

## ABSTRACT

**Subject of final qualification work:** Design of forecasting system based on neural networks

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**Relevance of a subject of a research:** In modern realities, the ability to predict the result of the development of a system is the key to successful operation. The increase in the volume of information, the complexity of its presentation, the need to detect hidden, deep connections makes it inefficient, and sometimes impossible to use classical statistical forecasting methods. Among the very diverse methods of forecasting a special place is occupied by methods based on the use of artificial neural networks. Great forecasting capabilities provided by the neural network, and determined the relevance of the research topic.

**The purpose of work** it consists in creating a neural network that predicts the success of University students in innovation and intellectual activity, depending on the "pre – University" factors.

**Tasks:**

1. To study the scientific literature on the design of neural networks forecasting.
2. On the basis of the studied theoretical materials to make a choice of network architecture, activation functions, training method, and other parameters.
3. To study the methods of forecasting and the possibility of using an artificial neural network in forecasting tasks.
4. Combine this knowledge to create and use a neural network.
5. Conduct experiments to train the system and determine the effectiveness of its work.

**The theoretical and practical significance** of the study is the development and testing of the proposed model of neural network in the framework of the final qualifying work and its application in forecasting tasks

During work the program of the analysis of tonality of texts on the basis of methods of machine learning has been realized. The following tasks have been solved:

1. The problem of the analysis of tonality is studied, approaches of her decision are analysed.
2. It is realized an algorithm of classification of texts on tonality.
3. The neural network for a clustering of text messages is developed and designed.
4. Testing of efficiency of algorithms is held by method of cross check.

**Results of a research:** In the course of solving the problem of forecasting in the framework of the final qualifying work was designed neural network – a perceptron with two layers. The developed forecasting system consists of three subsystems: the subsystem of forecasting and neural network training parameters adjustment; the neural network training subsystem; the subsystem of predictive values calculation. Empirically, the model included the following influencing factors: school performance, the result of graduation, the profile of the class of education, the region of study, the type of settlement in which the training took place, sex, the result of the exam in mathematics, the result of the exam in the Russian language, the conditions for admission to the University, the basis for admission to the University, the predicted factor was the average score for the session that preceded the study.

**Recommendations:** the use of neural networks in forecasting tasks is quite productive, but it requires consideration of different network architecture options to achieve greater accuracy.