Proposal

# Project Aim and Objectives

To develop a mobile application that motivates users to exercise by gamifying recreational exercise with the help of augmented reality.

The aim can be achieved by completing the following objectives. Once I have a finished product that adheres to the first five objectives, I will evaluate the success of my application.

1. Research existing fitness applications.
2. Research what motivates people to exercise.
3. Investigate what game-like features to integrate into the application.
4. Investigate different augmented reality technologies for iOS.
5. Build a mobile application with the practice of good UI/UX design.
6. Evaluate the effectiveness of my application.
7. Evaluate the integration of augmented reality within my application.

# Motivation and Rationale

Fitness is not always fun, yet so many people strive to exercise more. A study found that almost two-thirds of adults in the United States made it their New Year's resolutions to exercise more. However, 73% gave up before meeting their goal (Bodybuilding.com, 2017).

According to ITNOnline article (Imaging Technology News, 2017), two-thirds of Americans favour a digital health management over physical, meaning there is a strong demand for mobile applications and wearable technology to monitor personal health. Furthermore, 61% of healthcare app users stated that their app fell into the category of 'activity, exercise instruction and monitoring' (Statista, 2017). With a highly saturated market for mobile healthcare apps but low app usage continuation, innovation into better technology or more captivating apps is needed.

Augmented reality (AR) is a relatively new technology, with a limited appearance on the app store. That being said, in 2016 a game called Pokémon Go was launched, which became a huge success. Users would use their phone to track the locations of virtual Pokémon and use their camera to ‘capture’ it. The release of this application demonstrated the existence of a huge market for augmented reality and sparked huge interest and investment in this technology.

Pokémon Go isn’t designed for fitness, yet it motivated so many people to go outdoors in search for these virtual animals. Additionally, the technology used was widely accepted and enjoyable to use.

I believe there is a demand for a more motivating, enjoyable fitness application. My project aims at meeting this demand by creating a mobile fitness app that gamifies recreational exercise. With evidence of the acceptance and success of AR technologies, especially in mobile applications, I am confident that using augmented reality will significantly aid in achieving this goal.

# Background

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| **Source** | **Description** | **Relevance** |
| Gamification. Using game elements in serious situations. (Stieglitz et al., 2017) | This book explains how playful functions can be applied to various contexts, and give an overview of what gamification actually means.  The authors then describe several cases for the use of gamification in mobile applications, among other topics. | Using this book will ensure I understand the idea of gamification  and its application.  Following on from this, I will then be able to identify what features are appropriate for my application to achieve the goal of gamification and ultimately motivate people to exercise more. |
| Games for Health 2014: proceedings of the 4th conference on gaming and playful interaction in healthcare. (Schouten et al., 2014) | This book focuses on the use of games and game-technology to improve health and healthcare.  It looks at performance-based feedback and task completion feedback, and two contexts for that feedback, private versus shared. | I will use the findings in this book to influence the techniques my app will implement in order to fully motivate people to exercise.  It will also help look at the extent that sharing on social media has to better motivate people to exercise, and whether this is a feature I will add to my app. |
| Program the internet of things with Swift for iOS. (Bakir, Chesler and Torriente, 2016) | The purpose of this book is to teach the reader how to build an iOS application in the Swift programming language.  This book covers implementing the CoreLocation and MapKit frameworks into a mobile application. | I will be building an application that uses the CoreLocation and MapKit frameworks. Understanding the best practice for implementing these features is crucial to the success of my application. |
| Health and Fitness App Use in College Students: A Qualitative Study. (Gowin et al., 2015) | The American Journal of Health and Education published a study on how college students use health/fitness apps.  The article published the results from this study which sheds light on how fitness apps are used, what makes the successful, and thoughts and feelings on particular existing applications. | This study will be a guideline for when I design and construct my application. I needed to research what existing applications are in use and what users think about them.  This study provides direct feedback from users of existing applications, giving me an idea of what they enjoy, and what they are looking for. |
| Pro iOS 5 Augmented Reality (Roche, 2011) | This book explains the process of using various iOS libraries (including MapKit) in conjunction with augmented reality.  It has several case studies and tutorials that help the reader understand these libraries and how to use them. | As stated earlier, I will be using the MapKit framework to allow the user to track their location. This book will aid me in bridging the gap between MapKit and ARKit when it comes to building my app.  Additionally, it looks at third-party AR toolkits, which is where my investigation into existing AR technologies for iOS will be achieved. Succeeding in this will allow me to reach a better understanding for how I will use AR in my project. |

# Diagrammatic Work Plan

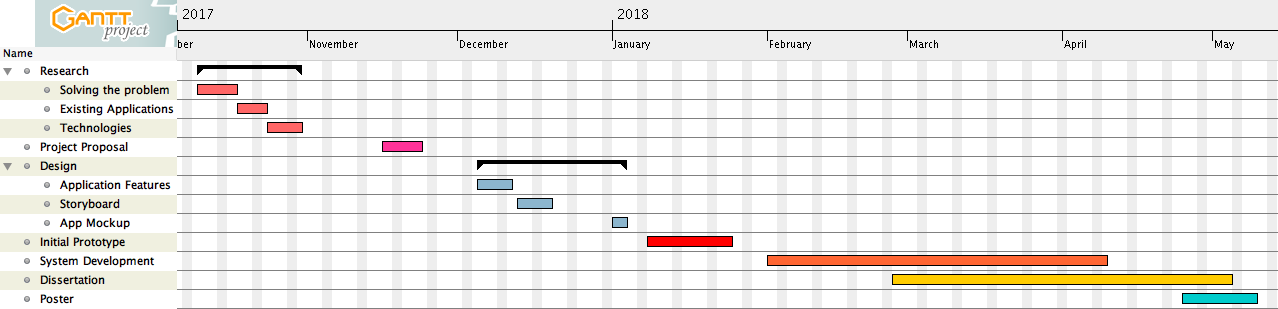


Figure 1: Gantt chart

# Description of my work plan

I have conducted all of my research, chosen the technologies I will use, and decided on some features to include in my application, meaning I am currently ahead of schedule. Following the Gantt chart shown in Figure 1, I should have the full design of my proposed application done before term starts again in the New Year. Given my position, I expect my design work to be completed early, allowing me to start building a prototype application soon after to ensure my system development deadline is not pushed back.

I have considered possible setbacks that could be caused by my exams in January and alleviated work as much as possible during this period. Additionally, it is worth pointing out that any gaps between tasks are to account for coursework deadlines or exam revision, such as seen in November.

I have decided to use the waterfall software development process due to the nature of this project. The requirements will be created using the data from my market research. From there I will design the appearance and functionality of my system, and the technologies I will use. Utilising my design and system requirements, I will then develop the app, before finally releasing it for user testing and evaluation.

It was tough to predict how long building, testing, and evaluating the application would take, so I decided to set the start date for this as soon as my exams are over. Additionally, during my research of existing technologies, I was able to put together a very simple application that used Apples ARKit to generate a 3D sprite viewable using a phone's camera. This not only gave me a better indication of a realistic timeframe for my systems development but gave me a brief insight into any difficulties I might run into.

My plan progresses linearly through discrete objectives. This will allow me to reflect on each deadline and how it helped me achieve my aim; ultimately preparing me for a clearer evaluation.

# References

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