**MATHEMATICS SIT, PROGRAMMING OPERATORS SIT AND SOME APPLICATIONS**

**Danilishyn Illia Vitaliovich**

applicant for higher education in

Sumy State University

**Danilishyn Oleksandr Vitaliovich**

applicant for higher education in

Sumy State University

**Scientific director: Pasynkov V.M** PhD of physic-mathematical science, assistant professor of applied mathematics and calculated techniques department of “National Metallurgical Academy”

*Ukraine*

There is a need to develop an instrumental mathematical base for new technologies. The task of the work is to develop new approaches for this through the introduction of new concepts and methods.

Sit - elements

Definition 1. The set of elements at one point x of space X we shall call Sit – element, and such a point in space is called capacity of the Sit – element. We shall denote .

Definition 2. An ordered set of elements at one point in space is called an ordered Sit – element.   
It is possible to correspond to the set of elements, and to the ordered Sit - element - a vector, a matrix, a tensor, a directed segment in the case when the totality of elements is understood as a set of elements in a segment.

It is allowed to add Sit – elements: =.

**Self-holding capacity**

Definition 3. The self-holding capacity A of the first type is the capacity containing itself as an element. Denote .

Definition 4. The self-holding capacity of the second type is the capacity that contains the program that allows it to be generated. Let's denote . An example of self-holding capacity of the first type is a self-set containing itself. An example of self-holding capacity of the second type is a living organism, since it contains a program: DNA, RNA.

Definition 5. Partial self-holding capacity of the third type is called self-holding capacity, which contains itself in part or contains a program that allows it to be generated partially. Let us denote .

All capacities in self-space are self-capacities by definition. The self-capacities may to appear as Sit-capacities and usual capacities. In these cases there is used usual measure and topology methods.

**Connection of Sit – elements with self-capacities.** For example, is the self-holding capacity of the second type if it is a program capable of generating .   
Consider a third type of self-holding capacity. For example, based on , where , i.e. n - elements at one point, it is possible to consider the self-holding capacity with m elements and from , at m<n, which is formed by the form:

wmn=(m,(n,1)) (1)

that is, only m elements are located in the structure.

Self-capacities of the third type can be formed for any other structure, not necessarily Sit, only through the obligatory reduction in the number of elements in the structure. In particular, using the form

(2)

Structures more complex than S3f can be introduced.

**Mathematics itself**

Consider first the arithmetic of Sit:

1. Simultaneous addition of a set of elements are realized by .

2. By analogy, for simultaneous multiplication: : enter the notation of the set B with elements , R= R is the index of the lower discharge (we choose an index on the scale of discharges):

|  |  |
| --- | --- |
| index | discharge |
| n | n |
| … | … |
| 1 | 1 |
| , | 0 |
| -1 | 1st digit to the right of the point |
| -2 | 2nd digit to the right of the point |
| ... | ... |

Then gives the final result of simultaneous multiplication. Any system of calculus can be chosen, in particular binary. The simplest functional scheme of the assumed arithmetic-logical device for Sit-multiplication:

Register of entering a set of numbers to multiply

Sit-block of simultaneous multiplication in all chains   
of digits of the levels of these numbers

Sit-block of simultaneous addition of the values   
of these products

Register of saving the final result

Register of saving the final result

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1. Similarly for simultaneous execution of various operations: , where . qi an operation, i = 1,…,n.

1. Similarly, for the simultaneous execution of various operators: , where Fi is an operator, i = 1,…,n.
2. The arithmetic itself for self-capacities will be similar: addition - , (or for the third type), multiplication (.
3. Similarly with different operations: (, and with different operators: ().
4. the result of the holding operator action. For sets A, B we have
5. , where D is self-set for . There is the same for structures if it`s considereds as sets.
6. Sit-derivative of f(*x1,,x2,…,xn*) is S, where *x*=(*,,…*)- any set from (*x1,,x2,…,xn*). Let’s designate Sit- . Sit-integral of f(*x1,,x2,…,xn*) is S, where (*,,…*)- any set from (*x1,,x2,…,xn*). Let’s designate Sit-∫…∫ -k-multiple integral. Sit-lim of f(*x1,,x2,…,xn*) is S. Let’s designate Sit-. Self- .
7. In the case a self- derivate are obtained inclusions of multiple derivates. There are the same for self-integrals: there are obtained inclusions of multiple integrals.
8. Let’s denote self-(self-Q) through self2-Q , fS(n,Q)= self-(self-(…(self-Q))) = selfn-Q for n-multiple self.

