

GENERAL DESCRIPTION OF WORK

Dissertation 66 p., 15 figures, 43 sources.

Keywords: MATLAB, HEART RATE VARIABILITY, AUTONOMIC NERVOUS SYSTEM, HOLTER MONITORING, MACHINE LEARNING.

The object of the study: heart rate variability during a short-term emotional outburst.

The purpose of the work: analysis of heart rate variability using MATLAB to assess the state of the autonomic nervous system during a short-term emotional outburst when watching videos from social networks.

Research methods: Holter monitoring when watching short and long videos, data analysis using MATLAB, statistical analysis using Python.

The results were obtained: a significant decrease of 2 times c was revealed in such parameters as SDNN, SDANN, SDNN index, NN50, pNN50, RMSSD, Maximum NN, Minimum NN, RR intervals, NN Intervals. When viewed, the values of SDNN, SDANN, SDNN index, NN50, pNN50, RMSSD decreased by 40-50%, and the RR Intervals, NN Intervals increased by 45-55%, indicating a deterioration in heart rate variability due to beta-adrenergic stimulation and increased sympathetic influences. In the study of the differences between the intervals on the ECG, where the subjects watched long videos and the control group, a significant 2-fold decrease in such parameters as SDNN, SDANN, SDNN index, NN50, pNN50, RMSSD, Maximum NN, Minimum NN, RR intervals, NN Intervals was revealed.

According to the results of plotting the Poincare graph in MATLAB by ECG intervals, when watching long videos and short emotional clips in TikTok, arrhythmias can be expected or indicate the presence of extrasystoles of NAJES, ZHES or pauses. There is a decrease in SS when watching long and short videos compared to rest by 56%, which indicates a predominance of sympathetic activity. According to the nature of the Poincare schedule, significant changes in the functioning of higher vegetative centers have been identified. This may indicate a decrease in the adaptability of the cardiac system.

With the described model using Python it is possible to recognise short-term emotional outbursts when viewing content with 100% accuracy.

Possible applications: The results can be applied to the fields of biology and medicine.