Wednesday 15/05/19
Lab 1 (Lab A)

Today was the first day we met as a group and introduced ourselves to the AVC project. At this stage we discussed what each of us would be most confident working on and decided to split into two sections.

- We split each other's roles into 2 sections
    - Software - Raresh and Paul
    - Hardware - Raewyn and Chris

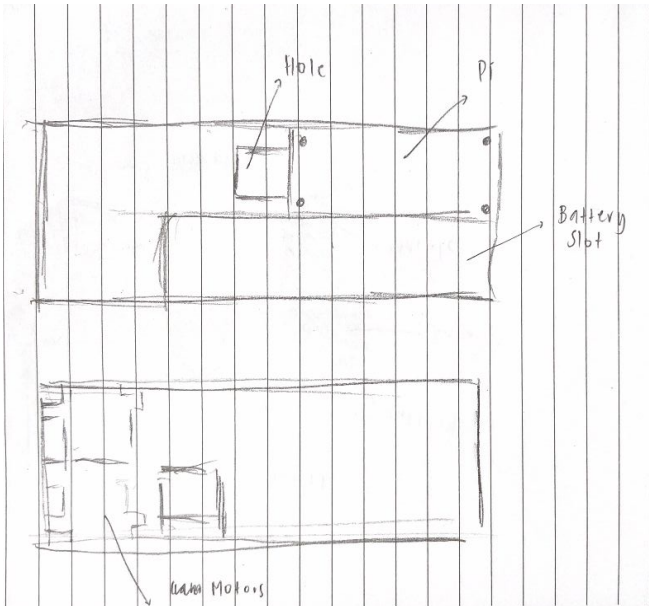
Paul started working on the AVC Project Plan and had each of the members sign the paper before leaving the lab.

- Chris and Raewyn took a look at the model of the robot and took a few notes about what the robot that will need in order to construct and assemble it. We did a rough sketch of a potential robot, played around with SketchUp and looked at parts in which we maybe able to use later on during the process of building a robot.

Thursday 16/05/19
Lab 2 (Lab B)

Today in Lab B we realised that Chris was not actually suppose to be in our team and rather was meant to be in another team. Due to this issue, it may delay our progress as we may have to start from scratch with the process of creating our hardware. Although this issue could have been easily prevented if we looked properly at our team members, it was a bit hard to avoid since the original 4th person, Thisali wasn't present in lab B due to a Doctor's appointment.

Since Thisali came and said she would like to be part of hardware, her and Raewyn decided to redesign what our future robot could look like. This meant we had to scratch out Chris and Raewyn sketch and start from square one. However, since we were in a bit of a rush we decided to just go straight to SketchUp and 'sketch' a base at the same time.

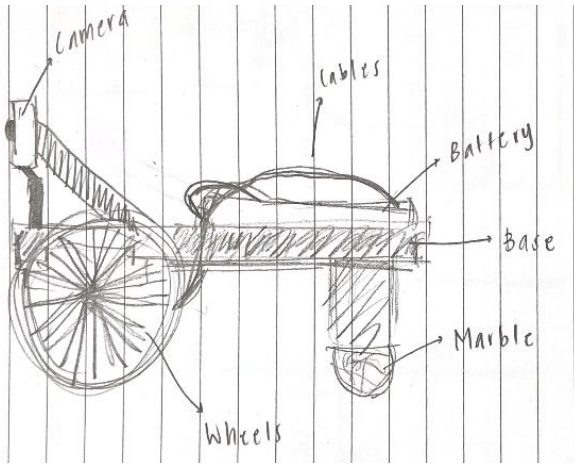


Here is a rough sketch of the base we decided to go along with for our robot. We decided to stick with one solid base that will have all the parts of what the robot must need in order for it to work and go through all quadrants of the maze. These parts are:

- Raspberry Pi
- Camera motor
- Power bank
- Wheel motors

The sketch of the base shows that the battery will have its own slot for it to sit perfectly. The hole will be for the wires of the wheel motors to go through in order to make the robot look clean and efficient during testing. This will prevent the wheels from interfering with the wires in which could be prone to errors if the wires interfere. The Pi would be situated next to the power bank. We want to create some depth for the motors so that it could just fit in perfectly to the base once printed.

