Research Logbook – Jordan Lewis

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| Date | What Happened |
| 21 July 2014 | Got most of the equipment required for this research project from Mr. Tim Clark.  Background Research |
| 23 July 2014 | Started Logbook  Background Research |
| 24 July 2014 | Background research on electronics (how to set up the ultrasound sensor on a Raspberry Pi). <https://www.youtube.com/watch?v=xACy8l3LsXI>  Talked to Christy Brown (Lab Technician) about ordering a breadboard. |
| 25 July 2014 | Installed Raspbian onto Raspberry Pi. Learning how to use Raspberry Pi, playing with network configs.  Background Research |
| 26 July 2014 | Installed TightVNC  Installed Real VNC Client on Laptops  http://www.realvnc.com  Installed MySQL Python  http://stackoverflow.com/questions/7459766/installing-mysql-python  Installed Web.py  http://webpy.org/install  Wrote the code to measure the distance via the sonar sensor  Started wiring the sonar sensor  Failed  https://www.youtube.com/watch?v=xACy8l3LsXI  Other Links  http://www.csgnetwork.com/resistcolcalc.html  http://www.hobby-hour.com/electronics/resistorcalculator.php |
| 27 July 2014 | Rewired and got the sonar to work  Installed many dependencies  Got more wires from TC  http://nobru54.blogspot.com.au/2013/07/rapsberry-pi-mesures-meteo.html  Wired up the temp and humidity sensor  failed once  wired 3.3v to the ground pin  fixed the temp and humidity wiring  tested and confirmed that both circuits are working as expected  cleaned up the breadboard - shortened resistor lengths and bent bridges to fit properly  installed DHTReader python module  wrote a python script to get temp and humidity  confirmed it works  wrote a python script to fetch sonar->distance and dht22->temp and humidity  error with python tuples - http://stackoverflow.com/questions/7696924/multiline-comments-in-python; http://www.tutorialspoint.com/python/python\_tuples.htm  fixed the issue  works as expected  wrote today and yesterday’s logs into text file on my laptop.  installed mysql connector and server  https://packages.debian.org/wheezy/python-mysql.connector  http://raspberrywebserver.com/sql-databases/using-mysql-on-a-raspberry-pi.html  Other links  http://makezine.com/projects/tutorial-raspberry-pi-gpio-pins-and-python/ (GPIO Pin Numbering)  http://robig.net/blog/blog/tag/raspberrypi/ (GPIO Pin layout)  http://superuser.com/questions/404103/exit-ssh-session-in-mac-terminal |
| 28 July 2014 | Worked on cutting a hole into the Raspberry Pi Case  Created ‘science’ database  Created ‘data’ table in ‘science’ database  <http://raspberrywebserver.com/sql-databases/using-mysql-on-a-raspberry-pi.html>  <http://dev.mysql.com/doc/refman/5.5/en/database-use.html>  <http://dev.mysql.com/doc/refman/5.5/en/getting-information.html>  <http://dev.mysql.com/doc/refman/5.5/en/entering-queries.html>  http://dev.mysql.com/doc/refman/5.5/en/tutorial.html |
| 29 July 2014 | Worked on the server.py file to view the data in real time |
| 30 July 2014 | Worked on the server.py file |
| 31 July 2014 | Worked on the server.py file |
| 1 August 2014 | Started on the Website |
| 2 August 2014 | Worked on getting the server to send data to the website via web.py and javascript  Downloaded plot.js from  Website  Worked on setting up the graphs to look nice  Installed Proftpd server to work on files on the Raspberry Pi via text wrangler |
| 3 August 2014 | Perfecting the website and graphs  Finalized the class to send the initial JSON data  Finalized the class to send the latest JSON data |
| 4 August 2014 | Tried to do the first deployment  Failed due to the python files dying when the remote computer disconnects  Tried several methods of getting the scripts (collectdata.py and server.py) to start on boot. All failed, got the rc.local method to start the server.  Later that night figured out the fix in the rc.local  Spelt Science wrong in dir – spelt as Sciece in the start code. |
| 5 August 2014 | Attempted to add timeout to the sonar measurement code so it does not freeze and stop when it doesn't get a response from the sensor. Got error with indenting in python |
| 6 August 2014 | Fixed indentation error at 6am  Did the initial setup and deploymentMacintosh HD:Users:38559:Documents:Year 10 2014:Science:Student Research Project:Images:Snapshots:Set Up 1:Photo on 21-08-14 at 12.37 PM.jpg |
| 7 August 2014 | Checked in on the data recording progress  Found that the sonar distance recordings were up and down and all over the place |
| 8 August 2014 | Fixed the sonar distance measurements by adding a layer to below the bread board to lift up the sensorsMacintosh HD:Users:38559:Documents:Year 10 2014:Science:Student Research Project:Images:Snapshots:Set Up 2:Photo on 8-08-14 at 11.40 AM #2.jpg |
| 11 August 2014 | Found out that the DHT22 sensor has stopped responding.  Maybe fog?  Fixed in the after noon, it spontaneously started responding. |
| 12 August 2014 | Checked in on the system  Checked in on the measurements. Some are all over the place but started to calm down, I’ll let it be for now and see how it goes over time. |
| 13 August 2014 | Found that the measurements where inconsistent  Created a new database and restarted. |
| 15 August 2014 | Took apart the setup, started extracting data from Raspberry Pi in CSV form |
| 17 August 2014 | Reformatted the information in excel. Used Plot.2.200 (Downloaded in bkmks) to graph all the data. |
| 18 August 2014 | Worked on the Variables |
| 20 August 2014 | Played around with data to decrease the range of distances by using the temperature and humidity after about 4 tries, go to half the range successfully (playing around with squares and roots). |
| 21 August 2014 | Worked on Method, formatted it and set up the structure |
| 22 August 2014 | More in depth work on the method |
| 27 August 2014 | Got BMP180 Barometric Sensor from Mr Clark  Downloaded the base files to use itMacintosh HD:Users:38559:Documents:Year 10 2014:Science:Student Research Project:Images:Snapshots:Initial BMP180 Wiring:Photo on 27-08-14 at 3.46 PM.jpg |
| 28 August 2014 | Installed the drivers to use the BMP180 sensor  Made a duplicate of the collectdata.py file and altered it to read from the bmp180 sensor  Deployed the system after school, ran into issues with the dht22 not responding, but it fixed itself after some playing around and started working.Macintosh HD:Users:38559:Documents:Year 10 2014:Science:Student Research Project:Images:Snapshots:Set Up 3:IMG_4056.jpg |
| 29 August 2014 | Checked in on deployment5 database, found that the sonar sensor started returning ridiculously short distances and the frequency of successful measurements had decreased by a lot.  Decided to create a new database deployment6 and fix the sonar sensor and begin again.  Started porting JavaScript speed of sound calculator to Python  While porting, something stopped responding, trying to fix.  Started to work after rebooting |
| 3 September 2014 | Thought about taking the set up down to work on the SRP  Ended up redeploying |
| 4 September 2014 | The recording stopped again, so restarted and redeployed |
| 5 September 2014 | Last day of practical, so took apart the set up and packed up  Later extracted all the datasets from the Raspberry Pi and graphed them. |
| 6 September 2014 | Started drawing the circuit diagram for my set up  Finished later that day |
| 7 September 2014 | Started and finished the formal method for the assignment so most lay people can do it, by rewriting it in separate parts.  Worked on other aspects of the SRP Report |
| 8 September 2014 | Worked on several aspects of the SRP Report |
| 11 September 2014 | Finished the SRP Report, tidied up any loose ends. |