Colloquium Computing Science

Date: Monday, June 23 2008

Speaker: Prof.dr. Gintautas Dzemyda  
System Analysis Department  
Institute of Mathematics and Informatics  
Lithuania

Room and time: 5161.0267 (Bernoulliborg), 16.00

Title: Visualization of Multidimensional Data by Using Neural Networks: Methods and Applications

Abstract:

Part 1: Institute of Mathematics and Informatics: Studies and Research
Institute of Mathematics and Informatics (www.mii.lt) has been established in 1956. Currently it is the largest in Lithuania independent state research institute. Fields of activities of the institute: scientific research and experimental development, doctoral studies, scientific organizational work, publishing, education The main research areas: data analysis; differential equations; optimization; system analysis; numerical analysis; mathematical logic; mathematical statistics; multimedia systems; probability theory; process control; software engineering; signal processing; informatics methodology. Six international journals are published. Two of them deal with the computer science: "Informatica" and "Informatics in Education". There are about 50 Ph.D. students at the institute. The research interests of the System Analysis Department and detailed examples of applications will be presented and discussed. The department has a competence and experience in such research topics: Multiple criteria decision support systems; Global optimization methods; Local optimization methods; Creation and computational realization of complex simulation models in epidemiology, state education and state energy supply systems and of various other origin with uncertainty; Statistical analysis of multidimensional data using neural networks, Data mining; Visualisation of complex multidimensional data; Optimal control applications; Medical data analysis and decision support.
Part 2: Visualization of Multidimensional Data by Using Neural Networks
Visualization of multidimensional data is a complicated problem followed by extensive researches because it allows to the investigator to observe data clusters, to estimate the internearness between the multidimensional points, to make proper decisions. The stress is put on the combinations of the multidimensional scaling methods with the self organizing maps, and the SAMANN-type neural networks. Examples of applications: analysis of ecological and environmental parameters, analysis of the economic and social conditions of Central European countries, analysis of curricula of studies, analysis of general education schools, analysis of data on the fundus of eyes, analysis of physiological data, psychological tests analysis, etc. Software may be demonstrated: the self organizing map (SOM), multidimensional scaling (MDS), combinations of SOM and MDS.

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