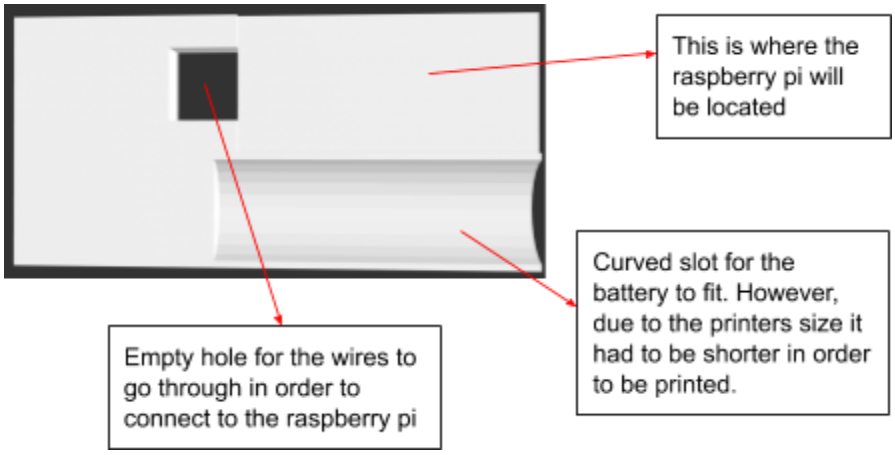
If the base of the robot becomes successfully, we think the robot can potentially look like the sketch on the right. Having big wheels would be beneficial as it would control the balance of the robot and thus, having a marble stand on the back would help strengthen the robot and its base. It is important that the base of the robot is strong, steady and balanced in order for it to successfully work and move around freely when tested.



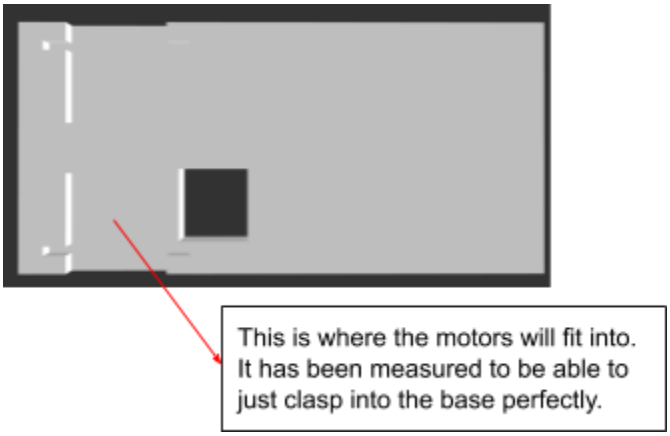
Thisali and Raewyn were not familiar with this software and found that it took a lot of time trying to play around and get the adjustments correct so that we would not need to reprint because of simple mistakes. We played around with SketchUp trying to create a base that we sketched however, we realised that the 3D printer in the lab took measurements in mm and not cm, which delayed us even more from printing right away as we had to reconvert the measurements in order to get the right sized base for our robot. Another problem that we encountered was that the base of our robot was too long for the 3D printer at university since it could only accept a maximum size of 120cm cube. This meant we had to adjust the size of our base and meant that

the slot for our battery would be short which will mean that half of the battery would be hanging off.

Front of base:



Back of Base:



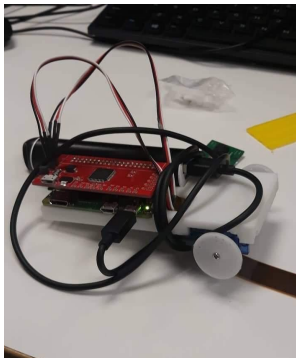
Just before the lab finished, when we were about to print after finally fixing the base in order to print, many others were printing too. This now means that we are currently behind schedule with hardware. This is because since we decided to change up and redesign our robot model, meant that we had to 3D print again. During this lab the printer was heavily occupied by the other teams where majority of the waiting time took up to 3 hours. We couldn't do anything at this point as we must print out our base in order to get started with constructing the robot.

