

# **Team 17: IoT Based Pet Tracker Bi-Weekly Update 5**

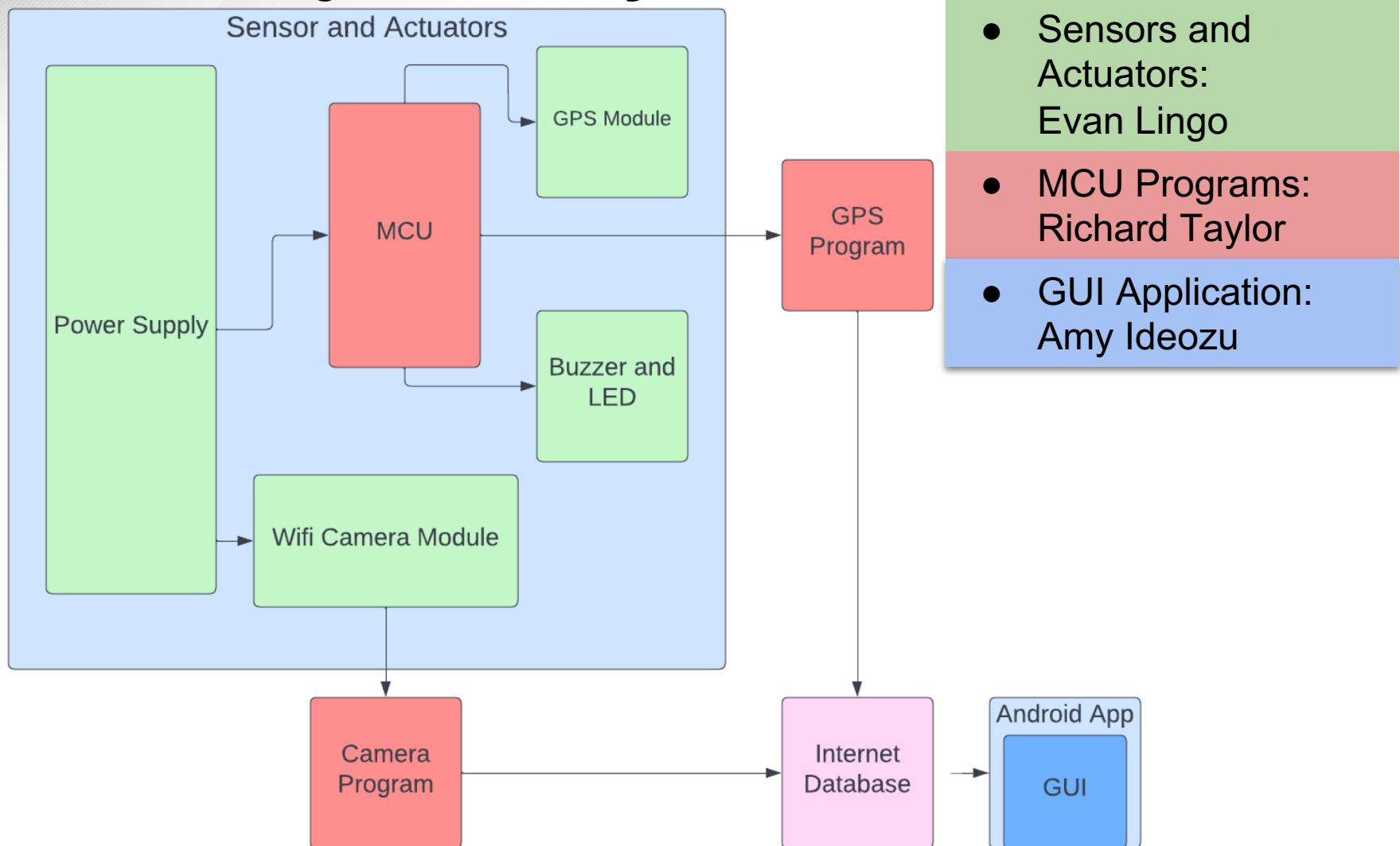
**Amy Ideozu, Evan Lingo, Richard Taylor  
Sponsor: Souryendu Das  
TA: Eric Lloyd Robles**

