



The prediction of average-decade air temperature using neural network

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We attempted to forecast some meteorological parameters invoking the neural network technology. The neural network modeling is used as a variation statistical solution of this problem rarely. But this modeling enables to make some predictions quickly in the context of modern outgrowth of computer power.

Two problems remain constant for neural network modeling: 1. the trial-and-error method for input parameters; 2. the type of neuronet.

For simplicity we selected the average-decade air temperature data set for the last 50 years in Vladivostok (station code 31960) as input parameters. Since we planned to predict the air temperature in June (one of the most unstable months) so the average-decade air temperature data from March to June were taken into account. So we had 12 input and 3 output parameters.

The program Statistica Neural Networks (StatSoft) was used to make our predictions. After tests we chose a type of neuronet as Generalized Regression Neural Network (GRNN). This type of neuronet contains 25 invisible (intermediate) layers. During the tests we reached next probability errors: 12% (maximum) for the first decade and 3% (minimum) for the third one.

The following results were obtained: I decade – 12,3°C, II – 12,7°C and III – 14,1°C. So the average-month air temperature was to be 13°C. Actually this temperature ranged 16,7°C.

So we demonstrated the possibility of meteorological parameters forecasting on the basis of neural network technology. Various inputs in addition to temperature are required to make prediction more accurate.