

# Convolutional neural network for recognition of the problem zones on ultrasound images of blood vessels with atherosclerotic lesion

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Today the problem of cardiovascular disease is one of the leading causes of death in the world. Therefore, new methods of treatment and detection of diseases are necessary for the successful struggle against such ailments. There are a lot of techniques, based on the using information technology, which can help to identify cardiovascular diseases. Most of them are associated with artificial neural networks.

In this paper is considered a method for the recognition of problem zones on ultrasound images. The image classifier is built on an ensemble of convolutional neural networks (CNN). This technology allows to determine the features for each individual class of images automatically at the training stage. This function makes CNN a powerful tool for solving problems associated with the classification of images, including medical ones. The proposed method allows to identify problem zones on an ultrasound image and also to identify zones with a risk of spreading the disease.

The main contributions of this paper are:

- 1) prepare dataset for training model,
- 2) build classifier for fragments of medical images,
- 3) propose effective classifier for the recognition of the problem zones on medical images.