THE SAINT-PETERSBURG STATE UNIVERSITY

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THE COGNITIVE MODELING TECHNOLOGY FOR THE SYSTEM ANALYSIS OF THE INFORMATION-EDUCATIONAL ENVIRONMENTS

The specialty 05.13.01 – "The system analysis, control and information processing" (technical sciences)

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V-39 Vetrov A.N. The cognitive modeling technology for the system analysis of the information-educational environments: the dissertation (tech., phys.-math. and med. sciences) (spec. 05.13.01, 05.13.10, 19.00.02 (19.00.03)) (3 volumes) / A.N. Vetrov; “The S.-Petersburg.st.un-ty”. – SPb.: “SPbSETU "LETI"”, 2006, M.: “RAS”, 2007, SPb: “SPbSU”, 2023. – 910 (240, 252, 418) p.: 310 (44, 89, 177) pic., 327 (2, 154, 171) tab. – Bibliogr. 499 (299) (499, 0, 0) nom. – Eng. – Dep. in “RAS”, 2007.

In the dissertation the research and the system analysis of the information technologies for the support of the information environment of automated training is conducted, the features of the structure of the adaptive information-educational environment of the automated (remote) training based on the cognitive models are presented, the cognitive modeling technology and the structure of the parametrical cognitive models for the adaptive intelligent automated training systems (at distance), and also the experimental checking of parametrical cognitive models for the system analysis and the increasing of efficiency of the information interaction of the diverse subjects of training and the various means of training of a new generation.

As the subject of research acts the cognitive modeling technology for the system analysis of the information-educational environment of the automated (remote) training system (environment) with the properties of adaptation based on the innovative parametrical cognitive models block.

The system analysis of the structure of the adaptive information-educational environment of the automated (remote) training based on the cognitive models was carried out, in particular the organization and technological stages of the automated (remote) training with taking into account of the individual features of personality of the subjects of training, the software of automated training as an information process, the features of the structure of the technological process of automated training (at distance) and the levels of presentation of the structured data in the information-educational environment, the algorithms (principles) of functioning of the various classical and innovative components of the automated training system (at distance) (in particular the adaptive electronic textbook, the laboratory workshop and library, the basic and applied diagnostic modules and electronic dean's office), the structure of the adaptive representation of a sequence of information fragments processor based on the parametrical cognitive models, the specifics of the channels of information interaction of the subjects and means of training.

The cognitive modeling technology and the structure of the parametrical cognitive models for the adaptive systems of automated training (at distance) are presented.

The experimental checking of cognitive models for the system analysis and the increasing of efficiency of the information interaction of the subjects and means of training was carried out, in particular the primary statistical processing of a posteriori data assumed the searching of the anomalies of sequences of the nominal values in the samples with a posteriori data (the revealing of anomalous emissions and artifacts in the values, the formation of primary descriptive statistics, the calculation of the critical values of indicators and the displaying of graphs), and also the secondary statistical processing of a posteriori data was carried out by the means of use of the dispersion, regression, discriminant, cluster analysis, multidimensional scaling and the factor analysis.

It is intended for the scientists and employees of SRI, teachers of technical HEIs and students in spec.: 05.13.01 – “The system analysis, control and information processing”, 05.13.05 – “The elements and devices of computer equipment and control systems”, 05.13.06 – “The automation and control by the technological processes and manufactures”, 05.13.10 – “The management in the social and economic systems”, 05.13.11 – “The mathematical and program support of computing machines, complexes and computer networks”, 05.13.17 – “The theoretical foundations of informatics”, 01.01.05 – “Theory of probability and mathematical statistics”, 01.02.01 – “Theoretical mechanics”, 19.00.02 – “Psychophysiology of perception”, 10.02.21 – “Applied and mathematical linguistics” and others.

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