# Project Summary

- At times it can be difficult to keep track of your pet
- $\frac{1}{3}$  of pets in the United States are reported missing in their lifetime, with more than 80% never being found
- Develop an IoT Based Pet Tracker to keep knowledge of your pets location via GPS and video feed through the use of an android app



# Project/Subsystem Overview



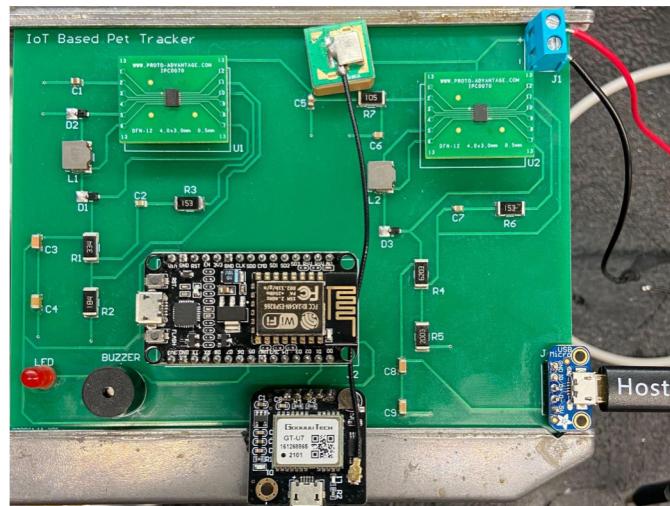
# Project Timeline

Subsystem Designs and Testing (completed 9/08)	Integration of S&A and MCU subsystem (completed 9/22)	Integration of MCU and GUI subsystem (to complete by 10/06)	Final Integration (to complete by 10/20)	System Test (to complete by 11/03)	Validation (to complete by 11/10)	Demo and Report (to complete by 12/01)
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# Sensors and Actuators / MCU Integration

Evan Lingo

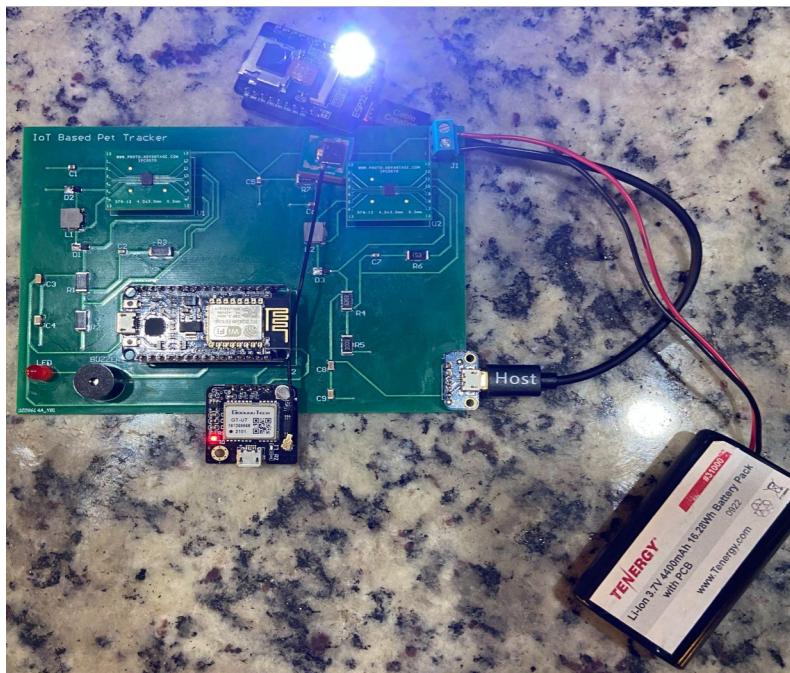
Accomplishments since last update <b>14 hrs of effort</b>	Ongoing progress/problems and plans until the next presentation
<ul style="list-style-type: none"> <li>- PCB assembled and tested</li> <li>- Integration testing with MCU and camera</li> </ul>	<ul style="list-style-type: none"> <li>- Order PCB version 2</li> <li>- Design housing unit</li> <li>- Validation testing</li> </ul>



