

Research on the Use of a Simulated Environment to Demonstrate the Transmission of COVID-19

Interim Report

DT211C

BSc in Computer Science (Infrastructure)

**Kyle Heffernan**

C17444434

Bryan Duggan

School of Computer Science

Technological University, Dublin

**14/12/2020**

Abstract

As the number of coronavirus infections continue to grow worldwide,

Declaration

I hereby declare that the work described in this dissertation is, except where otherwise stated, entirely my own work and has not been submitted as an exercise for a degree at this or any other university.

Signed:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Kyle Heffernan

Date: 14/12/2020

Acknowledgements

I would like to thank my supervisor Bryan Duggan for his constant support and guidance throughout this project.

Table of Contents

[1. Introduction 7](#_Toc21978017)

[1.1. Project Background 7](#_Toc21978018)

[1.2. Project Description 7](#_Toc21978019)

[1.3. Project Aims and Objectives 7](#_Toc21978020)

[1.4. Project Scope 7](#_Toc21978021)

[1.5. Thesis Roadmap 7](#_Toc21978022)

[2. Literature Review 8](#_Toc21978023)

[2.1. Introduction 8](#_Toc21978024)

[2.2. Alternative Existing Solutions to Your Problem 8](#_Toc21978025)

[2.3. Technologies you’ve researched 8](#_Toc21978026)

[2.4. Other Research you’ve done 8](#_Toc21978027)

[2.5. Existing Final Year Projects 8](#_Toc21978028)

[2.6. Conclusions 8](#_Toc21978029)

[3. Prototype Design 9](#_Toc21978030)

[3.1 Introduction 9](#_Toc21978031)

[3.2. Software Methodology 9](#_Toc21978032)

[3.3. Overview of System 9](#_Toc21978033)

[3.4. Front-End 9](#_Toc21978034)

[3.5. Middle-Tier 9](#_Toc21978035)

[3.6. Back-End 9](#_Toc21978036)

[3.7. Conclusions 9](#_Toc21978037)

[4. Prototype Development 10](#_Toc21978038)

[4.1. Introduction 10](#_Toc21978039)

[4.2. Prototype Development 10](#_Toc21978040)

[4.3. Front-End 10](#_Toc21978041)

[4.4. Middle-Tier 10](#_Toc21978042)

[4.5. Back-End 10](#_Toc21978043)

[4.6. Conclusions 10](#_Toc21978044)

[5. Testing and Evaluation 11](#_Toc21978045)

[5.1. Introduction 11](#_Toc21978046)

[5.2. Plan for Testing 11](#_Toc21978047)

[5.3. Plan for Evaluation 11](#_Toc21978048)

[5.4. Conclusions 11](#_Toc21978049)

[6. Issues and Future Work 12](#_Toc21978050)

[6.1. Introduction 12](#_Toc21978051)

[6.2. Issues and Risks 12](#_Toc21978052)

[6.3. Plans and Future Work 12](#_Toc21978053)

[6.3.1. GANTT Chart 12](#_Toc21978054)

[Bibliography 13](#_Toc21978055)

# 1. Introduction

## Project Background

The purpose of this project was to design a simulation of the transmission of COVID-19 between people in a populated environment. As Coronavirus became a sizeable factor of everyday life for most people, I wanted to make a simulation to assist in visualizing how easily it can be spread in a populated environment. I believe it will be beneficial in understanding the transmission of the virus, as observing it spreading in real time will highlight the severity of the virus.

## Project Description

An overview of the project

Include a diagram

## Project Aims and Objectives

Overall aim and some milestones along the way to achieve the aim

* 5-9 objectives

## Project Scope

Project scope, what the project isn’t about

## Thesis Roadmap

One sentence explaining what each of the following chapters is about.

# 2. Literature Review

**As least 4 pages, but as many as you like**

## 2.1. Introduction

In this chapter …

## 2.2. Alternative Existing Solutions to Your Problem

Software you’ve looked into

## 2.3. Technologies you’ve researched

Programming languages, operating systems, etc.

## 2.4. Other Research you’ve done

Domain specific research

## 2.5. Existing Final Year Projects

## 2.6. Conclusions

# 3. Prototype Design

**As least 6 pages, but as many as you like (but lots of diagrams, which count towards the page total).**

## 3.1 Introduction

## 3.2. Software Methodology

## 3.3. Overview of System

Include a diagram

## 3.4. Front-End

Including screen prototypes and Use Cases

## 3.5. Middle-Tier

## 3.6. Back-End

Including ERDs, and maybe ISDs

## 3.7. Conclusions

# 4. Prototype Development

**As least 2 pages, but as many as you like (but lots of code samples).**

## 4.1. Introduction

## 4.2. Prototype Development

## 4.3. Front-End

## 4.4. Middle-Tier

## 4.5. Back-End

## 4.6. Conclusions

# 5. Testing and Evaluation

**As least 2 pages, but as many as you like**

## 5.1. Introduction

## 5.2. Plan for Testing

## 5.3. Plan for Evaluation

## 5.4. Conclusions

# 6. Issues and Future Work

**As least 5 pages, but as many as you like**

## 6.1. Introduction

## 6.2. Issues and Risks

## 6.3. Plans and Future Work

### 6.3.1. GANTT Chart

# Bibliography