The application of ensemble learning for delineation of the left ventricle on echocardiographic records

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The possibility of an ultrasound study of the heart is widely used in modern cardiology. This non-invasive technology allows studying cardiac activity of the patient by determining the global contractility of the heart muscle. The methods, which used in echocardiography, require performing manual operations from specially trained medical professionals. A number of researchers are working on the problem of automation of this medical technology. The article shows the way of solving the problem of the left ventricle region identification in echocardiography records with machine learning techniques. The task of the left ventricle delineation is reduced to the problem of pixels classification on video frames. A pixel can belong to one of two classes (the background region or the region of the left ventricle). The possibility of solving the task was tested with the following classifiers: decision tree, AdaBoost classifier and random forest classifier. The assessment of classification results was performed using ROC curves. The best performance was obtained for decision tree classifier (AUC 0.93) and random forest classifier (AUC 0.93).