Weekly Updates - 2/12/19

Team P.V.I.R
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Mechanical Arm Parts Order

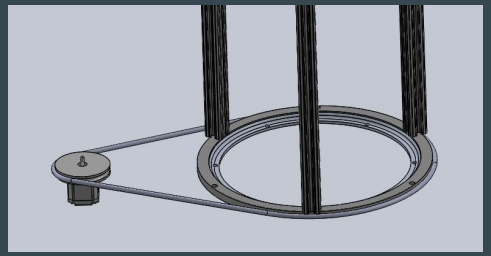
• Lubricated Turntable Round, 1000 lbs. Capacity, Galvanized Steel		1	$19.95
• T-Slotted Framing Single Rail, Silver, 1" High x 1" Wide, Hollow		3	$17.68
• Pulley	Pulley for 1/4" Diameter Round Belt, 3" OD	1	$13.12
• Round Belt	Round Belt 1/4" Diameter	1	$14.75
• Al Sheet	6061 Aluminum Sheet 0.063" Thick, 12" x 24"	1	$25.23

Running Total= $126.09

Mechanical Arm Update

- There are currently 3D design iterations in progress for the arm
- Iteration 1 shows the 3D rotational movement with using a ¼“ round belt and a pulley system.
- Iteration 2 shows the 3D rotational movement with a spoke design approach

Iteration 1



Iteration 2

Ordered Parts - Updates

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)
Grand Total: $145.86

Order 2

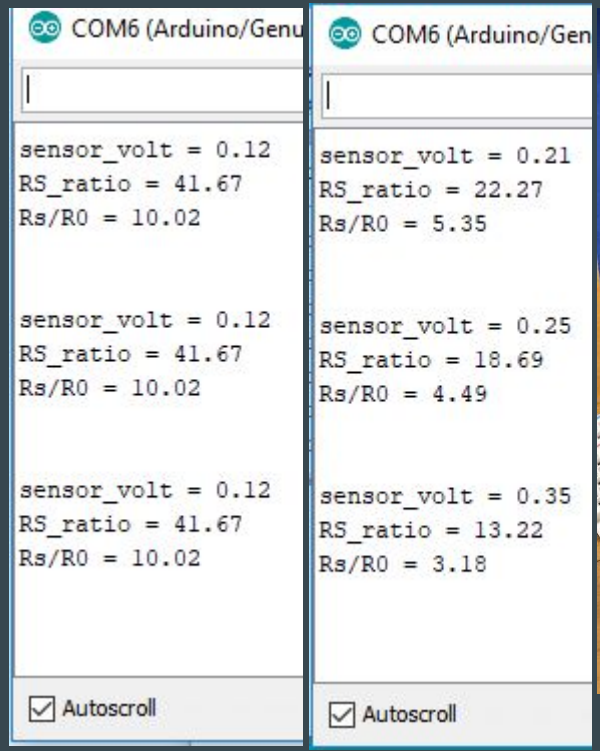
- 8 Samsung 30T 21700 Battery ($6.99)
- 1 EFAN 6 Channel Battery Charger ($29.97)
- 4 21700 Battery Tray ($5.25)
- 1 10ft Ethernet Cable ($2.58)

