A project submitted in partial fulfilment of the award of the degree of Bsc (Hons) Computer Games Programming From Staffordshire University

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A Self-Driving Neural Network to handle multiple off-road terrains

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Table of Contents

[Introduction 3](#_Toc62928623)

[Aims and objectives 3](#_Toc62928624)

[Legal and Ethical Considerations 3](#_Toc62928625)

[Risk Assessment 3](#_Toc62928626)

[Project Management 3](#_Toc62928627)

[Considered Methods 3](#_Toc62928628)

[Chosen Methods 3](#_Toc62928629)

[Background Research 3](#_Toc62928630)

[Tools Research 3](#_Toc62928631)

[Engine 3](#_Toc62928632)

[Unity 3](#_Toc62928633)

[Unreal 3](#_Toc62928634)

[Chosen Engine 3](#_Toc62928635)

[API 3](#_Toc62928636)

[TensorFlow 3](#_Toc62928637)

[OpenAI 4](#_Toc62928638)

[Chosen API 4](#_Toc62928639)

[Analysis 4](#_Toc62928640)

[Requirements 4](#_Toc62928641)

[Requirement Guidelines 4](#_Toc62928642)

[Programming Languages 4](#_Toc62928643)

[C++ 4](#_Toc62928644)

[Python 4](#_Toc62928645)

[Implementation 4](#_Toc62928646)

[Use Case Diagram 4](#_Toc62928647)

[Data Flow Diagram 4](#_Toc62928648)

[User Input 4](#_Toc62928649)

[Testing 4](#_Toc62928650)

[Testing Method 4](#_Toc62928651)

[Critical Evaluation 5](#_Toc62928652)

[Success of the project 5](#_Toc62928653)

[Ethical and legal consideration 5](#_Toc62928654)

[Project Management 5](#_Toc62928655)

[Research 5](#_Toc62928656)

[Implementation 5](#_Toc62928657)

[Experience Gained 5](#_Toc62928658)

[Academic Skills 5](#_Toc62928659)

[Professional Skills 5](#_Toc62928660)

[Repeat of the project 5](#_Toc62928661)

[Bibliography 6](#_Toc62928662)

# Introduction

## Aims and objectives

## Legal and Ethical Considerations

* None as it does not physically effect anyone as it’s a simulated car in video games

## Risk Assessment

* Tiny risk
* Mainly Desk Ergonomics

## Project Management

### Considered Methods

* Agile
* Waterfall

### Chosen Methods

* Agile
* Did not know what to expect as its first-time doing python neural networks/ TensorFlow and ue4
* Needed to be able to adapt quickly and efficiently

# Background Research

# Tools Research

## Engine

* Important choice as it effects the usability of the end project

### Unity

* More used by indie developers
* Uses C#
* Already supports Neural Network Driving

### Unreal

* Has premade advance car template
* Uses C++

### Chosen Engine

* Unreal
  + C++ use
  + Premade Car template

## API

### TensorFlow

* Open source
* Very flexible
* Multiple API layers using TensorFlow, Keras etc.

### OpenAI

* More used for text and image-based applications
* No support in unreal
* In private beta

### Chosen API

* TensorFlow
  + Has plugin for ue4
  + Allows GPU acceleration
  + Backed by google
  + Large community of developers
  + There is a new C++ version that could be used in the future

# Analysis

## Requirements

## Requirement Guidelines

### Programming Languages

#### C++

#### Python

# Implementation

## Use Case Diagram

## Data Flow Diagram

## User Input

# Testing

## Testing Method

# Critical Evaluation

## Success of the project

### Ethical and legal consideration

### Project Management

### Research

## Implementation

## Experience Gained

### Academic Skills

### Professional Skills

## Repeat of the project

# Bibliography

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