ARTIFICIAL INTELLIGENCE ARTEFACT

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B Eng in Software Engineering
Batch 11

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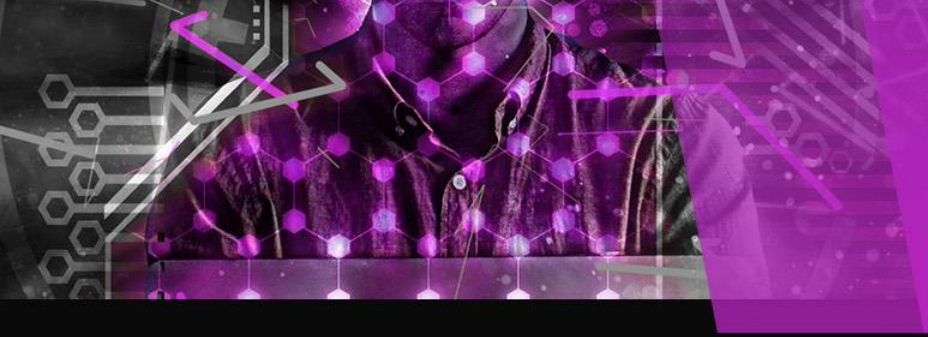
ACKNOWLEDGEMENT

- I would like to express my deepest appreciation and gratitude to all those who provided me the possibility to complete this project along with the documentation.
- I would like to extend my deep and sincere gratitude to Ms.Nishadi Ariyasinghe for being the module leader/lecturer guiding me expertly through the project giving ideas and guidelines on the trending areas, contribution in stimulating suggestions and encouragement and providing me with the existing resources that can be made use of.
- I am highly indebted to Esoft Metro Campus and the staff for their guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the project.

Introduction

An automated driving system is a complex combinations of various components that can be defined as systems where perception, decision making, and operation of the automobile are performed by electronics and machinery instead of a human driver, and as introduction of automation into road traffic. This includes handling of the vehicle, destination, as well as awareness of surroundings. While the automated system has control over the vehicle, it allows the human operator to leave all responsibilities to the system.

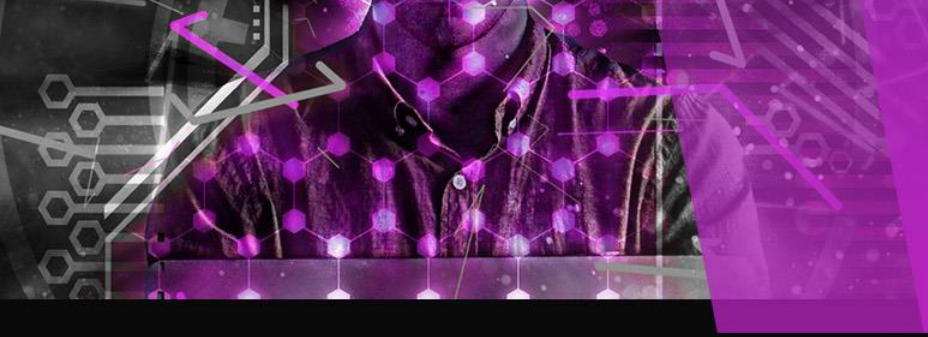
This paper presents a car racing simulator game called Racer, in which the human player races a car against three game-controlled cars in a three-dimensional environment. The objective of the game is not to defeat the human player, but to provide the player with a challenging and enjoyable experience. To ensure that this objective can be accomplished, the game incorporates artificial intelligence (AI) techniques, which enable the cars to be controlled in a manner that mimics natural driving. The paper provides a brief history of AI techniques in games, presents the use of AI techniques in contemporary video games, and discusses the AI techniques that were implemented in the development of Racer. A comparison of the AI techniques implemented in the Unity platform with traditional AI search techniques is also included in the discussion.



