# Through Computer Experiment to Understanding Neural Networks

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Nowadays there is a great interest in artificial neural networks, but the materials on this topic are either incomprehensible for high school students or offer ready-made solutions using high-level functions such as TensorFlow. The purpose of this work: the development of a computer program that allows conducting a series of experiments using mathematical modeling methods, as a tool for studying the features of neural networks functioning with a reasonable combination of mathematics and practice in order to be apprehensible for high school students. The work includes the following steps: Developing a list of more than 20 parameters and metrics used to control the neural network. Some of them were developed by the author of this work. Developing a computer program in Python with a plan of 12 different experiments. Experimenting with the neural network the user can evaluate how various parameters of the neural network affect the efficiency of its work, assess the impact of the training sample size on the training of the neural network, etc. It is possible to compare the neural network and the naive Bayes classifier. The program can work autonomously and in the Google Colaboratory environment. The results of the program are displayed in form of graphs, tables and images of matrices. Animation of the images improves perception of the dynamics of weights matrix changes.

**Awards Won:**