Project CAMS

Team CHOMP

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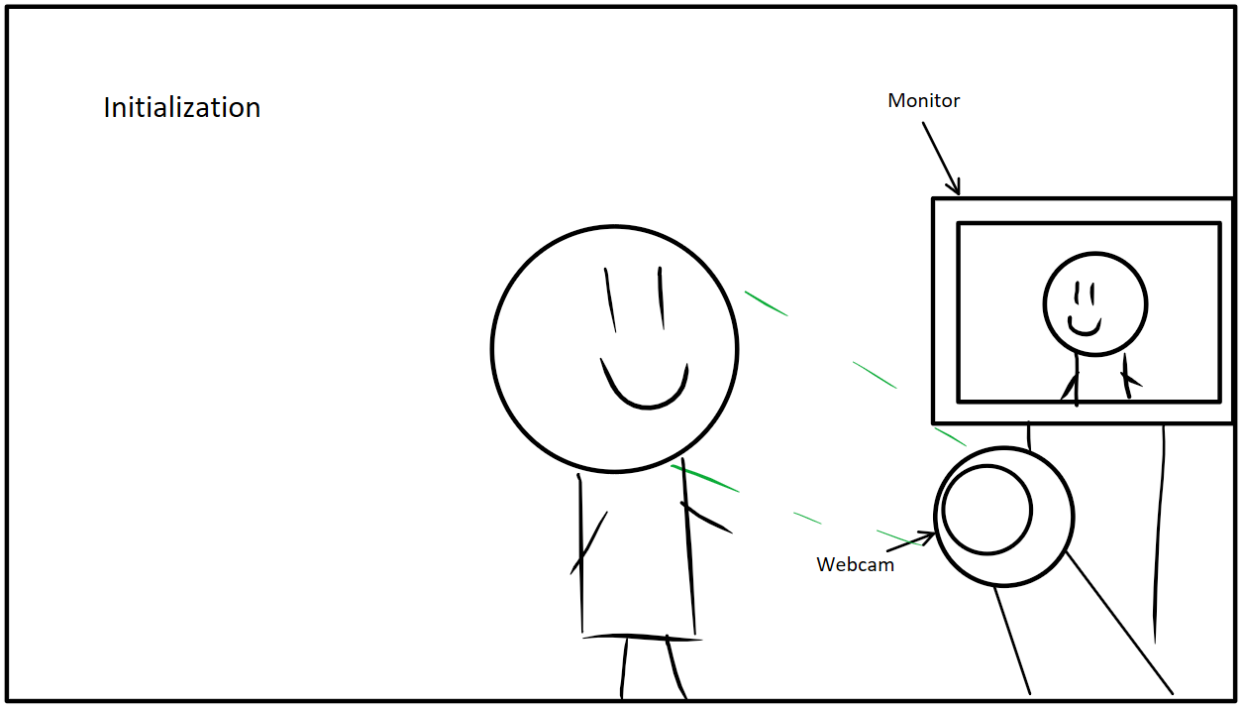
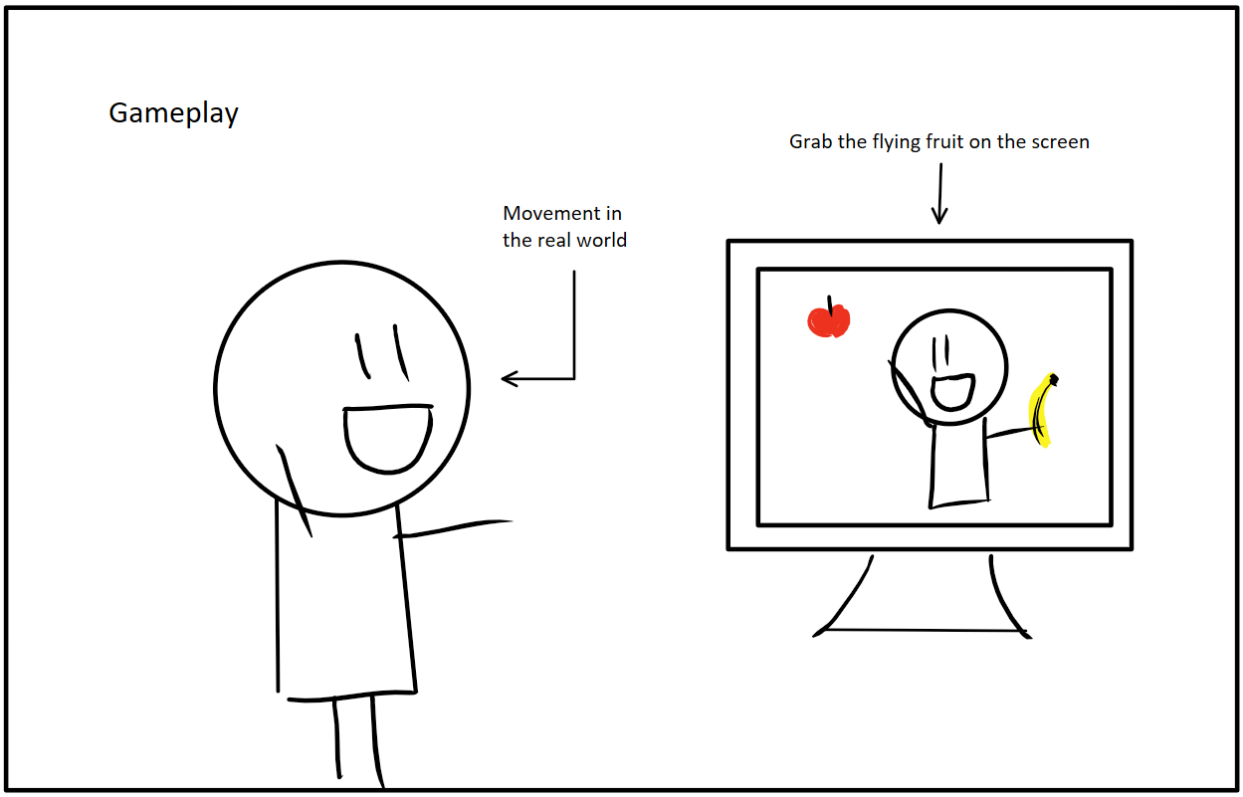
Project Description

