

Bi-Weekly Report: Period ending in 20th December 2019

Overview: What we've done

In the past few weeks we have moved on to building an initial prototype for our project.

We became more familiar with Unity AR Foundation and basics of AR programming in Unity such as Raycasting and Planes. We built a basic application to detect horizontal planes and to allow the user to place an avatar on a detected plane by tapping. This showed us how to use basic AR functionality like AR Session Origin and AR Plane Manager.

We built some basic animation scripts to allow our avatar to move and do different movements. We understood how animation controllers work and how you can use boolean variables to change the way the avatar animates. We experimented with different animations, but so far we don't have a basic 'waving' animation, so when the avatar says "hello" it currently does a backflip! However this demonstrated the basic premise that the avatar can do different things depending on the intent it receives from Watson.

We fixed bugs to do with the IBM Watson SDKs for Unity. We fixed the "Credentials" bug by rebuilding the authentication classes from a class in a different script that was working. This allowed us to finally build a full pipeline of Watson services and "speak" to our avatar, with voice recognition, chatbot and voice synthesis all working in tandem. This was a big milestone because it took a lot of time and patience to get to this point.

We got hold of android devices from the department and built an app with our basic animated avatar appearing in world space. We still didn't manage to build the avatar onto Android, it returns a strange 403 error when trying to connect to the Watson cloud from Android. We think this is something to do with SSL and we may have to disable this to get it to work.

We fixed a black screen issue when building to Android, and spent a week debugging this issue! The issue was with AR Foundation not prompting for camera permission, and we realised needed to install AR tools package onto the device from the Google Play store, which we were not aware of. This was only solved when we tried to build to someone else's device, which prompted them to install the package from the play store.

We built a basic UI that allowed us to enter text and send this to the Watson assistant instead of speech. Currently we can see what the avatar is saying in our UI, which is helpful for users that might have audio issues with their device, but we can't currently send text input and we need to debug this further before our deadline.

We looked into how Watson Assistant might be able to interface with a database, and we saw that Watson has the ability to call an external webhook. We started researching how to implement a webhook and which services we could use to host this.

Tasks completed:

- Made a solid timeline and allocated tasks amongst team members
- Fixed 'Credentials' bug in Watson SDK by rebuilding the authentication class
- Got our pipeline working so we can now "speak" to our avatar

- Made an app to detect horizontal planes in AR and place a prefab object on them
- Fixed black screen issue and installed AR tools package onto the device
- Built a basic version of our app onto Android
- Experimented with animation and got a basic animated avatar working
- Built a basic UI and learnt about UI elements in screen space
- Got the avatar to display what it's saying in words for users that might have audio issues with their device
- Started designing and building our website
- Researched connecting our avatar with a database

Problems to be resolved → Steps we intend to take

- Increasing accuracy of SpeechToText → Try changing microphone
- What's our testing strategy? → Research writing tests for AR
- How can we technically implement a system that texts a staff member when someone is there to see them? → Research APIs for text messaging
- Implement database link for staff info
- Fix our UI issue so we can send text input to our chatbot backend
- Fix the problem with watson not connecting on Android
- Find a better "Hello" animation that is not a backflip!

Plan for the next two weeks

- Focus on getting the full pipeline avatar to work on Android for our demonstration
- Dillon to work on the website for the submission
- Oliver to work on implementing the webhook.