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THE FUNDAMENTAL DEVELOPMENTS BRANCH "COGNITIVE MODELING IN THE MATHEMATICAL SCIENCES" ("OMN") OF "THE SRI "SFA CMT" OF "THE RA(N)S" NAMED AFTER V.N. VENIAMINOV"

The developed "The fundamental developments branch "Cognitive modeling in the mathematical sciences"" ("OMN") treats to the fundamental developments divisions of "The scientific-research institute "System and financial analysis based on cognitive modeling technology" of "The RA(N)S" named after V.N. Veniaminov" ("The SRI "SFA CMT" of "The RA(N)S" named after V.N. Veniaminov" – The SRI) as the first SRI in structure of "The SIO "Academy of cognitive natural sciences"" ("The SIO "ACNS""), an additional component of science and education system of the modern country for creation, distribution and use of the main and derivative scientific results of the cognitive modeling technology (CMT) (www.vetrovan.(spb.)ru) [see the fundamental developments branches and departments of The SRI]:
1) it is executed by the principle of "administrative-economy submission";
2) works in several main directions, which allow to provide development of the fundamental main and derivative scientific results (my second report on SRW from 2006-2008(9) y. was submitted to "The SPbSETU "LETI"" and The Government of The RF for the translation, carrying out of int. action and receiving of "The Nobel Prize");
3) includes several various main divisions:
I. "The fundamental developments department "The theory of the mathematics and complex system analysis based on cognitive modeling technology"" ("SM") (*) [***the fundamental developments in area "The theoretical mathematics" (*)*** – theory of mathematical logic, theoretical bases of mathematics, theory of numbers, theory of algebra, theory of topology, theory of geometry, theory of the mathematical analysis, theory of functions valid variables, theory of functions of complex variables, theory of ordinary differential equations, theory of differential equations with private derivatives, theory of integrated equations, theoretical mathematical models of objects, processes and phenomena of natural and technical sciences, theory of equations of mathematical physics, theory of variational calculus, mathematical theory of optimum control, theory of the functional analysis, theory of calculation mathematics, theory of probability and mathematical statistics, theory of the combinatory analysis, theory of graphs, theoretical mathematical cybernetics, theory of ways of representation of structure of cognitive models and problem environments, theoretical basis of parametrical cognitive models block, theory of cognitive modeling technology in theoretical mathematics;

the fundamental developments in area "The theoretical complex system analysis" (*) – theory of general questions of the complex system analysis, theory of tendencies, dependences and laws of the complex system analysis of difficult objects, processes and phenomena, theory of cognitive modeling technology with dynamic cloning, verification and subverification, theory of iterative cycle and technique of use of cognitive modeling technology for the complex system analysis of difficult objects, processes and phenomena, theory of parametrical cognitive models block for the complex system analysis and increase of efficiency of functioning of difficult objects, processes and phenomena, theory of structure of parametrical cognitive models of the 0^{th}, 1^{st}, 2^{nd} and 3^{rd} generations, theory of ways of representation of structure of cognitive models and problem environments: formal classical of the 0^{th} generation (logical and production models), nonformal classical of the 0^{th} generation (semantic network, frame network and ontology), formal new of the 0^{th} generation (calculus of theory of sets and corteges on domains and innovative calculus of theory of sets and graphs), nonformal new of the 0^{th} generation (multilevel structural scheme and multilevel encapsulated pyramids combining theory of graphs and theory of sets), flat of the 1^{st} generation (cognitive circle and cognitive disc), volumetric of the 1^{st} generation (cognitive cylinder, cognitive cone and cognitive sphere), flat and volumetric of the 2^{nd} generation (one-, two-, three-, four-, five- and more cognitive circle, cognitive disc, cognitive cylinder, cognitive cone and cognitive sphere), hybrid of the 3^{rd} generation (combinations of the existing cognitive models), theory of algorithms of formation of difficult cognitive models of the 0^{th}, 1^{st}, 2^{nd} and 3^{rd} generations, theory of techniques of research of parameters of difficult cognitive models of the 0^{th}, 1^{st}, 2^{nd} and 3^{rd} generations, theory of algorithms of processing of a posteriori data of the complex system analysis of problem spheres, theory of software for automation of research tasks, theory of statistical substantiation of practical use of received results, theory of factors influencing to efficiency of functioning of difficult objects, processes and phenomena, theory of organization and plan of carrying out of experiment, theory of research of cognitive models parameters, theory of preliminary processing of a posteriori results of diagnostics, theory of choice of the statistical analysis methods of generated data sets, theory of analysis of productivity dynamics of difficult object, process and phenomena of research, theory of dispersion, regression, discriminant, cluster analysis, multidimensional scaling, factor analysis and bibliographical lists, the theoretical complex system analysis of basic rocket engine, the first, the second, the third and the fourth rocket engine of launch vehicle, the theoretical complex system analysis of multivariate code device (access monitoring systems), the theoretical complex system analysis of modified model of reduced eye for research of visual acuity, field of vision, color perception and other parameters in Descartes space of the 2 and 3 coordinates, the theoretical complex system analysis of modified model of reduced ear for research of absolute sensitivity and thresholds of sensitivity in Descartes space of the 2 and 3 coordinates, the theoretical complex system analysis of chemical element with 1, 2, 3, 4, 5 and more nucleus, the theoretical complex system analysis of difficult multidimensional hurricane and other difficult objects, processes and phenomena].

