ABSTRACT

Bachelor’s thesis: 95 p., 20 fig., 7 tabl., 2 appendixes, 26 sources.

The topic of the research: “Remote contactless heart rate determination by video image analysis”.

In this paper an algorithm for obtaining and analyzing human heart rate by video was reviewed. An overview of some of the known methods for heart rate definition using the camera was made. From known approaches the one based on the determination of movements of head was chosen. The algorithms that can be applied at various stages of implementation of this approach were analyzed. The most rational algorithms that may be used to implement each of the modules of this system were chosen.

Based on the selected algorithms, the modules of the system were implemented. They allow the estimation of human heart rate by video using an algorithm based on the detection of head movements. Implementation involves the use of one of two approaches - analysis of data in real time or analysis of received data with use of PCA.

The system was implemented on the platform .Net Framework using the programming language C#, and packages for data analysis - EMGU and Accord.net. As a result of experiments with the implementation of the system it was decided, that further improvement of it would be expedient. The main direction of further improvement should be the filtering of data.

COMPUTER VISION, PULSE DETERMINATION, MOVEMENT IN VIDEO, OPTIC FLOW, FACE DETECTION, HAAR CASCADE, PRINCIPAL COMPONENT ANALYSIS, PREVENTIVE MEDICINE, CIRCULATORY SYSTEM