Memo

To: Professor Pisano, Professor Osama, Professor Hirsch

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Team: 12

Date: 4/4/23

Subject: Final Testing Plan

1.0 Software & Equipment

- Unity Application
  - Game Assets
    - Rabbit
    - Unity UI objects (text, shapes, etc)
    - DreamScape environment
    - Fruit package
  - C# scripts
    - Main.cs, MoveWithTerrain.cs, buttonControl.cs, ChangeScene.cs, ClapDetector.cs, DragObject.cs, FilterButterworth.cs, Game1.cs, Game2.cs, Game3.cs, MovingAverage.cs, StreamingMic.cs, ThirdPersonCam.cs
- Flask
- Tensorflow
- iPad

2.0 Setup

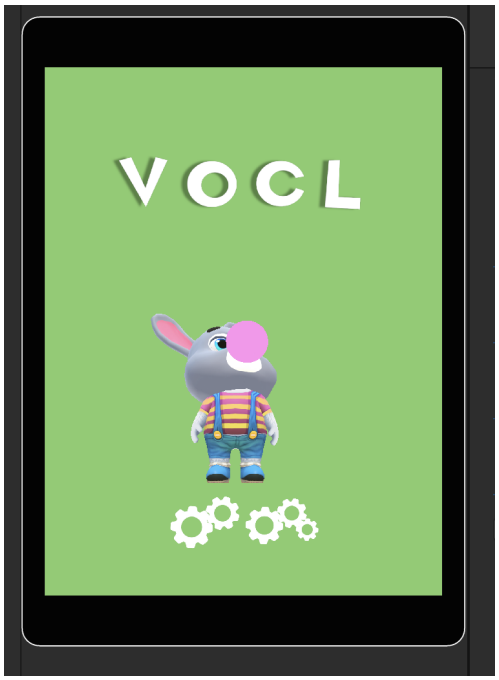
2.1 The required hardware for this prototype is a computer capable of running Unity 2021.3.22f1, Xcode, and Tensorflow, and an iPad with the Unity application simulator downloaded. Connect the iPad to the computer via a USB cable; a USB-c to USB convertor is required on Macbooks. With the application built on Xcode, rebuild to re-initiate metric tracking and follow Build on iPad instructions. Upon starting Unity, navigate to Edit on the toolbar, then go to Project Settings and

then to the Editor tab. Once there, click on the iPad that should be listed on the drop down menu. Pressing the play button on the Unity IDE will start the game and position the game assets (i.e. rabbit, fruits, text) as defined graphically and programmatically via the Unity IDE and C# scripts, and follow Unity Simulator Flask Webapp instructions.

