in its own energy state by way of impacting the structural components within which the field exists. The programming principle where the value of the signal is pre-set by its modulation in the course of time is replaced with the principle of creation of a spatial condition with the help of structural specifics of the system. The signal value is pre-set by spatial characteristics, i.e. from what side the signal has come to the system and what distortions it has caused therein, whereas all signals can be totally identical for the purpose of measurement in relation to the check earthing – as to the current strength, voltage and frequency.

Such spatial and energy approach enables to create a complex effect completely at the present time and make it real. The replacement of the temporal freedom with the spatial one enables to reproduce quality, the difference of potentials in the mains – the signal strength, and the processing of these qualitative states in the course of time will enable to achieve the effect most close to the operation of natural intelligence and our mind.





Emergence of simplest "animateness"

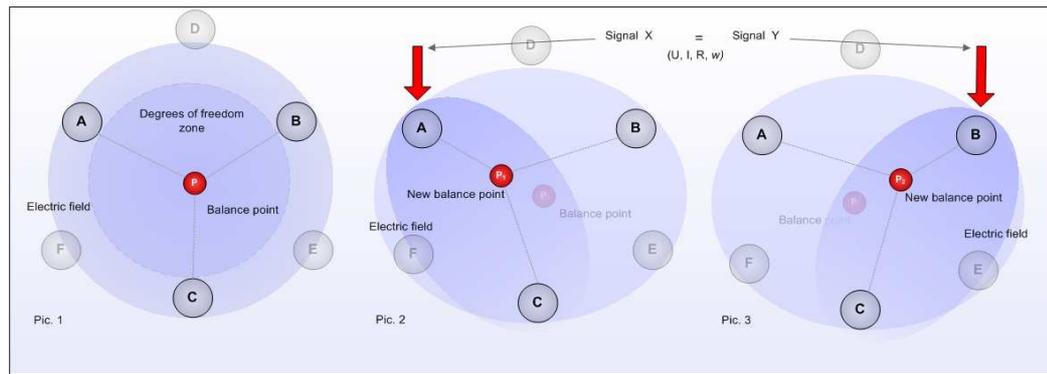
Under the notion of animateness the availability in a certain system of any internal feature or value may be understood which really exist for the system and lack this property or value in the objective physical world. We may say that the emergence based on effect* is the synonym of animateness.

Reproduction

It is known that electric current in the conductor is the movement of electric particles (electrons, ions) in the electric field which tends from the higher potential to the lower one. This stimulus of current to move in one or another direction may be taken as some value with the help of which information may be expressed. This value will be manifested for the state of energy equilibrium as an internal characteristic of the field itself.

In the event of availability of at least three interacting conductors we can receive a simple emergent effect based on the comparison of signals in relation to the energy equilibrium.

For example, a 5 Volt signal is equal from the physical point of view everywhere in the objective world. In modern electronic technologies using two wires in order to express information a difference is required which is caused by a signal other than 5 Volt following in the course of time after the first signal. For our system the value for the signal is pre-set not by electric characteristics of the signal and not its modulation in time but with the help of to what conductor the signal was delivered - A, B or C. This value is manifested as a difference for the energy state of the system which functionally is a perceiving "observer".

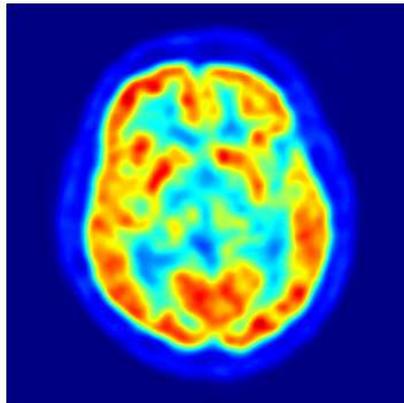


The shift of the zone of energy equilibrium will cause an additional impact on the other element – D, E or F – located in this zone, which will lead to the change of the difference of potentials between them and a chain reaction of changes of values across the whole system which at the same time do not exist for the objective world. Due to this various systemic effects and relations may be simulated, including the duplication of the algorithm of human sensations or artificial worlds.