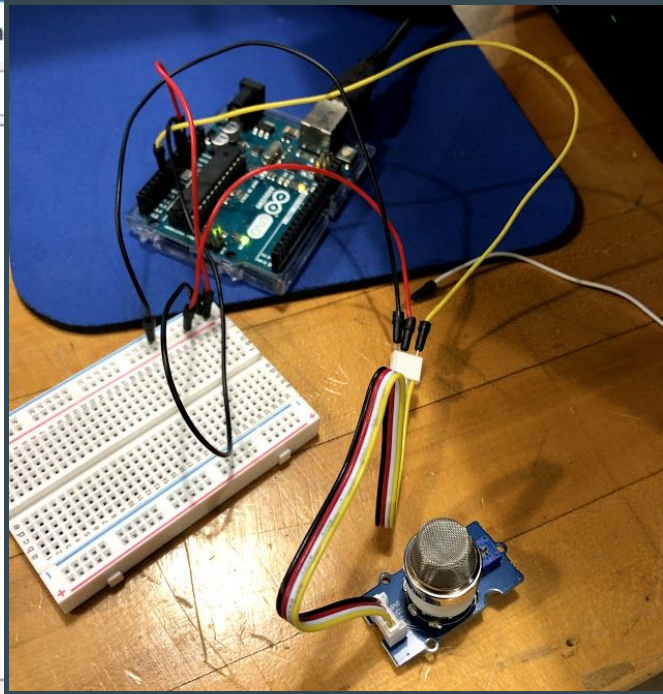
Total: $109.47

Grand Total Spent: 369.44

Parts Testing

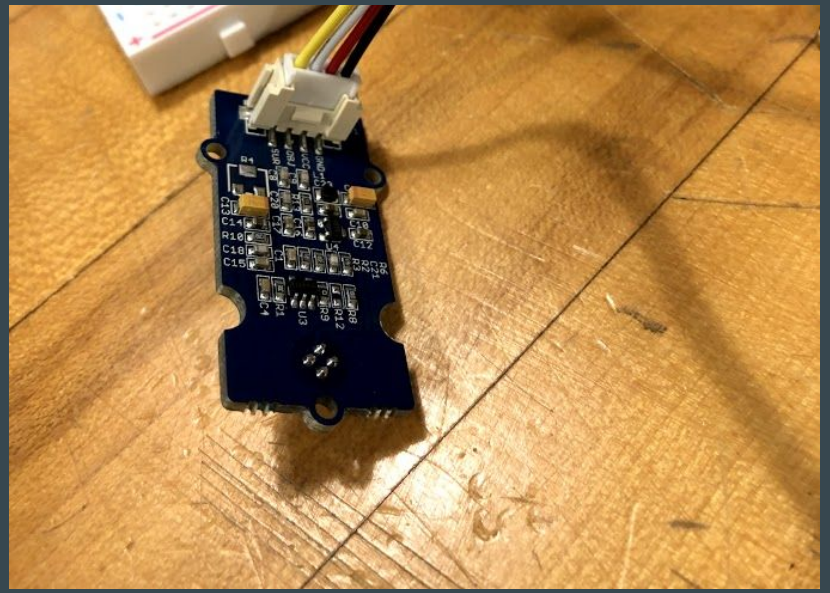
- Grove Gas Sensor MQ2
- 5V/Analog Signal
- Need to test in presence of alcohol