- Before the lab ended we printed the 3D version of the platform overnight, it took an hour and a half to complete the printing.

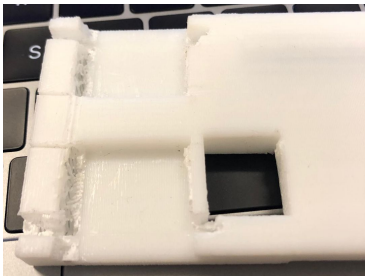
Wednesday 22/05/19
Lab 3 (Lab A)

For today's lab A, we were able to work with the 3D printed base that was printed overnight last week. We worked with what we got, see if we could do something with what have and decided to work with our original base. s with sticking to this base.

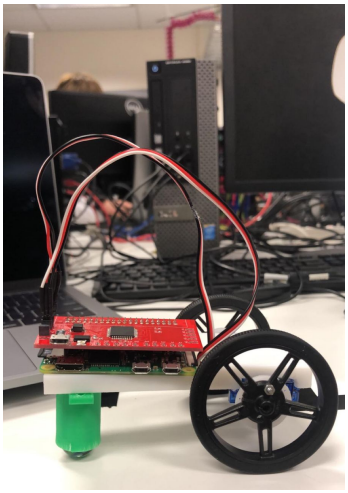
Here is a photo of what we tried to work with. When we put all the parts needed for the robot together, we realised this structure was not a very suitable, systematic and logical for a robot to be working around a maze.



The first problem encountered was that the calculations when creating the base on SketchUp were a bit off when we tried attaching the motors to the base. In order for the motors to fit, we had to sand the base in order to give allowance for the motors to go into their slots.



Another problem we encountered was that the weight of the battery was too heavy for the base to carry and because half of the battery was hanging off the edge, it made the base just less practical to use.

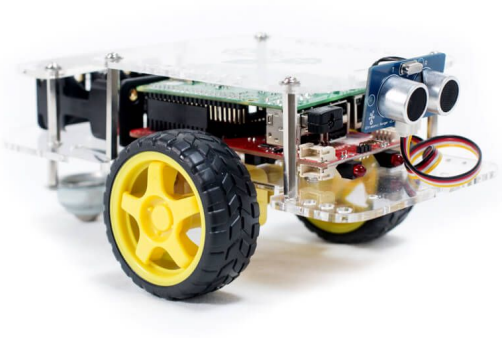


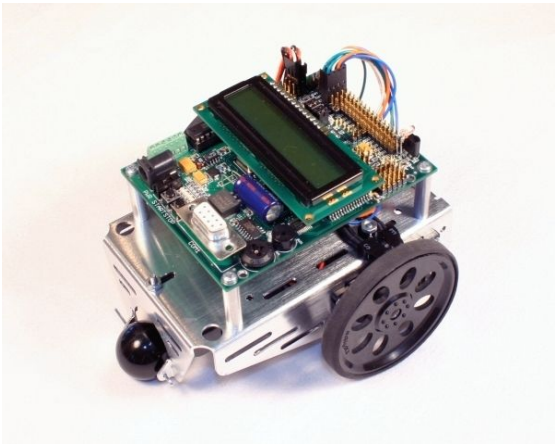
Everything just seemed way too cramped together which may increase the chances of losing points because of not having an 'aesthetically' pleasing robot with clean wires. The wheels on the initial robot also seemed way too small to support the base. By sticking to this structure would mean that adding the camera onto the base will make the robot more cramped and could cause a lot of loose wires all over the place which may result in an error prone robot.

Since this structure hand many disadvantages in the long run, Thesali and I decided to upgrade the robot a bit so that it could have more room.

In the process up stepping up from the initial structure, we first did some basic research on some potential robots that we could base our ideas from.

