

Formation of dynamic cause-and-effect relationships when controlling the behavior of an intelligent agent based on the multi-agent neurocognitive architectures formalism

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Annotation. Promising intelligent decision-making systems should ensure the construction of cause-and-effect relationships between events under conditions of uncertainty associated with unreliable and incomplete knowledge, leading to the inability to predict the exact consequences of the decision taken with a variety of choices. In such cases, it is very important to take into account the correlation between cause and effect. It is known that the basis of the causal inference is the representation of all possible alternative scenarios, which allows to plan and manipulate actions in the decision-making process. The paper presents a simulation model for the formation of dynamic cause-and-effect relationships to control the behavior of an autonomous intelligent agent based on neurocognitive architectures. The multi-actor structure of event-type agneurons and the process of formation of cause-and-effect dependencies by concluding or terminating multi-agent contracts are considered. An experiment was conducted to train an autonomous intelligent agent, to predict the consequences of various actions in the current circumstances.

Key words: intelligent agent, causation, correlation, multi-agent systems, neurocognitive architecture

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Нагоев З. В., Пшенокова И. А., Канкулов С. А., Аталиков Б. А., Айран А. А. Формальная модель мультиагентного поиска оптимального плана поведения интеллектуального агента на основе самоорганизации распределенных нейрокогнитивных архитектур // Известия Кабардино-Балкарского научного центра РАН. 2021. № 3(101). С. 21–31. DOI: [10.35330/1991-6639-2021-3-101-21-31](https://doi.org/10.35330/1991-6639-2021-3-101-21-31)

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