

Meeting 3: Module Design

Meeting Minutes

Date: 3/05/2022

Time: 2:00 pm

Location: Zoom

Attendance

- Zhanbo Zhu
- Nathan Lui
- Marc Seif
- Haohao Feng (online)
- Olivia Chen (online)
- Yixun (Teddy) Yan (online)

Meeting Agenda

- Go through the idea with tutor for confirmation
- Design modules
- Allocate roles

Points Discussed from last meeting

We talked about our idea that we thought about over the last meeting and after getting it confirmed by the tutor we are going to start allocation of roles and designing the modules.

Discussion Points

- Sensor to look at a shelf and see if the shelf is empty or full by looking at the shelf to see if there are any “empty” spots
- We spoke with our tutor in regards to the ideas that we came up with and had them confirmed

Design quality discussion with tutor:

- Yes it does merit the idea
- Breaking it down into modules. Where d the function most logically lie, what data needs to be stored and what data is received
- Some of the projects and modules should be able to used in different projects that we should just be able to copy and paste oer
- Documentation
- Testing: we need to show that each part of the overall system works individually
- When we are making it, try to
- Also deciding how the staff members are going to use it as well
- Start off with the basic scope of things and then one we get them working for “perfect conditions”. Once we get that working, then we can make it more complex with what if a box is not straight, what if there is a tilt etc.
- Create a prototype the size of a table so that we can demonstrate that it works

Module design and breakdown:

1. User input - serial command: total rows and cols, total height and width of the shelf, height and width length of the box on the shelf. (either terminal command or using something like a number pad from the dragonboard (which we will have to figure out))
 - a. Initialise storage: (split the data up into rows and cols and create an array for the program to go through and fill up with information)
2. LiDAR camera: scanning the distance from the camera to the object (returning a distance)
3. Pan and tilt: computing the correct angles for panning and tilting the camera (allow the camera to pan and tilt)
 - a. Submodule: break down the boxes to find the centre of the boxes and decide the angle to tilt and pan
4. Box detection: taking in the distance taken in from the camera and using it to decide if there is a box in that spot (returning a boolean value to tell if there is a box there are not) → then append this value to the final array (main file)
5. 7 seg display: displays the number of boxes remaining
6. Sound: play a 'beep beep' periodically (to tell the user that the shelf is empty)
7. 8 LED lights: display the percentage of existing boxes through illuminated LEDs (scale of lights from 0-8 leds representing 0-100% full)
8. LCD display: show a message - "the shelf is full", "the shelf has x items", "the shelf requires a refill"

Allocated Tasks

Module 1: Olivia and Zhanbo

Module 2: Nathan and Haohao

Module 3: Nathan and Haohao and Olivia

Module 4: Haohao

Module 5: Zhanbo

Module 6: Nathan

Module 7: Marc

Module 8: Teddy

Next Meeting Time

- 2pm 10/05/2022