Actors

-The system in automatic play

-The user in manual play (Only the Single player option os available)



Functionalities

-Automatic driving

- Collision detection and response
- Identification of the barriers coming along the way.
- Intelligent movement/driving

-Manual driving

- Controlling the movement of the car with the aid of arrow keys.
- Collision detection and response

Goals of the game

Automatic driving

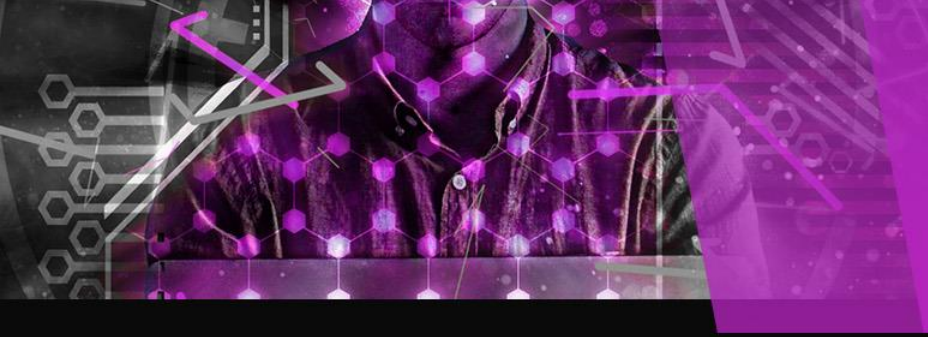
Though still in its infancy, self-driving technology is becoming increasingly common and could radically transform our transportation system (and by extension, our economy and society).

Software then processes those inputs, plots a path, and sends instructions to the vehicle's "actuators," which control acceleration, braking, and steering. Hard-coded rules, obstacle avoidance algorithms, predictive modeling, and "smart" object discrimination (ie, knowing the difference between a bicycle and a motorcycle) help the software follow traffic rules and navigate obstacles.

Safety is an overarching concern. Many thousands of people die in motor vehicle crashes every year.

Equity is another major consideration. Self-driving technology could help mobilize individuals who are unable to drive themselves, such as the elderly or disabled.

Environmental impacts are a serious concern, and a major uncertainty. Accessible, affordable, and convenient self-driving cars could increase the total number of miles driven each year.



Concept and Design

System design

The user interfaces were primarily created and the logical component was later added.

