

MODELING OF NEURON'S SELF-REGULATION IN THE NETWORK

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In [1] A.L. Shamis considers the problem of modeling neural networks in the process of their interaction. He emphasizes that the behavior of living neural networks is caused by their internal activity. This activity requires the establishment and maintenance of stable non-equilibrium state.

Modeling of active neural networks requires the maintenance of this state in every element of a neural network. Active element of a neural network - a neuron is experiencing external action and having homeostasis (self-regulation to achieve an optimal internal state).

Homeostasis is maintained by the mechanisms of refractoriness (increase threshold of excitability of the neuron), changes in the weights of connections, the formation of new connections and generate signals. This way, the reaction of neurons to external stimuli can modify their surrounding network. In [2] also consider a mathematical model of the behavior of neurons competing as one of the options to describe their behavior.

In the model of self-regulation of the neuron are considered variants of reactions of individual neurons or groups, causing a positive or negative modification of the surrounding network. Positive modification of the network is preserved, the negative violates the homeostasis of other neurons, which leads to yet another modification of the network.

This way, adaptation and learning of the network is due to its internal processes as a response to the exerted influence.

Literature

1. *Shamis A.L.* Way of the Modeling thinking: Active synergistic neural networks, thinking and creativity, formal models of behavior and «recognition with understanding». - KomKniga, 2006. P. 208.
2. *Chernavskii D.S., Karp V.P., Vasiliev A.N., Chernavskaya O.D.* Preprint 9. A mathematical model of the processor converting the image into a symbol. - RIIS FIAN, 2011.