**Operator itself.** Definition: An operator that transforms into any ; where is the operator itself.

Example. The operator includes the set itself.

**Lim-itself.**

1. Lim Sit  
   For example, the double limit corresponds to :  
   Similarly for itself limit with n variables.

In the case of lim-itself, for example, for m variables, it is sufficient to use the form (1) of lim Sit, for n variables (n>m). Similarly, for integrals of variables m (for example, a double integral over a rectangular region, through a double lim).

The sequence of actions you can "collapse" into an ordered Sit element, and then translate it, for example, to capacity. As an example, you can take the receipt. Here is the sequence of steps 1)🡪 . "collapses" into ordered ones that can be translated into the corresponding The differential operator itself is also interesting.

Remark. We can consider the concept of Sit - element as , where A fits in capacity B. Then it will mean S1f B. Let’s denote S through L(B). The rule of 2d: L(L(B))→2L(B).

**About Sit** **and S3f programming**

The ideology of Sit and S3 can be used for programming. Here are some of the Sit programming operators.

1. Simultaneous assignment of the constant to the variables . Implemented through.
2. Simultaneous check the set of conditions for a set of expressions. It is implemented through where Q can be any.
3. Similarly for loop operators and others.

– software operators will differ only in that aggregates will be formed from corresponding Sit program operators in form (1) for more complex operators in form (2).

Quite interesting is the OS (operating system), the principles and modes of operation of the computer for this programming. But this is already the material of the next articles.

Using elements of the mathematics of Sit1, we introduce the concept of Sit – the change in physical quantity B: . Then the mean Sit - velocity will be vcpst(t, Δt) =, and Sit is the velocity at time t:. Sit – acceleration .

In normal use, simply Sitx reduce to result a sum at point x of space, and when using Sitx with "target weights", we get, depending on the "target weights", one or another modification, namely, for example, the velocity (with a "target weight" f) in the case when two velocities are involved in the set , f − instantaneous replacement we get an instantaneous substitution at point x of space at time t0.

Consider, in particular, some examples: 1) describes the presence of the same electron e at two different points . 2) The nuclei of atoms can be considered as Sit elements.

Similarly, the concepts of Sit - force, Sit - energy are introduced. For example, it would mean the instantaneous replacement of energy E1 by E2 at time t0. Two aspects of Sit– energy should be distinguished: 1) carrying out the desired "target weight". 2) the fixing result of it. Do not confuse energy - Sit (this is the node of energies) with Sit – energy that generates the node of energies, usually with the "target weights". In the case of ordinary energies, the energy node is carried out automatically.

Remark. In fact, Sit – elements are all ordinary, but with "target weights" they become peculiar. Here you need the necessary kind of energy to perform them. As a rule, this energy lies in the region itself. This is natural, since it is much easier to control the elements of the k level by the elements of the more highly structured k +1 level.

Consider the concepts of self-holding capacity of physical objects. Similar to the concepts of publication: the self-holding capacity of the first type contains itself, the second type contains a program (like DNA) capable of generating it, the third type - partially containing itself or a program capable of generating it, or both. The question arises about the self-energy of the object. In particular, according to the results of the publication[2]: « will mean S1f B.» In particular, it allows you to determine the self-energy of DNA through - self-energy Q. The law of self-energy conservation acts on the level of self-energy already. Also, in addition to self-capacities, you can consider the types of self-holding: the first type is containment in itself, the second type is the containment of oneself potentially, for example, in the form of programming oneself, the third type is partial accommodation in oneself. For example: self-operator, self-action, whirlwind. It is as a result of self-holding that self-holding capacity can be formed.