3.0 Test Procedure

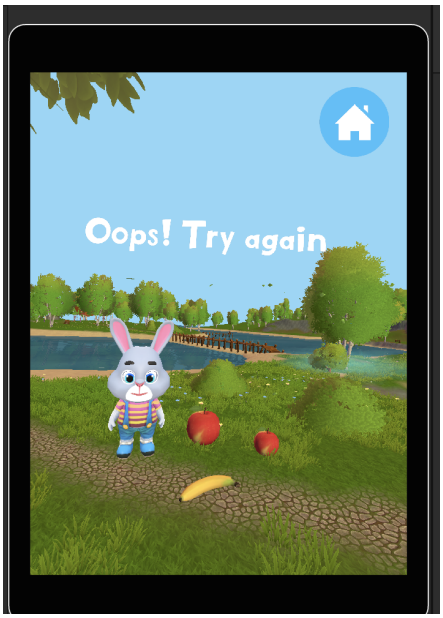
Build on IPad

1. Press the application icon on the test iPad.

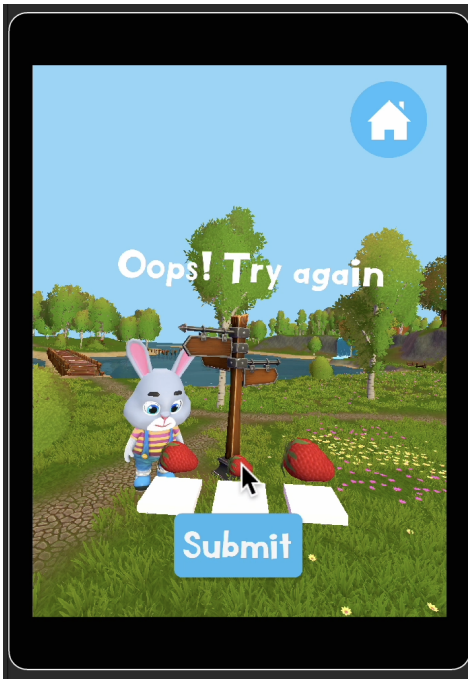


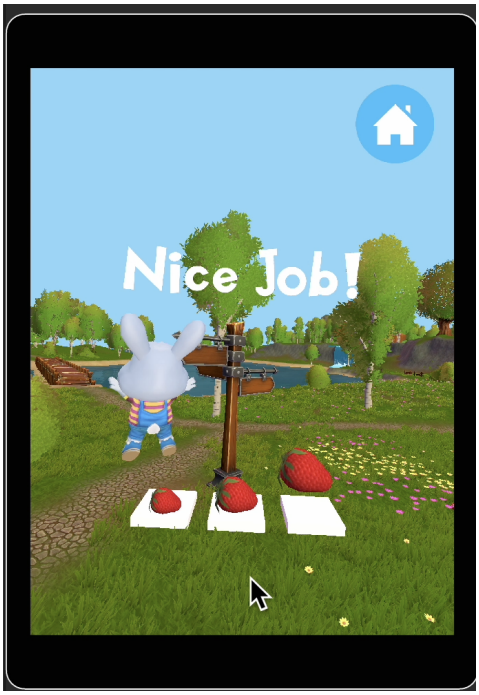
2. When prompted with the “Play” button, tap the Play button. This will start the game.

3. Tap on the largest apple, if incorrect the user is prompted to try again. If correct, the rabbit asset does a celebration animation and runs to the next destination.

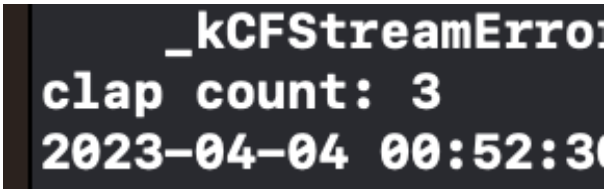


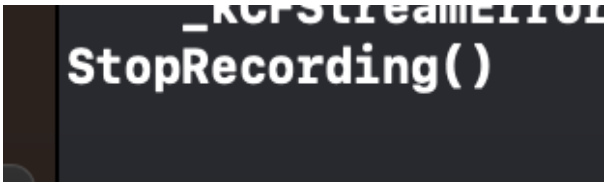
4. Order the strawberries by dragging them. Once done, tap the ‘Submit’ button. If incorrect, the user is prompted to try again. If correct, the rabbit asset does a celebration animation and runs to the next destination.





