**Belarusian State University   
Faculty of Mechanics and Mathematics  
Department of nonlinear analysis and analysis of the economy**

**Annotation to the diploma work  
" Neural networks and its applications for problem solving "**

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The bachelor thesis –“Neural networks and its applications for problem solving” –­ contains 17 Figures, and the list of literature consists of 8 entries. The thesis comprises 48 pages including Annexes.

**Key words**: neural networks, machine learning, [backpropagation algorithm](http://www.multitran.ru/c/m.exe?t=7218965_1_2&s1=%E0%EB%E3%EE%F0%E8%F2%EC%20%EE%E1%F0%E0%F2%ED%EE%E3%EE%20%F0%E0%F1%EF%F0%EE%F1%F2%F0%E0%ED%E5%ED%E8%FF%20%EE%F8%E8%E1%EA%E8), activation function, classification, neural network architecture

The thesis examines basic concepts of neural networks such as activation function, architecture, error function, [multi-layer neural network](http://www.multitran.ru/c/m.exe?t=7218966_1_2&s1=%EC%ED%EE%E3%EE%F1%EB%EE%E9%ED%E0%FF%20%ED%E5%E9%F0%EE%ED%ED%E0%FF%20%F1%E5%F2%FC)s, [backpropagation algorithm](http://www.multitran.ru/c/m.exe?t=7218965_1_2&s1=%E0%EB%E3%EE%F0%E8%F2%EC%20%EE%E1%F0%E0%F2%ED%EE%E3%EE%20%F0%E0%F1%EF%F0%EE%F1%F2%F0%E0%ED%E5%ED%E8%FF%20%EE%F8%E8%E1%EA%E8), and problem analysis of classification

*The object of the research* is devoted to neural networks, where *the main goal* was to define basic concepts for upbuilding of neural networks and alignment of bilayer neural network for problem analysis of multiclass classification.

For more efficient implementation of the aim of the paper, the following *research tasks* were elaborated:

* To examine basic concepts of neural networks ;
* To introduce particular qualities of neural networks
* To exemplify the appliance of [backpropagation algorithm](http://www.multitran.ru/c/m.exe?t=7218965_1_2&s1=%E0%EB%E3%EE%F0%E8%F2%EC%20%EE%E1%F0%E0%F2%ED%EE%E3%EE%20%F0%E0%F1%EF%F0%EE%F1%F2%F0%E0%ED%E5%ED%E8%FF%20%EE%F8%E8%E1%EA%E8)

The conducted research revealed the following *results*:

The construction of the artificial bilayer neyral network was carried out with a purpose to value different kinds of wine considering its chemical composition by the virtue of multiclass classification problem with the help of embedded modules and Python programming language.

The bachelor thesis is both of theoretical and practical nature. The results of the research are well suited for problem analysis.

The bachelor thesis is an *independent* project which contains no plagiarism.