PaddlePals

Team G01-2

Deliverable G: Prototype II and Customer Feedback

Engineering Design GNG1103

Team Members:

Faith Harmath	300316328	Zahra Alavi	300259587
Connor Mackillop	300231023	Marissa Ruth	300220560
Layane El Merini	300288563		

Faculty of Engineering

November 13th, 2022

Abstract

The following deliverable will provide a detailed description of prototype II created based on the previous client feedback on prototype I. It will discuss the testing results of prototype II and what will be done in the future to improve our prototype towards creating a final design. The feedback includes personal group feedback as well as feedback observed from other groups prototype I from client meet II.

Table of Contents

1. Introduction

In the previous deliverable, our team developed prototype I. Prototype I underwent testing; Through the results and client feedback, we have developed Prototype II. The purpose of this deliverable is to present our design for prototype II and analyze the results of its performance during testing. This deliverable will also cover feedback from the client for our team, and others in order to improve our next design.

2. Prototype II

Prototype II was a focused prototype; it includes the home screens and the ball tracking shown through the 3D environment in Unity. These were the features presented in Prototype I which have been improved based on the client's feedback. Prototype II also underwent most intensive testing to ensure its functionality.

2.1. User Interface Home Screen

As described in the previous prototype the home screen is the introductory visual interface displayed, from which will allow access to functions. The buttons on the Main home screen provide access to different screens, initially it gives access to the player screen or the coach screen. Secondly, on both player and coach home screen it asks for name and ID, also there is a button for new members which was made in this prototype. Based on the info you enter as your name and ID depending on initially what you selected(Coach or Player) you would have access to the main screens, for instance if you had selected player at the beginning and entered your full name and ID, then the main screen for player will pop up which includes the option for recording a new match, watching previous matches, Feedbacks and the user manual from which allow us to access different things. Most of the buttons are associated with a function. However, this application's different parts were created in different computers and need to be exported from unity, allowing us to assign all the buttons with a function, which will be completed in the next prototype.

Furthermore, the home screen is mostly completed, however there is a few changed that needs to be made. The buttons will be assigned a component. The tutorial video and the user manual will be created in the next prototype. Finally for prototype II, new pages were added to the user interface as modelled below, mainly the add new member screen which will be used both for player and coach and will be edited in the next prototype as well. In addition the pervious match screen demonstrates a view of how the
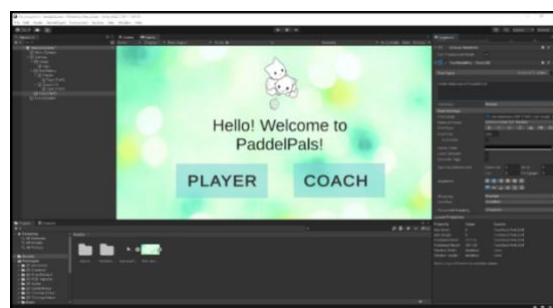

Figure 1. Application Home Screen

Figure 2. Application Home screen Player

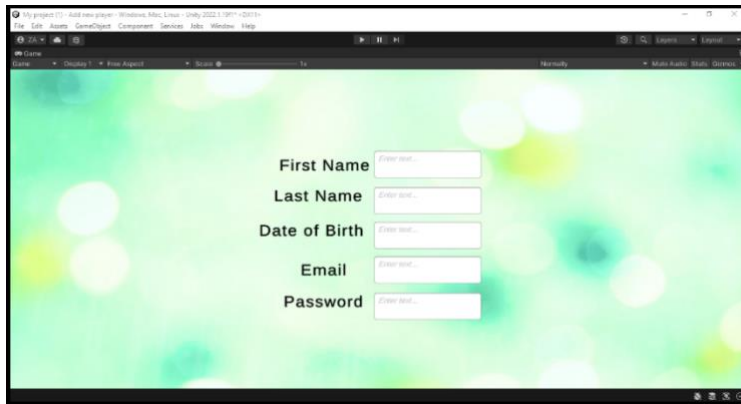*Figure 3. Application Home screen Player*