5. Clap three times. On the Xcode console, the tester will see the amount of claps detected.

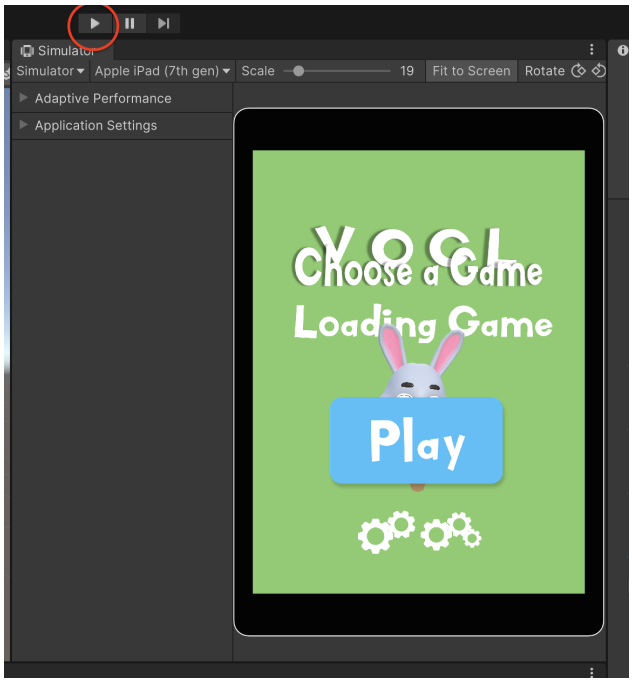


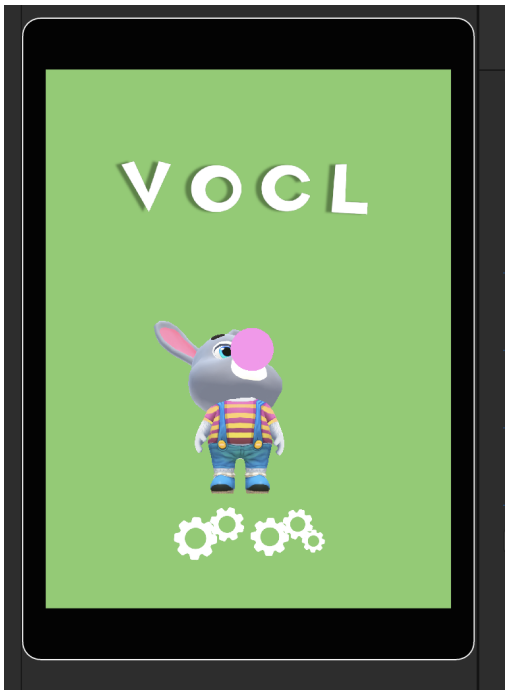


6. Upon 3 claps detected, the user is prompted to return to the loading screen or replay the game.

In Unity Simulator with Flask Webapp

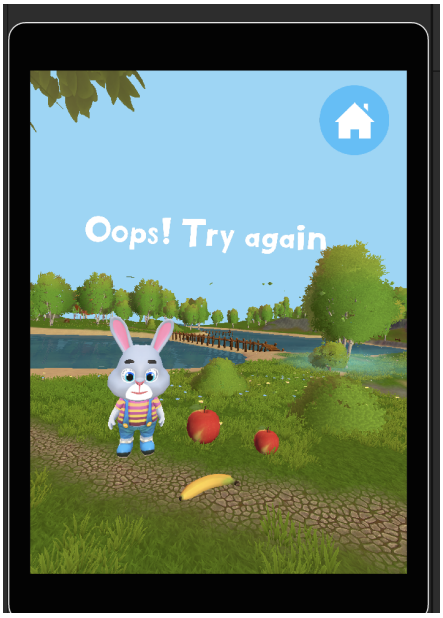
7. Press the Play button located on the Unity IDE. This will start with the loading screen on the simulator as well as the iPad.