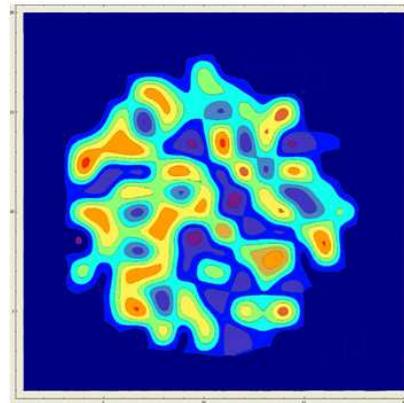
By imitating the signals coming from the receptors, memory, intelligence we will receive a continuous change of the difference of potentials between the elements of the network. These changes will be an impulsion for the field to move towards a new equilibrium. The impulsions will constitute inside values existing for the field itself. In the event of a difference of potentials between many elements of the artificial neural network currents of different directionality will emerge which will flow from the higher to the lower potential impacting the middle centre and many other local centres of equilibrium. Under the impact of receptors the directions of currents and the polarity of elements may constantly change changing the values for the field perceiving its state.

If in the system there is a balanced impact on all connected elements we will receive the state of “indistinction”, or the analogue of the white noise. No values will be observed for the state of the energy equilibrium, as in the event of a complete absence of impact, which fully corresponds to the above principle of operation of our sense organs.

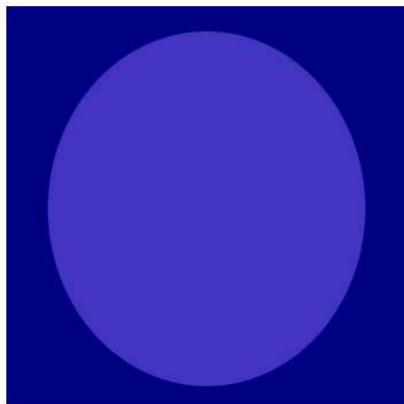
The structure enables to form complex connections in the event of which neurons can be connected with remote neurons and not interact with those located in the proximity, which enables to model complex processes. Shifts of voltage areas of the field may cause closings and interruptions of areas of the neural network, which will cause new values and relations in the system. The tomography of these processes will resemble the recording of the brain activity – many zones of different colors.



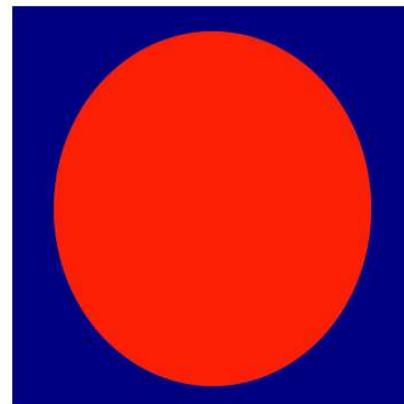
Positron-emission tomography of activity of a living human brain



Computer modelling of a two-dimensional distribution of the fields of point-source conductors with different potentials in the dielectric medium as a graphic representation of the above algorithms.
The general zone of equilibrium (light blue colour) and local zones of equilibrium (other colours) can be seen.



No signal. A dead brain or a "switched-off" artificial neural network without electric field



Maximum impact on all receptors at a time, or the "white noise".
There is no difference of the field and no values expressed thereby.
Such state is only theoretically possible, because the maximum value of one kind of analyzers may differ as to their intensity from the maximum values of other sense organs

We may say that we have achieved the understanding what these zones of activity and equilibrium mean, and what role they play in the emergence of feelings. Unlike the information approach all values reproduced in such a way will exist at the present time and will be real for the energy state of the field itself.

Subjectivity

Any system created in such a way has a clearly expressed subjectivity. Properties and all processes will exist only within the system itself as inside values in relation to its zones of equilibrium. The system may consist of millions of parts and the relations therein may be extremely complex. The measurement of electric parameters with the help of a device with only two wires will not give a complete picture of complex internal relations. It is practically

impossible to take readings from such system, as even by measuring of all possible connections between millions of elements we will receive discrete values of electricity between two contacts, and not that total systemic effect, the emergence, which occurs for the system as a whole and really exists at the present time.

