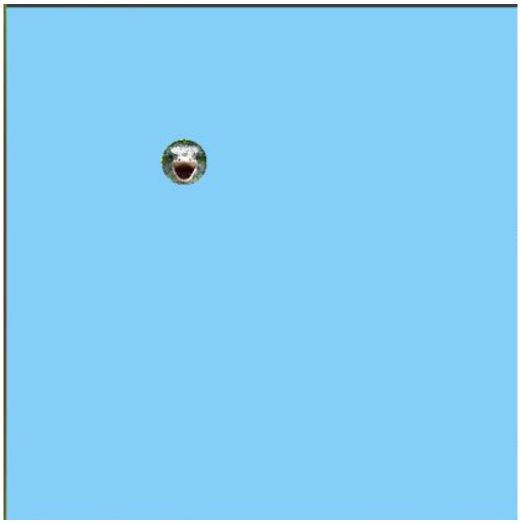
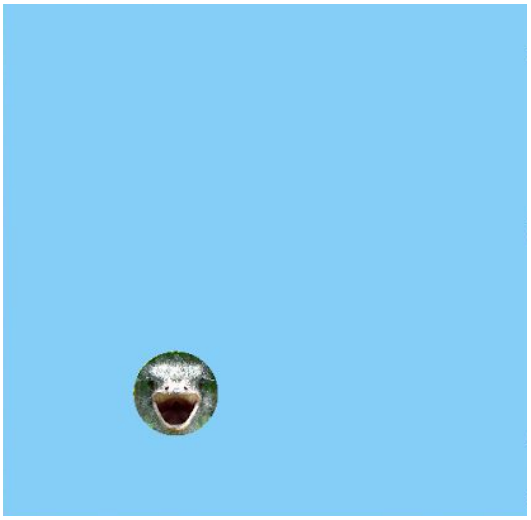
Project Overview and Backstory

The user is walking along, minding their own business. Suddenly, a cargo plane overhead malfunctions and is dropping ostriches. The objective of Dodgy Game is to dodge the ostriches falling from the sky. Dodgy Game utilizes computer vision to control the character in the game. Once the character gets hit by an ostrich, the game is over.

Results

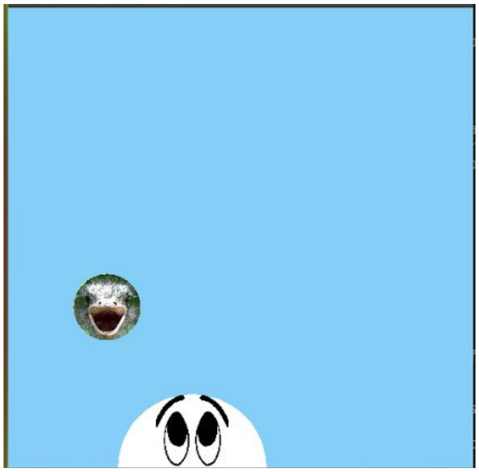
We accomplished a game that has several features the first feature is that the bird grows as it falls from a random starting point at the top of the screen.



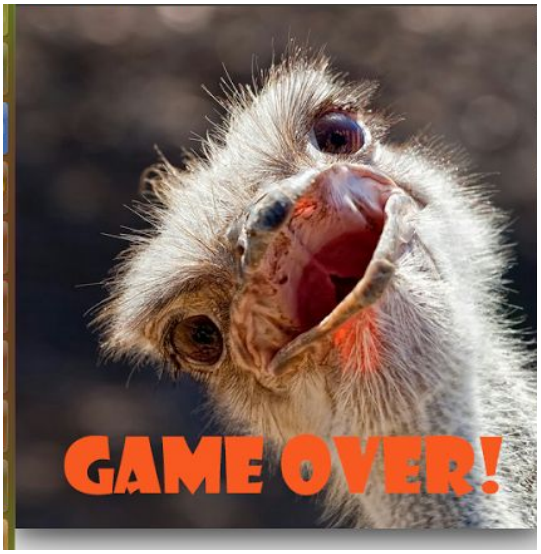


This is meant to show perspective. As the bird grows, it is also getting closer to the user. However, the bird also falls lower on the screen to make it clearer to the user at what poit they must dodge the bird.

