Self-Evaluation Report

Introduction

This report is to give details about my contributions during the AR VR Car Parts Simulation assignment in TeamKuitBois. Our project aims to aid with the education system, mainly related to automotive education. We are expected to produce detailed 3D models for professionals to dissemble, assemble and understand the machinery in the virtual world, while reducing the costs needed for the education.

In this report, I will describe all the tasks I have completed, along with the challenges faced and the skills I obtained during the assignment period. Screenshots or links will be provided as evidence for the works I had created during these time period. Finally, I will also evaluate the overall quality of the project with suggestions and possible improvements for upcoming projects.

Role

As a technical lead for this project in the group, there are several important responsibilities I have to make sure the assignment is going on smooth and successful. I am tasked mainly by ensuring all the version control are in place. I am also responsible for managing all the repositions in the GitHub and ensuring all the works are up to date to avoid conflicts in the group. Appropriate branches and comments must be made too to ensure the quality of the commits and all updated 3D models are also uploaded to the GitHub repo. Thus, we can monitor clearly each stages of work we had done, and also request for any feedback or guidance in each stage if needed. Besides that, with a clean repo, all users have the luxury to access easily to any wanted resources which a messy repo can never provide.

Besides that, I am also responsible to create some of the 3D models that would be implemented later in the application. I have used tools like Blender to create the 3D models. I am tasked to create the car battery components and the windshield washer reservoir. Functions such as assemble and dissemble of the 3D models are a must and labels must be clearly lay out for each of the components in the 3D models. All 3D models must allow interactions between the models and users using the stylus pen to enhance the learning experience for students.

Contribution

Researching

One of the contributions I have made is during the researching phase to better understand about the newest AR and VR technology. With these researches, I can better understand the flow of the project and the best way to implement the simulation. We have compared the pros and cons for goggle and goggleless AR VR technology after reading multiple articles and journals.

After deep thought, all our group members discussed on our research and decided to settle on goggleless way to display our 3D models, taking in factors such as cost-effective, hardware compatibility, easier implementation and much more. Based on the research, a stylus pen is way better than using a VR goggles as it is much more suitable in education purposes. With long use of VR goggles, user may suffer from eye strain and motion sickness too. By using the Stylus pen, the risk of educator getting discomfort from teaching is minimize. Affordability of the stylus pen is also cheaper compared to the VR goggles as it would be accessible for all the users while being present in the class.

Project Validation

In the project validation phase, I am tasked with creating a Risk Management Plan for the group to be prepared for any unexpected occurrences and make suitable actions towards the occurrences. Inside the risk management plan, all the possible impacts have been listed out with explanation on how it would damage and delay our implementation for the application. Lists of the possible impacts are listed below:

- Time consuming
- Reputational Risks
- Stakeholder risks
- Hardware compatibility
- Lack of resources

A Risk register have also been created for the purpose of calculating the impact and probability level all the risks that would bring to the project. The highest priority level being the hardware compatibility as most of the group members' devices might not be able to support the development of 3D models. To solve this problem, we have requested access to the computer lab to avoid any unwanted problems during development phase. All the created models are also stored in OneDrive and GitHub for future references or editing.

3D Models

Currently, I had created two 3D models for the application. Both 3D models are uploaded inside the OneDrive and GitHub repo for my teammates to view and give feedback, and also for documentation purposes. The 3D models I have created are car battery and windshield washer reservoir. Before creating the design, I need to research and check out the models of the car battery and windshield washer reservoir, making sure it fits the model of the Car Engine Overview. During the creation of these models, I had learnt how to correctly and efficiently use blender to develop the models I have wanted by modeling, texturing and rendering it. Below are the 3D models created:

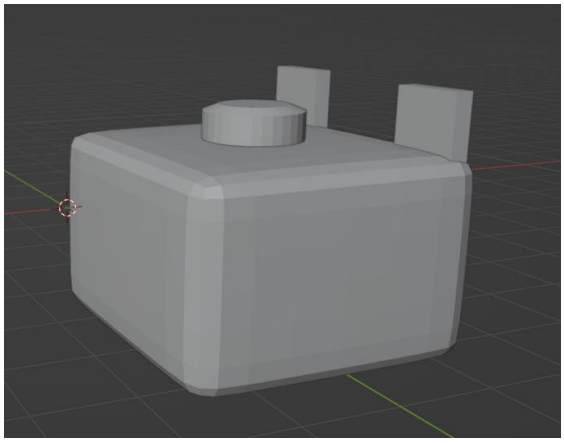

Figure 1.1: windshield washer reservoir

Figure 1.2: Car battery

Besides that, I have also looked online for any sources for 3D models related to our assignment such as TurboSquid or CGTrader to help with our design in the blender. These websites gave us a rough idea on how to develop a 3D models from scratch as references and modifying them based on our requirements.