Three constituent parts of the technology:

1. **Physical condition** (networks from the conductor, field carriers) – structure pre-setting the logic of interactions and values and forming complex energy relations within the field. By closing and interrupting the elements of the network connection it is possible to control the characteristics of the field.
2. **Field** (electric or other) – is located in this condition-structure.** By delivering external signals to the elements of the structure it is possible to cause distortions of the internal energy state of the field which perceives its internal states. For each of such deviations one or another value can be pre-set with the help of structural specifics of the physical condition.
3. **Effect** – emerging due to the interaction of areas of the field with one another which get different values for one another. This effect existing completely at the present time is functionally capable to duplicate the mechanism of any feeling or sensation known to us. This is what we call “animateness”.

Physical condition consists of two parts:

- 1.1. **Functional part** is the condition itself where the complex field is contained in which relations occur. The functional part consists of elements – conductors having many connections with other conductors which form a network. Such element fulfils the function of an artificial neuron. The functional part plays the role of a prism inflecting different parts of the total field and pre-setting by these deviations the inside values for this field.

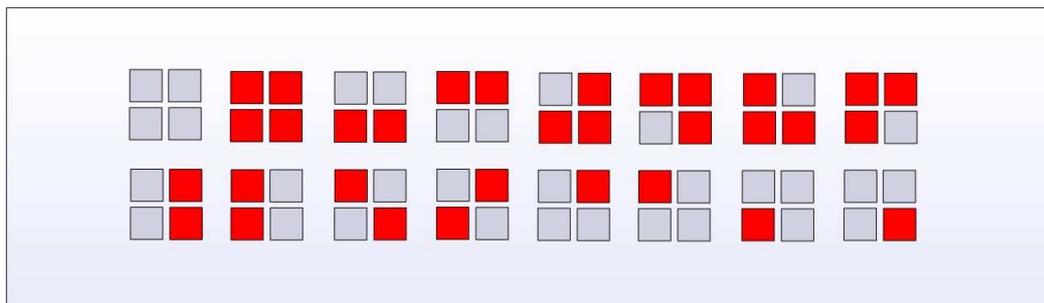
1.2. **Technical part** which does not contain the field and does not overlap the functional part but closes and interrupts the areas of the condition forming therein the effect with pre-set parameters.

The effect represents the capacity of the field to perceive its internal energy state and move towards a new equilibrium.

- **Consciousness** in this event is the condition of superposition – energy equilibrium in relation to which any deviation occurs in the field as a difference in the system. Function – capacity to perceive. Exists only at the present time.

- **Sensation** is the impact of the energy imbalance, the urge of the point of equilibrium of the field to move in one or another direction. In this event the feeling really exists as a physical phenomenon having a value for the field itself and having no value for the objective physical world. Qualitative characteristic of consciousness. Exists only at the present time.

In the same field many deviations may emerge from the general and local zones of the energy equilibrium which gives the opportunity of simultaneous perception of many feelings, like we have in our consciousness. At the same time there will always be one common centre of equilibrium by which the singularity and uniqueness of consciousness is determined for each system or the neural network of a living brain.



In the event of four elements in the system at which the change of voltage is possible 16 combinations of the system position are possible. In the event of 10 elements - 100 variants, and so on, provided that the voltage between the elements will change by one fixed value. If the voltage is different between all elements there will be even more values and the relations

between them more complex. The areas of equilibrium, their superposition will always change, consequently the properties which are manifested in relation to them will change too.

Response speed

It is necessary to take into account that sensation exists only at the moment of the actual imbalance in the system, at the time of its equalization. The use of metallic conductors will lead to an immediate equalization of the energy state of the system and the disappearance of sensation. In the biological medium the stimulus is transmitted much slower – from some centimetres up to hundreds of meters per second. This fact must also be taken into account and materials with such speed of current conduction must be used.

