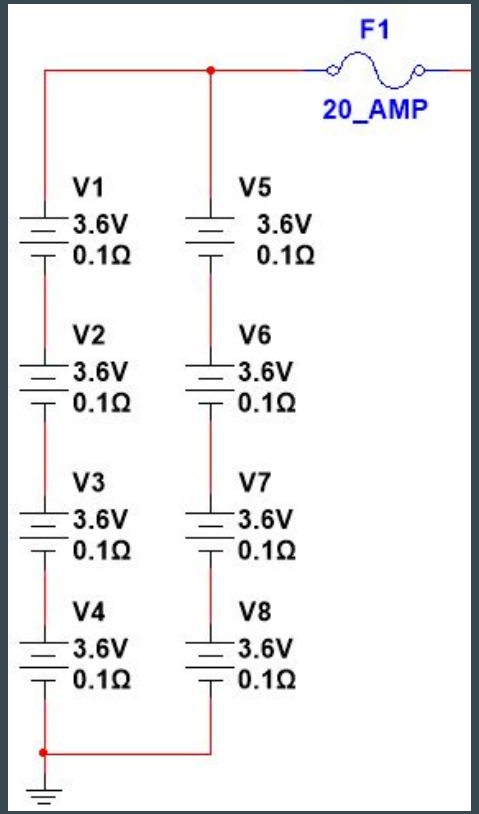
Weekly Updates - 3/5/19

Team P.V.I.R
Advisor: Lukas Graber
Team Members: Stephanie Chan, Elizabeth Fuller, Adrian Munoz
Nelson Raphael, and Lemek Robinson

20 Amp Fuse

- Circuit protection
- Comes with 2 blade fuses



WaterProofing Cable Solution

Various diameters in the package

All thread lengths are > 0.25” (thickness of the top plate of the robot)

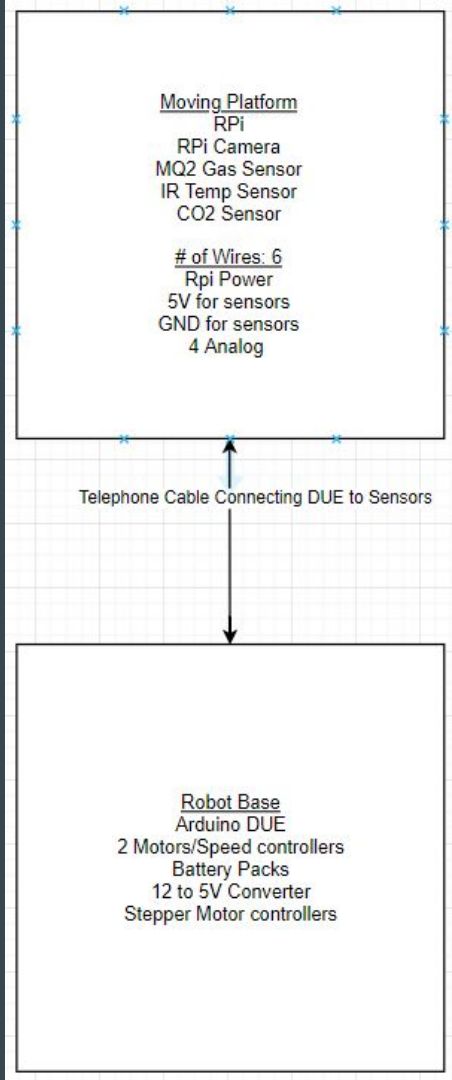
If the diameter of the cable doesn’t fit snug with the connector : use epoxy to seal cable in place

