

Group Update:

After shaking off a particular professor's opinion of our knowledge on certain subject matter, we decided to take a step back and re-access our project goals and objectives. We split our group effort into two parts: embedded systems and electromagnetics. The following was done independently:

Ryan:

Met with Dr. Golcowski and Dr. Harid discussing options for how to proceed with "hot spot" identification. May be able to do far field/near field but need to verbosely do the math to prove the concept and required power. Will be moving over to looking at a simplified general sensing region to prove the concept and determine if specific object shapes (I.E. square, circle & triangle) could be detected if machined from highly conductive material.

Nathan/Randy:

Met with Dr. Liu and Dr. Connors to discuss applications and use of sensors that are within our budget and also have the potential to work with depth. Was given a structure.io sensor from Dr. Connors and was evaluated but found to have a minimum sensing depth issue (>35 cm from source). This pushes the requirements to be much further away from our sandbox than we originally thought. Also, this sensor only has hardware capability with the Apple iPad and the company does not like to give away hardware without the supporting software (downloaded from the Apple Store). Dr. Liu also gave us an Xbox Kinect which has not yet been evaluated but will have the same problem with overhead mounting and distance away from the sandbox. This may not work well for the prototype but may work quite well for the final design (which will be much larger in size). Additionally due to incurred cost of use Plexiglas we will likely move the physical construction over to a cheaper material (I.E. wood). Began working on generic python code for showing/reading topographical data using JetBrains PyCharm IDE. Was able to generate a simple 2D plot of hand drawn single topographical layer. This can be easily extrapolated to multi-layers given a resolution of the sensor. For now we will continue down the line of the Xbox Kinect due to already having a sensor.

Next Milestones: 2017-NOV-04

Ryan:

1. Investigate the solenoid receiver option for simple quadrant object detection
 - a. Use software to fill the gap if required
2. Investigate use of "off the shelf" pre-built antenna options
3. Evaluate pricing for "off the shelf" options against our budget
4. Power calculations on power for a given frequency and FCC regulation for legality
5. Engineering notebook
6. Add GanttProject and start tracking project task completion

Nathan:

1. Email/Call Zivid for information on RGB+D sensor
2. Discuss Sterolabs options with Dr. Connors and pull datasheets for info
3. Start playing with the Kinect mounted above our prototype
4. Complete requirements document
5. Software/Hardware flowchart
6. Add GanttProject and start tracking project task completion
7. How to pull of Kinect data and read into python
8. Parse vectors and matrices for z-height
9. HWSW Acceleration (at the back end)
10. See python code (Augmented Reality Sandbox.py) for detailed next steps

Senior Design
Group Meeting Notes/Milestones
2017-OCT-21

Randy:

1. Investigate GPR with applications and examples
2. URL for previous work (benchmarking for component selection on a budget)
3. Patent search, create document with results, be verbose and include all results that are close enough to our global project goals (Augmented Reality Sandbox)
4. Add GanttProject and start tracking project task completion
5. How to take Nathan's parsed data from python (2D representation of height) and project that out through HDMI using python only