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THE APPLIED DEVELOPMENTS DIRECTION "COGNITIVE MODELING IN THE NATURAL SCIENCES" ("NEN") OF "THE SRI "SFA CMT" OF "THE RA(N)S" NAMED AFTER V.N. VENIAMINOV" (PART 1)

The developed "The applied developments direction "Cognitive modeling in the natural sciences"" ("NEN") treats to the applied 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 applied developments directions and scientific-researches laboratories 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 applied 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 scientific-researches laboratory "The research of applications of the (Cognitive) computer science, cybernetics, automatics, computer engineering, data transmission and connection"" ("SIC") (*)
[***the applied developments in area "Applications of computer science (theory of information)"*** – usage of theory of computer science (theory of information), usage of theory of information work organization, usage of theory of documentary information sources, usage of theory of analytical-synthetic processing of documentary information sources, usage of theory of information search, usage of theory of information service, usage of theory of technical means of information processes support, usage of theory of cognitive modeling technology in applications of computer science (theory of information);

the applied developments in area "Applications of cognitive computer science" (*) – usage of theory of modified stratified-step model of perception (psycho-physiology of perception), processing (cognitive psychology) and understanding (cognitive linguistics) of information fragments content, usage of theory of cognitive modeling technology in technical, economical, physical-mathematical and other sciences, usage of theory of parametrical cognitive models block for the system analysis of information-educational environments (cognitive models of subject of training and means of training), usage of theory of parametrical cognitive models block for the financial analysis of (credit) organizations and enterprises (cognitive models for the vertical, horizontal and trend financial analysis of managing subjects of economical system), usage of theory of parametrical cognitive models block for the complex analysis of difficult objects, processes and phenomena, usage of theory of ways of representation of structure of cognitive models and difficult 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), usage of 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), usage of theory of technical means of support of adaptive information interaction (adaptive representation of sequence of information fragments processor, question-answers structures sequence processing processor, linguistic processor and others processors), usage of theory of technical means of support of the financial analysis (automation means of forming of working plan of accounts based on normative-regulated plan of accounts of accounting, automation means of forming of accounting balance and report on profits and losses of organization, automation means of the vertical, horizontal and trend financial analysis based on analytical coefficients system), usage of theory of technical means of support of the complex analysis (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 applied developments in area "Applications of cybernetics" – usage of theory of automatic control systems, usage of theory of modeling, usage of theory of cybernetic control systems, usage of theory of information, usage of theory of artificial intelligence, usage of theory of final automatic devices and formal languages, usage of theory of reliability of objects, processes and systems, usage of theory of the system analysis of objects, processes and phenomena, usage of theory of cognitive modeling technology in applications of cybernetics;
the applied developments in area "Applications of automatics and computer engineering" – usage of theory of automatic control, usage of theoretical bases of programming, usage of theory of computer engineering, usage of theory of elements, units and devices of automatics and computer engineering, usage of theory of input-output devices, usage of theory of memory devices, usage of theory of technology and equipment for manufacture of means of automatics and computer engineering, usage of theory of keyboard and calculation-tabulating machines, usage of theory of analog computers (APC), usage of theory of digital computers and computer complexes (DPC), usage of theory of analog-digital (hybrid) computers and computer complexes, usage of theory of computer centres (PCC), usage of theory of computer networks (PCN), usage of theory of software of computers, complexes and networks, usage of theory of systems of automatic measurement, regulation and control, usage of theory of systems of tele-control and tele-measurement, usage of theory of automated control systems of technological processes (technological stages), usage of theory of automated systems of organizational management, usage of theory of automation of designing and scientific researches, usage of theory of cognitive modeling technology in applications of automatics and computer engineering;
the applied developments in area "Applications of data transmission and connection" – usage of theory of data transmission and connection, usage of theory of designing and constructing of connection devices, usage of theory of technology and equipment for assembly and adjustments of connection equipment, systems of data transmission, communication lines, multichannel connection, networks and communication centres, services and services of connection, usage of theory of telegraph (cable) connection and equipment, usage of theory of systems and equipment of data transmission, usage of theory of tele-information services and equipment, usage of theory of tele-communication and equipment, usage of theory of systems of transfer of moving images and sound, usage of theory of facsimile connection and equipment, usage of theory of radio-communication and radio-broadcasting, usage of theory of hyber-optic (LED) connection and equipment, usage of theory of television (TV), usage of theory of optical connection in free space and equipment, usage of theory of post connection, usage of theory of cognitive modeling technology in applications of data transmission and connection].