Connector will be aligned with center axis of the lazy susan

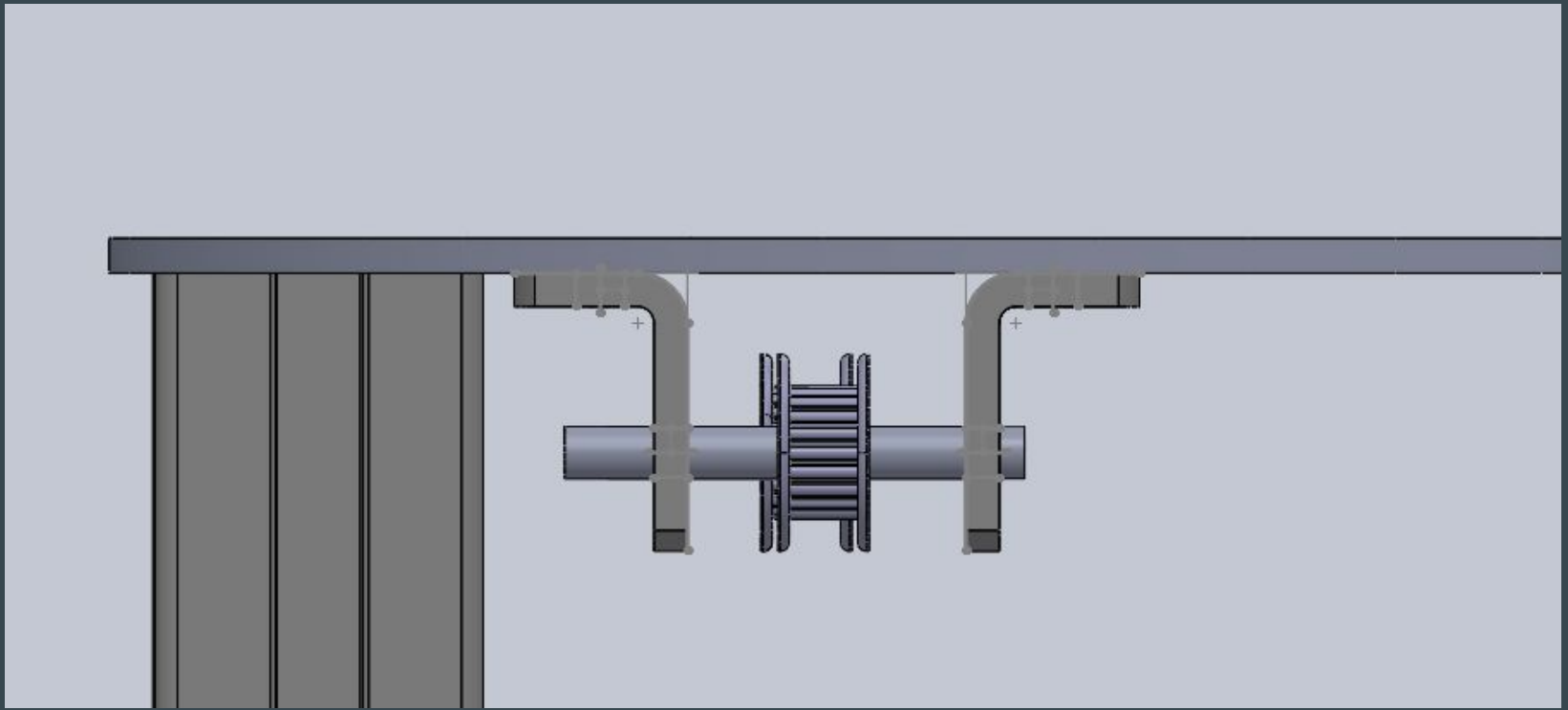
Connector for ethernet cable will be located at (??)

Cabling

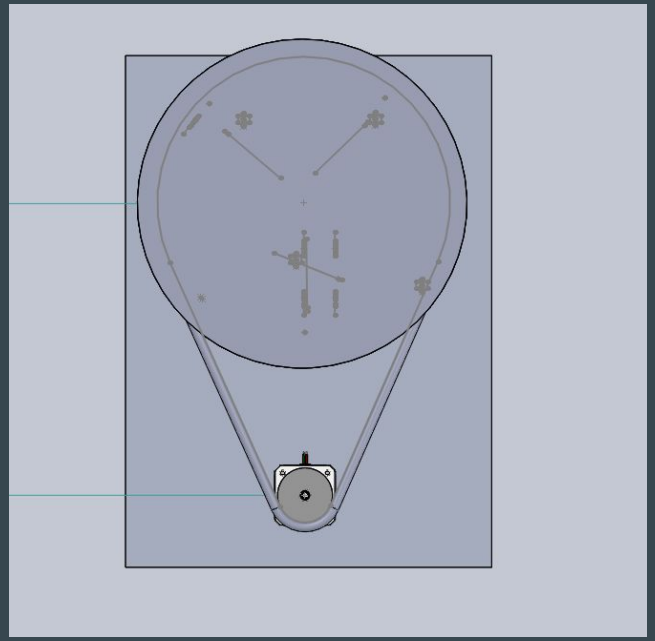
- Telephone cords have 4 wires inside
- Total of 8 wires to run from robot base to moving platform (only need 6 right now)
- Uncoiled is 11.5 feet, length of the coiled part is 16 inches
- Will be used to connect sensors that are on the moving platform to the microcontrollers inside the robot
- Can use regular wire to connect stepper motors

