INFORMATION-EXTREME TECHNOLOGY FOR LOAD ESTIMATION OF TELECOMMUNICATION GRID-SYSTEM NODES

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GRID-system is considered as poorly formalized control object that is functioning in conditions of uncertainty and unguided random factors. Due to inefficiency of traditional methods of parametric control, the usage of a learning control system by functional state is promising approach. The report considers increase functional effectiveness of management by GRID-system within information-extreme intelligent technology (IEI-technology) of analysis and synthesis of learning systems, that is based on machine learning and pattern recognition.

Based on the monitoring data of the GRID-network obtained from LDAP-servers through GIIS-service (Grid Internet Information Service) a feature set and a set of classes are formed. Feature set includes computational parameters of the node, parameter of communication channels and queue toward the node, amount of resources required by the given task. Each class characterizes the same functional state of GRID-system node. Estimation of functional state of GRID-system node is performed by information-extreme hyper-ellipsoidal classifier, that is updated in radial basis of binary feature space. A learning of control system of GRID-infrastructure within of IEI-technology is based on an iterative process of searching for a global maximum of information functional efficiency of proposed Kulback's criterion modification in the working area of the determination of its functions. In this case the algorithm of planning for the tasks distribution between the nodes of GRID-system consist of such steps: determine the list of available nodes; identify the functional state (priority) of available nodes of GRID-system for given task; select one node from the list of highest functional state (priorities) for given task by random way.

The result of this approach are decrease probability of failures, overloads and total time of tasks execution.

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