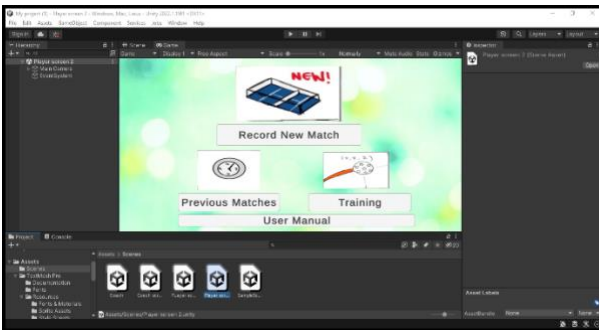*Figure 4. Add new player screen*
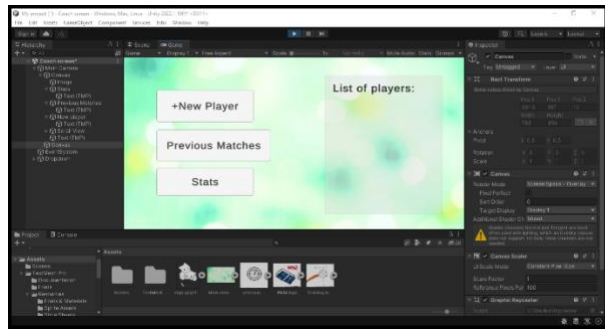

Figure 5. Main Home Screen For Player
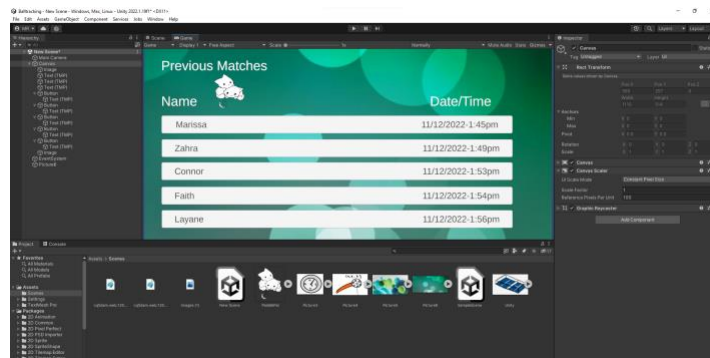

Figure 6 Main Home Screen For Coach

Figure 7 Previous Match-Viewing Screen

The figure above presents the opening screens to our application. The shows the first page you would see, asking the user to identify themselves as 'Player' or 'Coach'. The purpose of this is to simplify the options for the user, since only a coach would need access to all the players' stats on the team, for example. The second line shows the screen a user would be directed to by choosing either option. The user is then asked to login. This was added to ensure privacy of players and coaches. In the third line, players or coach will be directed to the home screen, allowing them to use the functions of the application like 'Record a New Match' (for players) or 'Add a Player' (for coaches). These screens are similar to Prototype I but have been slightly changed. In the final line, a new screen for the 'Previous Matches' button has been developed according to our conceptual design. All the screens shown have not been connected or linked together in Unity however, only designed. The primary next step for the user interface will be connecting all the screens together correctly and ensuring that each button functions properly, directing the user to the appropriate screen. Other changes may also be made to make the user interface more visually pleasing to the user, but this can easily be done after we link these screens together. These changes may include new button images or backgrounds for each screen or even adjusting the layout.