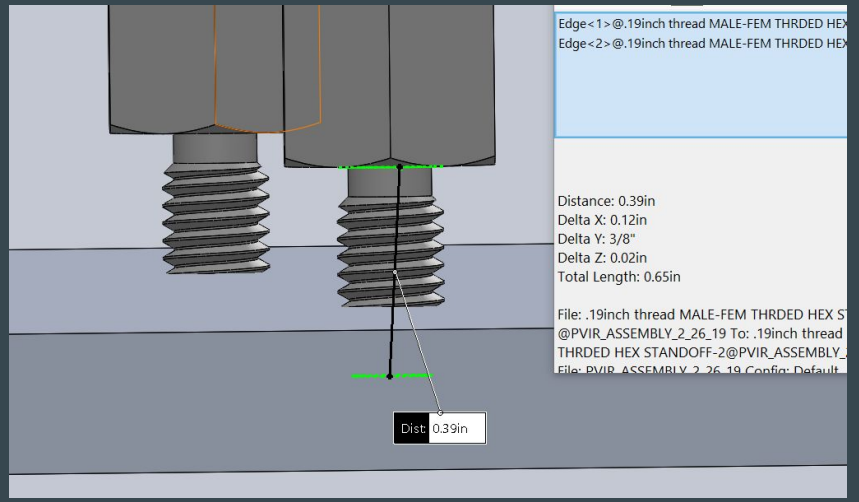


Mechanical Arm Design Updates



Mechanical Arm Design Updates cont’d





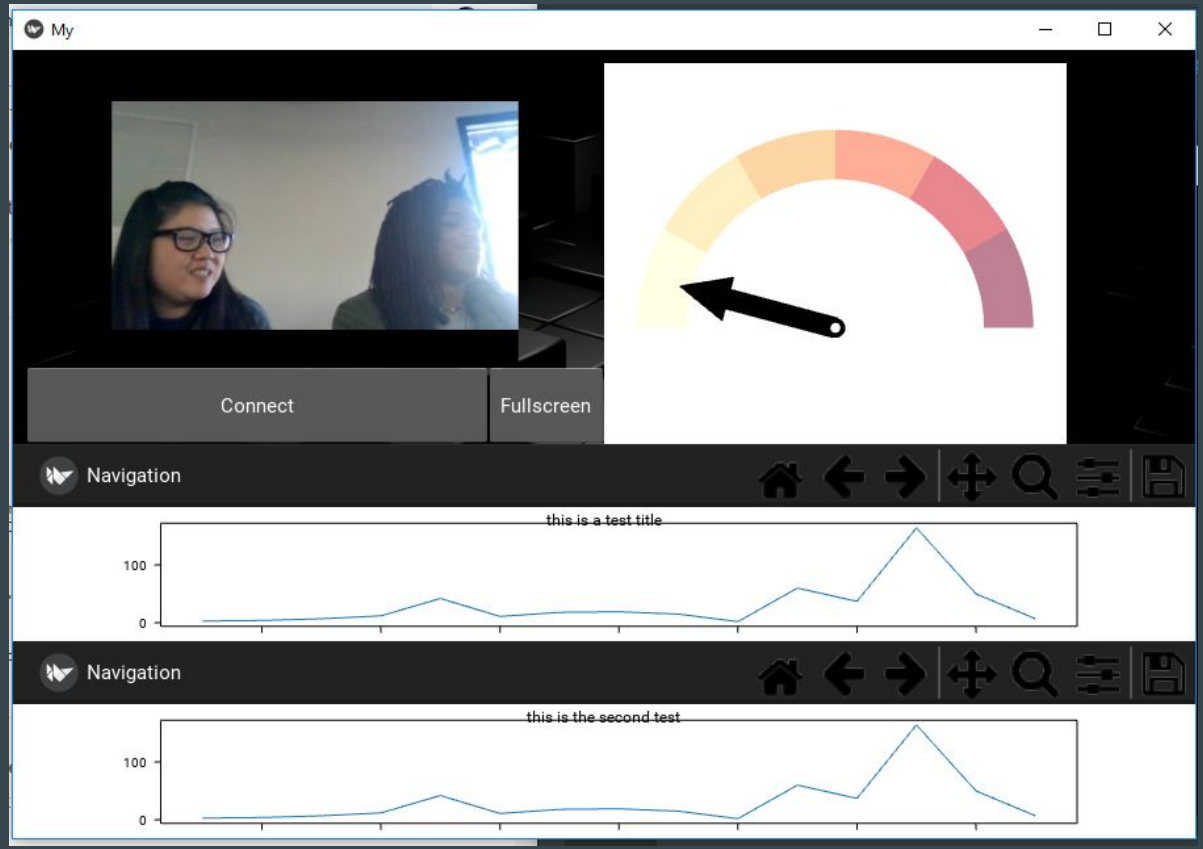
Mechanical Arm Parts Update

- O-ring to keep belt around lazy susan up
- Using the 2” x 2” L brackets to mount T-slots to the base and top plate
- 1” x .5” L brackets for mounting pulleys on top (require #8 screws)
- #10-32 (1-1/2") steel bolts and 1” steel hex standoffs

