



*Dwight Look College of*

**ENGINEERING**  
TEXAS A&M UNIVERSITY

# **Team 29: Automated Greenhouse Bi-Weekly Update 1**

**Chandler Kramer, Samuel Erickson, Mengtian Ke**

**Sponsor: Kevin Nowka**

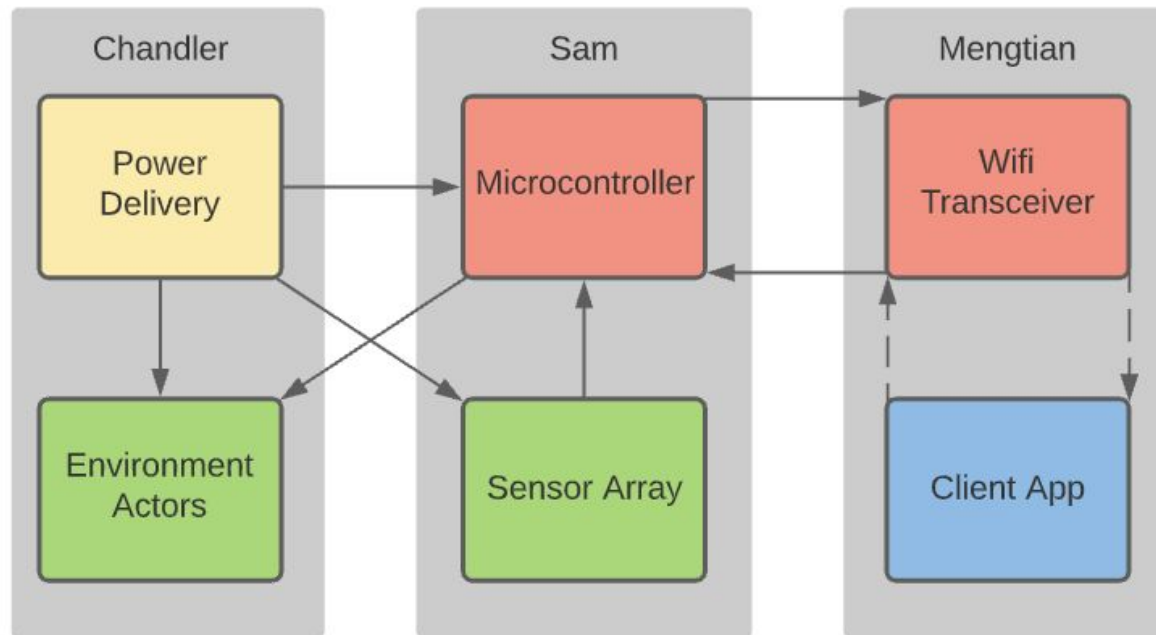
**TA: Skyelar Head**

# Project Summary

- Traditional gardening, even with a greenhouse, is a very manual process that can be very time consuming and plants are still vulnerable to the elements.
- The automatic greenhouse attempts to alleviate this problem by automating water delivery, temperature regulation, and airflow according to remotely set values by the user.