Project CAMS is an interactive camera video game application that challenges users to execute a variety of tasks and poses using themselves as a controller. A webcam and a monitor are used in conjunction with the PYNQ board to use the application. The webcam will scan the user's facial features and monitor the user's movements to interact with the game. The monitor is used to display the user during gameplay. Several graphical images are superimposed onto the video stream (like augmented reality) that will provide context for the game. The video captured by the webcam will be streamed to the PYNQ board where the images and the user's movement will be processed and handled appropriately. When the user completes the first challenge, the user will move onto the next challenge until all challenges are completed. Finally, once the user has completed every single challenge the user will be rewarded with a series of recorded clips highlighting their experience playing the game. This experience is intended to be lighthearted in tone and provide comic relief for users and anyone watching.

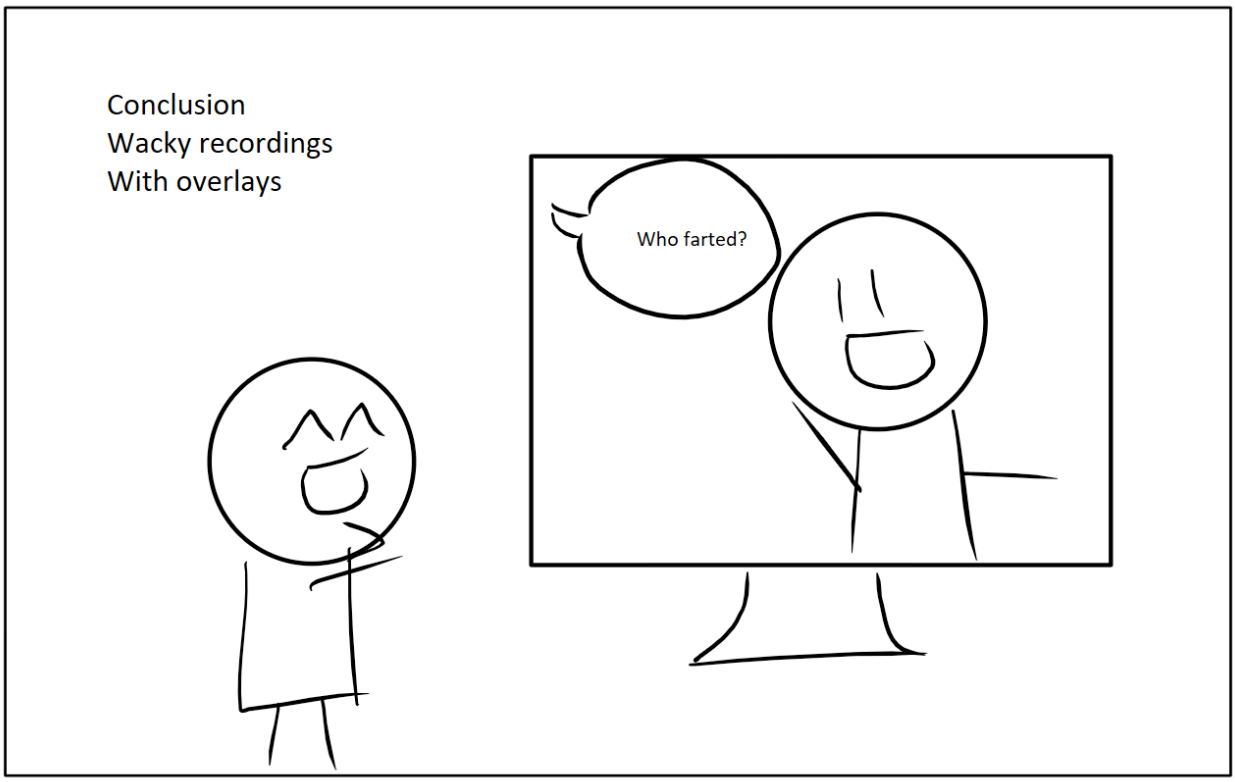
Concept Art



This exemplifies the initialization phase of Project CAMS. The webcam scans for facial features and projects the user onto the monitor. Once initialized, the game will start either by timeout or by pressing a button.



Sprites and other graphical images are overlayed onto the screen that are intractable with the user. The user must move their body or face to interact with the objects in the game. In this example, the user is trying to catch various flying fruits that are flying around the screen.



Once the challenges are over, screenshots of the user are displayed on the screen with specific overlays that are intended to be comical in nature. Using the example from earlier, the user is seen raising his hand to catch a fruit. This specific bubble is inserted to make a slight jab at the user.

Project Planning

The project is intended to be small in scope. This is a one-person team with limited time and resources so the idea is to implement as many features as possible and add as many challenges within the time frame. Since this project requires a display set and a webcam, these items must be procured. Fortunately, a television display is on-hand but a compatible webcam needs to be ordered for use with the project. The timeline of events are as follows:

Week 6	Week 7	Week 8	Week 9	Week 10
Order necessary parts	Test the webcam	Code up challenges on Python	Finalize challenges	Wrap up project
Test HDMI connection with the display	Try out the facial recognition software	Test movement with the webcam.	Time buffer for midterms	Add extra features if possible
Draft challenges and necessary resources	Code tracking and movement into the PYNQ board			
	Finalize challenges			

As of right now, some testing has been done with the HDMI display via an in-class example. Almost all the needed parts are on hand as of this documentation.

Sensors/Needed Parts

- PYNQ Board
- 2 x HDMI Cables
- Television/Monitor Display
- Webcam

  https://www.amazon.com/Logitech-Desktop-Widescreen-Calling-Recording/dp/B004FHO5Y6/ref=sr_1_1?s=electronics&ie=UTF8&qid=1494042922&sr=1-1&keywords=LOGITECH+HD+WEBCAM+C270

Project Breakdown

This is a one-man team so every task will be performed by me. Hopefully, some assistance will be provided along the way.