Week 14 to 16 Work Record

29th May to 18th June

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| **COMPLETED TASKS** | **COMMENTS AND CONTINUATION OF TASK** |
| Cube Colour Tests  **Hours: 4** | Developed a function to perform a set of tests on the colours of the cube faces. It tests each face has nine colours describing the colour layout, each face centre is unique, and there is 9 of each colour. |
| Run Cube Explorer  **Hours: 6** | Developed code to check if the process for Cube Explorer is running. If it isn't, run the process. This allows me to automate the whole process after the python program is called. Additionally another function was developed to quit the Cube Explorer. |
| Colour notation to Singmaster Notation  **Hours: 3** | Developed code to convert the face colours to the corresponding Singmaster Notation. Cube Explorer only accepts Singmaster notation. Additionally this notation does not depend on the face colour. |
| Send Face Encoding to Solver  **Hours: 6** | Developed code to send face encoding to the cube solver, wait for its reply then save the returned data. HTLM encoding on the data is removed then the string broken into individual moves. |
| Begin assembling the functions to work together as Test code  **Hours: 15** | Combined all the code into a single file. Each one had to be converted to work as a function, and return values where needed. So far, the code automates starting Cube Explorer, getting the face values (currently just set variables), sending them to Cube Explorer, perform checks on the returned face colours, convert to Singmaster and finally send to Cube Explorer. Some additional functions such as exit cube solver were written to reduce code repetition. |
| Error checking/handling  **Hours: 10** | I wrote outputs based on what parts of the code were triggering, and to allow me to easily debug common errors or issues.  When starting up, sometimes Cube Explorer will fail to start the webserver (what I'm using to communicate with it). To combat this, at the start of the Test code after checking whether the Cube Explorer was running, the code tries to contact it. This is implemented as a while loop which allows a timeout after a set time to prevent the code from hanging forever. This returns an error so I know what happened.  This timeout is also implemented when sending the face encoding, preventing the code from getting stuck. |

**What to do next:**

Expand error detection to detect when the cube could not be solved by Cube Explorer (the error is sent as a message back to my code).

Continue with OpenCV tutorials and to ultimately make the vision system.

After the vision system has been developed, test using images from Baxter's head camera and make any necessary changes.

Begin working with Baxter and learn MoveIt to aid in motion planning. Additionally I will have to explore how to mount Baxters camera so the computer can access its feed.