

COGNITIVE COMPUTING SYSTEM BASED ON DISTRIBUTED KNOWLEDGE

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In the current paper the results of research and development of a computational system with cognitive properties based on inhomogeneous knowledge distributed by a set of Intelligent Agents are presented [1, 2, 4]. The Multi-Agent system represents a network with the Mesh topology in which each Agent $A_i, \forall i = \overline{1, I}$ is defined by: the initial state $X_i(t_0)$, where $X \in \mathbf{R}^N$; a strategy S_i , or a set of data processing rules for system evolution; and a target $X_i^{opt}(T)$, which also determines the purpose of the Multi-Agent system evolution.

An Agent is defined as a computing structure with Wireless communication properties that manages two data structures: the knowledge storage model and the knowledge search model [3, 4]:

The knowledge storage model of an Agent presents a data structure in XML that includes: Agent's name $A_i, \forall i = \overline{1, I}$; keyword list (target goal) $X_i^{opt}(T)$; and the list of knowledge (the status of the Agent $X_i(t)$), where $t_0 \leq t \leq T$:

The knowledge search model presents a data structure in the XML that includes: Agent name $A_i, \forall i = \overline{1, I}$; list of keywords $X_i^{opt}(T)$; and the list of rules for data processing (S_i strategy), for searching the knowledge, in order to reach the target objective $X_i^{opt}(T)$.

The evolution of the Multi-Agent system over time is determined by the expression:

$$X(t_0) \xrightarrow{S} X(t_1) \xrightarrow{S} X(t_2) \cdots \xrightarrow{S} X^{opt}(T) .$$

Keywords: *Multi-Agent system; cognitive computing; distributed knowledge; initial state; strategy; target goal.*

References

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