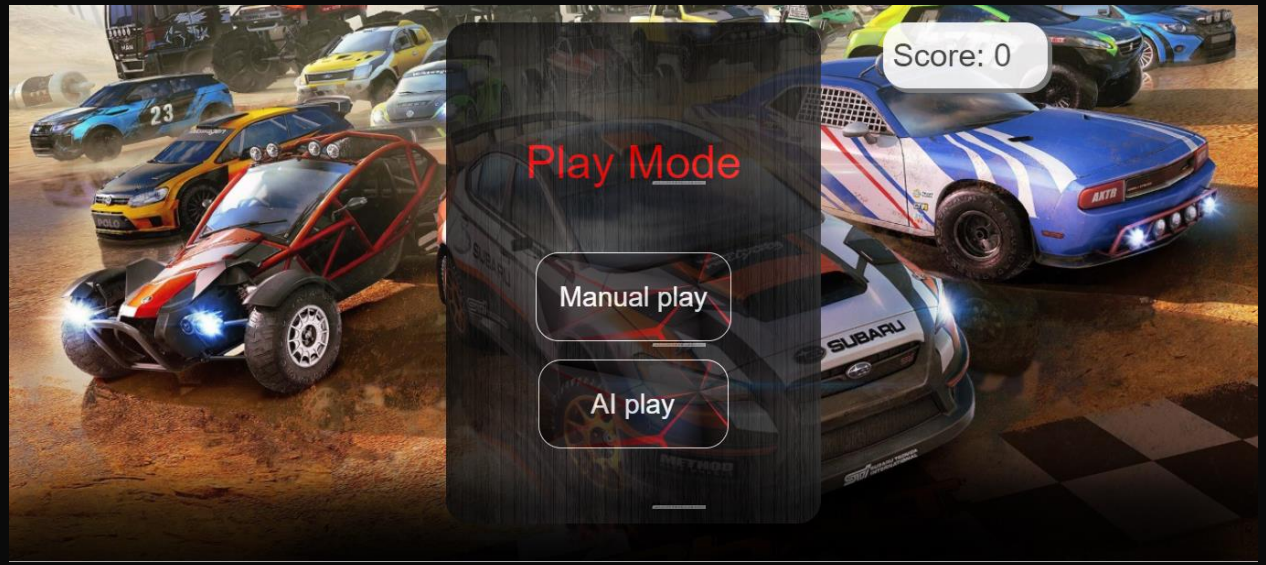
Overall flow of the system

The created game is created for two types of users where the user initially has a selection of the modes among

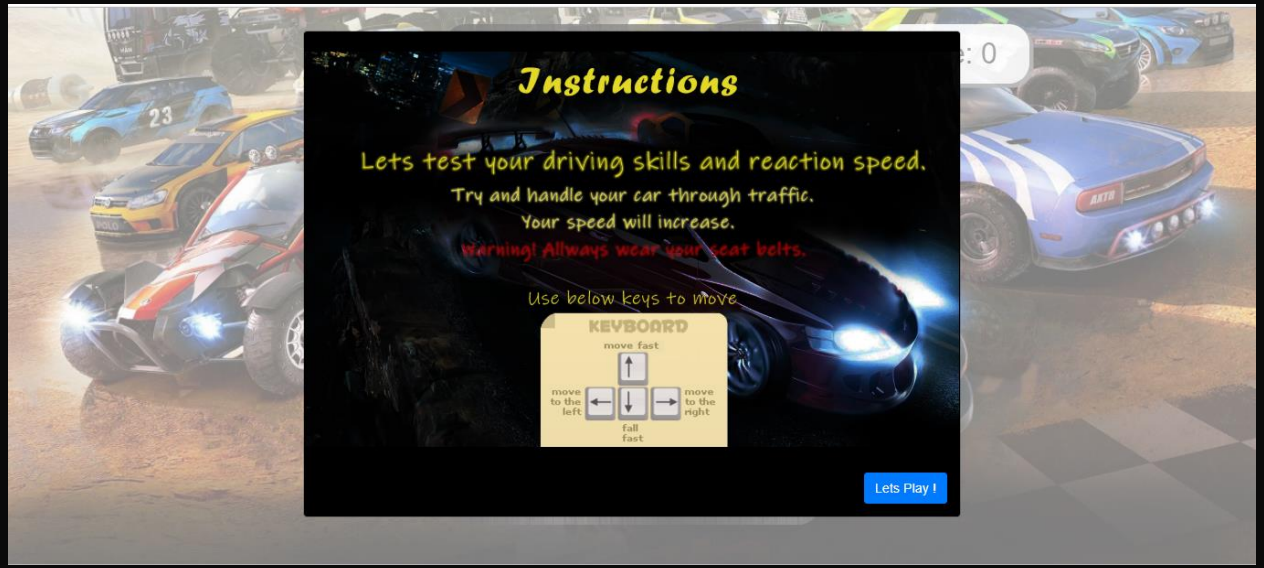
- **Manual play and**
- **AI play/Auto pilot mode**