II. "The scientific-researches laboratory "The research of applications of the mathematics, mathematical physics, mechanics, metrology, astronomy, space researches, complex system analysis based on cognitive modeling technology and complex problems of natural sciences"" ("SMMF") (*)
[***the applied developments in area "Applications of mathematics"*** – usage of theory of mathematical logic and applied bases of mathematics, usage of theory of numbers, usage of theory of algebra, usage of theory of topology, usage of theory of geometry, usage of the mathematical analysis, usage of theory of valid variables functions, usage of theory of complex variables functions, usage of theory of ordinary differential equations, usage of theory of differential equations with private derivatives, usage of theory of integrated equations, usage of theory of mathematical models of natural and technical sciences, usage of theory of mathematical physics equations, usage of theory of variation calculation, usage of mathematical theory of optimum control, usage of theory of the functional analysis, usage of theory of calculus mathematics, usage of theory of probability and mathematical statistics, usage of theory of the combinatory analysis, usage of theory of graphs, usage of theory of mathematical cybernetics, usage of theory of cognitive modeling technology in applications of mathematics;
the applied developments in area "Applications of mathematical physics" (*) – usage of theory of general problems of mathematical physics, usage of theory of mathematical models of physics of elementary particles, usage of theory of fields (united theory of field), usage of theory of mathematical models of high energy physics, usage of theory of nuclear physics, usage of theory physics of gases and liquids, usage of theory of mathematical models of thermo-dynamics and statistical physics, usage of theory of physics of firm bodies, usage of theory of physics of plasma, usage of theory of physics of atom and molecule, usage of theory of optics, usage of theory of physics of lasers, usage of theory of radio-physics, usage of theory of mathematical models of physical bases of electronics, usage of theory of acoustics (theory of distribution of waves in environment), usage of theory of cognitive modeling technology in applications of mathematical physics, usage of theory of cognitive models of interaction between elementary particles and firm bodies, fields, liquids and gases, usage of theory of cognitive model of modified volumetric planetary model of atom named after N.H.D. Bor, usage of theory of cognitive model of temperature areas of plasma of atom and molecule, usage of theory of cognitive model of optical environment of eye, usage of theory of cognitive model of acoustical environment of ear, usage of theory of cognitive model of waves distribution in environment;

the applied developments in area "Applications of mechanics" (*) – usage of theory of general tasks and methods of mechanics, usage of theory of mechanics of liquid and gas, usage of theory of mechanics of deformable firm body, usage of theory of complex and special sections of mechanics, usage of theory of cognitive modeling technology in applications of mechanics, usage of theoretical bases of formation of parametrical cognitive models block for the complex system analysis of objects, processes and phenomena of mechanics, usage of theory of ways of representation of structure of cognitive models and difficult problem environments (formal and nonformal classical and new of the 0^{th} generation, flat and volumetric of the 1^{st} generation and the 2^{nd} generation and hybrid of the 3^{rd} generation), usage of theory of adaptive automation means of research of objects, processes and phenomena of mechanics, usage of theory of technical means of support of research of objects, processes and phenomena of mechanics, usage of theory of technical means of support of the complex system analysis of difficult objects, processes and phenomena of mechanics (automation means of formation and research based on cognitive circle, cognitive disc, cognitive cylinder, cognitive cone, cognitive sphere, one-, two-, tree-, fore-, five- and more cognitive sphere and others);
the applied developments in area "Applications of mechatronics (theory of hygroscope engineering)" – usage of theoretical bases, general tasks and methods of mechatronics, usage of theory of general mechatronics, usage of theory of mechatronics of liquid and gas, usage of theory of mechatronics of deformable firm body, usage of theory of complex and special sections of mechatronics, usage of theory of automation means and devices of mechatronics, usage of theory of cognitive modeling technology in applications of mechatronics (theory of hygroscope engineering);
the applied developments in area "Applications of metrology (theory of measurement)" – usage of theory of scientific bases and technical means of metrology and metrological support, usage of theory of state, national and international systems and services of metrology, usage of theory of measurement of separate sizes and characteristics, usage of theory of standard samples of structure and properties of substances and materials, usage of theory of cognitive modeling technology in applications of metrology (theory of measurement);
the applied developments in area "Applications of astronomy" (*) – usage of theory of astronomy, usage of theory of heavenly mechanics, usage of theory of astrometry, usage of theory of astro-physics of The Solar system, The Sun, stars, fogs, interstellar environment and star systems, usage of theory of cosmology, usage of theory of observatories, tools, devices and methods of astronomical supervisions, usage of theory of cognitive modeling technology in applications of astronomy, usage of theory of cognitive models of relative positioning of 1, 2, 3, 4, 5 and more planets and satellites, The Earth, The Sun and others;

