

# UCL Peach Group 39: Reality

## Bi-weekly Report #5

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### 1 Overview of the last 2 weeks

In the last 2 weeks we mostly focused on production of documentation and evaluation of existing systems. You can find more information in the sections below.

### 2 Summary of meetings held

#### 2.1 Monday December 5<sup>th</sup>, 2016

On the fifth of December the Corporate Vice President of Microsoft, Steve Guggenheimer, was visiting UCL with his team to discuss the Industry Exchange Network (IXN) and the potential funding and the support the program could receive from Microsoft. As a part of the event, we presented a brief summary of our project together with the video demonstration of the HoloLens application prototype in action. In the process, we've received a lot of useful feedback about the potential vectors of development and how we can present our project to other developers.

Before the meeting, we had a chance to try our prototype on HoloLens and see which features perform as expected, as well as judge about the reliability of various user interactions such as gestures and voice commands. The information we gathered became a part of the data we'll use for evaluation of the system before producing the final implementation.

#### 2.2 Friday December 9<sup>th</sup>, 2016

During this meeting we discussed the production of documentation for the project website and preparation for development in Term 2. We've identified the places where documentation was incomplete or ambiguous and produced a schedule to distribute the documentation production evenly among the team members. Additionally, we've looked at the existing prototypes of the system and identified the parts that would need to be refined or refactored before making it into the final Proof of Concept implementation. Finally, we've discussed how we're going to go about implementing the features that were defined in the project requirements but have not yet been tested as a part of any experiments, such as exporting models, DICOM images and relevant meta data using a new file format for holographic patient cases.

### 3 Tasks completed

- Completed the production of the documentation for the project website, which now contains an overview of the project's scope and requirements, summary of research done, the complete development log, summary of all experiments conducted and the description of all prototypes produced to date
- Implemented data markers that support text notes and voice recordings

- Updated project requirements to include the most recent additions from our client and supervisors
- Updated the UI of the web app frontend to incorporate user feedback and new project requirements

We've made some decent progress in Term 1 that gave us a solid base to build on for the PoC implementation we're going to produce in Term 2.

## 4 Problems encountered

- React has quite a steep learning curve and applying knowledge gathered from documentation to our own solution and the API considering the specific features we need proved to be quite challenging. We'll need to experiment more with React and especially making AJAX requests to the API.
- At the moment, the whole process of creation and management of data markers is quite unreliable, due to the small size of markers and low precision of marker creation. We'll have to look into ways to improve current user experience and user interface in relation to data markers.
- The module we developed for downloading of models and DICOM images for the API doesn't seem to be working with our current HoloLens model viewer. We'll have to look into that to find the root of the issue and fix it.

## 5 Tasks to accomplish before Term 2

- Evaluate all existing user interfaces and user experience in our application and come up with strategies to improve them
- Continue researching and developing the new file format for holographic patient cases
- Finalise the development of React-based webapp prototype that will be migrated to Electrode in the future
- Refine HoloLens application prototype by fixing all known bugs and issues

## 6 Individual reports

### 6.1 Timur Kuzhagaliyev

On the 5th of December together with my team I have presented our project to the corporate vice president of Microsoft Steve Guggenheimer, who's given us a lot of useful feedback and suggested how we can improve our project. As a part of the presentation, I prepared [the slides](#) that can serve as a concise description of our project and also [a short video demonstration](#) of the features that we have implemented in the HoloLens app so far.

Prior to our presentation, I have implemented the data marker feature. Users can now switch to the data marker placement mode when the model is in exploded view, and then place markers on top of the mesh by looking at certain parts of it and performing the air tap gesture (begins at around 2:50 in the video). At the moment, it only supports voice recordings and text notes, but we're planning to refactor the current concept a lot to improve user interactions and introduce new features, such as SNOMED CT and various multimedia files.

Finally, in the last 2 weeks I've coordinated the production of the documentation for our project, which can be found on [on the project website](#).

## 6.2 Fraser Savage

During the past two weeks the rate of iteration has slowed down on the back-end prototype. The core focus for this period was on preparing for the presentation of the prototype and filling out the missing sections on the project website.

Prior to the presentation I started progress to add functionality to load a model from the back-end API. Unfortunately this hit a snag at the last hurdle and so was not able to be demoed — the code used to load a model and run time was unable to load the downloaded files. I managed to get the model-viewer prototype to do the following:

- Authenticate user through API
- Download ZIP archive for a sample model onto the HoloLens
- Extract the ZIP archive onto the HoloLens

Following the presentation the majority of my time working on the project was spent writing up the formalised research report which led to the technology choices of the initial prototype delivered, as well as the testing plan for the development of the final prototype.

## 6.3 Laura Foody

This week I have been continuing to work on the user interface, I redesigned the page structure so that the first page is now the login page and after you login you are taken to the my models page. I have been trying to get the front end to communicate with the back end using the APIs although I have not yet been successful. I decided to try to build the login page without using stormpath as it is unclear what is stored when the user logs in which is what makes it difficult to use the API; so therefore most of my time has been spent looking at alternative ways to implement user authentication. I have also written up pages for the project website. I wrote pages on: front end evaluation, front end design, and research into react and electrode.