# Sensors and Actuators / MCU Integration

Evan Lingo

- PCB testing
  - Buck/Boost 3.7V->3.3V: 3.478V
  - Buck/Boost 3.7V->5V: 5.01V
- Tested with both MCU and camera with 3.7V Li-Ion battery



# MCU / GUI / S&A Integration

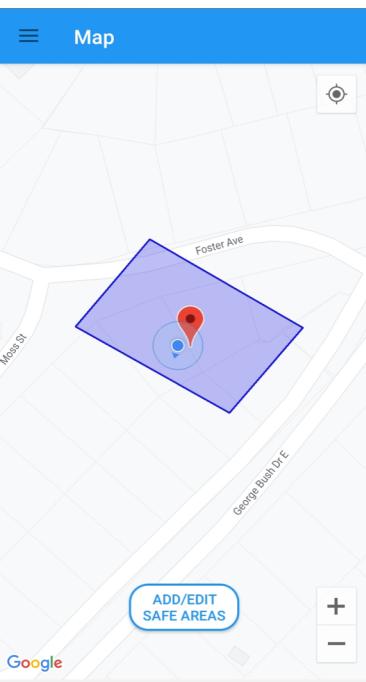
Richard Taylor

Accomplishments since last update <b>14 hrs of effort</b>	Ongoing progress/problems and plans until the next presentation
<ul style="list-style-type: none"><li>- PCB has arrived</li><li>- ESP8266 being used for final integration</li><li>- Full integration completed</li><li>- Some validation testing for GPS and camera completed</li></ul>	<ul style="list-style-type: none"><li>- More validation testing</li></ul>

# MCU / S&A Integration

Richard Taylor

- MCU integrated with both other subsystems
- MCU code provides GPS coordinates to database
  - Takes approximately 50.7 seconds from startup to first GPS reading
- Camera provides streaming to app via generated ip address
  - Takes approximately 10 seconds to launch



Realtime Database

Data Rules Backups Usage

Protect your Realtime Database resources from abuse, such as billing fraud or phishing

Configure App Check

https://geofencingtest-342422-default

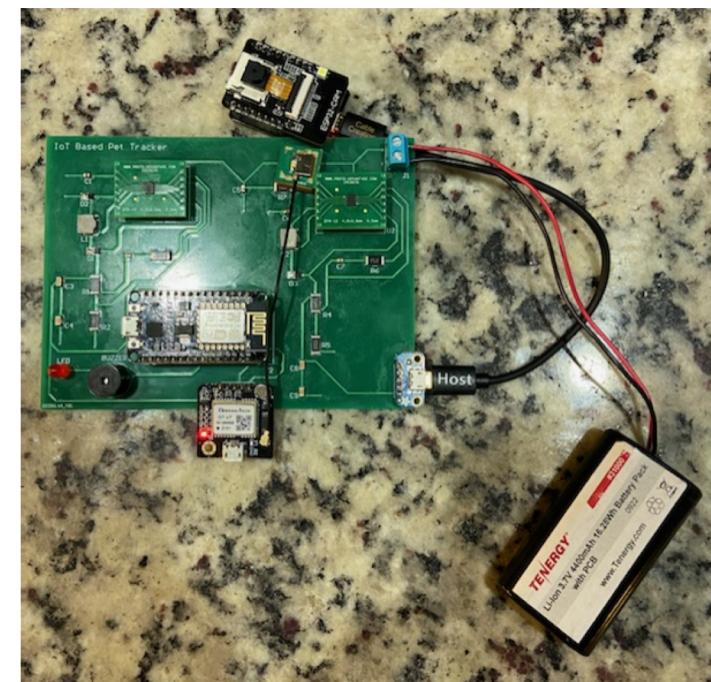
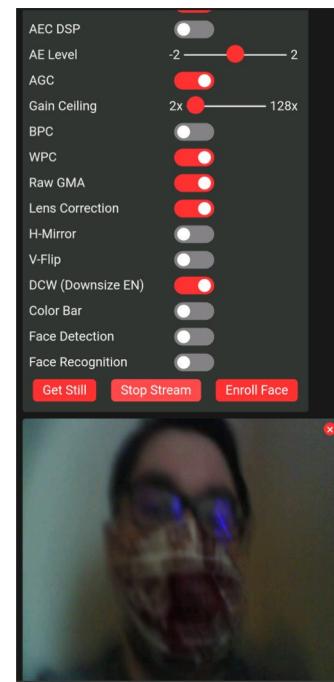
Your security rules are defined as public, so anyone can steal, modify, or delete data in your database

