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MACHINE LEARNING METHODS FOR DETERMINING THE STATE OF THE CARDIOVASCULAR SYSTEM BASED ON QUANTUM PHASE SPACE

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To solve the problem of classifying diseases of the cardiovascular system based on the results of Holter monitoring, the following algorithm has been developed:

1. Data preprocessing based on the quantum phase space approach;
2. Binarization of numerical features;
3. Application of machine learning methods to solve the classification problem;

A set of programs has been developed for creating the instantaneous heart rhythm (IHR) function and creating slices of 3D histograms in the language of computer algebra Maple. A set of programs for loading, preprocessing and analyzing the results of 3D histogram slices in Python has been developed. The support vector machine (SVM) method has been implemented for analyzing slices of 3D histograms in order to classify the studied data into categories (normal, deviations from the norm) with an accuracy of 93%.

Keywords: quantization, quantization constant, phase space, instantaneous heart rhythm, visualisation, machine learning.

Summary

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