

Using Probabilistic Neural Networks for Diagnostics and Prediction Model of the Router State

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Abstract – In the present paper neural networks are applied to the investigation of router state. Particular attention is given to probabilistic neural networks. Experimental results obtained by means of simulation modeling are presented. A new method for the router state specifying is described.

Keywords – Probabilistic Neural Network, Router.

I. INTRODUCTION

It's no doubt that one of the basic distinctive features of the modern society is its informatization. Creation of the modern information systems is impossible without development of high-performance technologies of data exchange. One of the basic tasks in this case the task of the development of network management methods. One of the basic elements of network is a router. Thus a task of router state specifying is actual.

II. DIAGNOSTICS AND PREDICTION MODEL OF THE ROUTER STATE

The router state is characterized by the set of quality indexes contained in a MIB database. The results of imitation experiment detected that the most sensible quality index of the router state is queue length in a buffer. Depending on the changeable parameters of network (communication channel state, data stream nature, cooperating components state) the function of buffer queue length from time has different character. Thus we can develop a model that will recognize factors rendering the most influence on queue length in a buffer and predict its behavior. The analysis carried out in [1] showed that for the decision of such class tasks of most effectively to use neural networks. At present the device of neural networks has been developed well enough. Neural networks are an exceptionally powerful method of modeling enabling us to reproduce extraordinarily difficult dependences. There is a great number of neural networks different types, types of their structures and not always it is possible to define the most effective model for the decision of specific task. The analysis of neuron networks different types is carried out, results are shown in fig. 1-2.

Good results are got through the instrumentality of a probabilistic neuron network. This type of neural network works so quickly as far as it in general possibly.

A number of neurons in a probabilistic neural network is depends on the number of vectors for teaching. The more vectors are for teaching, the more neurons, the higher result of recognition but up to a certain time. As we see on a diagram the increase of teaching vectors number from 12 to 15 does

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not make sense.

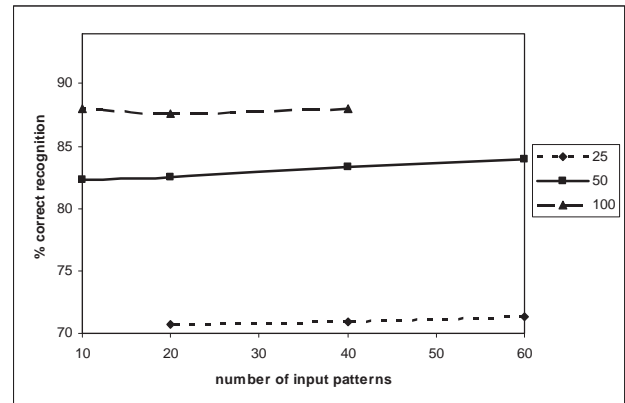


Fig.1 The recognition results are got by the instrumentality of multilayer perceptron

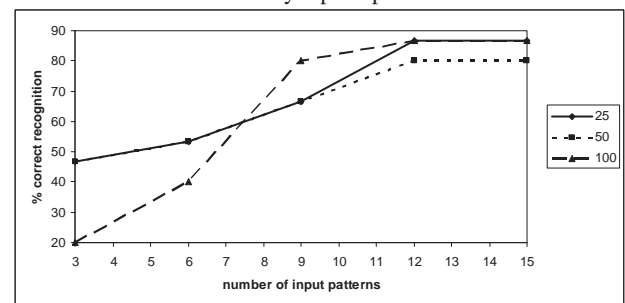


Fig.2 The recognition results are got by the instrumentality of probabilistic neural network

III. CONCLUSION

The subject of investigation is the possibility of diagnostics and prediction of the router state. The aim of research is was to study the problem of router management, investigate the properties of the router, obtain the data on features, that specify the router state, and analyse this information. The studies were directed at solving the problem of network management. In our investigation the attempt was made to work out a new approach to this problem based on neural networks. In view of the aforesaid it is possible to assert that the our investigation is actual both from the theoretical and practical point of view and contains the elements of scientific novelty.

REFERENCES

- [1] O.S. Vysochyna, S.I. Shmatkov, "Selection method of informative features for solving the classification problem of telecommunications network states", *Kherson national technical university herald*, vol. 31(2), 2009.
- [2] S. Haykin, "Neural Networks: A Comprehensive Foundation (2nd Edition)", *Prentic-Hall*, 1999.