

# ULTRASOUND ELASTOGRAPHY BIOMECHANICS (UEB)

## OPTIMIZATION OF ALGORITHM PERFORMANCE USING NEURAL NETWORKS

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**Annotation.** In this article, we look at a comparison of graphical objects generated by triggers using elastography and using artificial neural networks. Modern functional studies of soft tissues biomechanics underlies diagnostic tools in all areas of medicine. This, in turn, is the basis for in-depth study of the field and expansion of application, leads to the formation of information.

**Key words.** Ultrasound, elastography, biomechanical, Python, neurons.

**Introduction.** Biomechanical properties of soft tissues provide additional advice for the diagnosis of the disease.

Unreliable findings in obese patients and patients with narrow intercostal spaces. The problem of time is to make the correct diagnosis in the analysis of each elastogram.

In cases where other ultrasound methods are weak, the effectiveness of elastography methods in oncological studies and the need to determine the elastic properties of biological tissues are studied when making a diagnosis. The use of elastography allows you to make a clear, early, basic diagnosis, as well as to form an auxiliary and the largest database for the doctor.

**Materials and methods.** Solving an existing problem. Compare the graphical objects obtained using the trigger. The resulting database is created, and the condition is to compare the conclusions using the verification algorithm. The resulting database is created, and the condition is to compare the conclusions using the verification algorithm. UEB we used the PYTHON programming language to optimize the performance algorithm using neural networks.

**Results and Discussion.** In general, a multilayer perceptron consists of the following elements:

- a set of input nodes that make up the input layer;
- one or more hidden layers of computational neurons;
- one output layer of neurons.

*Stages of ultrasonic elastography:*

Firstly, elastography extracts digitized radio frequency echo lines from the fabric;

secondly, it slightly compresses the fabric with a sensor along the radiation axis to produce a slight displacement;

thirdly, the digital radio frequency receives an echo line after compression "Optimization of the work process by analyzing the bank of graphic objects obtained in ultrasonic elastography devices in the algorithm of neural networks created on the basis of the Python programming language" We received the DGU certificate number 23332 from the Intellectual Property Agency.

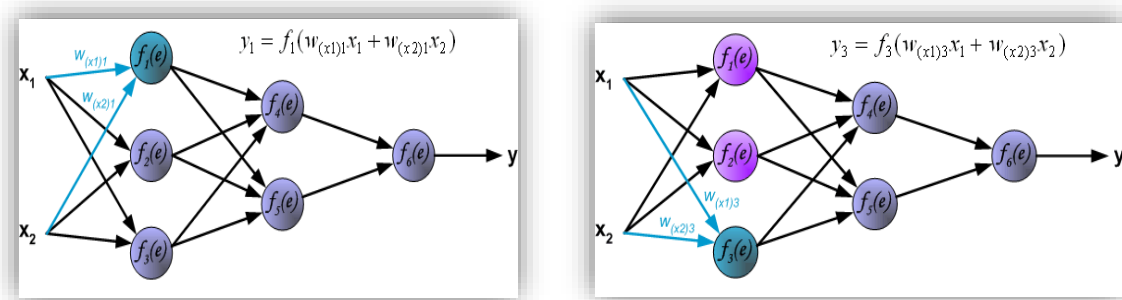


Fig 1,2. Multilayer perceptron

**Conclusions.** Accuracy, speed, will allow you to make a diagnosis by transmitting all the exact information to the doctor from the saved database. It should be noted that this is of great help in research on skin elastography. Ultrasound elastography methods are portable, are becoming increasingly popular and usually provide accurate fibrosis and diagnostic accuracy in oncology.

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