the applied developments in area "Applications of space researches" – usage of theory of devices and methods of applied scientific researches of space environment, usage of theory of planning and realization of starts of space vehicles and artificial heavenly bodies, usage of theory of uncontrol movement of space vehicles and artificial heavenly bodies, usage of theory of control of movement of space vehicles and artificial heavenly bodies, usage of theory of space technics and technology, usage of theory of safety and medical-biological problems of space flights, usage of theory of use of space systems for connection and navigation, usage of theory of practical problems of development of extraterrestrial territories and prospects of astronautics, usage of theory of applied scientific researches of astronomical objects by space means, usage of theory of geo-physical applied scientific researches by space means, usage of theory of research of The Earth from space, usage of theory of cognitive modeling technology in applications of space researches;

the applied developments in area "Applications of the complex system analysis" (*) – usage of theory of tendencies, dependences and laws of the complex system analysis of objects, processes and phenomena, usage of theory of cognitive modeling technology with dynamic cloning, verification and subverification, usage of theory of iterative cycle and technique of use of cognitive modeling technology for the complex system analysis of difficult objects, processes and phenomena, usage of theory of parametrical cognitive models block for the complex analysis and increase of efficiency of functioning of difficult objects, processes and phenomena, usage of theory of structure of cognitive models of the 0^{th}, 1^{st}, 2^{nd} and 3^{rd} generations, usage of theory of ways of representation of structure of cognitive models and difficult problem environments (formal and nonformal classical and new of the 0^{th} generation, flat and volumetric of the 1^{st} generation and the 2^{nd} generation, hybrid of the 3^{rd} generation), usage of theory of algorithms of formation of difficult cognitive models of the 0^{th}, 1^{st}, 2^{nd} and 3^{rd} generations, usage of theory of techniques of research of parameters of difficult cognitive models of the 0^{th}, 1^{st}, 2^{nd} and 3^{rd} generations, usage of theory of algorithms of a posteriori data processing of the complex system analysis of problem spheres, usage of theory of software for automation of research tasks, usage of theory of statistical substantiation of practical use of received results, usage of theory of factors influencing to efficiency of functioning of objects, processes and phenomena, usage of theory of organization and plan of carrying out of experiment, usage of theory of research of cognitive models parameters, usage of theory of preliminary processing of a posteriori results of diagnostics, usage of theory of choice of methods of the statistical analysis of generated data sets, usage of theory of analysis of dynamics of productivity of training, usage of theory of dispersion, regression, discriminant, cluster analysis, multivariate scaling, factor analysis, bibliographical lists, usage of theory of the complex system analysis of basic rocket engine, the first, the second, the third and the fourth rocket engine of launch vehicle, multivariate code device, modified model of reduced eye for research of visual acuity, field of vision, color perception and other parameters in Descartes space of 2 and 3 coordinates, modified model of reduced ear for research of absolute sensitivity and thresholds of sensitivity in Descartes space of 2 and 3 coordinates, chemical element with 1, 2, 3, 4, 5 and more nucleus, difficult multivariate hurricane].

The applied developments directions and scientific-researches laboratories of The SRI allow to develop the main and derivative scientific results of CMT.