Below are the two we decided to get our inspiration from:

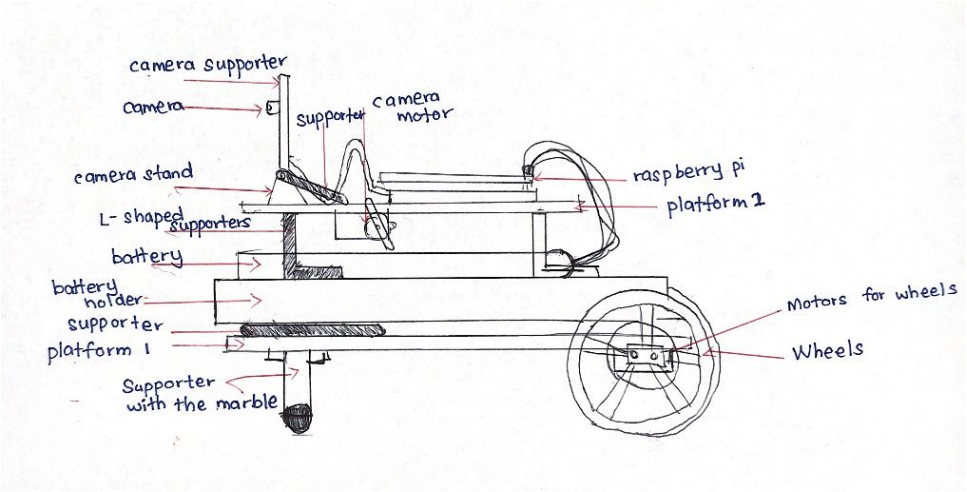


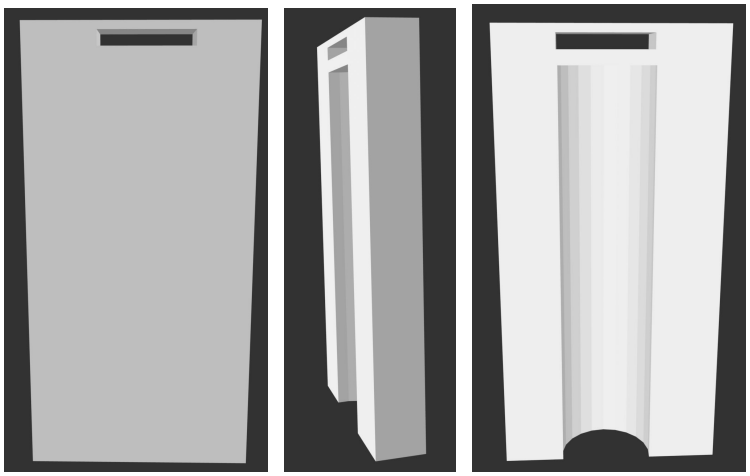


- Clean
- Wirefree
- Has a marble to support the back
- Sandwich (2 layers)
- Big wheels

23/05/19
Lab 4 (Lab B)

In lab B we sketched up what we want our redesigned robot to look like. Below is a sketch. We are thinking of using 3 platforms.



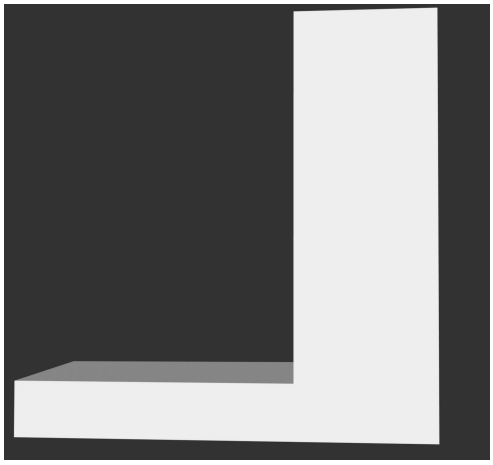


Monday 27/05/19

- We had to make sure that the platform is balanced with the wheels, so we attached a cylinder with a marble at its bottom, that helps to balance and move.
- We fixed the wheels to the motor with screw nails, as we faced a few malfunctionings on wheels.
- Fixed flimsy battery holder and wiring.

