THE SAINT-PETERSBURG STATE UNIVERSITY

On the rights of manuscript

Vetrov Anatoly Nikolaevich

THE ENVIRONMENT OF AUTOMATED TRAINING WITH THE PROPERTIES OF ADAPTATION BASED ON THE COGNITIVE MODELS

The specialty 05.13.01 – "The system analysis, control and information processing"
(on applied mathematics and control processes)

THE DISSERTATION

on the competition of scientific degree
of the candidate of technical sciences

The scientific supervisor:
doctor of physical-mathematical sciences, professor
Kvitko Alexander Nikolaevich

Saint-Petersburg city
2019 y.

UDC 681.513.66+004.81
LBC 32.965-01(09)+22.18
V-39

The scientific supervisor –
professor of the chair “Information systems”
of “The Saint-Petersburg state university”,
the member of “The American mathematical society”,
doctor of physical-mathematical sciences, professor
Kvitko Alexander Nikolaevich.

Reviewers:
the head of the chair “Systems and means of automation of control”
of “The Military-naval institute of radio-electronics named after A.S. Popov”,
doctor of technical sciences, associate professor, captain of the 1st rank
Philippov Pavel Vasilyevich;
the senior assistant of the head of “The scientific-research and editorial department”
of “The Military-naval institute of radio-electronics named after A.S. Popov”,
candidate of technical sciences, associate professor, captain of the 2nd rank
Kusov Eugeny Vladimirovich.

V-39 Vetrov A.N. The environment of automated training with the properties of adaptation based on the cognitive models: the dissertation (tech., phys.-math. and med. sciences) (spec. 05.13.01, 05.13.10, 19.00.02 (19.00.03)) / A.N. Vetrov; “The S.-Petersburg.st.un-ty”. – SPb.: “SPbSETU "LETI"”, 2005, M.: “RAS”, 2007, SPb: “SPbSU”, 2019. – 272 p.: 79 pic., 29 tabl. – Bibliogr. 35 (85) nom. – Rus. – Dep. in “RAS”, 2007.

In the dissertation there were reflected the problematics, relevance and theoretical bases of creation of the information-educational environments and operation of the systems of automated training at distance, containing the adaptive intellectual means of training of a new generation, the factors, significantly influencing to the increase in efficiency of the formation of knowledge of the contingent of trainees are revealed.

As the subject of research performs the structure of the system of automated (remote) training with the properties of adaptation based on the cognitive models, and also the principles and algorithms of functioning of its components.

There were presented the modifications in the organization and technology of the automated training for creation of the contour of adaptation based on the parametrical cognitive models block, which allows to realize the individually-oriented formation of knowledge of the contingent of trainees taking into account the level of their residual knowledge and physiological, psychological and linguistic features.

There was created the cognitive modeling technology, including the technique of its use, the ways (models) of representation of the structure of the cognitive model, the algorithm of formation of the structure of the cognitive model, the techniques of research of parameters of the cognitive models and the algorithm of processing of a posteriori data of testing.

There were formed the structures of the cognitive models of the subject of training and the means of training, which are in the basis of the parametrical cognitive models block.

There was developed the complex of programs for automation of the tasks of research, which includes the adaptive electronic textbook and the diagnostic modules.

It was intended for the scientists and the staff of SRI, the teachers of technical HEIs and the students of the specialties: 071900 – “Information systems in technics and technologies”, 210100 – “Control and computer science in technical systems”.

The table of contents