Deployment of a Remote Photo Plethysmography Detection and Monitoring System

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Background

Heart rate and heart rate variability are very useful parameters in order to gauge health conditions including stress level, fatigue, and emotional state. Researchers at Marquette University in the past have developed an algorithm to use human face videos to estimate the heart rate and heart rate variability using face and skin coloration.

Objective

Design an Android application to deploy a Heart Rate and Heart Rate Variability monitoring system via REST API

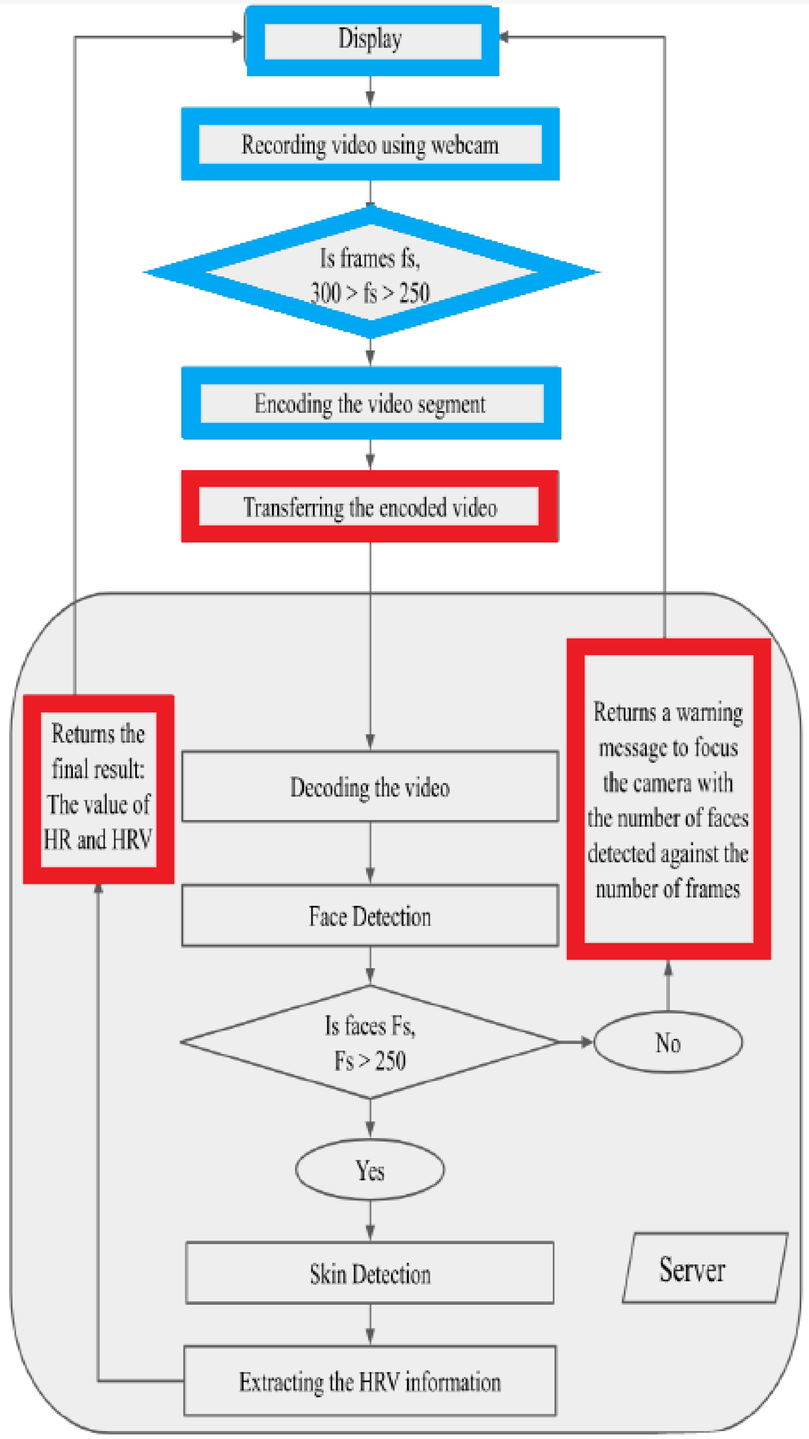
Motivation

- Advances telehealth possibilities
- Non-invasive monitoring
- Inexpensive and accessible system

Previous Work

The Marquette University detection and monitoring system is currently web-based. The existence of such a system is based on research from Verkruysse et al, and Kwon et al.

Current system picture taken from Alam, Kazi et al.



Blue- Completed
Red- Incomplete
Uncolored – Server-side

Workflow of the system taken from Alam, Kazi et al.

Final Product

The application records 10 second videos and then sends those videos to the server at Marquette University. It includes several features:

- Preview of recording
- Chronometer
- Saves videos to the device
- Live stream
- Report of health statistics and error messages
- Color-toggling record button
- Communication with the server via REST API (in development)

At the time this picture was taken, server connection was incomplete, and random numbers were produced to provide a simulated experience

Future Work

- iOS application
  - Expands reach of system
- Data collection via application
  - Inexpensive
  - Simple
- Detection and Monitoring of other Health Factors
  - Mental Stress
  - Blood Oxygenation
  - Blood Pressure

Acknowledgements

This material is based upon work supported by the National Science Foundation under Grant #1950826.
The NSF REU program was supervised by Dr. Dennis Brylow and Dr. Praveen Madiraju
Kazi Alam and Wylie Frydrychowicz were great resources while completing this project.

References

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