Due to the low speed of flow of stimulus the process of perception by an awoken person is continuous, the states flow from one into another, and our consciousness is constantly filled with different sensations. Sometimes we can not focus due to disturbances which draw our attention and which may cause random thoughts or actions. A computer without such problems does everything much more accurate and faster than us. This reason – many disturbances and a slow flow of feelings – may explain the diversity of impressions and the possible unpredictability of human actions which is often explained by the “freedom of choice”, the “soul” and ensures the human creativity. Unlike a well-organized operation of the computer according to the program installed therein.

Attention

At its core attention is consciousness to which the entry of other signals is limited and the contrast of those entering is increased. Technically attention also constitutes the common centre of energy equilibrium. By forming and interrupting connections between the elements of the physical condition we can move “the beam of consciousness” which for us is attention towards one or another area and focus on certain sensations in relation to the general background. In this event only a small part of all possible sensations, thoughts, memory penetrates consciousness. By focusing our attention on a certain memory area we reproduce in our thoughts the required images. At the same time we simultaneously continue to study information from different parts of the brain – sensors - remembering “who I am” and fulfilling certain physical actions. As in the same system there can be only one energy centre of equilibrium at a time we always have only one attention, as well as consciousness. But there may be many sensations.

Dissimilarity from state-of-the-art digital and analogue technologies

Summarizing the above let us define the main differences from the existing technologies. The functional aim of the technical solution in the event of modeling of sensations is not processing of information, but creation of a complex uninterrupted effect fully available at the present time in form of a single effect. The difference of potentials between two conductors used in state-of-the-art devices is able to express a certain sense only by way of modelling in the time, whereas there is no observer, no single perception which could connect the received signals from receptors, signals from the memory, thinking, emotions, compare them and thus receive consciousness. Voltage drops are discrete and not interconnected. No matter how quick the information processing it will not be one-time. There will always be a situation when the past bit (or voltage spike in analogue devices) is already gone, and the future one has not yet started. And the existing bit in form of a physical effect is very simple and does not bear for itself any value.

If we try to duplicate the analogue of sensations it is necessary to make an uninterrupted complex field in which values exist for the energy equilibrium of the field itself. But even in modern structures of artificial neural networks the logic of a discontinuous signal is used and the objectives of information processing are pursued, and not of creation of effect contained between millions of elements and fulfilling the function of consciousness and sensations. We have been writing about it in the course of the whole project.

As for the described spatial and energy approach the processing of information is not required either. Everything runs on its own as an urge for a total energy equilibrium, and the program, the logic of the process is the structure topology.

Unlike existing technologies it is impossible to transfer, save or replicate the emerged effect. It can be duplicated only subject to the creation of a similar condition. This is much more complex than the principles of the existing information technologies. But our task is not to improve the existing technical approaches, but to reproduce sensations, which determines totally different horizons of the scientific and technical progress.

* Emergence can also be based on sense

** Instead of the field any interactive medium can be used. If we replace conductors with pipes and elements with distributors the same effect can be created using the pressure of fluid or other substance in the pipes.

08. Articles and publications

The section is devoted to the logical analysis of the emergence phenomenon, the concept of consciousness of animateness and modeling of artificial systems-worlds with their own laws based on the principles described above. Here you can find the most interesting subjects in connection with the research, each of which requires a thorough consideration, examination and discussion.

Edge of creation of the animated. Principles of alive in inanimate nature

The perception of one another by the carriers of fundamental physical interactions – gravitational, electromagnetic, nuclear – in the inanimate nature is of the same kind as in animated systems which represent more complex combinations of the same interactions. They operate accompanied by the energy exchange at the present time too. Structures where complex effects and relations can occur are not limited only to the neural networks of the brain. Interactions in complex molecules, stellar systems and even electric or water supply systems can resemble the operation of neural networks. These simplest energy perceptions of one another between many component parts give complex systemic effects. The difference between them is just the format of inside values, the absence of memory and environment full of events ensuring the complexity and the quantity of external and internal stimuli...