Concept and Design

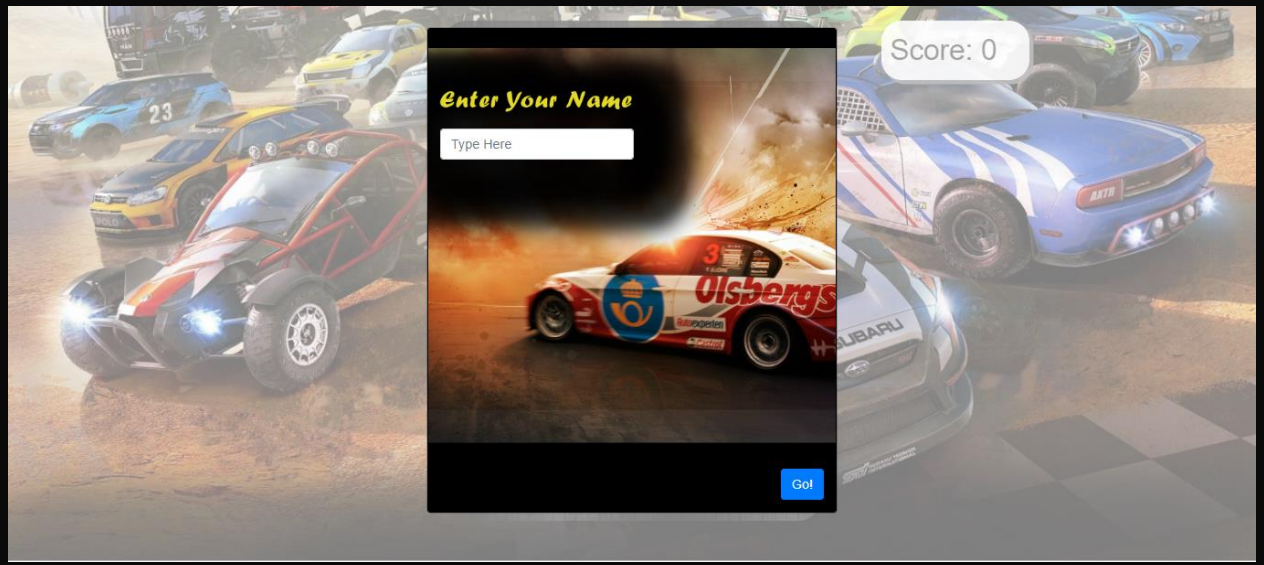
Manual Mode



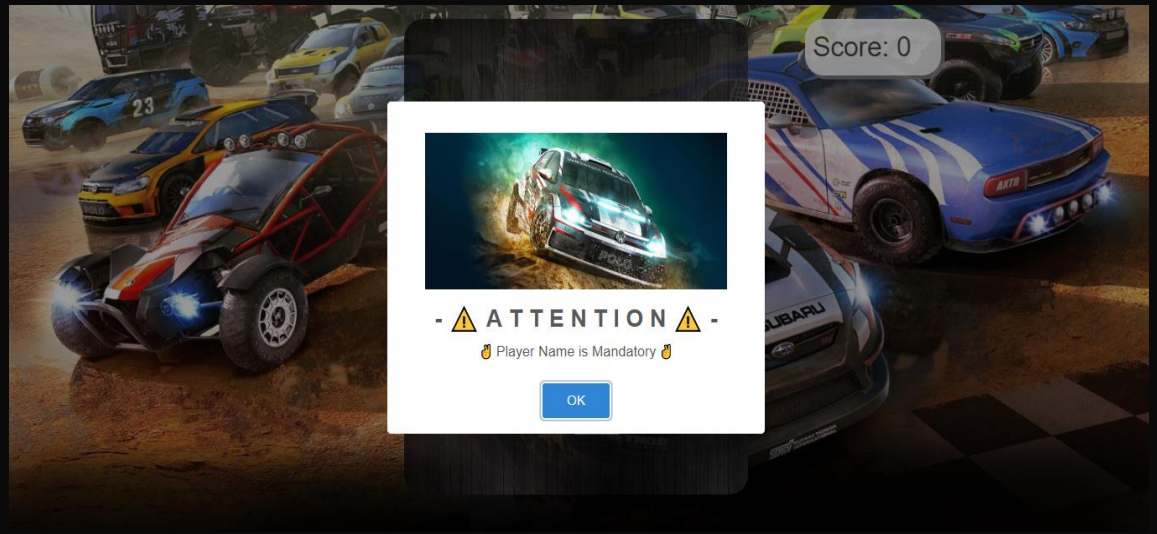
Prior to proceeding with the game, the player is taken through the instructions page which elaborates the key movements to be used in order to drive the car.



