

PROBLEM SITUATIONS AND THEIR STATES IDENTIFICATION IN COMPLEX TECHNICAL SYSTEMS USING MODIFIED FOREL ALGORITHM

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The article describes the peculiarities of the problem situations and their states identification that is done via the use of modified FOREL algorithm of clasterization. The main difference of the modified algorithm from the classical one is in the user's ability to set the value of the quality indicator for clusters, which makes the algorithm flexible in analyzing problem situations and states in complex technical systems.

The study aims to improve the accuracy of identification of problem situations and states in complex technical systems by modifying the FOREL algorithm.

The main objective is to break the set of problem situations in complex technical systems and their states into disjoint subsets called clusters.

The object of research is the process of identifying problem situations and states in complex technical systems.

The subject of the study are the identification technologies of problem situations and states in complex technical systems.

Classical FOREL algorithm has been modified, so that the radius of the cluster is calculated based on the quality of clustering, which is entered by the user. To exclude the possibility of the emission in clusters (such problematic situations and their states that according to selected parameters and characteristics are remote from the main cluster of objects in the cluster), the analysis of each cluster and retrieval of problem situations are conducted after cluster formation. The retrieved problem situations are defined as emissions and referred to another cluster.

The proposed modified algorithm of clustering problem situations and states in complex technical systems, based on the FOREL algorithm, enables the identification improvement of the relative quality index partition by 4.6%.

Keywords – cluster analysis, FOREL algorithm