**1.1 Background and Project Vision**

High Intensity Training (HIT) also known as High intensity interval training (HIIT) is widely recognized for its health benefits. HIT is a form of cardiovascular exercise using short periods of intense anaerobic exercise with shorter recovery periods. Many applications are available to assist with HIT. At this time none are monitoring the end user’s physiological response to the training. This proposes a problem for many users trying to seek health benefits and weight loss. These individuals are unable to get effective and consistent results from their training leaving them unable to reach the health goals they have set. Professionals from the health and fitness industry are also having problems.

Due to the lack of physiological feedback these professionals are unable to devise effective HIT workouts consistently. The American Heart Association generally recommends a heart rate of 50% to 70% of your maximum heart rate for exercise that is considered moderate intensity and 70 to 85% for exercise intensity that is considered vigorous. A simple way to calculate one’s maximum heart rate is to simply subtract your age from 220. For example, an individual that is 20 years old has a maximum heart rate of 200.

A [2013 study](http://heart.bmj.com/content/99/12/882.full?sid=90e3623c-1250-4b94-928c-0a8f95c5b36b) tracked the cardiovascular health of about 3,000 men for 16 years and found a high resting heart rate was linked to poor health such as higher blood pressure, high body weight, levels of circulating blood fats as well as poor overall general physical fitness. It was also discovered that the higher a person’s resting heart rate, the greater the risk of premature death. A resting heart rate of 81-90 doubled the chance of death while a resting heart rate of 90 tripled it.

A [2010 study](https://bjsm.bmj.com/content/44/Suppl_1/i20.2) tracked the effects of exercise on resting heart rate and its correlation to blood pressure and other coronary artery disease. 12 CAD patients were randomized to HIT training with an exercise intensity of 65-75% of maximum rate over the course of 8 weeks. Results showed that HIT significantly lowered the resting heart rate of these patients.

Our goal with this project was to target individuals who are trying to get healthier and trainers who would like a more advanced tracking/response feature for their clients and address the issues previously stated. Our solution involves offering trainers the tools to adapt and customize their plans for their client based on the client’s oral and physiological feedback via heart rate information.

**1.2 Socio-economic Impact, Business Objectives, and Gap Analysis**

Socio-economic impacts include, the ability for trainers to provide a surefire way to affect an individual's health. With heart rate feedback and information from workouts they’ve created and assigned, they will be able to adjust the workout to better suit their client’s needs and guarantee results. Unfortunately, FitBits will be needed in order to do so. Without the FitBits, trainers will be unable to get the physiological feedback from their clients in order to provide guaranteed health benefits. Trainees who enroll in our app will get health benefits from its use, and the previous information can back up this claim.

Our business objective is a non profit one. We simply wish to create a visually appealing and functional app, that will provide health benefits to the trainees using it as well as make trainer’s jobs easier to accomplish. With this project we also wished to expand our skill set and bring more familiarity with this entire process. We hope that after graduation this project will add to our existing knowledge and allow us to make a strong impact in a CS/IT environment.

Gap Analysis(WIP)

**1.3 Security and Ethical Concerns**

Project road bumps are a common thing in a project of this scale. Instead of shifting blame during any obstacles, the project team banded together to come up with a solution to overcome said obstacle. It is not uncommon for projects to not always go as planned but it was important for us to find solutions to these obstacles in order to get the project back on track.

Security Concerns(WIP)

**1.4 Glossary of Key Terms**

**High Intensity Training:** A form of interval training, a cardiovascular exercise strategy alternating short periods of intense anaerobic exercise with less intense recovery periods, until too exhausted to continue.

**Maximum Heart Rate:** The maximum number of beats made by your heart in 1 minute of effort

**Anaerobic Exercise:** Any activity that breaks down glucose for energy without using oxygen. Generally, these activities are of short length with high intensity.

**Resting Heart Rate:**  Defined as the number of times your heart beats per minute while at complete rest.

**CAD(Coronary Artery Disease):** Plaque buildup in the wall of the arteries that supply blood to the heart

2.1 Team Information