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TITLE: SUBNEURAL FACTORS OF NEURAL NETWORKS
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RELEASE: NOFORN (NF); WNINTEL (WN)

TEXT: *C* *NOFORN* ENTIRE. DURING THE INTERNATIONAL JOINT CONFERENCE ON NEURAL NETWORKS, HELD 15 TO 19 JANUARY 90, IN WASHINGTON, DC, A PAPER ENTITLED SUBNEURAL FACTORS OF NEURAL NETWORKS WAS PRESENTED. THE PAPER WAS WRITTEN BY DJURO KORUGA OF THE MOLECULAR MACHINES RESEARCH CENTER, FACULTY OF MACHINE ENGINEERING, UNIVERSITY OF BELGRADE, 27 MARTA 80, 11000 BELGRADE, YUGOSLAVIA.

C *NOFORN* THE EMPHASIS OF THE RESEARCH WAS ON THE STUDY OF SUBNEURAL ACTIVITIES ON A MOLECULAR LEVEL. KORUGA HAS MADE A LINK BETWEEN SUBNEURAL NETWORKS BASED ON CYTOSKELETON AND TODAY'S MODELS OF NEURAL NETWORKS. HIS APPROACH SHOWS THAT THE SUBNEURAL NETWORK BASED ON CYTOSKELETON PLAYS AN IMPORTANT ROLE IN BOTH CONTROL MECHANISMS OF NERVE CELL GEOMETRY AND THE NEURAL NETWORK.

C *NOFORN* CYTOSKELETAL LATTICES INCLUDE PROTEIN POLYMET MICROTUBULES (MT), ACTIN, INTERMEDIATE FILAMENTS AND MORE THAN FIFTEEN OTHER PROTEINS. THE MAJOR NEURAL ARCHITECTURAL ELEMENTS OF MT'S ARE CYLINDRICAL POLYMERS, WHICH ALSO COMPRISE CILIA, MITOTIC SPINDLES AND OTHER ORGANELLES. MT'S ARE INTIMATELY INVOLVED IN DYNAMIC BIOLOGICAL ACTIVITIES, BUT MECHANISMS OF REAL TIME REGULATION AND CONTROL OF MT'S OR OTHER CYTOSKELETAL FILAMENTS ARE YET COMPLETELY UNKNOWN. OF ALL THE BIOLOGICAL STRUCTURES THAT PARTICIPATE IN BIOINFORMATION MOLECULAR PROCESSES, ONLY A SMALL NUMBER WORK ON SUCH A PRINCIPLE THAT CAN BE APPLIED TO THE COMPUTER SCIENCES. ONE OF THESE RARE BIOLOGICAL STRUCTURES IS A MICROTUBLE, A SELF ORGANIZED ORGANELLE USUALLY CONSISTING OF 13 SUBUNITS. THESE CYTOLOGICAL STRUCTURES CREATE A NETWORK OF PROTOFILAMENTS IN THE CELL (NEURON), SIMILAR TO THE WAY IN WHICH NEURONS CREATE A NETWORK IN THE BRAIN.

C *NOFORN* KORUGA STATED THAT THE SYMMETRY THEORY AND MT STRUCTURE LEAD TO THE CONCLUSION THAT THE PACKING OF TUBULIN SUBUNITS IS EQUAL TO INFORMATION CODING. THIS MEANS THAT MT'S POSSESS CODE SYSTEMS WHICH CAN PROVIDE, IN THE NEURON, DYNAMIC INFORMATION ACTIVITIES. SUBNEURAL FACTORS BASED ON CYTOSKELETON AND MT'S PLAY AN IMPORTANT ROLE IN BOTH THE CONTROL MECHANISM OF NEURON GEOMETRY AND THE NEURAL NETWORK. BEARING IN MIND THAT GEOMETRIC NEURONS LOOK LIKE FRACTALS,

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THE RESEARCHERS BELIEVE THAT CYTOSKELETON AND MT'S ARE A FRACTAL ATTRACTOR OF THE NEURON. FROM THE SUBNEURAL FACTOR POINT OF VIEW, A NEW RESEARCH APPROACH CAN BE INTRODUCED IN THE FIELD OF NEURAL NETWORKS IN WHICH THE NEURON IS NOT JUST A SIMPLE OFF ON ELEMENT, BUT AN ELEMENT WITH A HISTORY.

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