

RecyClic

Team B03

Deliverable F – Prototype 1 and Customer Feedback

Engineering Design – GNG 1103

Team Members

- James Gray (300133111)
- Patrick Meechan (300161098)
- Chelsea Sikubwabo (300185015)
- Moyin Wright (300163259)
- Franck Pradel Tchombe (300160183)
- Gabrielle Vincent (300164417)

Abstract

This project deliverable will be focusing on the first prototype as well as feedback from the client on the progress of the project. Prototype 1 was developed based on our previous deliverables and research. This deliverable will identify the different features and details of our prototype 1. Our second client meeting went very well, and it appears that this project is on track towards its end goal of creating a great mobile application for our client.

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1. Introduction

In the last deliverable, we proposed a project schedule and cost estimation used to organise the rest of the project and layout our goals and milestones. The purpose of this deliverable is to build the previous conceptual design using unity and other software. As a reminder our group design was based on an AR software which will enable the customer to take images of the waste material which the app will scan and return an answer on if the waste material is recyclable or not. A nature game is also added to our software which is an animated garden which tracks the time spent by the user on the app to display life content in the garden.

Focus was laid on building the scanning part of our AR app since it is an essential part of the project. The feedback from the latest client meeting and how to implement them is also discussed.

2. Prototype 1

2.1 Scanner

The first part of the prototype is the scanner prototype. This prototype was made using Google's Teachable Machine Web API. This API allows you to insert a library of images sorted based on class to teach an AI to recognize objects/images by comparing it to the images it has already learned to sort.

In this case a library of images was retrieved from GitHub (credit in Sources.) The images were then classified based on 6 criteria; paper, plastic, metal, cardboard, glass and trash roughly 400-500 images were used to train the model to detect each class (Fig. 1).

The next step for the scanner is to implement it into Unity so it can be used in the app instead of the web. The implementations of the Teachable Machine into Unity is going to cause a few problems since the code for Teachable Machine is done with JavaScript, which isn't a native coding language for Unity. The solution for this is to host the code for Teachable Machine on a server that unity can send the images to. This server will then send the image through the Teachable Machine and output the class of image it detects. This class will then be sent back to Unity as a string which Unity can interpret to display the information to the end-user.

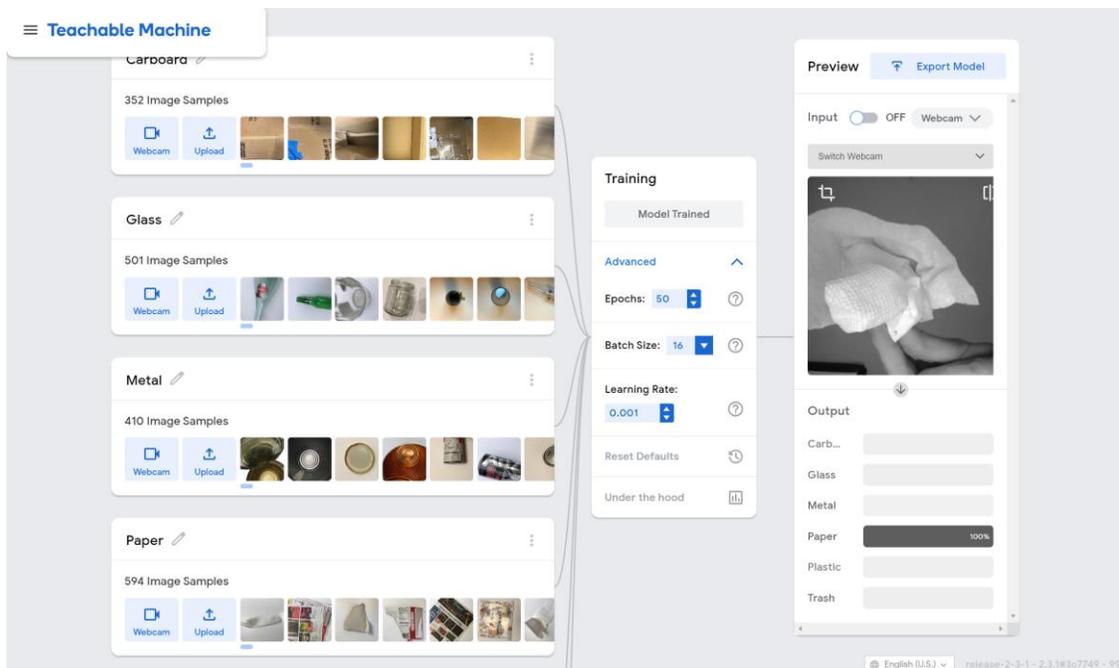


Figure 1 (Teachable Machine)

2.2 User Interface

The user interface (UI) is the main means of interaction between the user and the application. The prototype was made using custom icons, themselves made with Microsoft 3D Paint, and scripts in Unity's native language C#. In the upper right corner (see Figure 2) is the Settings button, and on the bottom is the menu which adapts to a device's layout. In order from left to right the icons on the menu represent a camera (the scan), a picture (the image gallery), an open book (the glossary), a leaf (the Nature Game), and outward signals centered on a globe (the news). Each of these icons will be used to switch between the different features of the application.