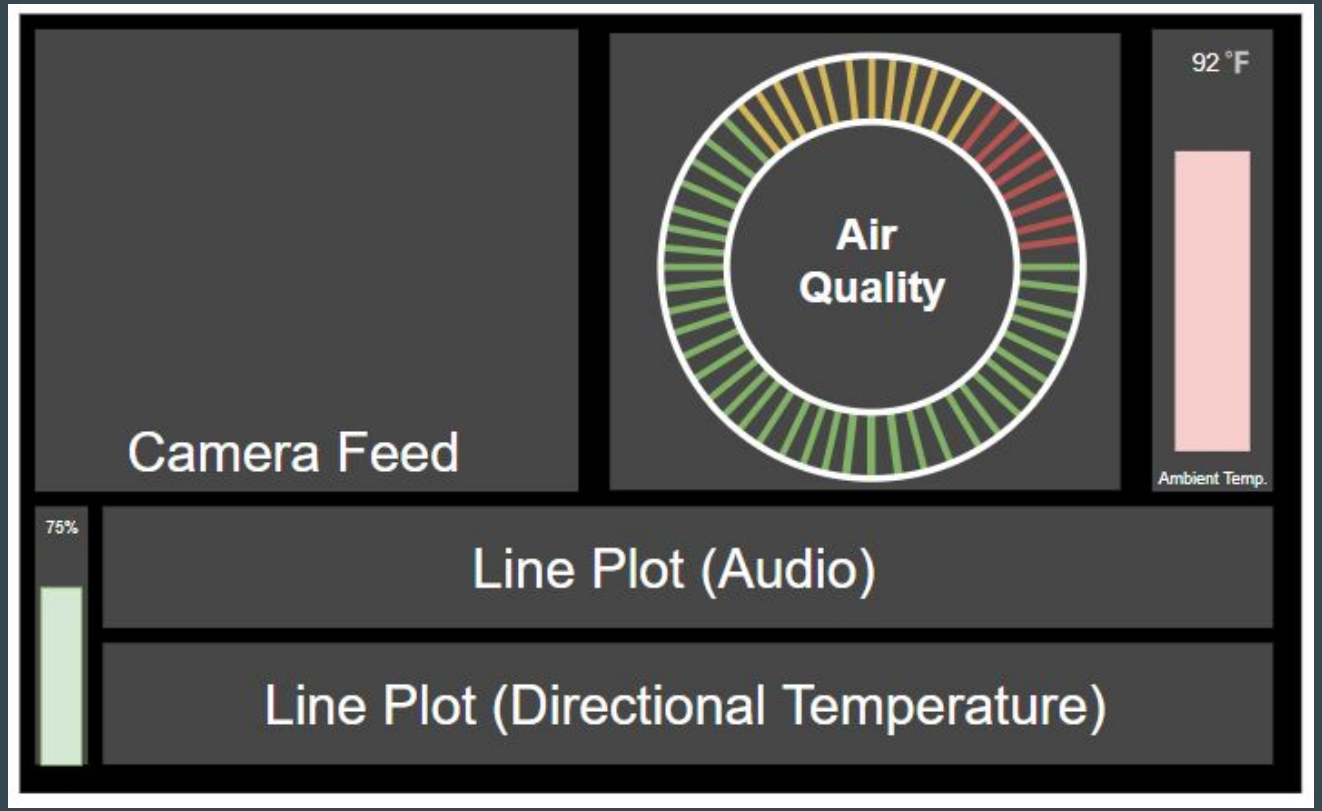
GUI Update

Working Aspects:

- Live Streaming
- Log-in window functions
  - Error messages
  - Allows Log-in
- Live Line Plot working
- Fullscreen camera
- Gauge Graphic



GUI design


Camera Feed
Air Quality
92 °F
Ambient Temp.
75%
Line Plot (Audio)
Line Plot (Directional Temperature)

MQTT Communication

- Tested serial communication between RPi and Arduino DUEDUE
  - (This was unsuccessful)
  - No feedback or output that demonstrated the information was received
- Tested OOP format for communication of GUI information
  - (This was successful)
  - Information was received promptly by Lemek’s computer

MQTT Communication

- Code cleanup
  - Consolidating all of the codes into respective classes
  - Running the single code with the main function
  - Cleaner execution
  - Easier to debug and change
- Simplifying the serial test
  - Making the output an LED response
  - Can only send serial through the same port used to program
  - Lack of terminal window

Order 1 Status

The following parts have been ordered:

- 2 Grove MQ2 Gas Sensor ($7.53)
- 2 Grove Infrared Temperature Sensor ($9.90)
- 1 30pcs Protoboard set ($10.85)
- 1 130pcs Jumper Wire Kit ($7.89)
- 1 3pcs Solderless Breadboard ($7.99)
- 1 Arduino DUE board ($37.40)
- 1 Waveshare RPi Camera F Module ($25.99)
- 1 Sandisk 32gb micro SD card ($8.90)
- **2 Parallax Carbon Monoxide Sensor ($5.99)**

