Vetrov Anatoly Nikolaevich, author of the unique cognitive modeling technology
www.vetrovan.(spb.)ru
The RF, Saint-Petersburg city

THE FUNDAMENTAL DEVELOPMENTS BRANCH "COGNITIVE MODELING IN THE NANOTECHNOLOGIES AND INFORMATION TECHNOLOGIES" ("ONIT") 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 nanotechnologies and information technologies"" ("ONIT") 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 electronics, radio-engineering and connection"" ("SVLTSEB") [***the fundamental developments in area "Theoretical electronics and radio-engineering"*** – theoretical bases of electronical technics, theory of radio-engineering, theory of materials for electronics and radio-engineering, theory of technology and equipment for electronical and radio-engineering manufacture, theory of designing and constructing of electronical devices and radio-electronical equipment, theory of electrical-vacuum and gas-discharge devices and units, theory of accelerators for charged particles and plasma, theory of solid-state devices, theoretical bases of quantum electronics, theory of holography, theoretical bases of crio-electronics, theory of radio-electronical circuits, theory of radio-waves distribution, theory of antennas, theory of wave transports, theory of elements of micro-wave techniques, theory of radio-transmission and radio-receiving devices, theory of radio-engineering systems of sounding, location and navigation, theory of television (TV) technics, theory of record and reproduction of signals, theory of electrical-acoustics, theory of ultra-sonic and infra-sonic technics, theory of infra-red technics, theory of units, details and elements of radio-electronical equipment, theory of devices for radio-engineering measurements, theory of systems and units of information display, theory of cognitive modeling technology in theoretical electronics and radio-engineering;

the fundamental developments in area "Theoretical connection" – theory of connection, theory of designing and constructing of connection devices, theory of technology and equipment for assembly and adjustment of connection equipment, systems of transfer and communication lines, theory of multichannel connection, theory of networks and centres of communication, theory of services and good turns of connection, theory of telegraph connection and equipment, theory of systems and equipment of data transmission, theory of tele-information services and equipment, theory of tele-communication connection and equipment, theory of transfer systems of moving images and sound, theory of facsimile connection and equipment, theory of radio-communication connection and radio-broadcasting, theory of hyber-optic (LED) connection and equipment, theory of TV, theory of optical connection in free environment and equipment, theory of post connection, theory of cognitive modeling technology in theoretical connection and terminal equipment of data transmission].

II. "The fundamental developments department "The theory of the automatics, computer engineering and system analysis based on cognitive modeling technology"" ("SITA") (*)

[***the fundamental developments in area "Theoretical automatics and computer engineering"*** – theory of automatic control, theoretical bases of programming, theoretical bases of computer engineering, theory of elements, units and devices of automatics and computer engineering, theory of input-output devices, theory of memory devices, theory of technology and equipment for manufacture of automatics means and computer engineering, theory of keyboard and calculating-tabulating machines, theory of analog computers (APC), theory of digital computers and computer complexes (DPC), theory of analog-digital (hybrid) computers and computer complexes, theory of computer centres (CPC), theory of computer networks (NPC), theory of software of computers, complexes and networks, theory of systems of automatic measurement, regulation and control, theory of tele-control and tele-measurement systems, theory of automated control systems of technological processes, theory of automated systems of organizational management, theory of designing automation, theory of scientific researches automation, theory of cognitive modeling technology in theoretical automatics and computer engineering;

the fundamental developments in area "The theoretical system analysis" (*) – theory of tendencies, dependences and laws of the system analysis of 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, theory of parametrical cognitive models block for the system analysis of information-educational environments and increase efficiency of functioning of automated training system with properties of adaptation based on cognitive models (cognitive models of subject of training and means of training), 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 algorithm of formation of cognitive model structure, theory of technique of research of cognitive model parameters, theory of algorithm of analysis of a posteriori results of research, theory of adaptive automation means of information-educational environment (basic and applied diagnostic module, electronical textbook, laboratory practical work, electronical dean, electronical 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 statistical substantiation of practical use of received results, theory of factors influencing to efficiency of knowledge formation in information-educational environment and efficiency of functioning of 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 statistical analysis methods of generated data sets, theory of analysis of productivity dynamics of objects, processes and phenomena, theory of dispersion, regression, discriminant, cluster analysis, multidimensional scaling, factor analysis and bibliographical lists].

