

## **ABSTRACT**

Diploma consists of 66 pages and contains 29 figures, 3 tables, and 17 literature sources.

The work describes the principles of functioning and operation of artificial neural networks. The backpropagation procedure of training networks was analyzed in detail. The comparison of parameters and characteristics of training algorithms was made, showing their advantages and disadvantages. The tool for building neural system was selected and the multilayer perceptron was built with it. Efficiencies of different network training algorithms were compared. The training method based on gradient descent with momentum and adaptive learning rate. The conclusions about the quality of character recognition by network trained with different algorithms, and the prospects for further development of neural network technology were made.

Results of improving of training algorithm can be used to reduce computational costs in branches where neural networks are used for decision-making (economics, medicine, robotics, etc.).

**Keywords:** neuron, network, gradient, weight training.