Total of Parts that have come in: $133.88 (parts ordered from Amazon and Digikey)
Order Total: $145.86 (assuming first link was used for remaining items)

Order 2 Status

- 8 Samsung 30T 21700 Battery ($7.99)
- 2 EFAN 4 Channel Battery Charger ($9.97)
- 4 21700 Battery Tray ($5.25)
- 1 10ft Ethernet Cable ($5.99)
- 1 8” Aluminum Lazy Susan ($17.00)
- 1 USB Breakaway cable for Xbox 360 ($3.99)
- 1 6061 Aluminum plate 12” x 12” , ¼” thick ($47.11)
- 1 6061 Aluminum plate 12” x 24”, ⅛” thick ($43.12)

Order Total: $220.07

Order 3 Status

- 1 Test Pressure Gauge (2-½")($1.61)
- 1 General Purpose Pressure Gauge (2-½") ($3.59)
- 1 Liquid Filled Pressure Gauge (2-½") ($4.85)
- 1 Xbox 360 Controller, Wired USB controller ($16.99)
- 4 T-slot sliders ($5.50)
- 3 30mm x 30mm T-slotted profile 6ft ($19.23)
- Timing Belt Kit (Includes timing belt, pulleys, tension spring, clamp mount) ($12.99)
- 5 Zinc-plated steel corner bracket 2" x 2" ($0.92) (Note: Steinberg also ordered the item from the additional link which costs $9.99 for 16 L-brackets)
- 1 6061 Aluminum plate 12" x 12", ¼" thick ($43.12)

Order Total: $167.44 (Note: The additional $9.99 was NOT included in this calculation)

Budget Update

Order 1 Total: $145.86
Order 2 Total: $222.07
Order 3 Total: $167.44

Grand Total: $ $535.37 (assuming first link was used for remaining item)
Remaining Budget: -$35.37
(Again, note: additional $9.99 was not included in this calculation)