Learn more Dismiss

https://geofencingtest-342422-default-rtdb.firebaseio.com

Trackers

- 111
  - isActive: true
  - isInGeofence: 1
  - latitude: 30.61999
  - longitude: -96.32264
- 123
  - isActive: true



# GUI / MCU Integration

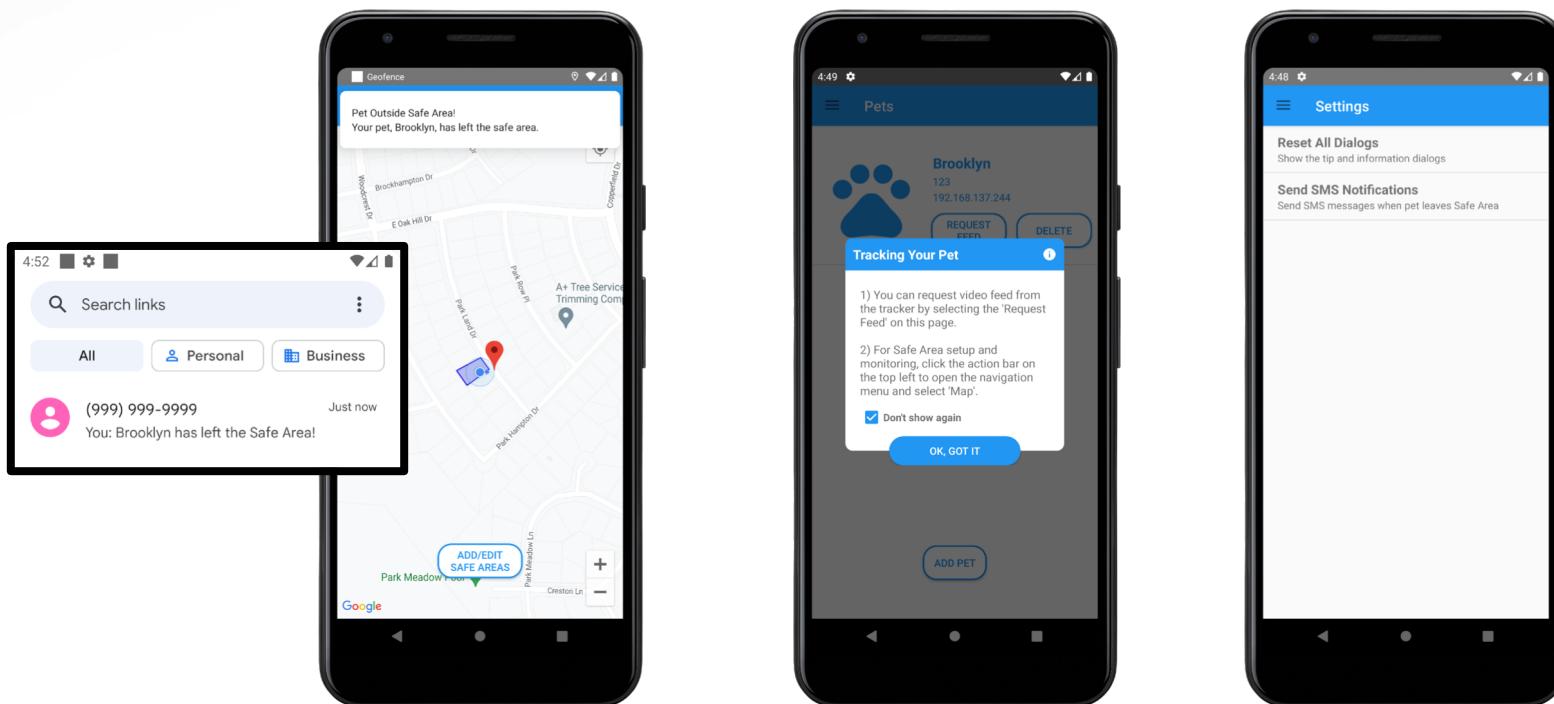
Amy Ideozu

Accomplishments since last update <b>14 hrs of effort</b>	Ongoing progress/problems and plans until the next presentation
<ul style="list-style-type: none"><li>- Validation tests done between database, camera response</li><li>- SMS alert added</li><li>- Additional settings added</li></ul>	<ul style="list-style-type: none"><li>- Continue validation tests<ul style="list-style-type: none"><li>- New scenarios, etc.</li></ul></li><li>- Bug fixes</li></ul>

# GUI / MCU Integration

Amy Ideozu

- Database, camera response tests complete
- Response between database and notification: Instantaneous - 3 seconds
- Additional validation tests in progress



# Parts Ordering Status

Part Description	Status (order approved/order placed/part received)
PCB 1st Edition	Part Received
Microcontroller - ESP8266	Part Received
10uF Capacitor	Part Received
22uF Capacitor	Part Received
1.5nF Capacitor	Part Received
47nF Capacitor	Part Received
220uF Capacitor	Part Received
Diode	Part Received
330k Ohm Resistor	Part Received
180k Ohm Resistor	Part Received
620k Ohm Resistor	Part Received

# Parts Ordering Status

Part Description	Status (order approved/order placed/part received)
200k Ohm Resistor	Part Received
15k Ohm Resistor	Part Received
1M Ohm Resistor	Part Received
4.7uH Inductor	Part Received
15 Pin Housing Connector	Part Received
5 Pin Header Connector	Part Received
Micro USB Breakout Board	Part Received
Micro USB Male-to-Male Connector	Part Received
LED	Part Received
BUZZER	Part Received
LTC3441 DFN Breakout Board	Part Received

