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CONTACTLESS VIDEO-BASED HEART RATE DETECTION

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In this thesis, we introduced a contactless method for detecting human heart rate using a monocular camera.

Introduction. Monitoring the heart rate (HR) using cheap devices like smartphone cameras has drawn the attention of researchers for the last few years because it can detect different pathologies related to cardiac problems. Detecting such symptoms at an early stage can save human life and can lead to avoiding surgical procedures.

Main part. Heart rate detection methods use devices in contact with the skin. Such devices are inconvenient, and cause discomfort, especially when the subject is doing daily tasks like driving a car. In addition, such devices are expensive and not that easy to use.

To overcome these shortages, we implement a contactless method for measuring the heart rate based on a smartphone camera. The proposed method uses neural networks to detect and track a region of interest (face), then extract the features from this region, and finally estimate the heart rate.

The neural network was trained using a custom dataset that was collected from persons while driving a car.

Conclusion. The implemented algorithm was tested on various subjects of different ages. The results showed that the proposed method provides a good estimation of human heart rate.