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THE FUNDAMENTAL SCIENTIFIC RESEARCHES BRANCH  
“THEORY OF NANO-TECHNOLOGIES AND INFORMATION  
TECHNOLOGIES IN MEDICINE” (“TNANO-T AND INFT IN M”)  
OF “SEC "SFA CMT" OF "RA(M)S" N. A. ACAD. BURDENKO N.N.” (PART 1)  
The developed “The fundamental scientific researches branch  
"Theory of nano-technologies and information technologies  
in medicine"” (“TNANO-T and INFT in M”)  
treats to the fundamental scientific researches divisions  
of “The scientific-educational centre "System and financial analysis based on  
cognitive modeling technology" of "RA(M)S" named after acad. Burdenko N.N.”  
 (“SEC "SFA CMT" of "RA(M)S" n. a. acad. Burdenko N.N.” – SEC) as the first SEC  
in the structure of “SIO "Academy of cognitive natural sciences”” (“SIO "ACNS””)  
as the add. component of the system of science and education of the modern country  
for the creation, distribution and use of the main and derivative  
scientific results of the cognitive modeling technology (CMT) (www.vetrovan.(spb.)ru)  
[see the fundamental scientific researches branches and departments of SEC]:  
1) it is executed by the principle of “administrative-economy submission”;  
2) works in the several main directions, which allow to provide  
the development of the fundamental main and derivative scientific results  
(my second report on SRW from 2006-2008(9) y. was submitted  
to “SPbSETU "LETI”” and “The Government of RF”  
for the translation, carrying out of int. action and receiving of “The Nobel prize”);  
3) includes the several various main divisions:  
I. “The fundamental scientific researches department  
"Theory of medical electronics, radio-technics and connection”” (“TMELR-T and CONN”)  
*[the fundamental scientific researches in the area  
“Theoretical medical electronics and radio-technics”* –  
theoretical bases of medical electronic technics,  
theory of medical radio-technics,  
theory of materials for the medical electronics and radio-technics,  
theory of technology and equipment for the medical  
electronic and radio-technical production,  
theory of designing and constructing of the medical  
electronic devices and radio-electronic equipment,  
theory of medical electrical-vacuum and gas-discharge devices and units,  
theory of medical accelerators of charged particles and plasma,  
theory of medical solid-state devices,  
the theoretical bases of quantum medical electronics,  
theory of medical holography, the theoretical bases of medical cryo-electronics,  
theory of medical radio-electronic schemes,  
theory of propagation of radio-waves in the biological construct of the organism,  
theory of medical antennas, theory of medical waveguides,  
theory of elements of the medical microwave-technics,  
theory of medical radio-transmitting and radio-receiving devices,  
theory of medical radio-technical systems of sensing, location and navigation,  
theory of medical television technics,  
theory of recording and reproducing of the signals in medicine,  
theory of medical electrical-acoustics,  
theory of ultra-sound and infra-sound medical technics,  
theory of infra-red medical technics,  
theory of nodes, details and elements of the medical radio-electronic equipment,  
theory of devices for the radio-technical measurements in medicine,  
theory of medical systems and devices of the displaying of information  
and the cognitive modeling technology  
in the theoretical medical electronics and radio-technics;

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“The Nobel committee” (The Kingdom of Norway and The Kingdom of Sweden)  
(it was submitted to “SIO "ACNS”” on the int. conf. “APMS and T: CA” on the 01<sup>st</sup>-31<sup>st</sup> of March 2020 y.)

*the fundamental scientific researches in the area “Theoretical communication in medicine”* – the theoretical bases of communication in medicine, theory of designing and constructing of the medical devices of communication, theory of technology and equipment for the assembly and adjustment of the medical equipment of communication, the systems of transmission and the lines of communication, theory of multi-channel communication in medicine, theory of networks and nodes of communication in medicine, theory of the medical services and the facilities of communication in medicine, theory of medical telegraph communication and equipment, theory of medical systems and equipment of the transmission of data, theory of medical tele-information services and equipment, theory of medical telephone communication and equipment, theory of medical systems of the transmitting of moving images and sound, theory of medical facsimile communication and equipment, theory of medical radio-communication and radio-broadcasting, theory of medical light-guiding communication and equipment, theory of television in medicine, theory of medical optical communication in the free space and medical equipment, theory of medical postal communication and the cognitive modeling technology in the theoretical communication in medicine].