II. "The fundamental developments department "The theory of the cybernetics and (Cognitive) computer science"" ("SPMI") (*) [***the fundamental developments in area "Theoretical cybernetics"*** – theory of automatic control systems, theory of modeling, theory of cybernetic control systems, theory of information, theory of artificial intelligence, theory of discrete (final) automatic devices and formal languages, theory of reliability, theory of the system analysis, theory of cognitive modeling technology in theoretical cybernetics; ***the fundamental developments in area "Theoretical Computer science"*** – theory of Computer science, theory of organization of information work, theory of documentary information sources, theory of analytical-synthetical processing of documentary information sources, theory of information search, theory of information service, theory of technical means of support of information processes, theory of cognitive modeling technology in theoretical Computer science; ***the fundamental developments in area "Theoretical Cognitive computer science" (*)*** – theory of modified stratified-step model of perception (psycho-physiology of perception), processing (cognitive psychology) and understanding (cognitive linguistics) of information fragments content, theoretical bases of Cognitive computer science and cognitive modeling technology in technical, economical, physical-mathematical and other sciences, theoretical bases of formation of parametrical cognitive models block for the system analysis of information-educational environments (cognitive models of subject of training and means of training), theoretical bases of formation of parametrical cognitive models block for the financial analysis of (credit) organizations (cognitive models for the vertical, horizontal and trend financial analysis), theoretical bases of formation of parametrical cognitive models block for the complex analysis of objects, processes and phenomena in Cognitive computer science, theory of ways of representation of structure of cognitive models and problem environments (formal and nonformal classical and new of the 0^{th} generation, flat and volumetric of the 1^{st} generation and 2^{nd} generation and hybrid of the 3^{rd} generation), theory of adaptive automation means of information-educational environment (basic and applied diagnostic module, electronic textbook, laboratory practical work, electronic dean, electronic library and others), theory of technical means of adaptive information interaction support (adaptive representation of sequence of information fragments processor, question-answers structures sequence processing processor, linguistical processor and other processors), theory of technical means of the financial analysis support (automation means of formation of working plan of accounts based on normative-regulated plan of accounts of the accounting; automation means of formation of accounting balance and report about profits and losses of (credit) organization and enterprise, automation means of the vertical, horizontal and trend financial analysis of (credit) organization and enterprise based on diverse analytical coefficients system), theory of technical means of the complex analysis support (automation means of formation and research of cognitive circle, cognitive disc, cognitive cylinder, cognitive cone, cognitive sphere, one-, two-, tree-, fore-, five- and more cognitive sphere and others)].

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