Action Plan

As a team, we have organized and managed our tasks using the team hood, which is an online platform that tracks our progress of the assignment in different phases. Our tasks are labelled accordingly and marked as done when each of the following are completed. These are the prototype that I have completed, waiting for further enhancement in the future:

- Windshield washer reservoir: Currently the 3D models have mostly been completed, but still lacking the realistic feel and also labelling to it. We have tested and decided to further improve with the current design.
- Research on the car Engine: This research allows us to have a general understanding of where all the components are supposed to be in to make the design of the model reasonable.
- 3D modelling in blender: In this phase, we learnt the basics of 3D modelling using videos from YouTube, and also with the help from the company SiliconMax, who provided free training sessions with us to help us better understand the process of creating a 3D model.

As per right now, I am working on the assemble and dissemble animation of the engine. For future updates, please refer to the team hood link and screenshot provided below.

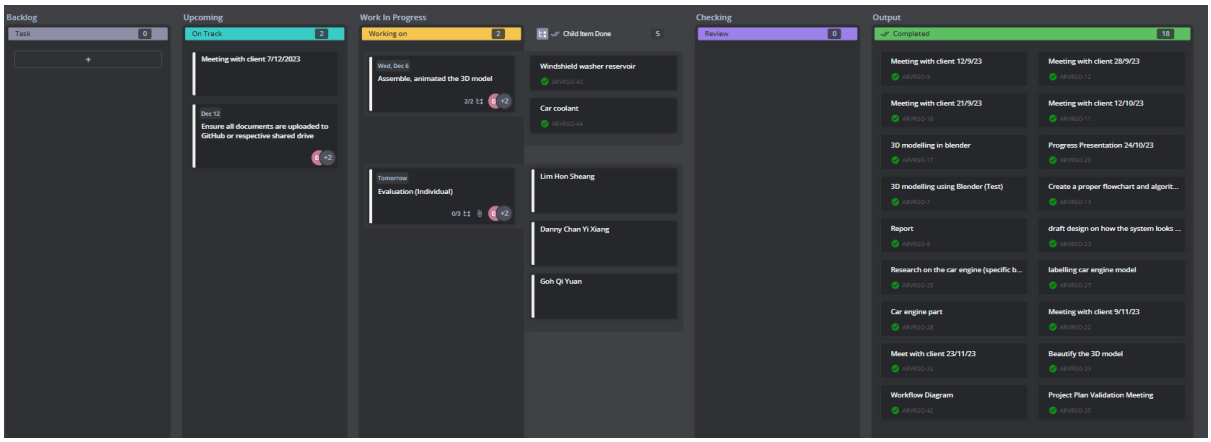

Figure 2.1: team hood screenshot

Links: https://honsheang.teamhood.com/ARVRSO

What I have learnt

- I learnt a lot of new technologies regarding to AR VR technologies. I've been exposed to new area and fields such as modelling, animation and much more.

- As we are doing modelling for automobile, specifically car engine, I have learned how the car engine function to correctly model the 3D models to be reasonable and realistic

- I have learned to correctly use GitHub repo to work together with my teammates to documents all progress in order within the repo.

Challenges

- As a beginner in modelling 3D models, I find it hard to efficiently model and use the tools provided in Blender due to lack of experience. To solve this problem, I found multiple tutorials online, mostly from YouTube videos.

- Without a engineering background, it is quite complicated to understand properly how the car engine works. Having just a grasp idea might lead to design failure so I have researched online on the flow of the engine before implementing the design of the 3D model to make sure all the model fits together.

- Trying to fully understand what the client needs are a challenge for me too due to being new to this field. Clarifications are needed from the client when I am taking notes about the requirements for the 3D models.