Issue of duplicating of consciousness as an achievement of immortality

One of the most intriguing questions is the following: is it possible to save or copy consciousness for the purpose of immortality? If we consider consciousness as an effect it can not be transmitted, recorded or saved. It can only be possible to reproduce exactly the same effect by creating an exact physical copy of the inanimate condition and reproduce the interconnections of neurons inside the brain. But if we make a number of copies all consciousnesses – both in the copies, and in the original body – will consider themselves the original, because memory on which the concept of ego is based was fully copied too. Which consciousness can be considered the original? In the body which was copied? Can the copies be considered the continuation of the first consciousness which may be contained in the

doomed body? If you think that this is impossible on the basis that the consciousness of the original has always been in its body since its birth – you are mistaken.

Consciousness is an effect existing at the present time. In the body of the original it appeared at the time of the last awakening. In sleep neural connections as the condition of appearing of effect were interrupted and there was simply no consciousness. Consciousness is always new, instantaneous. In this event sleeping technically is no different from death, and awakening – from the reproduction of consciousness after many years in a new body. Most important is to maintain the structure of neural connections in the condition ensuring the effect. Furthermore, based on this logic many copies can be made of one and the same person by way of reproduction under new conditions of habits, memory and specific features. If in this event we could change bodies we would never know it, because the memory will tell us the history of the new body and not of the perception effect, which is per se neutral. “Ego” is what is feeling at this particular moment and not the memory determining the personality.

In this connection not only the question “Why am I in this particular body?” is taken off the table, but also a totally new view of our understanding of life, death is opened, such as...

Does nature feel? Unified coordination centre of the laws of nature

Not a single law or principle based on which the human brain or physical phenomena of this world work, belongs to a human being. Living organisms represent a weak-willed condition under which the laws of nature are implemented. In particular the principles of operation of consciousness which depend on the spatial location of the charge carriers creating current and voltage by which subjective values in neural networks are expressed. All processes, including emergence, sensations, emotions and thoughts are totally transparent for the laws of nature. Furthermore, they are reproduced thereby.

If processes in neural networks were somehow isolated from the mechanism of our world which makes the laws of nature determining time, spatial coordinates, perception by charges of one another, energy interactions between them work – they would simply never occur and there would be no values and sensations in consciousness. Neither the effect of consciousness itself. Nothing happens and nothing exists without the laws of nature. They penetrate everything. These laws are well-organized among one another. A charge is always a charge, a spatial point or matter retain their uniqueness and are not duplicated, time has its scale, all this is interconnected by energy relations. All manifestations of our world observe a

clear determinacy as to how to behave in one situation or another. If we talk about some coordination centre of these laws ensuring a unified format of their operation in the whole universe, for this centre the sensations of all living beings must also be accessible.

Notwithstanding the ideas of the audience about God, there is something quite different from various techniques of describing God, which leads to not less interesting conclusions...

Definitions of existence and reality. Logical analysis

Imagine that there is some particle with a unique feature which has no parallel in the universe. If nobody notices this feature, including the particle itself, can we consider it as existing? Probably it may be considered potentially existing if the possibility of its interaction already exists in certain laws of nature and only some condition for its manifestation is lacking. This must be put as the basis for the structure of systemic connections, as far as the system theory is concerned. For a real existence an interaction with something is required.

Let us consider another logical example:

2.2.1. Let us imagine there is some A and assume that A physically exists. A does not enter into an interaction with our world – with space, time, energy, weight, charges. The immediate question is – for whom and how does A exist? If this A can interact with something else there is a certain infrastructure which supports this interaction and determines not only the feature of that other with which A interacts, but the intensity, scale and other conditions and laws of this interaction. Consequently A is not something self-sufficient but represents only a part of some larger system and constitutes only its feature.

2.2.2. If A does not interact with anything external but has internal differences then A itself is a system which includes internal parts with certain features. The difference of one part from another is described with the help of these features – coordinates, direction, energy and so on. If there are no such features, A is not a system, and the inside structure of A is not an infrastructure for the purpose of determination and running of interaction between its parts, or features.

2.2.3. If A has neither external, nor internal interactions which run or are potential, A does not exist. Because it demonstrates itself neither for the external, nor for the internal. Neither potentially, nor really...