Items to be ordered

- 2 Nema Stepper Motors
- 1 ¼” diameter round belt
- 1 pulley for round belt
- 1 6061 Aluminum Sheet 1/8" Thick, 12" x 12"
- 4 Zinc-Plated Steel Corner Bracket, 5/8" x 1" x 1/2"
- 1 Foamular board (For testing environment) 4’ x 8’
- Waterproof DC/DC 12V Step Down to 5V 3A 15W Voltage Buck Converter
- 18-8 Stainless Steel Pan Head Phillips Screw 1 pack 100 screws
- Zinc-Galvanized Low-Carbon Steel Rod
- AutoEC 20A Inline ATC ATO Waterproof Fuse Holder (1 Set)
- GiBot Cable Glands - 25 Pack Plastic Waterproof 3.5-13mm Cable Glands Joints Wire Protectors
- Telephone Cord, Phone Cord, handset Cord, Black, 2 Pack
- 304 Stainless Steel Screw and Nut 515pcs, M3 M4 M5 Metric Socket Head Bolt and Nut
- Male-Female Threaded Hex Standoff
- 10-32 x 1-1/2" Hex Head Cap Screw Bolts, External Hex Drive, Stainless Steel 18-8, Full Thread, Bright Finish, Flat Point

Total: $204.22

Items to be Discussed

- Task Status: Arm CAD design, Sensor Package Schematic, Control System Design
- Action Items for the week

Design Notebook Information

ECE4012 Tentative Deliverables

Assignment	Student Deliverables Due Dates
.	
Confirm Project Groups Identify Your Group Leader & Web Master	ASAP
Proposal & Presentation Planning: Meet with & Review Advisor Feedback	Week 1
Progress Report Emails	Initially ASAP then Weekly before Wednesday beginning Week 2
.	
Oral Proposal Presentation	Before the end of Week 2
Submit any Revised Proposal	Before the end of Week 2
Project Summary: Revised to Advisor	Before the end of Week 2
.	
Start Purchasing & Building...	After Advisor approves Proposal documents
.	
Initial Web Site Posting including ECE4011 TRPs, Written Proposal, Proposal Presentation, Project Summary, ...	One week after notification from lecture instructor of web ... availability
.	
Design Notebooks	Before March 15 Friday
.	
Spring Break	March 18-22
.	
Design Notebooks	Before April 25 Thursday
.	
Final Presentation	As specified by Advisor, often at Expo
Capstone Design Expo	Probably April 23 Tuesday ~4-8pm
Final Project Demonstration	Before May 2 Thursday, see your Advisor for details
Final Project Report: doc pdf	Before May 2 Thursday, on your web site
Final Project Summary	Before May 2 Thursday, on your web site
Completed Web Site	Before May 2 Thursday
.	
Teamwork & Professionalism	Always

Design Notebooks

ECE4012 Design Notebook Grading

There are two Design Notebook submissions for grading this semester.

Details for submitting online will be provided shortly prior to the assignment due dates..

Design Notebook discussion

Project Notebook Grading Rubric

Points		
3		Each page is numbered, dated and signed
1		The notebook does not have removable pages
1		All blank pages/areas are marked Intentionally Left Blank
4		Your name, projects name, contact info, and team members contact info are recorded on the cover or inside of the cover
1		All Notebook entries are in chronological order
1	11	All notebook entries are in ink, i.e., no pencil entries allowed
3		Record team meetings dates, those present, and meeting highlights
2		Detailed meeting notes (if project has software component this includes documenting coding progress and source code locations)
1		Document information resources accessed (websites, books, scientific papers, professors, industry professionals, etc...)
3		Record design ideas in the form of block diagrams, sketches, etc.
3	12	Documentation of Engineering Results and Data (test plans, raw data, analysis and discussion of results)
2		Generate to-do items and place a box in the left hand margin ahead of listed item
3		Include check boxes for your and your team's and list individual responsibilities and deadlines
1		Check off to-do items when they are completed and write in completion date
1	7	To-do items should run chronologically through the notebook as your design work progresses
3	3	Professionalism (general organization, neatness, professional language)
33		Total