

Bi-Weekly Report

14 November 2014

Team Information

This document contains a summary of all that has been achieved over the last two weeks by team 19 on the CTSNet Robotics project as a part of the module Systems Engineering I of the University College London Computer Science course. Team 19 is formed of three students, Edward Collins (team leader), Kirithi Muralikrishnan (website and documentation lead) and Tom Page (research and programming lead).

Client Information

Team 19 has three clients:

- ~Dr Shabnam Parkar, a paediatric surgeon at Great Ormond Street Hospital.
- ~Dr Joel Dunning, cardiothoracic surgeon at James Cook University Hospital.
- ~Dr Lourdes Agapito, computer graphics and vision expert at UCL and primary supervisor.

Summary of Progress

The last two weeks have been focused on finishing the hacking of Kinect 2.0s. In the last lab session before reading week five were soldered, and three of these tested to confirm that they were working. There are now a total of six that are tested and working. The various teams that are using the Kinects have also started to experiment with using them through laptops, and soon hope to be at a point where programming of the Kinects can start.

In addition to this, the team travelled to Middlesbrough on 28 October to meet with Dr Dunning and to watch him perform surgery. The purpose of this was to see what surgery is like in person, and observe some of the issues and difficulties that surgeons face today. The team also discussed the project and its goals with Dr Dunning. One of the surgeries observed here was a short endoscopy of a patient's lungs. This was valuable because it showed us exactly what the feed from an endoscopic camera looks like, showing how it is difficult to judge depth from the camera feed alone.

Finally we made contact with Dr Parkar, who has sent us an email outlining the direction that our research should take and suggesting how the project could be progressed - starting with building a simple prototype to sense depth and then looking at implementing this on a camera that is actually used in surgery.

Successes and Failures

Successes	Difficulties
Six Kinects are now working and ready to be programmed.	Two team members have Macintosh computers which are not compatible with the Kinect SDK. This should not be a problem in the long run as Windows can be installed alongside OS X, but is currently delaying research into programming the Kinects.
Individual User Interface designs have been completed, ready to be compared in the coming week to finalise design.	

Summary of Team Meetings

Date	Topics Discussed	Time
28 October 2014	Travelled to Middlesbrough to meet Dr Dunning.	Whole day
31 October 2014	Lab session working on Kinects.	3 hours

Date	Topics Discussed	Time
14 November 2014	Lab session testing Kinects and assigning work.	2 hours

Progress Target

Over the next two weeks our aim is to:

- ~Create a full work assignment list for all outstanding work until the end of term.
- ~Begin learning to program the Kinects and research into relevant areas to this such as computer vision and graphics.
- ~Design our final user interface.
- ~Create team website.
- ~Formally write up system requirements.

Individual Description of Tasks

Ed Collins

The last three weeks have again been focused on rewiring the Xbox Kinects. We have reached a milestone in this task, as we now have enough Kinects working with laptops for each team member to take one and begin learning to program them. The team has collaborated on this and have all been equally involved.

We also travelled to Middlesbrough to meet Dr Dunning, where we both witnessed surgery first hand and discussed our project goals.

Finally I have completed the individual task of User Interface design, which will be compared with my teammate’s designs in the coming week to create our final UI design which we will then present to our clients.

Tom Page

Over the last few weeks the main tasks we have completed included a trip to Middlesbrough to visit Dr Dunning in order to watch some surgery and thus research some issues which we will need to cover in the project. This also involved looking at their current system they use to perform surgery, the Da Vinci robot. Dr Dunning explained how it is a poor system due to a number of reasons and emphasised that tactile feedback was important.

We also continued the development of the Kinects in order to be able to use them on computers. This process is almost ready. In addition I also conducted some reading about Kinects and how to program them as well as use their data readouts. This will prove useful later in the project.

Kirthi Muralikrishnan

The team went up to Middlesbrough to observe the surgeries performed by our client Dr. Joel Dunning. The ability to observe the surgeries gave me an insight into the requirements of the clients/surgeons (to understand the user needs). We also learnt about the drawbacks of the DaVinci robot. We also got the last few Kinects running. We were assigned a coursework to design a prototype and evaluate it with the help of users. The HCI coursework gave us a clear set of requirements that we have to achieve.