Analysis of Data Clusters Obtained by Self-Organizing Methods

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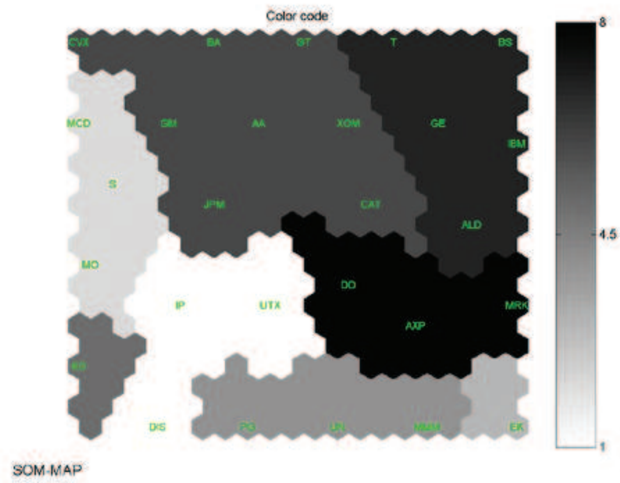
The self-organizing methods were used for investigation of financial market. As an example following R. Mantegna* we consider data time-series of Dow Jones index during 2002 year. In order to reveal new structures in stock market behavior of the companies drawing up Dow Jones index we apply SOM (Self-Organizing Map) and GMDH (Group Method of Data Handling) algorithms. As the object of investigation we take stock prices written as the table, each column of which contains information about changing of corresponding stock price during each working day. And each line contains information about every day state of all indexes. New properties and structures in data time-series have been revealed by applying GMDH and SOM techniques to processing these data. Using SOM techniques we obtain the following SOM-map from the input data.



The analysis of the clusters was made by GMDH. As a result we get analytical formulas for description of data time series behavior. GMDH methods use polynomial referenced functions and our results are presented as analogues of Kolmogorov - Gabor polynomials. The comparison of our results with obtained by standard statistical methods is also presented in the paper.

*Mantegna R. Hierarchical Structure in Financial Markets, e-print cond-mat/9802256 v.1, 1998.