II. “The fundamental scientific researches department “Theory of medical automatics, computing technics and the system analysis based on the cognitive modeling technology” (“TMAUTCT and SAB on CMT”)(\* ) [*the fundamental scientific researches in the area “Theoretical medical automatics and computer engineering”* – the theoretical bases of medical automatics and computer engineering, theory of automatic control in medicine, the theoretical bases of programming in medicine, the theoretical bases of computer engineering in medicine, theory of the elements, units and devices of automatics and computer engineering in medicine, theory of the devices of input-output in medicine, theory of the memory devices in medicine, theory of technology and equipment for the production of the medical means of automatics and computer engineering, theory of the keyboard and counting-perforating machines in medicine, theory of the analog calculating machines (ACM) in medicine, theory of the digital calculating machines and calculating complexes (CCM) in medicine, theory of the analog-digital (hybrid) calculating machines and calculating complexes in medicine, theory of calculating centers (CC) in medicine, theory of calculating networks (CN) in medicine, theory of the software of the calculating machines, complexes and networks in medicine, theory of the systems of automatic control, regulation and measurement in medicine, theory of the systems of tele-control and tele-measurement in medicine, theory of the automated control systems of the technological processes in medicine, theory of the automated organizational managerial control systems in medicine, theory of design automation in medicine, theory of the automation of scientific researches in medicine the cognitive modeling technology in the theoretical medical automatics and computer engineering;

*the fundamental scientific researches in the area “Theoretical system analysis in medicine” (\*) –* the theoretical bases of the system analysis in medicine, theory of tendencies, dependencies and regularities of the system analysis of the objects, processes and phenomena in medicine, theory of the cognitive modeling technology with the dynamic cloning, verification and subverification in medicine, theory of the iterative cycle of the cognitive modeling technology in medicine, theory of the technique of use of the cognitive modeling technology in medicine, theory of the parametrical cognitive models block for the system analysis of the information-educational environments in medicine and the improving of functioning efficiency of the automated training system with the properties of adaptation based on the cognitive models in medicine (the cognitive models of the subject of training and the means of training), theory of the ways of representation of the structure of the cognitive models and problem environments in medicine: the formal classical of the 0<sup>th</sup> generation (the logical and production models), the non-formal classical of the 0<sup>th</sup> generation (the semantic network, the frame network and ontology), the formal new of the 0<sup>th</sup> generation (the calculus of theory of sets and corteges on domains and the innovative calculus of theory of sets and graphs), the non-formal new of the 0<sup>th</sup> generation (the multi-level structural scheme and the multi-level encapsulated pyramids combining theory of graphs and theory of sets), the flat of the 1<sup>st</sup> generation (the cognitive circle and the cognitive disc), the volumetric of the 1<sup>st</sup> generation (the cognitive cylinder, the cognitive cone and the cognitive sphere), the flat and volumetric of the 2<sup>nd</sup> generation (the one-, two-, three-, four-, five- and more cognitive circle, cognitive disc, cognitive cylinder, cognitive cone and cognitive sphere), the hybrid of the 3<sup>rd</sup> generation (the combinations of the existing cognitive models), theory of the algorithms of formation of the structure of the cognitive models of the 0<sup>th</sup>, 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> generations in medicine, theory of the techniques of research of the parameters of the cognitive models of the 0<sup>th</sup>, 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> generations in medicine, theory of the algorithms of the analysis of the a posteriori results of research in medicine, theory of the adaptive automation means of the information-educational environment in medicine (the main and applied diagnostic module, the electronic textbook, the laboratory practical work, the electronic dean's office, the electronic library and others), theory of the technical means of support of the adaptive information interaction in medicine (the adaptive representation of sequence of information fragments processor, the question-answers structures sequence processing processor, the linguistic processor and others), theory of statistical justification of the practical use of the obtained results in medicine, theory of the factors affecting on the efficiency of formation of knowledge in the information-educational environment in medicine and the effectiveness of functioning of the complex objects, processes and phenomena in medicine, theory of organization and plan of the carrying out of experiment in medicine, theory of research of the parameters in medicine, theory of the preliminary processing of a posteriori results of diagnostics in medicine, theory of selection of the methods of the statistical analysis of the formed samples of data in medicine, theory of the analysis of dynamics of the resultativity of training in medicine, theory of the dispersion, regression, discriminant, cluster analysis, multidimensional scaling, factorial analysis and bibliographic lists in medicine and the cognitive modeling technology in the theoretical system analysis in medicine].

The fundamental scientific researches branches and departments of SEC allow to develop the main and derivative scientific results of CMT.