Modelling of artificial worlds. Logical analysis

We are used to take natural constants – space, time, matter, energy, charges of fundamental interactions – for granted. However even in the event of a logical attempt of artificial modelling we face difficulties. Isolated from everything else these notions are senseless, they do not exist. There is no space, time, matter or energy “in general”, in some “nothingness”. This is the instrument of measuring one through another, a freedom degree and a measure. All constants are determined by their functions in the system in relation to other constants. In order to create them artificially we must duplicate the interactions.

This is the explanation how the laws of nature are “stored and transmitted” in space, through nothingness. Space is often mistakenly considered as some vessel or arena for the purpose of running of processes. Space is only a condition, a consequence of all interactions of our world. This is why in any point of it the laws of nature and constants are synchronized. Try to create an isolated space and you will see that it’s impossible unless you introduce the notions of time, energy, weight and charge in your system. Otherwise, what determines the thing that you created? What for and how this space will exist?

Try to isolate some object from the laws of our world. First of all, you will hardly do it. Secondly, if you manage to do it the object will simply disappear. By stopping to interact with others it will stop being manifested for them. It will pass through them without any reaction on the weight and charges. It will not reflect light. It will lose its size and location in space and time, it will lose energy. It will simply cease to exist for the system of our world.

We would like to mention that it is unnecessary to know all the secrets of our world in order to simulate simplest models. These models might not look like our world; instead of space and time they might use different degrees of freedom, have different laws, different characteristics, features, dimensions, complexity. They might form their own integrated and more complex systems. Such as life in our world.

In the same way analogy may be drawn between “space and matter” and “consciousness and sensation”. Space is a degree of freedom for matter, an area of possible values. Like consciousness for sensation. Both cases have systemic regularities the implementation of which is possible at the instrumental level. Theoretically such interconnections can be reproduced with the help of the electric field and the method of emergent technologies...

Impact on natural constants. Logical analysis

If the physical parameters of our world represent properties is it possible to create such local systems and conditions in which we could impact them? Is it possible to impact physical values, their proportionality and interconnections by correcting physical and chemical processes, controlling space, time, energy of the real world without spending much energy like in the hadron collider?

09. Conclusion

The project was launched for the purpose of announcing of the research and publications on this topic. The complexity of the subject is that it is difficult to test in practice the validity of the theory and detect the existence of consciousness or other attributes in the structure. Judging about the correctness or incorrectness of conclusions is possible based on indirect indicators. This is why the emphasis is laid on the logic and the algorithmic approach with the use of such approaches as both verification, and falsification. Because we can not feel other people’s sensations but nevertheless we are convinced that they feel just about in the same way as us.

This topic is quite wide-ranging and poorly studied. We plan to do the following within the framework of the research:

- develop an approximate topology map of networks capable of reproducing the difference of fields algorithmically resembling human sensations with account of contiguous impacts by different sense organs, memory, physiology and intellectual, emotional and psychological specifics and relations;

- conduct a logical analysis of issues in connection with the attitude to the soul as an emergent effect with a detailed examination of familiar patterns of thinking which are common at the day-to-day and the religious level and under historic conditions, and draw conclusions as regards the new approach;
- develop a kind of a general table describing the interdependence of systemic features, the system hierarchy, their impact on one another. Including consider the question whether system properties can themselves serve as elements for second level systems forming an endless nesting;
- conduct a logical analysis of the possibility of creation of artificial world constants identical to our world, which will exist immediately for one another without requiring information processing and determining one another in a functional way. And the creation by these methods of complex subjective systems analogue to artificial worlds;
- conduct a logical analysis of the possibility of impacting of the artificially created systems on the natural constants of our world. In other words, by assuming that the laws of nature are systemic effects of our world, to impact them to some extent by using the logic of system interaction.

We will appreciate any information exchange on this topic, critical reviews and commentaries which at the moment are welcome via E-mail.

As this project is not commercial the intensity of work is constrained by the lack of funds. We are ready to consider the options of mutually beneficial sponsorship. Should you find this topic interesting and useful you can also support the project by making a link hereto or providing financial assistance via [PayPal](#) addressed to: mail@nonbit.com

THE END