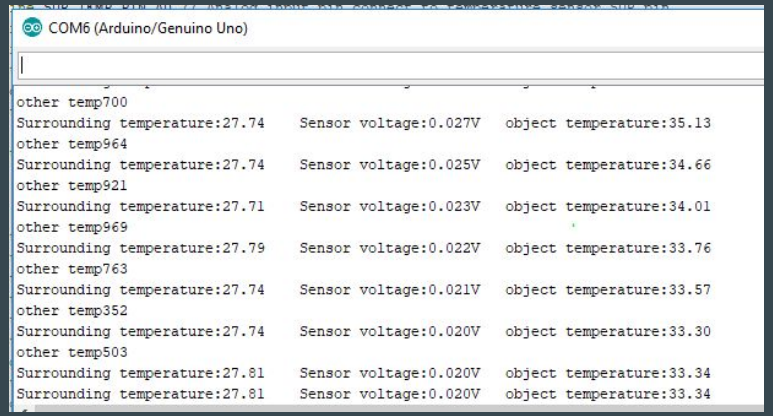




IR Temp Sensor

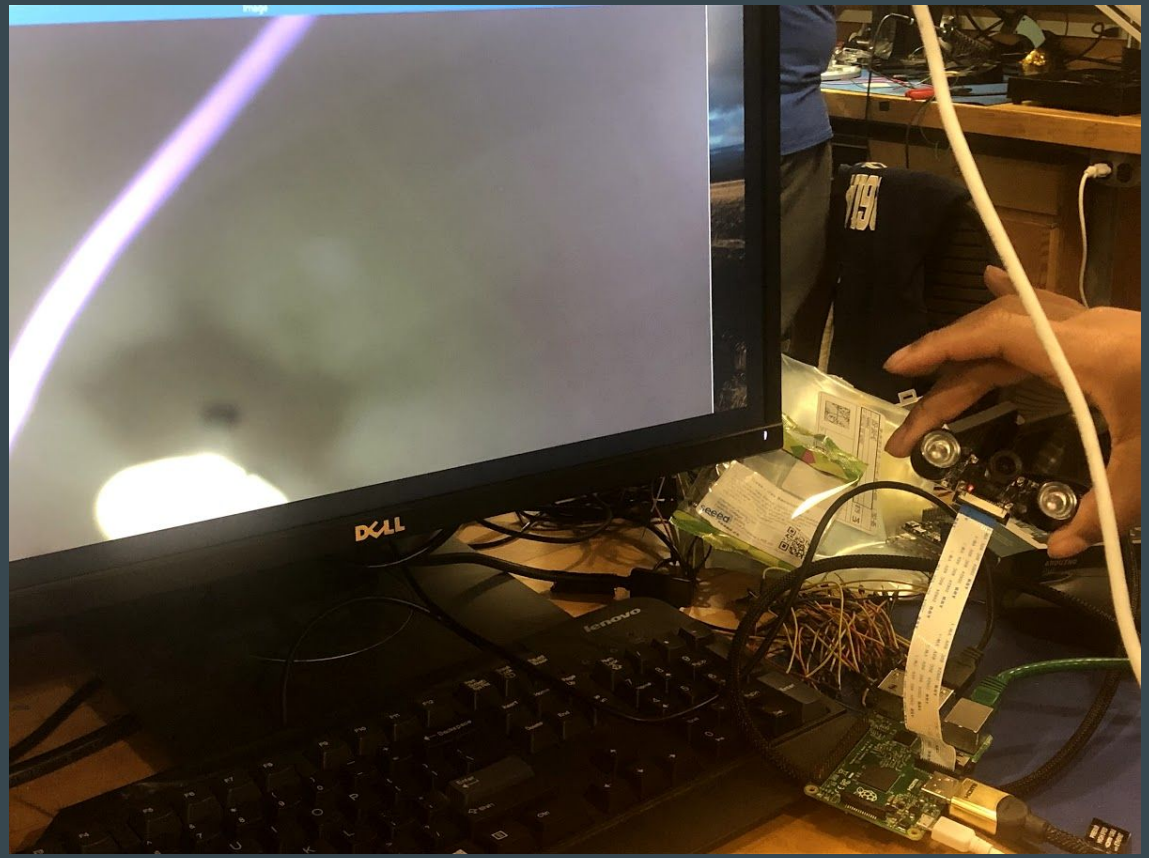
- 5V/ 2 Analog Inputs
- Surrounding Temp: Yellow Analog In
  - NEEDED
- Object Temp: White Analog In
  - NOT NEEDED
- Temp displayed in C
  - Convert to F
- Having issues displaying correct temp but “relatively” works- needs calibration





RPi Camera

- In process of 3D printing mount
- IR lights work - only turn on in the dark
- Capable of taking images and video
- Variable resolution



