IM3180 Design and Innovation Project (AY23/24 Semester 1)
Individual Report

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Group No: _____2_____

Project Title: __PetHome_____

Contributions to the Project (1 page)

For the project, I mainly led the Augmented Reality (AR) team (Gina, Brandon and I) to work on the AR feature. However, the unity file is unable to be uploaded to Github due to its file size. For the AR, I did research and came up with multiple proof-of-concepts (POC). I came up with the POC for ARCore in native Android but it was unable to achieve what we wanted at the end and had to experiment with other medium of AR.

Going into the weeks, the pace of our main android application development was slowing down and hence, I had to help out in debugging, enhancing UI, adding a few features such as the liked page and Gmail login via Firebase Authentication and cleaning up any issues. Pausing AR development for the time being.

The management of the project was not as effective as it could have been, I took up the role of tech lead and created a bunch of Jira tickets for the team to reference off of and led a meeting during recess week to discuss the changes. The pace then start to kick in after this meeting with everyone knowing specifically what tasks are available.

I experimented with ManoMotion. It is a per-by-use unity add-on that enables motion tracking. Unlike Echo3d, the free tier seemed enough to serve our use case. However, documentation was deprecated and there were no supporting information online. Even their own sample application does not work.

Finally, I experimented with Lightship ARDK by Niantic, it is built on top of ARCore as well and supports what we envisioned the AR to have. I created a sample application to test the ARDK and upon working, added the previously made AR models and features into the new application. This however requires a redo of the animation which I then did for running and walking.

Finally, I added the feature of throwing a ball onto the scanned mesh of the world, and made the dog run after it to bring back the ball to the original position. This took very long as the coordinates of the dog and ball in AR space are calculated differently. After that, I implemented the feature for the dog to stop on a stop hand sign. This took very long as we had to train motion tracking to detect a hand and the hand's stop sign.

Finally, the longest task. I integrated the unity project into the native android application and created a documentation for it as well since there are only 3 outdated documentation online and they do not work anymore.

Reflection on Learning Outcome Attainment

Reflect on your experience during your project and the achievements you have relating to at least two of the points below:

(a) Engineering knowledge
(b) Problem Analysis
(c) Investigation
(d) Design/development of Solutions
(e) Modern Tool Usage
(f) The Engineer and Society
(g) Environment and Sustainability
(h) Ethics
(i) Individual and Team Work
(j) Communication
(k) Project Management and Finance
(l) Lifelong Learning

Point 1: _____Project Management and Finance_____

I realized how important good project management is. With poor management, the whole team will be lost. They would not know what needs to be done for the period of time before the next meeting. In the beginning, management was not done properly. Meetings were quiet and at the end of the meetings, no tasks were properly assigned to each person. Jira tickets were big and vague, not completable by a single person within the timeframe. This made the Jira ticket idle and cause others to not know what is done and what isn't done. Not seeing the tickets move also made the team demoralized as we do not see any achievements. After I broke down and issued a proper set of primary tasks for each person during the meeting, members know what are the available tasks and the Jira tickets start to move around. From this experience, I realized how management can impact the whole efficiency and morale of the team.

Point 2: _____Communication_____

I realized that communication is very important. As the unity file cannot be uploaded to Github, we need a higher level of communication between the AR team to ensure there are no conflicts between the versions that we are working on, as well as what each of us is working on at every one point. Without proper communication, there is bound to be many conflicting codes, slowing down development even more. However, we managed to get it to work. Assigning and allocating task to each other so that we do not repeat each other's work. Touching back on point 1, effective communication helped to create a better and more understanding team such that each member knows what need to be done and complete the small tasks one at a time. Without good communication like the initial stages, the project probably would not have gotten to the point it is at today.