

cAReality: Mixed reality interactive gameplay

Mixed Reality Course - Final Report



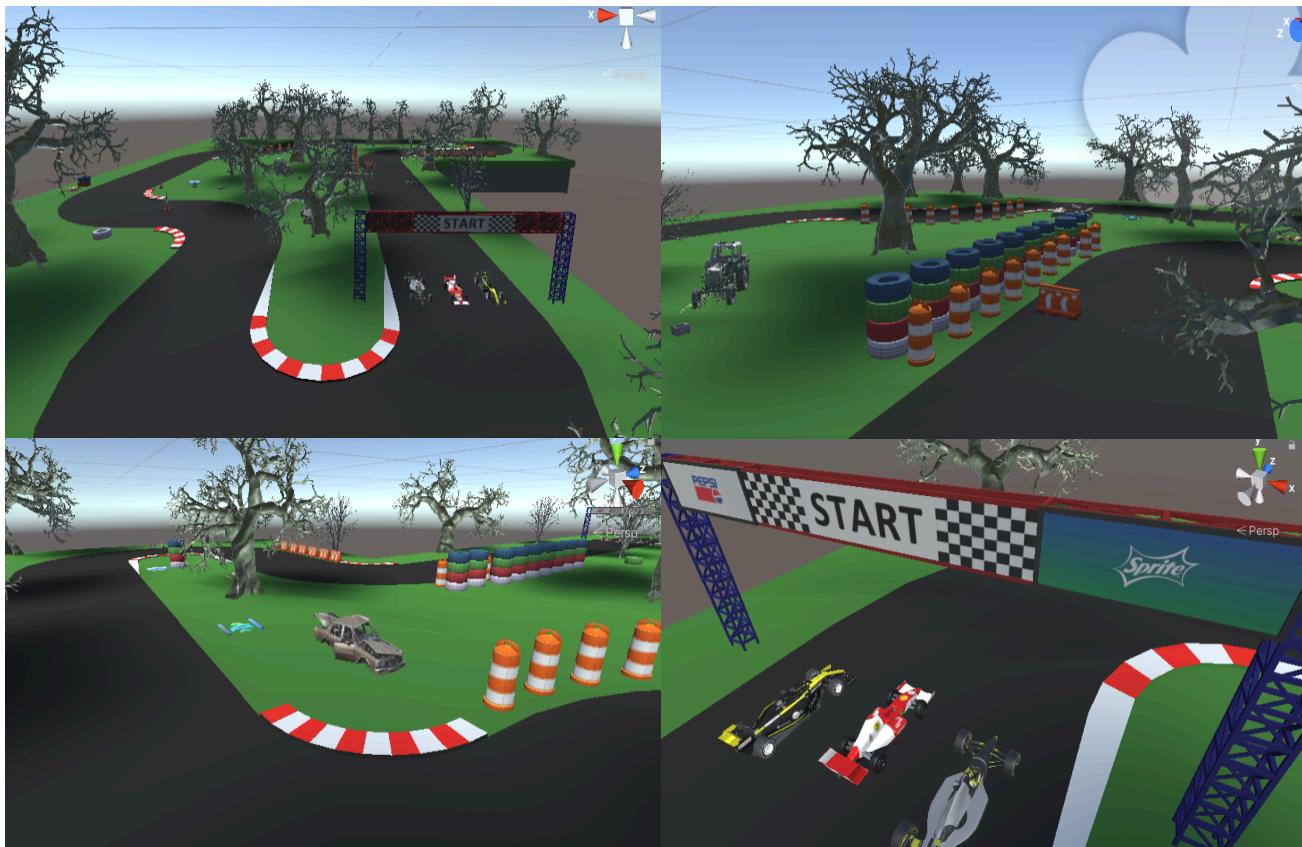
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Idea Description

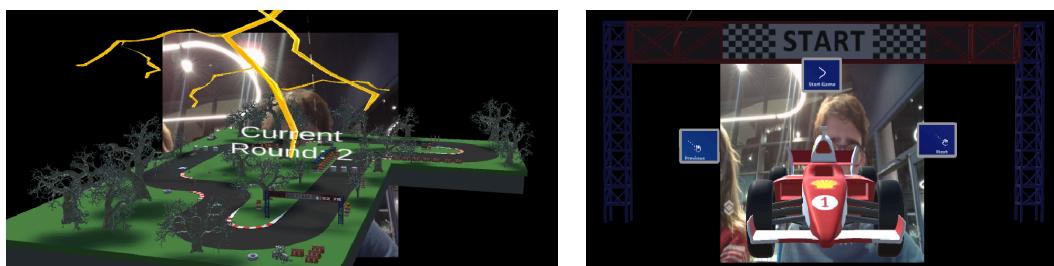
The designed game showcases a race circus where three cars compete to complete 5 rounds as fast as possible. This one-player game allows the user to select one of the three playable racing cars and compete with the competing cars in the race to victory. To win the player has to obtain power ups that can be launched into the race track and make his/her car speed up or slow down the competition and get ahead before the race ends. Several obstacles are also included in the race, and physical image targets can be scanned by the user in order to gain powers and gain advantages over the opponents.



Game Features

Timer & Restart Button: Once the race starts, there is a timer which tracks the total time that the player has spent on the game. Also, there is a restart button to restart the game to its initial state, as well as an indication of the total rounds at the end of the game.

Car Selection Menu: In the beginning of the game, the user is asked to select which of the 3 cars he/she wants to compete with. The race is then initiated by pressing the "Start" button.



Power Ups: During the race, there are various fixed obstacles and other assets placed on the circuit which can affect the player, producing speed boost or speed debuff. Another asset (cube) produces a rocket effect on the car as well as a lighting effect (accompanied by a visual lightning). Apart from that, during the race the player can scan multiple image targets, such as the “stop” target, enabling gesture recognition (*see next paragraph*), the “shield” target, protecting the player from the lightning, and another target which prevents opponents from acquiring the next power ups.



Gesture recognition: Last, we have implemented hand tracking of the user - when the recognition happens, a specific “pinch” gesture is detected, followed by a “pistol” gesture which then produces a virtual object (banana) thrown into the race field. The banana makes the opponent’s cars slow down and skip one effect from the fixed power ups.

In the end, if the selected car of the user completes first the 5 rounds, there is a winning panel, otherwise a lose panel indicating the status of the game.

For more details, please view our source code and clone our project:

<https://github.com/dttfrancesco/cAReality>