Let's clarify the concept of the term self-holding capacity: this is the capacity that contains itself potentially. Consider self-Q, where Q may be any, including Q=self, in particular it may be any action. Therefore self-Q is self-made Q, it does itself. There is a partial self-Q for any Q with partial made itself. Consider some examples for self-holding capacity: ordinary lightning, electric arc discharge, ball lightning.

A self-search of the solution of the equations fi(x)=0, where i=1,2,…,n, x=(x1,x2,…,xn), will be realized in or . The same for . , where - time points set, - object in point x from space X, give to enter in necessary time moments. The same for is Three concept representation, where α- point in connectedness space.

Based on the elements of Sit – physics and special neural networks with artificial neurons operating in normal and Sit – modes, a model of a helicopter without a main and tail rotors was developed. Let's denote this model through Smnst. To do this, it is proposed to use artificial neurons of type Sit (designation - mnSt) of different levels, for example, for the usual mode, mnSt serves for the initial processing of signals and the transfer of information to the second level, etc. to the nodal center, then checked and in case of anomaly - local Sit – mode with the desired "target weight" is realized in this section, etc. to the center. Here, in case of anomaly during the test, Smnst is activated with the desired "target weight". Here are realized other tasks also.

In the capacity of form potentiality in self-holding capacity it is possible to take a program if one is present or Sit – structure. In the same way Sit – structure of needed «target weight» are taken in target block at Sit – activation of the networks. It is used an alternating current of above high frequently and ultra-violet light, which are able to work with Sit – structures in Sit – modes by it`s nature for an activation of the networks or some of it`s parts in Sit – modes and at local using Sit – mode. Above high frequently alternating current go through mercury bearers that overheating does not occur. The power of the alternating current of above high frequently increase considerably for target block. The activation of all network is realized to indicative “target weights”.

To reach the self-energy level, the mode is used. In normal mode, it is planned to carry out the movement of Smnst on jet propulsion with the conversion of the energy of the emitted gases into a vortex, to obtain additional thrust upwards. For this purpose, a spiral-shaped chute (with "pockets") is arranged at the bottom of the Smnst for the gases emitted by the jet engine, which first exit through a straight chute connected to the spiral one. There is a drainage of exhaust gases outside the Smnst. Otherwise, Smnst is represented by a neural network that extends from the center of one of the main clusters of Sit - artificial neurons to the shell, turning on into the shell itself. Above the operator's cabin is the central core of the neural network and the target block, which is responsible for performing the "target weights" and auxiliary blocks, the functions and roles of which we will discuss further. Next is the space for the movement of the local vortex. The unit responsible for Smnst's actions is located below the operators' cab. In Sit – mode the entire network or its sections are Sit – activated to perform certain tasks, in particular, with "target weights". Unfortunately, triodes are not suitable for Sit -neural network. In the most primitive case usual separaters with corresponding resistances may be used instead triodes since there is not necessity in the unbending of the alternating current to direct. The belt of Sit-memory operative is disposed around central core of Smnt. There are Sit-coding, Sit-realize of Sit- programs, the programs from the archives without extraction it’s.

Remark. The concept of elements of physics Sit is introduced for energy space. The corresponding concept of elements of chemistry Sit is introduced accordingly. Examples: 1) the energy of instantaneous substitution and1 by a2, where a1, and2 are chemical elements, q is instant replacement. Similarly, one can consider for the node of chemical reactions. The periodic table itself can also be thought of as the Sit – element: he ideology of Sit elements allows us to go to the border of the world familiar to us, which allows us to act more effectively.

**Conclusions**: New concepts and new processing methods of information based on them and new software operators were introduced. Further development is associated with changing the structure of the arithmetic-logical device, the corresponding software and application for new technologies, in the light of the new approach.

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