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Energy exchange model between agneurons as part of multi-agent neurocognitive architecture

I.A. Pshenokova, A.Z. Apshev

Institute of Computer Science and Problems of Regional Management –
branch of Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences
360000, Russia, Nalchik, 37-a I. Armand street

Abstract. In recent years distributed artificial intelligence has attracted the attention of scientists due to its ability to solve complex computing problems. The main area of this article is multi-agent systems. The flexibility of multi-agent systems makes them suitable for solving problems in various disciplines, including computer science, economics, civil construction, etc. The aim of this study is to build an imitation model of energy exchange between agents in an intellectual decision-making system based on multi-agent neurocognitive architecture. The object of study is the process of energy exchange in the neural structure of the brain. The work proposes a model of energy exchange between agneurons as part of a multi-agent neurocognitive architecture of an intellectual agent. The proposed formalism is based on the neurofunctional similarity of the agneurons of an intellectual agent with neurons of the human brain. The process of energy exchange and consumption of the brain neurons in the process of performing cognitive functions is considered. In particular, the work combines the knowledge gained as a result of the study of mitochondrial function and the metabolic energy of the brain. Formalism is presented for calculating the energy of agneurons and actors at different levels of the invariant of multi-agent neurocognitive architecture of an intelligent agent. Further work will be to test the presented architecture in the simulation modeling program.

Keywords: intellectual agent, multiagent systems, cognitive architecture, decision making and management systems

Information about the authors

Pshenokova Inna Auesovna, Candidate of Physical and Mathematical Sciences, Head of lab., Institute of Computer Science and Problems of Regional Management – branch of Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences;

360000, Russia, Nalchik, 37-a I. Armand street;

pshenokova_inna@mail.ru, ORCID: https://orcid.org/0000-0003-3394-7682

Apshev Artur Zaurbievich, Research Assistant, the Institute of Computer Science and Problems of Regional Management – branch of Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences;

360000, Russia, Nalchik, 37-a I. Armand street;

apshev@mail.ru