RPi MQTT Communication

Setup the communication scripts between the linux computer and the raspberry Pi

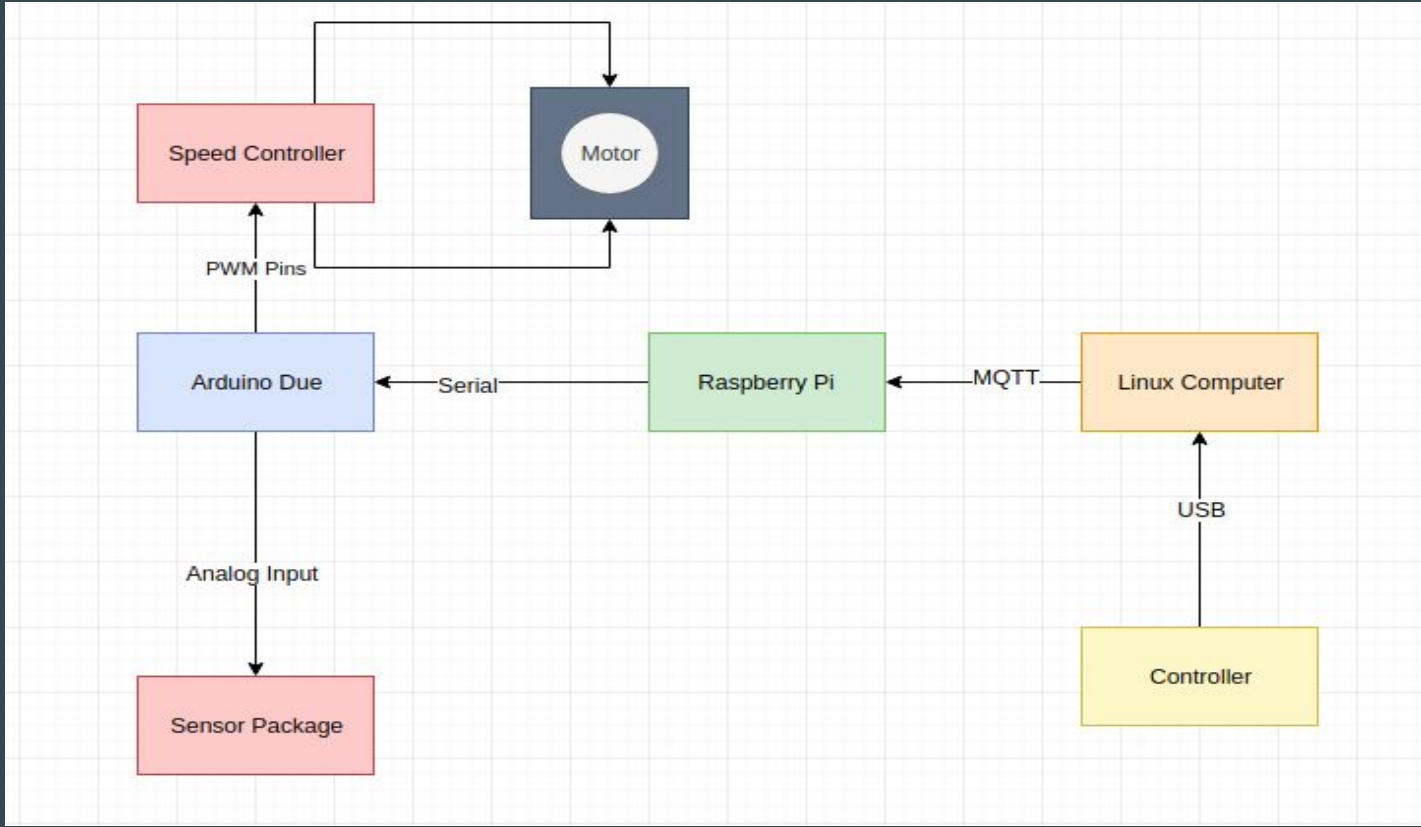
PC acts as the broker

- Manages the subscribers
- Publishes the messages

Next step get the serial connection between the Arduino DUE and RPi to work

- Make sure it can receive input from the computer all the way to the Arduino
- Purchase a usb converter cable for the Xbox 360 controller