III. "The fundamental developments department "The theory of the nano-technologies for the mechanical engineering, instrument making, polygraphy, reprography and foto-cinema-technics, easy and food-processing industry, transport, architecture and construction"" ("SNT") (*) [***the fundamental developments in area "Theoretical nano-technologies for mechanical engineering"*** – theory of nano-technologies for machines science and details of machines, for machine-building materials, for technologies of mechanical engineering, for foundry manufacture, for forge-stamp manufacture, for assembly manufacture, for cutting materials, for electrical-physical-chemical processing, for thermal and strengthening powder materials, for manufacture of nonmetallic products, for machine-tool construction, for robotics, for tool manufacture, for mining mechanical engineering, for metallurgical mechanical engineering, for reactor construction, for turbine construction, for special power stations, for chemical and oil mechanical engineering, for locomotive construction and carriage building, for engine construction, for motor car industry, for ship building, for aircraft building, for space technics and rocket building, for hoisting-transport mechanical engineering (industry), for building and road mechanical engineering, for municipal mechanical engineering, for tractor and agricultural mechanical engineering, for mechanical engineering of light industry (by types of production), for polygraphic mechanical engineering, for mechanical engineering of food-processing industry, for mechanical engineering of trade and public catering, for household machines and devices, for manufacture of weapon, for other branches of mechanical engineering, theory of cognitive modeling technology in theoretical nano-technologies for mechanical engineering; ***the fundamental developments in area "Theoretical nano-technologies for instrument making"*** – theory of nano-technologies for theoretical bases of instrument making, for general technology of production and equipment in instrument making, for designing and constructing of devices, for measurement devices of electrical and magnetical sizes (poles), for measurement devices of mechanical sizes, for measurement devices of time and frequency, for measurement devices of structure and physical-chemical properties of substances and materials, for devices of thermal-technical and thermal-physical measurements, for measurement devices of acoustical sizes and characteristics, for measurement devices of optical and lighting-technical sizes and characteristics, for measurement devices of ionization radiations, for devices of not destroying control of products and materials, for general structural elements, units of measuring devices and system, means of organizers (office equipment), theory of cognitive modeling technology in theoretical nano-technologies for instrument making;

the fundamental developments in area "Theoretical nano-technologies for polygraphy, reprography and foto-cinema-technics" – theory of nano-technologies for polygraphy, reprography and foto-cinema-technics, theory of cognitive modeling technology in theoretical nano-technologies for seal (press); ***the fundamental developments in area "Theoretical nano-technologies for light industry"*** – theory of nano-technologies for textile industry, for knitted industry, for clothing industry, for tanning industry, for fur industry, for industry of artificial leather and film materials, for shoe industry, for leather-haberdashery industry, for bristle-brush manufactures, for manufacture of accessories, theory of cognitive modeling technology in theoretical nano-technologies for light industry; ***the fundamental developments in area "Theoretical nano-technologies for food-processing industry"*** – theory of nano-technologies for food raw materials and auxiliary materials, for processes and devices of food manufactures, for (grain-)elevator and flour(-grinding)-sereals (croup) industry, for mixed-fodder industry, for baking of bread and macaroni industry, for confectionery industry, for sugar industry, for starched-treacle industry, for barmy industry, for brewing industry, for spirituous industry, for high-alcohol drinks industry, for wine-making (vinous) industry, for soft (without alcohol) drinks industry, for canning, vegetable drying and food-concentrate industry, for food-gustatory industry, for tobacco industry, for meat and bird fancier processing industry, for manufacture of eggs and egg products, for dairy (milk) industry, for creamery (butter-fatty) industry, theory of cognitive modeling technology in theoretical nano-technologies for food-processing industry; ***the fundamental developments in area "Theoretical nano-technologies for transport"*** – theory of nano-technologies for railway transport, for motor car transport, for water transport, for air transport, for pipeline transport, for industrial transport, for urban (municipal) transport, for interaction of different types (kinds) of transport, for mixed transportations, for other types (kinds) of transport, theory of cognitive modeling technology in theoretical nano-technologies for transport;

the fundamental developments in area "Theoretical nano-technologies for architecture and construction" (*) – engineering-theoretical bases of construction, architecture, building materials and products and building constructions, theory of technology of building-installation works, theory of technology of production of building materials and products, machines, mechanisms, equipment and tool, used in construction and industry of building materials, theory of engineering researches in construction, theory of architectural-building designing, theory of regional (district) lay-out, theory of town-planning, theory of objects of construction and engineering support of construction objects, tendencies, dependences and laws in architecture and construction, theory of cognitive modeling technology with dynamic cloning, verification and subverification, theory of iterative cycle and technique of use of cognitive modeling technology, theory of parametrical cognitive models block for architecture and construction (buildings and constructions based on cognitive circle, cognitive disc, cognitive cylinder, cognitive cone and cognitive sphere), theory of ways of representation of structure of cognitive models and problem environments (formal and nonformal classical and new of 0^{th} generation, flat and volumetric of the 1^{st} generation and 2^{nd} generation and hybrid of the 3^{rd} generation), theory of algorithm of formation of cognitive model structure, theory of technique of research of cognitive model parameters, theory of algorithm of analysis of a posteriori results of research, theory of adaptive automation means of architecture and construction (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), theory of statistical substantiation of practical use of received results, theory of factors influencing to efficiency of construction of buildings and constructions, theory of organization and plan of carrying out of experiment, theory of research of parameters of parametrical cognitive models block, theory of preliminary processing of a posteriori results of diagnostics, theory of choice of statistical analysis methods of generated data sets, theory of analysis of productivity dynamics of construction, theory of dispersion, regression, discriminant, cluster analysis, multidimensional scaling, factor analysis and bibliographical lists].

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