# Execution Plan

# Validation Plan

Paragraph #	Test Name	Success Criteria	Methodology	Status	Responsible Engineer(s)
3.2.1.1	Battery Operating Life	Battery last for 8 hours	IPT is put in default operating state and left to run for 8 hours. Power will be monitored with connection on IPT	Not Tested	Evan Lingo
3.2.1.2	Time to Alert (GUI)	Notification sent to user's phone within one minute	Use stopwatch to measure the amount of time between pet leaving geofence/safe zone and the user being notified on their device	Tested	Amy Ideozu
3.2.1.3	Geofence Size	Geofence size is $\geq 100 \text{ sq ft}$ $\leq 3600 \text{ sq ft}$	Phone application lets user choose a geofence size with a minimum radius of 100 sqft and maximum radius of 3600 sqft	Tested	Amy Ideozu
3.2.1.4	Video Stream quality	Stream quality of 480p	Video stream from camera is broadcasted to website using program where it can be monitored	Tested	Richard Taylor
3.2.2.1	Mass of IPT	Mass of maximum 213 grams	Measure system of sensors and actuators with a digital scale	Not Tested	Evan Lingo
3.2.2.2	Size	Volume should be 1.5 inches in height, 2 inches in width, 3 inches in length	Perform measurements for the enclosure created for the IPT	Not Tested	Evan Lingo
3.2.3.1.1	Power consumption	Max 3W consumption	Perform a power up to stable test	Tested	Evan Lingo
3.2.3.2.2	Output Voltage Level	Outout voltage level of 3.3V and 5V	Line regulation and load regulation test	Tested	Evan Lingo
3.2.3.2.3	Raw Video Output	Streams video to user via ip	The video stream will be available to watch whenever the user checks the designated web ip	Tested	Richard Taylor
3.2.5.1.1	GPS Functionality	GPS module provides accurate data tracking via program	The gps program will decode the NMEA sentences and provide gps coordinates of the current location of the module	Tested	Richard Taylor

**Thank you for your time.  
Questions?**