So far, the icons in the prototype are only connected to the Nature Game (see Figure 3). Hence, the next step is to connect each icon with the remaining features of the application. The current UI is integrated in each separate view, which means that each view has its own copy. However, a future prototype may have an overlay UI for fluid motion between the different views of the application.

The user interface's background is a low polygon-style animated sky created by BOXOPHOBIC, available in Unity's Asset Store (credit in Sources).

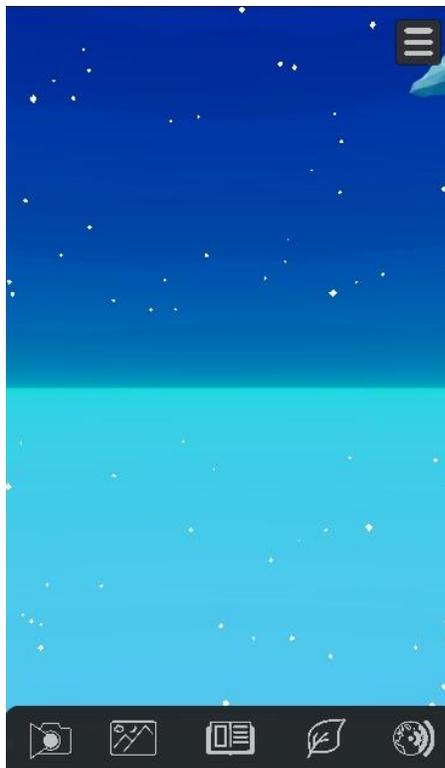


Figure 2 (User Interface)

2.3 Nature Game

This feature of the application is the generation of “life” collected in a 3D environment over *time of use*. Almost every item in the environment is animated and were made from resources (scripts and models) available in Unity’s Asset Store. The Nature Game’s view is accessible by the leaf icon in the UI’s lower right.

The next step will be to implement a counter to calculate a user’s time with the application. Then, the models in the Nature Game will be scripted to appear in sequence according to the calculated time of use. The means to test this feature will be an accelerated sequential generation where the script will generate models in the 3D environment in seconds rather than minutes or hours. A proposed feature for a future prototype is a reverse counter which counts the *time of disuse*: models will be removed or replaced according to the timespan between sessions.

As shown in Figure 3, the UI remains unchanged in each view of the application.



Figure 3 (Nature Game)

3. Feedback

3.1 Customer Feedback from Client Meeting

During our previous interaction with the client (Client Meeting 2), our team was able to receive positive and constructive feedback regarding the group's conceptual design and individual designs created by each team member. Using this feedback, the team has been able to solidify our final design idea and fully understand the expectations for the remainder of this project. Furthermore, the completion of this client meeting and the previous deliverable, has officially launched the team into the prototyping stage.

As previously stated, the overall feedback we received from the client was positive and did not cause the team to make any elaborate changes to the conceptual design; however, it enabled us to expand on some of the minor features of the design that we had conceptualized in 'Deliverable D'. A good example would be the game feature; our team's idea was to increase user engagement through a game feature which involved a virtual garden that would flourish if the user made use of the app frequently. After conversing with the client, he brought into thought that the animated flora and fauna in the garden could also die if the user does not use the app for an extended period. The client was also very impressed by the other features of the app proposed in the design such as, the 'News and Updates' feature as well as the 'Glossary and Instructions' feature, as they not only educate the user and keep them updated with global sustainability progresses, but also promote user engagement.

During the meeting, the client also asked questions that urged the team to begin a final round of decision making about how the various aspects of the app would be created. One of the questions was regarding the progress that had been made in the development of the AR feature. This prompted us to begin making arrangements for this, as it is likely the most crucial feature of the application. On that note, the team has begun exploring various platforms such as, Teachable Machine, which may be considered for developing the scanning feature of the app. We have also started to allocate responsibilities and roles, using each member's conversance with programming.

Overall, the client was impressed with the progress that had been made by the team. He commended the individual designs- stating that each design was unique and well-thought-out. The client was also quite inspired by the designs that did not take the approach of a mobile app and stated that although they were out of reach for the project, they would work be great considerations for future augmentations of the app and commercial use. From this conversation with the client, the team is in a better position to forge ahead with the prototyping stage.

4. Conclusion

In conclusion, the team has completed the first prototype of our product. We have worked hard to incorporate the client's feedback from our second client meeting into this first prototype. As we continue the development of further prototypes in the coming weeks, we will continue to utilize our client's feedback as a means of improving our final product design. However, based on the feedback we received in our second client meeting, the team feels we are on the right track to succeeding in our project.

Sources

- BOXOPHOBIC (2021, February 24). Polyverse skies • low POLY skybox shaders AND textures: Vfx Shaders: Unity asset store. Retrieved March 07, 2021, from <https://assetstore.unity.com/packages/vfx/shaders/polyverse-skies-low-poly-skybox-shaders-and-textures-104017>