2.2.   Camera Set-Up

The camera location on the court was proved to be the best camera set up for one camera. For prototype II there are two cameras able to collect data of the ball placement. The placement of these cameras will follow Prototype I, as shown in figure 8.
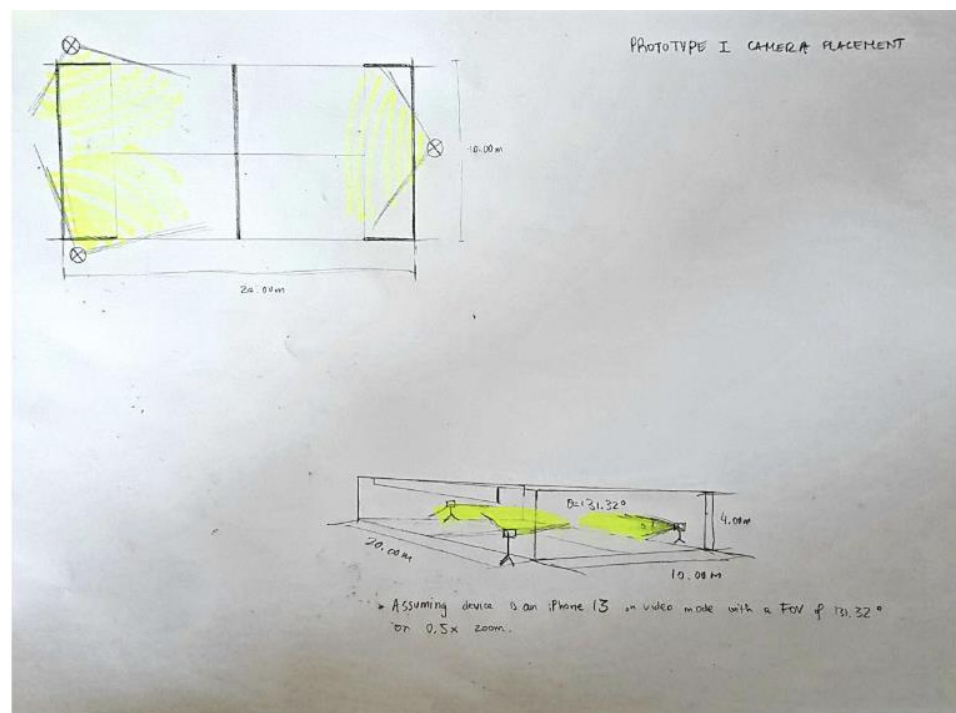

Figure 8 Camera Positioning For Best Results

2.3. Ball Tracking

The ability to accurately track the ball and record its coordinates with one camera was included in prototype I. However, having one camera will not give as precise of a position reading as having multiple cameras. Only having one camera poses another risk about the accuracy of this function, since the ball might not be always in sight of the camera throughout the match. To solve this issue, we have begun adding multiple camera view to track the position. As of currently, the two cameras can accurately track the position of the ball simultaneously. This data was also transported into Unity for testing.

The testing of this feature included throwing the object it was tracking in multiple directions, at high speed. Through this our team found that the prototype performed very well. The ball moved very smoothly and it's movement was accurately depicted in the 3D environment. With the addition of the second camera there was an overall improvement of the range of motion and accuracy.

3. Feedback and Next Steps

3.1. Personal Client Feedback

The client was happy with our prototype I. It included the ability to track the coordinates of the ball with high accuracy using a camera capable of capturing the high speed of the ball (a phone camera). Our prototype I also included the first few user interface screens that the client was happy with. The client agreed on our next steps stated in the previous deliverable, therefore we put our next steps in effect in prototype II.

3.2. Feedback For Other Groups

The main feedback gathered from watching other groups pitch their prototypes that will be useful going forward with our prototype is that the ball tracking must be as accurate as possible. Other groups had used a different type of camera (other than a phone camera) and the camera had produced lag. The client stated that using a phone camera is the best camera to use for the project, therefore we will continue to use a phone camera for our product. The client also stated not use the physics aspect of unity for calculating the speed of the ball as it is not entirely accurate.

3.3. What is Next?

Considering the feedback from client meet 2, going forward we will continue to use a phone camera for tracking and note that the physics aspect of unity is not up the accuracy standards of the product wanted from the client. This means exploring other options for calculating the speed of the ball.

In prototype III we will connect all the user interface screens together and connect those to the ball tracking camera to complete the product for testing. As previously discussed, we also have plans to improve the layout or design or some screens to ensure they are visually appealing to the user. Finally, Prototype III will include a 3D court for the matches to be shown in. This ensures that Prototype III will be a comprehensive prototype, including all aspects of the project together working as one.

4. Conclusion

In conclusion, our team has made significant progress on tracking the position of the ball and improving the user interface. However, there are still more improvements to be made, as discussed above. Prototype III will be a comprehensive prototype, including all aspects of our design. It will also undergo more rigorous testing to prepare our final design.