ANDROID-BASED IMPLEMENTATION OF EULERIAN VIDEO MAGNIFICATION FOR VITAL SIGNS MONITORING

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1. Motivation

Eulerian Video Magnification is a method, recently presented at *SIGGRAPH*[1] 2012, capable of revealing temporal variations in videos that are impossible to see with the naked eye. Using this method, it is possible to visualize the flow of blood as it fills the face [1]. Which provides enough information to assess the heart rate in a contact-free way using a camera [1, 2, 3].

Due to being recently proposed, the Eulerian Video Magnification method implementation has not been tested in smartphones yet. Thus, Fraunhofer Portugal is interested in testing the feasibility of implementing an Eulerian Video Magnification-based method on a mobile device with the Android platform.

There has been some successful effort on the assessment of vital signs, such as, heart rate, and breathing rate, in a contact-free way using a webcamera [1, 2, 3], and even a smartphone [4, 5].

Other similar products, which require specialist hardware and are thus expensive, include *laser Doppler* [6], *microwave Doppler radar* [7], and *thermal imaging* [8].

Since it is a cheaper method of assessing vital signs in a contact-free way than the above products, this research work has potential for advancing fields, such as, *telemedicine*, *personal health-care*, and *ambient assisting living*.

Despite the existence of very similar products by *Philips* [5] and *ViTrox Technologies* [4] to the one proposed on this research work, none of these implement the Eulerian Video Magnification method.

2. Objectives

The main goal is to develop a lightweight, real-time Eulerian Video Magnification-based method capable of executing on a mobile device. Which will require performance optimizations and trade-offs will have to taken into account.

In the process, the creation of an Android application which estimates a person's heart rate in real-time using the device's camera will be developed.

[1] `http://www.siggraph.org/`

3. Work description

3.1. Eulerian Video Magnification

3.2. Heart rate estimation

4. Conclusions

References

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