

## عنوان مقاله:

Development of a decision support system based on neural networks and a genetic algorithm

## محل انتشار:

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## خلاصه مقاله:

Given ever increasing information volume and complexity of engineering, social and economic systems, it has become more difficult to assess incoming data and manage such systems properly. Currently developed innovative decision support systems (DSS) aim to achieve optimum results while minimizing the risks of serious losses. The purpose of the DSS is to help the decision-maker facing the problem of huge amounts of data and ambiguous reactions of complicated systems depending on external factors. By means of accurate and profound analysis, DSSs are expected to provide the user with precisely forecasted indicators and optimal decisions. In this paper we suggest a new DSS structure which could be used in a wide range of difficult to formalize tasks and achieve a high speed of calculation and decision-making. We examine different approaches to determining the dependence of a target variable on input data and review the most common statistical forecasting methods. The advantages of using neural networks for this purpose are described. We suggest applying interval neural networks for calculations with underdetermined(interval) data, which makes it possible to use our DSS in a wide range of complicated tasks. We developed a corresponding learning algorithm for the interval neural networks. The advantages of using a genetic algorithm (GA) to select the most significant inputs are shown. We justify the use of generalpurpose computing on graphics processing units (GPGPU) to achieve high-speed calculations with the decision support system in question. A functional diagram of the system is presented and described. The results and samples of the DSS application are demonstrated.

## کلمات کلیدی:

Decision support system, DSS, Neural network, Genetic algorithm, GPGPU, CUDA

## لینک ثابت مقاله در پایگاه سیویلیکا:

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