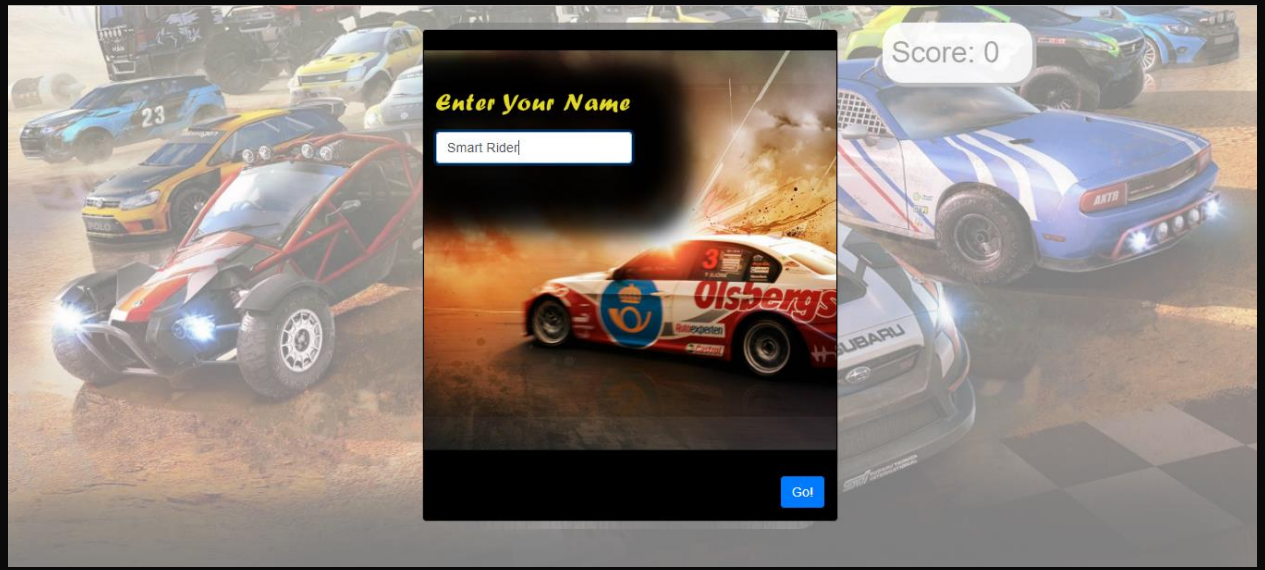
Under manual play the user is initially asked for the name to be inserted which is mandatory, and is then able to proceed to the game.