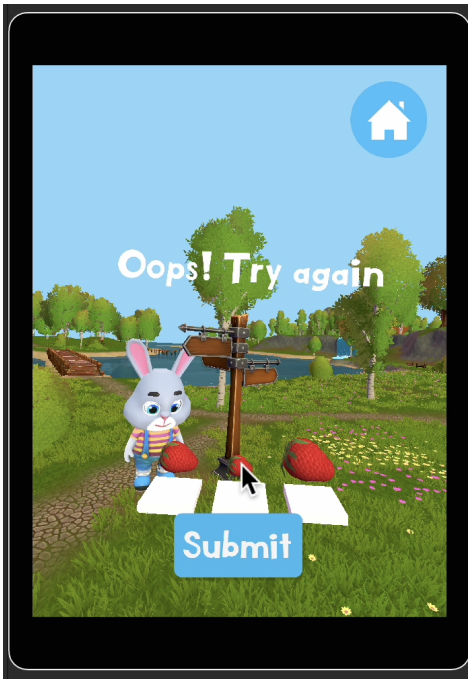


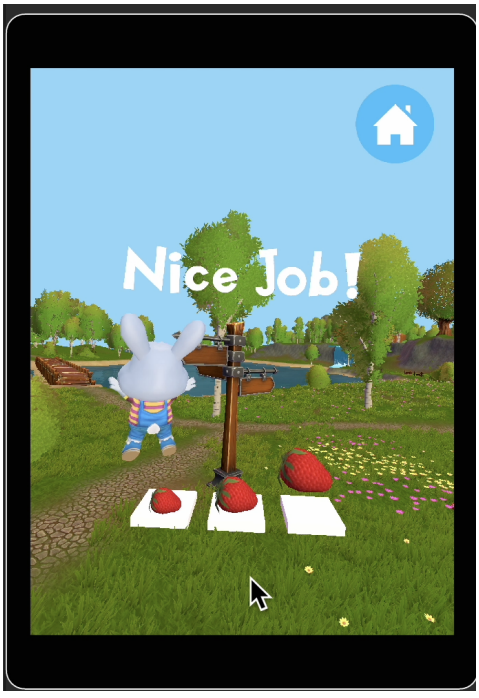
8. When prompted with the “Play” button, tap the Play button. This will start the game.

9. Tap on the largest apple, if incorrect the user is prompted to try again. If correct, the rabbit asset does a celebration animation and runs to the next destination.

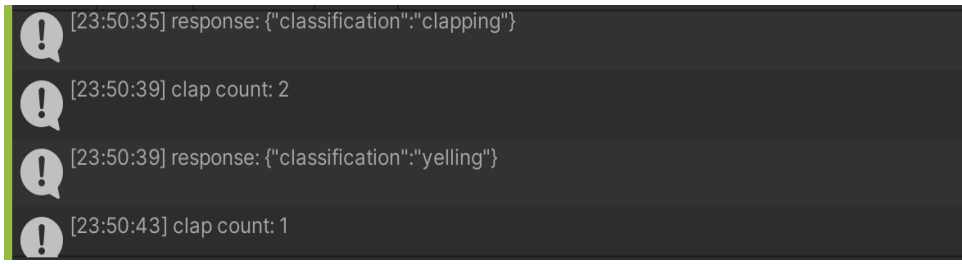


10. Order the strawberries by dragging them. Once done, tap the ‘Submit’ button. If incorrect, the user is prompted to try again. If correct, the rabbit asset does a celebration animation and runs to the next destination.





11. Clap three times. On the Unity console, the user will see the amount of sounds detected and the classification result from the machine learning model sent over the web app.



12. Upon 3 claps detected, the user is prompted to return to the loading screen or replay the game.

4.0 Measured Criteria

1. The Unity Application loading screen lasted for 7 seconds to account for the time lag on the iPad simulator.
2. The Play button successfully changed the active GameObject to allow the user to play the game.
3. In the first task, the Game1 script is able to detect if the correct fruit is tapped.
4. In the second task, the checkOrder function is able to distinguish if the fruits are in the correct order by comparing their x-coordinates.
5. In the third task, the ClapDetector script is able to detect different amounts of claps during intervals using the updated algorithm.
6. In the third task, the web app is successfully communicated with via HTTP
7. In the third task, the machine learning model is able to classify the user input as claps or yells

5.0 Conclusions

Our final game prototype demonstrated the capability of our Unity application to animate our purchased assets as seen in our loading and in-game screens. Additionally, we implemented 3 separate game tasks within our Unity app. The first two games test reading comprehension and incorporate touch based input. The third is able to test the user's ability to engage by prompting the user to clap three times. Our audio peak-counting algorithm is able to count the number of claps. The rabbit Unity asset is also able to congratulate the user by jumping, prompt them to try again if needed, and run to the next location using animation controllers and our C# scripts. The first game makes use of Unity's tag feature which is how we are able to tell when the user chooses an incorrect object. The second game also has boundaries – in DragObject.cs – so that the user cannot drag objects out of the screen or below the white planes. With these two details in mind, game edge cases were successfully accounted for. The GUI and game were visually engaging to the professors and TAs, which shows that we made good use of our budget in purchasing interesting assets.

Since the last prototype test, the team was able to create an end of game screen as well as build the app for the iPad. The Flask application running in Python locally was also implemented and our Unity app was able to successfully communicate with it. Before ECE day, the team hopes to improve the working conventional audio algorithm, re-train the audio classifier with more data, and create more interactive games for our Unity application.