

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 INDUSTRY

AND CHEMICAL SCIENCES” (“OHNM”)

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 industry  
and chemical sciences”” (“OHNM”)  
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 easy, food, forestry and wood processing industry,  
the architecture and construction, the agriculture, forestry,  
water, fish economy and aqua-culture”” (“SNM”) (\*)  
*the fundamental developments in area  
“Theoretical light industry”* –  
theory of textile industry,  
theory of knitted industry, theory of clothing industry,  
theory of tanning industry, theory of fur industry,  
theory of industry of artificial leather and film materials,  
theory of shoe industry, theory of leather-haberdashery industry,  
theory of bristle-brush manufacture, theory of accessories manufacture,  
theory of cognitive modeling technology  
in theoretical light industry;  
*the fundamental developments in area  
“Theoretical food-processing industry”* –  
theory of food raw materials and auxiliary materials,  
theory of processes and devices of food-processing manufactures,  
theory of (grain-)elevator and flour(-grinding)-sereals (croup) industry,  
theory of mixed-fodder industry,  
theory of baking of bread and macaroni industry,  
theory of confectionery industry, theory of sugar industry,  
theory of starched-treacle industry,  
theory of barmy industry, theory of brewing industry,  
theory of spirituous industry,  
theory of high-alcohol drinks industry,  
theory of wine-making (vinous) industry,  
theory of soft (without alcohol) drinks industry,  
theory of canning, vegetable drying and food-concentrate industry,  
theory of food-gustatory industry, theory of tobacco industry,  
theory of meat and bird fancier processing industry,  
theory of manufacture of eggs and egg products,  
theory of dairy (milk) industry, theory of creamery (butter-fatty) industry,  
theory of cognitive modeling technology  
in theoretical food-processing industry;

*the fundamental developments in area “Theoretical forestry and wood processing industry”* – theory of wood science, theory of forestry-cutting works, theory of forestry transportation, theory of forestry-timber works, theory of technology and equipment for wood processing, theory of forestry-sawmill manufacture, theory of joiner-building products manufacture, theory of manufacture of plywood and plates, theory of furniture manufacture, theory of matches manufacture, theory of wooden container manufacture, theory special wood-processing manufactures, theory of pulp-paper industry, theory of cognitive modeling technology in theoretical wood-processing industry;

*the fundamental developments in area “Theoretical architecture and construction” (\*)* – engineering-theoretical bases of construction, theory of architecture, theory of building materials and products, theory of building constructions, theory of technology of construction-installation works, theory of technology of production of building materials and products, theory of machines and mechanisms, theory of equipment and tool used in construction and building materials industry, theory of engineering researches in construction, theory of architectural-construction designing, theory of regional (district) lay-out, theory of town-planning, theory of objects of construction, theory of engineering support of objects of construction, theory of 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 classical of the 0<sup>th</sup> generation (logical and production models), nonformal classical of the 0<sup>th</sup> generation (semantic network, frame network and ontology), formal new of the 0<sup>th</sup> generation (calculus of theory of sets and corteges on domains and innovative calculus of theory of sets and graphs), nonformal new of the 0<sup>th</sup> generation (multilevel structural scheme and multilevel encapsulated pyramids combining theory of graphs and theory of sets), flat of the 1<sup>st</sup> generation (cognitive circle and cognitive disc), volumetric of the 1<sup>st</sup> generation (cognitive cylinder, cognitive cone and cognitive sphere), flat and volumetric of the 2<sup>nd</sup> generation (one-, two-, three-, four-, five- and more cognitive circle, cognitive disc, cognitive cylinder, cognitive cone and cognitive sphere), hybrid of the 3<sup>rd</sup> 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 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 the 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 in area "Theoretical agriculture and forestry"*** – theory of agricultural biology, theory of soil science, theory of agriculture, theory of agricultural land improvement, theory of agro-chemistry, theory of plant-growing science, theory of agricultural plants protection, theory of live stock farming (animal industry), theory of veterinary science, theory of preparation of agricultural production, theory of hunting and the hunting economy, theory of forestry, theory of economics and organization of agriculture, theory of mechanization and electrification of agriculture, theory of cognitive modeling technology in theoretical agriculture and forestry;

***the fundamental developments in area "Theoretical water economy"*** – theoretical scientific bases of water economy, theory of water economy, theory of water-economy construction, theory of hydro-technical and hydro-ameliorative constructions, theory of irrigation and water supply, theory of irrigating systems, theory of drying systems, theory of sewage waters, their clearing and use, theory of quality of water, theory of tests, measurements, control in water economy, theory of mechanization and automation in water economy, theory of complex use of water resources, theory of cognitive modeling technology in theoretical water economy;

***the fundamental developments in area "Theoretical fish economy and aqua-culture"*** – theory of biological resources of The World ocean and internal reservoirs, theory of aqua-culture, theory of fish breeding (culture), theory of industrial fishery, theory of technical operation of fishing industry fleet, theory of technical operation of fish seaports, theory of technology of processing of raw materials of a water origin, theory of equipment for fish-processing industry, theory of cognitive modeling technology in theoretical fish economy and aqua-culture;

***the fundamental developments in area "The theory of the chemistry, chemical technology and chemical industry" ("SCHN")*** –

***the fundamental developments in area "Theoretical chemistry"*** – theory of general-laboratory based chemical equipment, theory of equipment, theory of physical chemistry, theory of nonorganic chemistry, theory of complex compounds, theory of analytical chemistry, theory of organic chemistry, theory of bio-organic chemistry, theory of natural organic compounds and their synthetic analogues, theory of chemistry of high-molecular compounds, theory of biological chemistry, theory of cognitive modeling technology in theoretical chemistry;

***the fundamental developments in area "Theoretical chemical technology and chemical industry"*** – theory of processes and devices of chemical technology, theory of chemical raw materials, theory of technology of nonorganic substances and products, theory of fertilizers manufacture, theory of manufacture of silicate and refractory nonmetallic materials, theory of industrial organic synthesis, theory of industrial synthesis of organic dyes and pigments, theory of technology of photographic materials, theory of technology of explosive substances and chemical protection means, theory of storage and destruction of chemical weapon, theory of technology of chemical-pharmaceutical means, theory of technology of fragrant substances, theory of technology of pesticides and disinfectant substances, theory of processing of natural gases, oil, gas condensate, their products and analogues, motor fuel and lubricant materials, theory of technology of firm combustible minerals processing, theory of timber-chemical manufactures, theory of technology of natural high-molecular compounds, theory of technology of synthetic high-molecular compounds, theory of technology of plastics, theory of technology of production of rubbers and products from them, theory of technology of varnish-paint materials and organic coverings, theory of technology of chemical fibers and strings, theory of technology of chemical reactants and especially clean substances, theory of technology of household chemical (goods) products, theory of technology of auxiliary materials, theory of cognitive modeling technology in theoretical chemical technology and chemical industry;

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