Communication Scheme

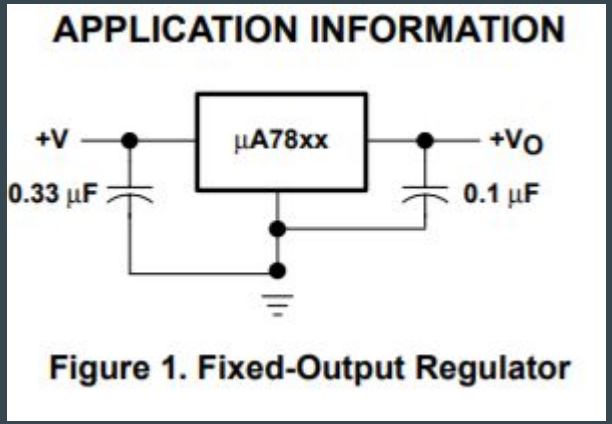


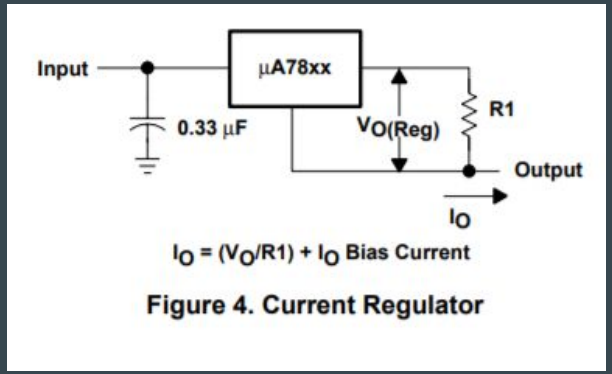
Power Supply Solution

- Samsung INR 21700 batteries
- 20A 2500mAh Rechargeable Flat Top 3.7V Battery
- 4 in series in parallel with another series of 4
- Battery Holder
  - Thicker wire to handle higher current
  - Solder holders together
- Charger

