

Heart-Rate Variability Monitor Apple

Anthony Jones, Anthony Peak, Carlos
Alvarez, Dillon Dalton





Project Description

- - Get live heart rate data from patients.
- - Store patient heart rate and HRV data over a configured amount of time.
- - Provide intrusive feedback in case of dangerous HRV levels.
- - Receive patient demographics to assist the HRV algorithm.
- - Use supervised learning algorithm with high accuracy to detect dangerous HRV levels.
- - Record metadata about stressful events.
- - Optionally store an emergency contact for the patient.
- - Run as a background service, always monitoring HRV.
- - Export data to connected device for review by physician
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Project Scope

Baseline Requirements

1. App will read heart rate from user and then calculate the variability.
2. App will alert user when the readings are within a narrow margin.
3. App will prompt user with a message that needs feedback.
4. App will be able to save and export data in a secure way to excel for review.

Deliverables

1. A stable apple watch application that accurately tracks a user's heart rate variability.
2. Robust documentation that will allow future people to work on and improve the application.

Assumptions

1. User either has PTSD or a TBI.
2. User owns a apple watch and an Iphone.
3. User will not ignore the notification when alerted.



Project Scope

Development Constraints:

1. The application should be developed using the latest version of Swift.
2. The application should utilize the Watch Connectivity framework for communication between the Apple Watch and its paired iPhone.
3. The application should be developed in accordance with Apple's Human Interface Guidelines.



User Stories

As a patient I want to track my heart rate variability so that I can be aware of when I get stressed.

As a patient I want to be alerted when my heart rate variability decreases in a way that indicates stress.

As a patient I want to have strategies for stress reduction prompted in the app

As a patient I want to be able to review my previous alerts so that I can track my progress.

As a doctor I want to be alerted if stressful events occur.

As a doctor I want to be able to review previous alerts so that I can adjust treatment as needed to provide better help for my patient.

As a family member I want to be alerted of a parent/grandparents heart rate variability decreasing or increasing in a way that indicates stress.



Project Requirements

User Requirements:

The application should accurately measure HRV using the heart rate sensor on the Apple Watch.

The application should also predict to a high degree of accuracy if a stressful event will occur based on the current trend in HRV

The user should be able to view their HRV data over time and track changes.

The application should provide alerts to the user if their HRV decreases to a dangerous level.

The user should be able to customize the HRV alerts, such as the threshold for when an alert is triggered.

The application should be user-friendly and easy to use.



Project Requirements

Functional Requirements:

R1: Get live heart rate data from patients

R2: Ability to store patient data

R3: Application provides intrusive feedback

R4: Patient demographic configuration

R5: Application uses an algorithm to detect dangerous HRV

R6: Application records metadata about stressful events

R7: Optional patient emergency contact

R8: Application will always run in the background

R9: Export data to connected device for review by physician



Project Requirements

Non-functional Requirements:

R10: Get Apple Development license/ Determine if its in use

R11: Determine use of HRV data by Apple/ How the data gets analyzed and exported

R12: Develop/improve current learning algorithm for HRV prediction

R13: Determine supported Apple Watch Series

R14: Determine supported WatchOS versions