The second feature of Dodgy Game is that the user is controlled by facial recognition. The webcam runs and the program detects where the user's face is. The horizontal position of the player on the screen corresponds to the actual position of the user's face.



The third feature is that if the user is hit by the ostrich, a game over screen pops up for several seconds before the game restarts. This is meant to encourage trying again and again because the game does not exit out of itself if the user loses.



Implementation

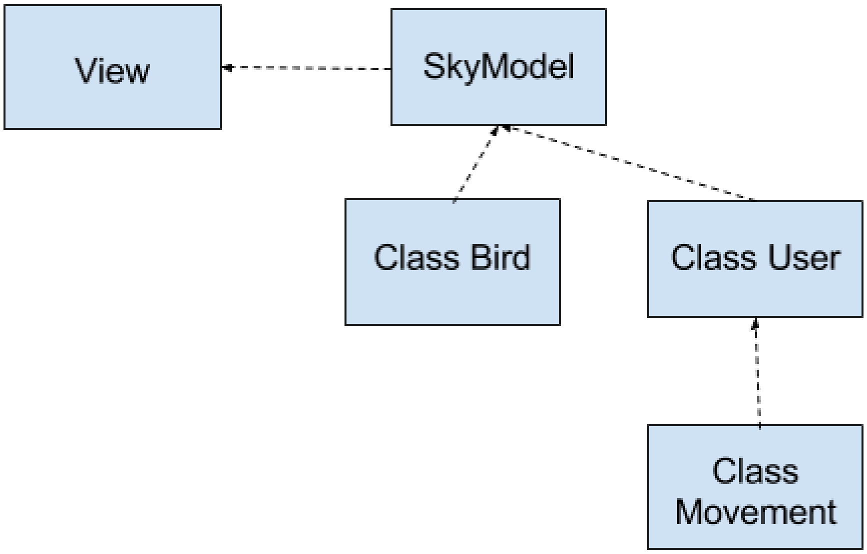
We have a User class that creates the user in the game as well as a Movement class that controls the User's movements. We define the user and the bird in the SkyModel class and draw them in the View class. For the pictures, we used pygame.transform.scale to scale the images to the right size and then blit the image onto the surface.

The Bird class assigns attributes to the falling bird in the game. The most important attributes are the growth rate and the position of the bird. The bird must grow as its y position increases (falling) as well as reset to a random x position at the top of the screen if it has fallen all the way to the bottom without colliding with the User. The growth attribute determines the rate at which the radius attribute increases, and the center_x and center_y attributes determine the position coordinates of the center of the bird, following the convention that the top left corner of the screen is (0, 0).

The User class assigns attributes to the user character. The most important attributes are the center_x and center_y positions that work the same as the corresponding attributes in the Bird class.

Movement utilizes opencv's facial recognition algorithm to grab the position of the player's face and then attribute this position the the horizontal position of the User in the game. Movement is also where the pygame time event is created that allows the game to accept the face coordinates and use them to move the user.

One design decision we had to make was whether or not to have the game quit itself after the player loses. In the interest of making this a fun, low stress game instead of one that has to be continually reopened to play again, we opted to restart the game automatically of showing the gameover screen for a few seconds.



Reflection

This game worked well in that it has all the elements we were looking for in the game. The user controls a character using computer vision, and there is a clear goal in the game. The final game we are turning in is slightly beyond what we envisioned, but overall is within the scope we determined it to be when we proposed it. Ultimately, we are satisfied with this project. We were able to unit test as the project progressed simply by running and debugging. Due to the schedules we had for the duration of this project, we were unable to meet up as often as we wanted. We, however, were able to overcome this by determining what we would do individually and came together to go over the code as well as work together on parts we had difficulties with.

Given more time, we would have included something to keep track of the player’s scores as well as a scoreboard that keeps a record of the top 10 scores for the game. Further iterations on this project would include perhaps more complex gameplay, such as catching eggs while dodging ostriches as well as power-ups that could enable the player to catch ostriches since they are, in fact, endangered species.