



Bi-Weekly Report Number 3

Computer vision for object detection in medicine

Team Number 6

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Week Overview

In the last 2 weeks we continued to research on the different approaches and APIs we could use for our project. Initially we were looking at either using the Microsoft Kinect to capture the live feed or just ordinary high-quality cameras. The Microsoft Kinect system has depth detection which we thought could help improve the accuracy of the object detection if we used multiple Kinects to make a mesh of the scene. The system however is old, and the video quality is quite low (640 x 480). Furthermore, there does not seem to be a highly developed object detection/tracking API especially with integrating multiple Kinects together, so we decided that we were probably better off using high quality cameras for the video stream instead.

After looking at a variety of object detection APIs that were available to us, we decided on using the TensorFlow object detection API developed by Google:

(https://github.com/tensorflow/models/tree/master/research/object_detection).

As the API has been developed by Google, which is a very respectable company, the system is very advanced and open source meaning there is a lot of support if we get stuck as it is widely used throughout the community. The API also uses another widely used open-source library OpenCV which gives us further support for the project.

We are currently in the process of setting up the environment and getting a very basic application up and running. As we are using TensorFlow we will be coding the majority of our project in Python.

Client meeting No.3 (15/11/2018)

During the meeting we discussed the decision to stop using the Kinect due to its poor resolution quality and use TensorFlow instead.

We were shown different medical tools that must be identified by the system and confirmed the situations in which the program must detect the them. We also received some of the equipment to take home in order to test the system.

List of tasks Completed

- Weighed pros and cons of using Kinect or cameras and decided on using cameras.
- Researched into the different APIs we could use for our project.
- Set up environment (API and libraries).
- Made basic application using webcam input.
- Finalise website design and put project brief up.

Plan for the next two weeks

- Further develop website.
- Add custom models (medical instruments).
- Test the reliability of the different detection settings

Individual tasks completed

Benedict

In the last two weeks I researched into the potential solutions we could use. I looked into the existing infrastructure for Kinect and cameras in computer visions and decided the Kinect approach would not be sufficient. I decided on using the Google TensorFlow object detection API and setup the basic program allowing the detection of basic objects with my webcam.

Shirin

During the last two weeks I have spent on finalizing the website and getting the framework set up in order to put up the content as it come up during the rest of the year, allowing for an easier way to update the client.