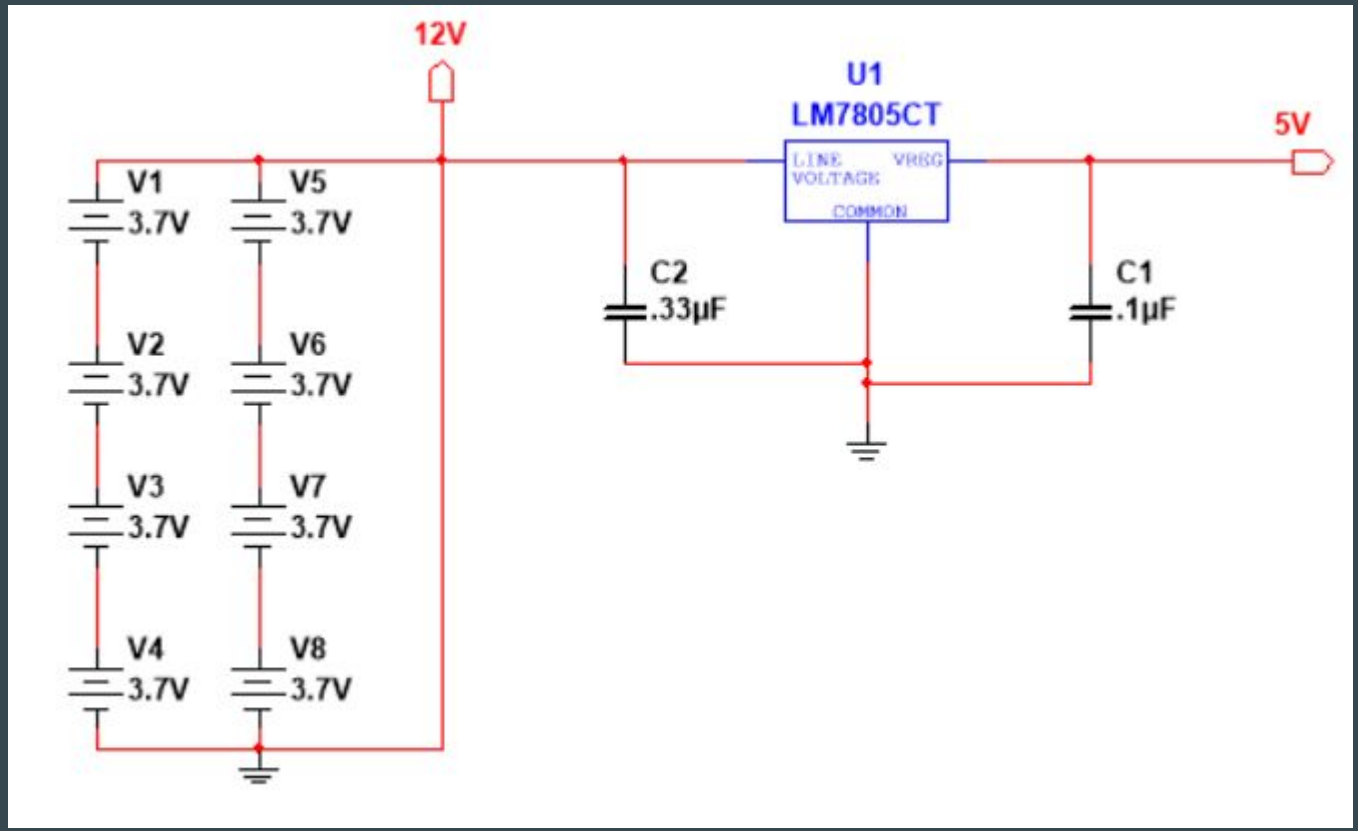
Voltage Regulator

- LM 7805
- Input Voltage 7-35V
- Output 5V
- Need to regulate the Output current
- Heat Sink required
  - Heat Generated = (InputV- 5V) * Output Current
  - P = (12V-5V) * I
  - Need help determining which heat sink to use





Power Schematic - Voltage Regulator



GUI

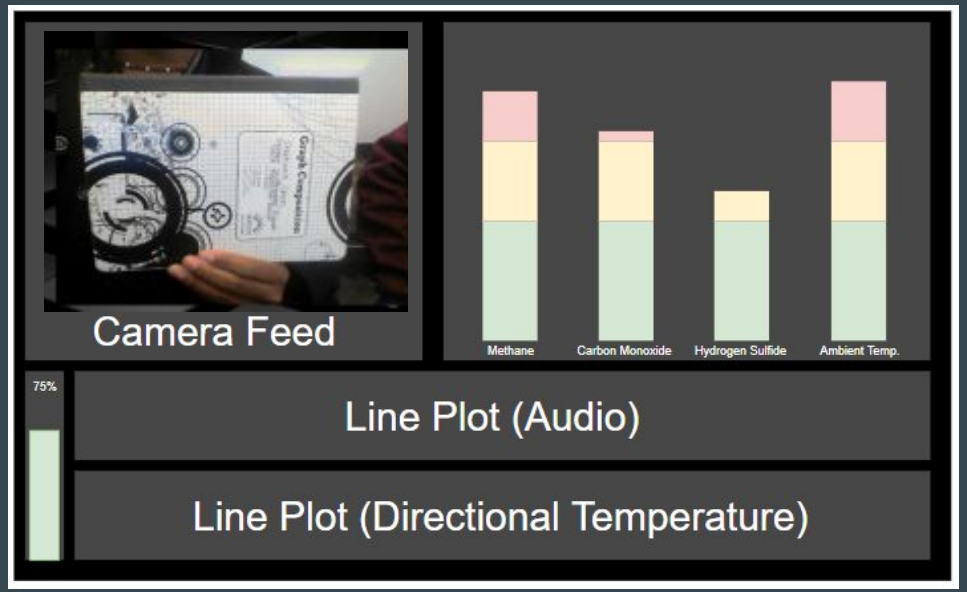
Working Aspects:

- Live Streaming
- Log-in window functions
  - Error messages
  - Allows Log-in
- Data Logging
- Error Catching, Formatting, Clean up
- Page Navigation (in progress)
- Live Line Plot working

