School of Computing

Year 4 Project Proposal Form

SECTION A

Project Title __AI Racing Game_____

Student Name __Kyrylo Khaletskyy_____

Student ID __15363521_____   Stream __CASE____

Project Supervisor Name __Martin Crane_____

SECTION B

General area covered by the project

I want to develop a game using the Unity Game Engine. It will be a racing game which implements machine learning to automate the safety car and the enemy cars to race against you around a track. The game will have the "game" aspect where the user can race around a track and also a "learning" aspect where the user can see the car learning its way around a track and training itself for other tracks, I hope to try a few different algorithms and compare them between each other to see one performs best around a track. I plan to create car physics and implement my own version of machine learning to control the cars.

Outline of the proposed project

- **Background –** I have always enjoyed playing games and ever since I started Computer Applications I realised I would like to base my career in game development. Watching F1 you will notice that there is a safety car which goes around the track at the start of the race to warm up race cars, it also paces race cars during crashes while the track is being cleared. I want to create a 3D modelled game which automates this process using Machine Learning.

- **Achievements –** The game provides a "racing" function where the user can play a racing game and a "learning" function where the user can see the learning process of the safety car which will be training on a given track, the goal is to train an AI to be able to perform on any track given after it has been trained, this extends into car automation in the real world. The user demographic will be computer gaming enthusiasts who enjoy racing games, currently on Steam (PC Gaming Platform) the top 10 racing games sold between 15-20 million copies.

- **Justification -** The reason why I think this project will be useful as it will teach me how to develop a game and implement machine learning within unity. With the recent gain in popularity of automated cars it would be beneficial to base my project around the automation of cars. Tesla, Google and Nvidia have invested millions into the development of automating cars making my project very valuable.

Programming language(s)

- C#
- Python (Possibly)

Programming tools/Tech stack

- Unity Engine

Learning Challenges

- C# Scripting
- Unity Game Engine Environment
- 3D Modelling
- Machine Learning
- Neural Networks

Hardware / software platform

- Windows