A MATHEMATICAL FORMULATION OF INFORMATION NETWORK SYSTEM AND ITS IMPLICATIONS TO ARTIFICIAL INTELLIGENCE

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The purpose of the paper is to give a mathematical formulation of information network system which is based upon a system of threshold functional equations, and to show how far it can be developed in order to give an insight into general dynamical features of intelligent and integrated system of information. The dynamical behaviours of our information network system

are determined by the inner connectivity and the external influences. Both the structural and the statistical features of the inner connectivity of the information network system are discussed in details, leading us to large system considerations which are indispensable to any artificial intelligence approach. Another crucial aspects are the learning processes which our information network system can display in virtue of the plasticity of the inner connectivity under the influences of external inputs. Associated with these mathematical preparations, artificial languages can be formulated and discussed, and a general formulation of artificial social information systems is given. Although there are certainly significant gaps between natural existences and artificial ones, it is hoped that each of our artificial languages and artificial social information systems may be recognized to be of some use as a first order approximation to natural languages and human social information system, respectively.