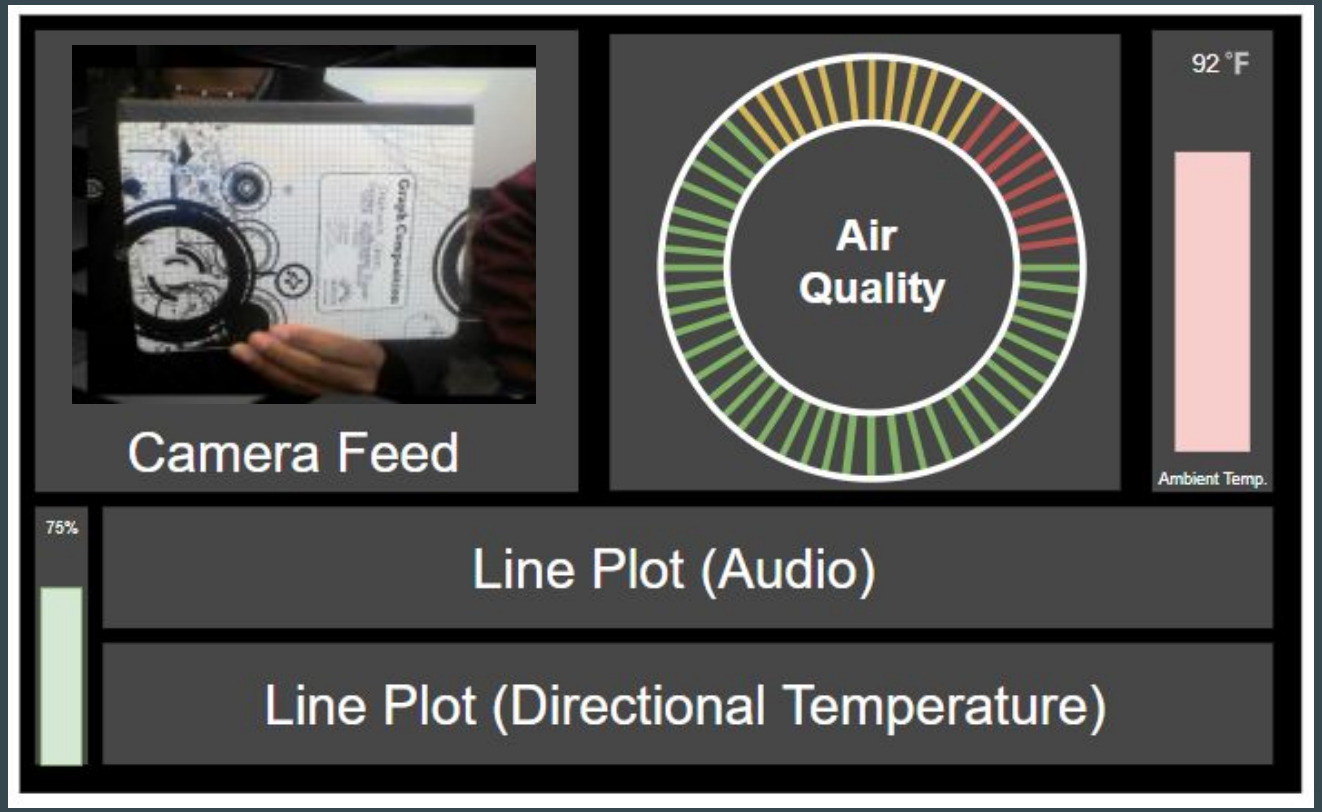
GUI Design Update

Data we want to display:

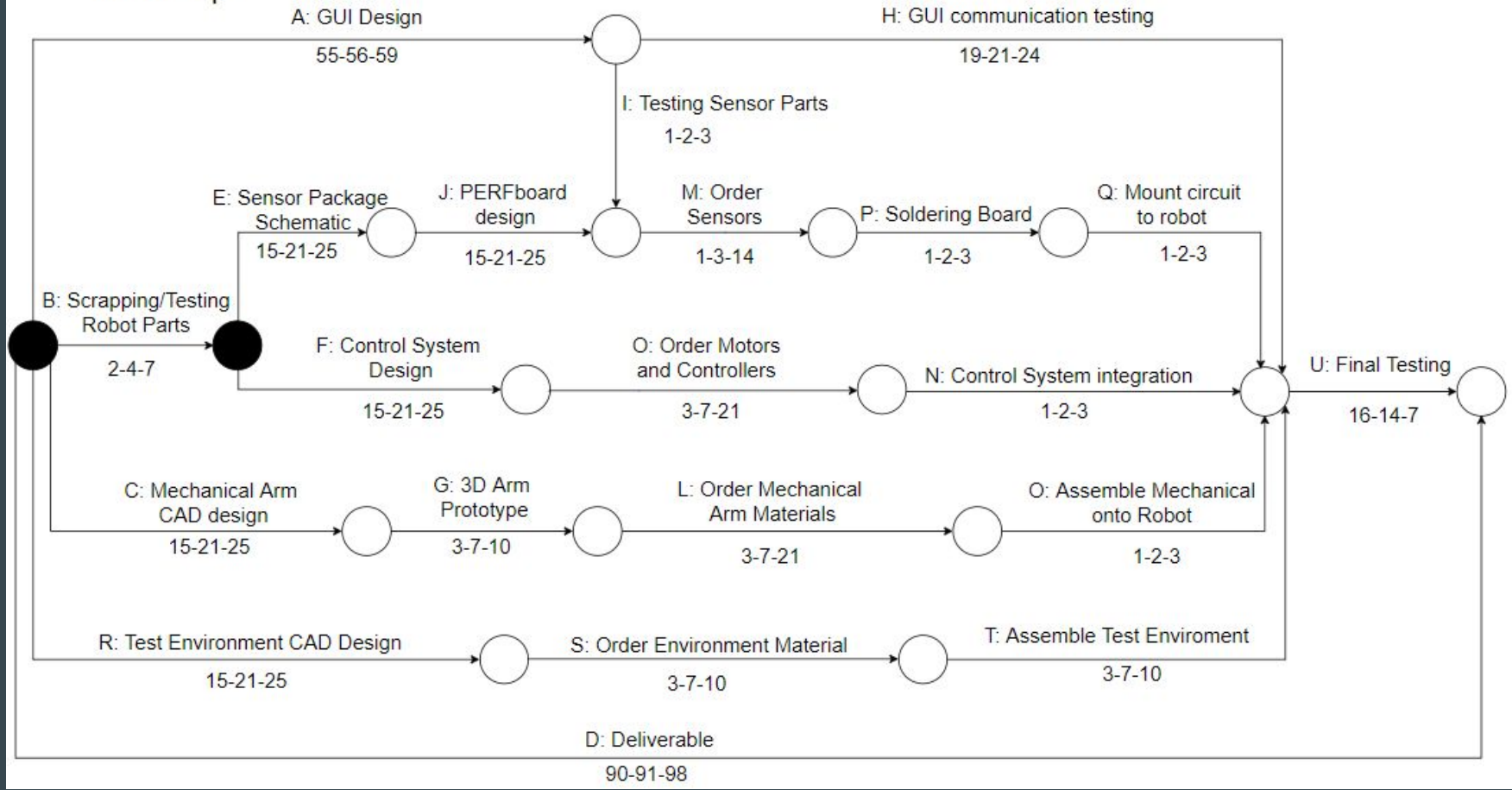
- Dangerous Gases:
  - Methane - Bar Gauge
  - Carbon Monoxide - Bar Gauge
  - Hydrogen Sulfide - Bar Gauge
- Temperature
  - Ambient - Bar Gauge
  - Directional - Time Plot
- Audio (Corona leakage) - Time Plot
- Live Camera Feed - Picture
- Battery Status



GUI


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

PERT CHART
To-Tm-Tp



Items to be Discussed

- Discuss, vote and decide which **Mechanical Arm** design we are going to pursue: Lead screw, scissor lift, or bike chain
- Discuss and decide on which **Power Supply** we should use
- Scheduling: Looking at the gantt chart we are **behind on schedule** with Sensor package schematic, Control System Design, and GUI Design
- Action Items for the week