# Subsystem Overview



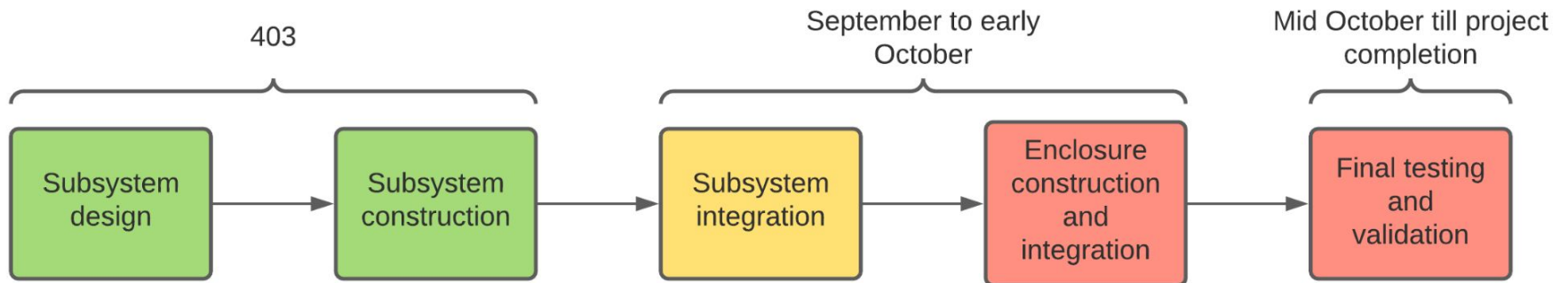


# Project Changes for 404

- Major change in scale:
  - Enclosure increasing in size from 3x3x3ft to 4x4x6ft
  - Fan size increase from 140mm to 12in.
  - Testing location TBD (campus or Prof. Nowka's backyard)
- Major change in water supply:
  - Moving from reservoir and pump to water spigot
  - Water flow will be controlled solely by solenoid valves



# Project Timeline





# Power Subsystem

Owner: Chandler Kramer

Accomplishments since 403 8 hrs of effort	Ongoing progress/problems and plans until the next presentation
<ul style="list-style-type: none"><li>- Tested components to ensure functionality</li><li>- Soldered drives and breakout adapter</li></ul>	<ul style="list-style-type: none"><li>- Evaluating and ordering buck converters for Solenoids and MCU</li><li>- Ordering fans for the updated enclosure</li></ul>



# MCU and Sensor Subsystem

## Owner

Accomplishments since 403 8 hrs of effort	Ongoing progress/problems and plans until the next presentation
<ul style="list-style-type: none"><li>- Verified mcu and sensor functionality.</li></ul>	<ul style="list-style-type: none"><li>- Establish communication with wifi subsystem (I<sup>2</sup>C)</li><li>- Drive relay board</li></ul>



# Client Interface Subsystem

Mengtian Ke

Accomplishments since 403 10 hrs of effort	Ongoing progress/problems and plans until the next presentation
<ul style="list-style-type: none"><li>- Photon receives data from the web app</li></ul>	<ul style="list-style-type: none"><li>- Establish connection with the MCU</li><li>- Display data to users</li></ul>



# Power Subsystem

Owner: Chandler Kramer

Changes:

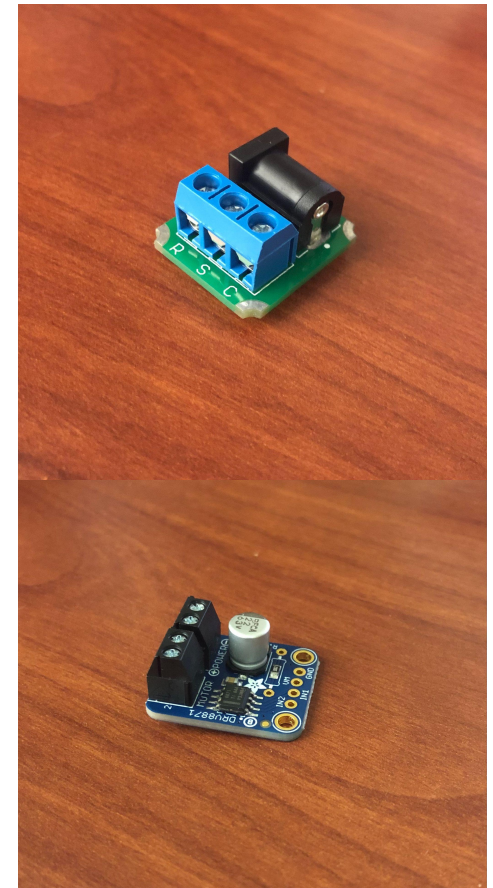
- Irrigation
- Solenoids
- Fans

What needs work:

- Connecting components to MCU
- Permanent configurations

What does work:

- AC power adapter
- Motor Drive



# MCU & Sensor Subsystem

Owner: Samuel Erickson

Changes:

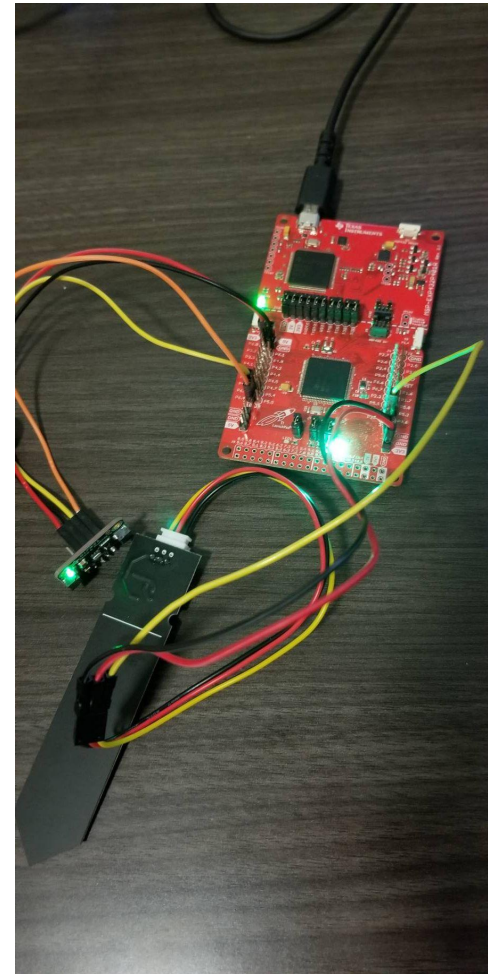
- Will power wifi board instead of discrete power source

What needs work:

- Connecting relay board to MCU
- Establishing communication between MCU and wifi board
- Permanent wiring
- Control algorithm

What does work:

- Sensors



# Client Interface Subsystem

Owner: Mengtian Ke

Changes:

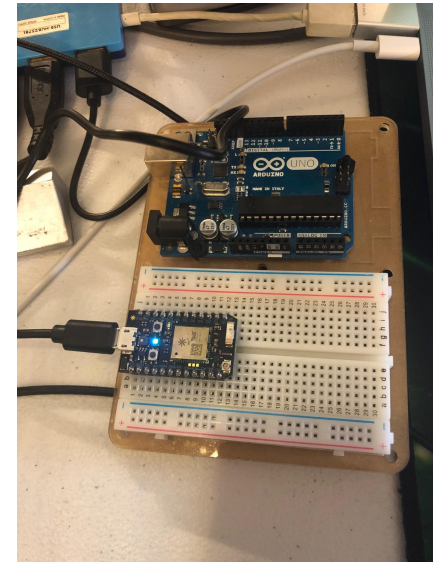
- Photon will get power from MCU to transceiver data

What needs work:

- Photon transceiver data to the MCU
- Web app displays a live graph

What does work:

- Photon receives data from web app





# Parts Ordering Status

- Ordered parts
  - 2 solenoid valves
  - 1 relay board
  - 2 12 inch 1800CFM fans
- Still needs to be ordered
  - Premade enclosure
  - Buck converters



# Execution & Plan

	8-Sep	15-Sep	22-Sep	29-Sep	6-Oct	13-Oct	20-Oct	27-Oct	3-Nov	10-Nov	17-Nov	24-Nov	1-Dec
Interface Subsystem:													
Checked subsystem from 403 to verify functionality													
Connect with the MCU and transfer data													
Design a report page to present data													
Design a live graph to show data visually													
Report page prints out the value from each sensor and illustrates a live graph													
Final assembly and testing													



## Execution & Plan cont.

	8-Sep	15-Sep	22-Sep	29-Sep	6-Oct	13-Oct	20-Oct	27-Oct	3-Nov	10-Nov	17-Nov	24-Nov	1-Dec
Microcontroller Subsystem:													
Make sure subsystem works from 403	Green												
Establish connection with wifi board		Yellow											
Order solenoids and relay board		Green											
Connect solenoids and fans to relay board and drive through MCU			Yellow	Yellow	Yellow								
Establish permanent wired connections between components				Yellow	Yellow	Yellow							
Create automatic control algorithm						Yellow	Yellow	Yellow					
Final assembly and testing									Yellow	Yellow	Yellow	Yellow	Yellow

## Execution & Plan cont.

	8-Sep	15-Sep	22-Sep	29-Sep	6-Oct	13-Oct	20-Oct	27-Oct	3-Nov	10-Nov	17-Nov	24-Nov	1-Dec
Power Subsystem													
Checked subsystem from 403 to verify functionality of components													
Compare and purchase upgraded fans for new design													
Order buck converters for MCU and Solenoids													
Receive buck converters for MCU and Solenoids													
Connect power subsystem with MCU subsystem and relay board													
Establish permanent wired connections between components													
Final assembly and testing													



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**Thank you!**  
**Any Questions?**