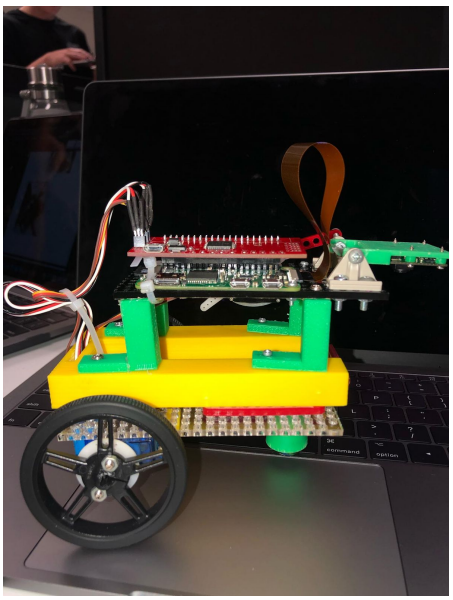
Wednesday 29/05/19
Lab 5 (Lab B)

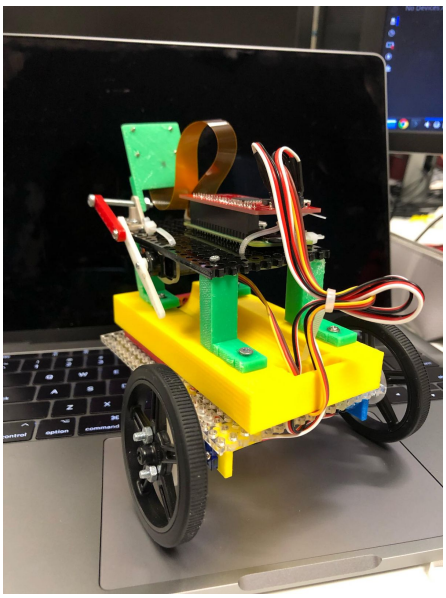
- The first time the robot was tested it received a preliminary score of 64% as it hit a duck the first time round.
- However, as it stands now, the raspberry Pi crashes mid-course. Raresh and Aurther's diagnosis is that the battery may not have charged and the motors suck too much power when switching directions.
- We used pre-printed L-shaped supporters to place the motor in the correct position and we attached them together by using screw nails.
- We managed to attach both of the motors in either sides.

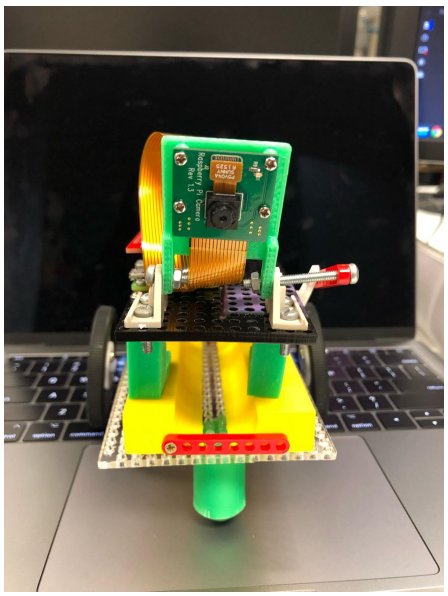


Thursday 30/05/19
Lab 6 (Lab A)

- Now we have officially finished our robot
- We fixed the hardware by cleaning up the cables and used a cable wire to reframe the robot from making easy errors that could be easily avoided with clean wires during the testing process
- We have attached the camera motor to the robot so that it could be capable for quadrant 4
- We mainly focused on making the robot secure so we had to deconstruct the bot and make the wires tighter so it will not fall apart during testing







31/05/19
Lab 7 (Lab B)

- We have tested our robot -it can successfully go through the gate and follow the curvy line which covers quadrant 1 and 2. Aurther has given us a preliminary mark of 67%. However, when we tested the robot on quadrant 3, the robot doesn't quite understand what to do.
- When the robot was tested at 2 during the tight corners it has a bit of trouble going through the corners and thus, slows down.