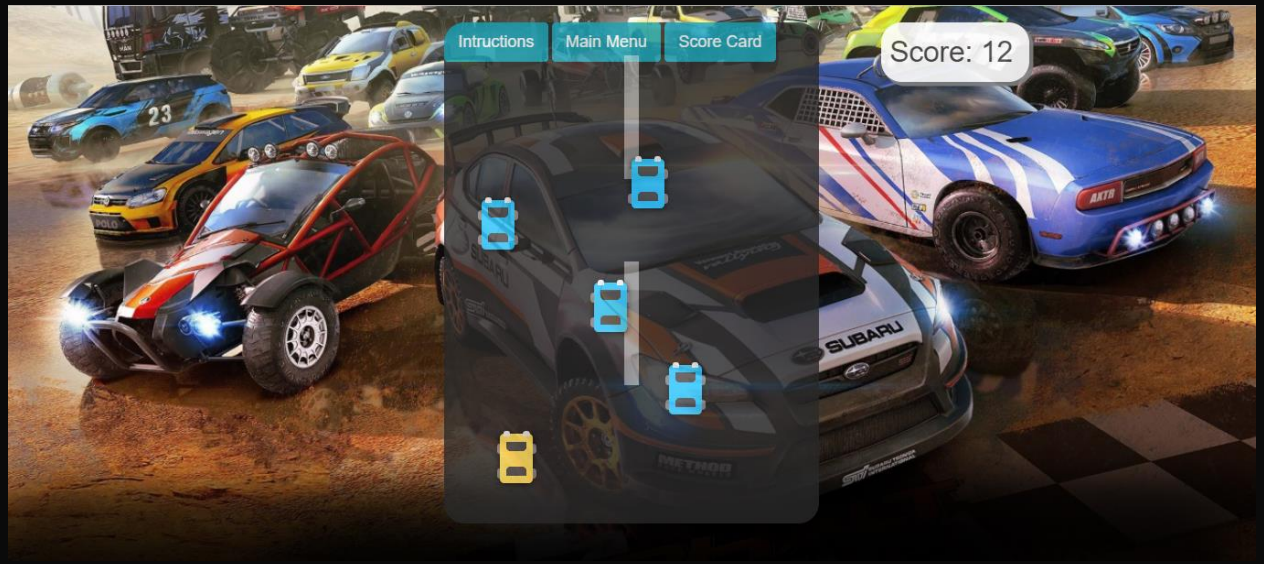


If the respective player name is not entered in, the user will be displayed a warning message and will be redirected to the previous screen (asking for the player's name).

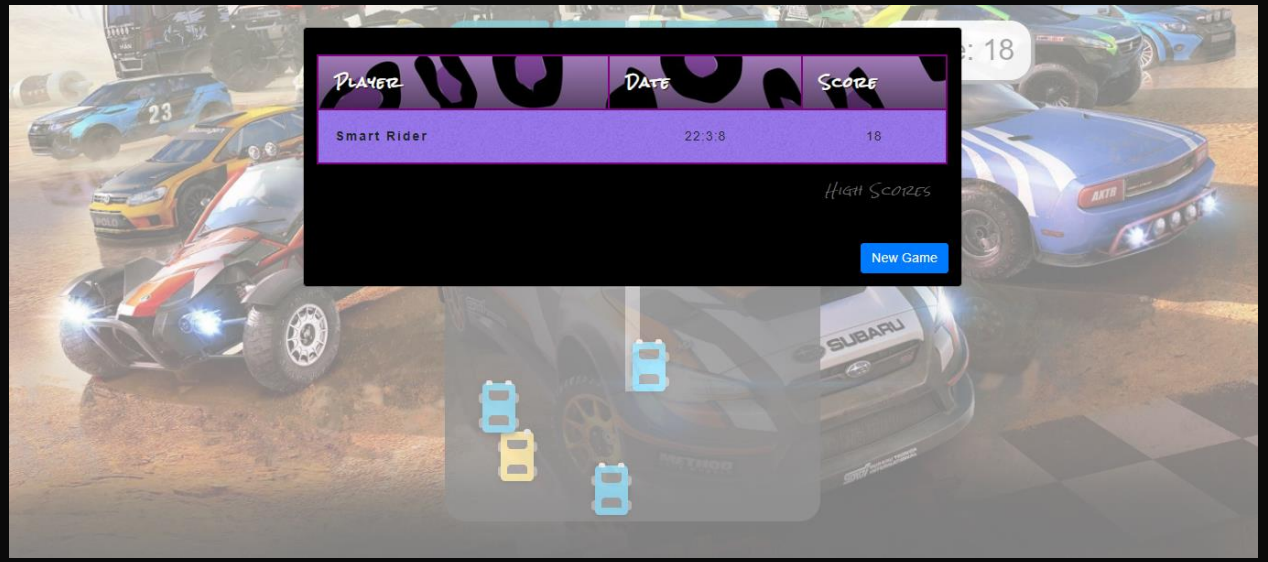


Upon provision of the name, the player will be directed to the gaming window, where the full control of the car is now in hands of the respective player.




Intructions
Main Menu
Score Card
Score: 12
SUBARU

Auto pilot mode

The player will be quitted once the vehicle is collided with any of the other vehicles coming along the way. Upon detecting a collision with any of the vehicles the score board will be displayed and the player will be directed to the respective windows upon the below selections:

- **If “New Game” button is clicked directs to the mode section window.**
- **Upon clicking anywhere on the screen the player will be kept remained at where it was left off, and will direct the user to the respective window upon the tab selections visible at the top of the screen.**