



ECEN 403 Final Presentation

Team 17: IoT Based Pet Tracker

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Problem Overview

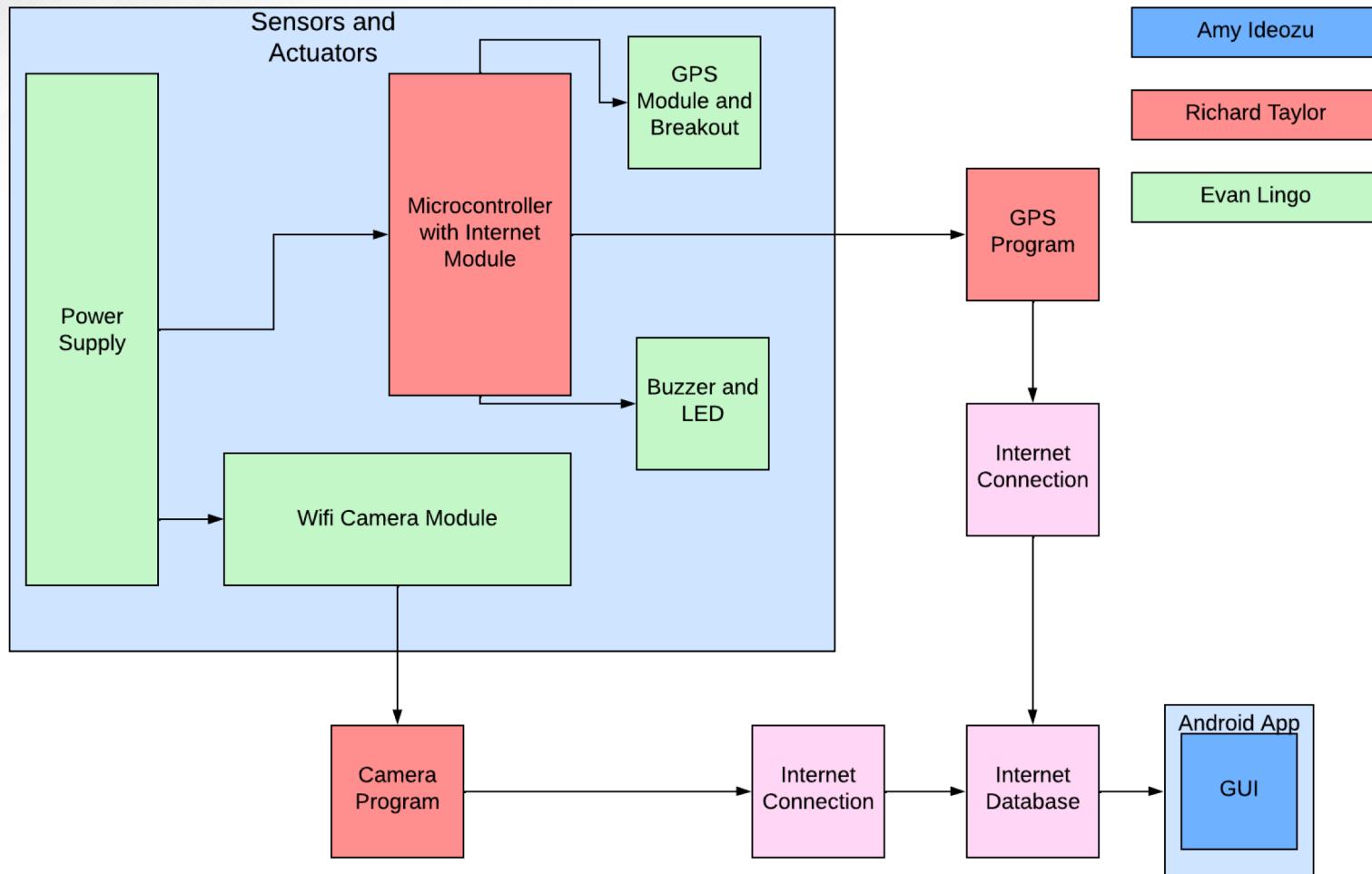
Problem statement:

- 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

Solution proposal:

- 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

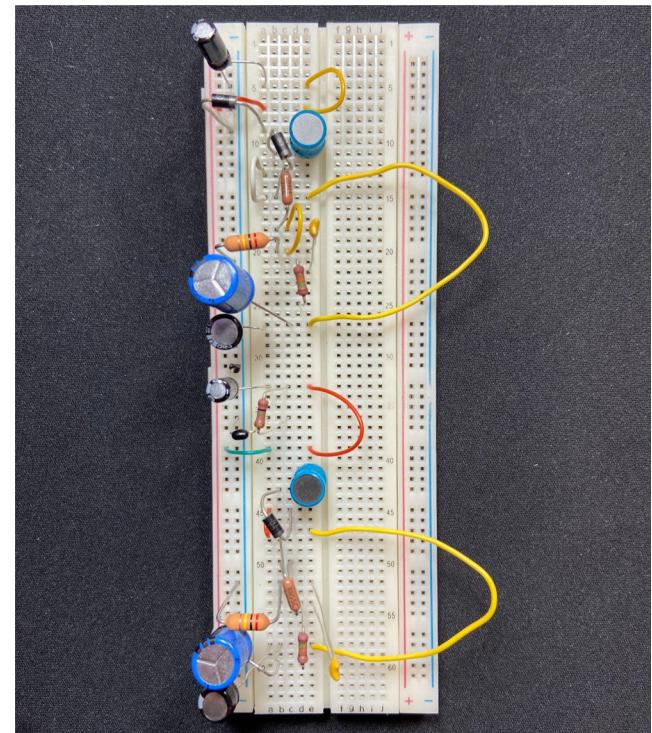
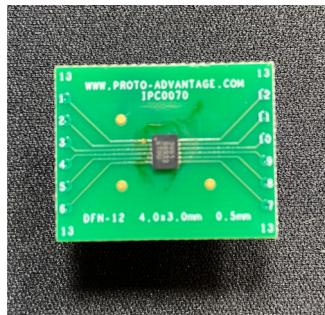
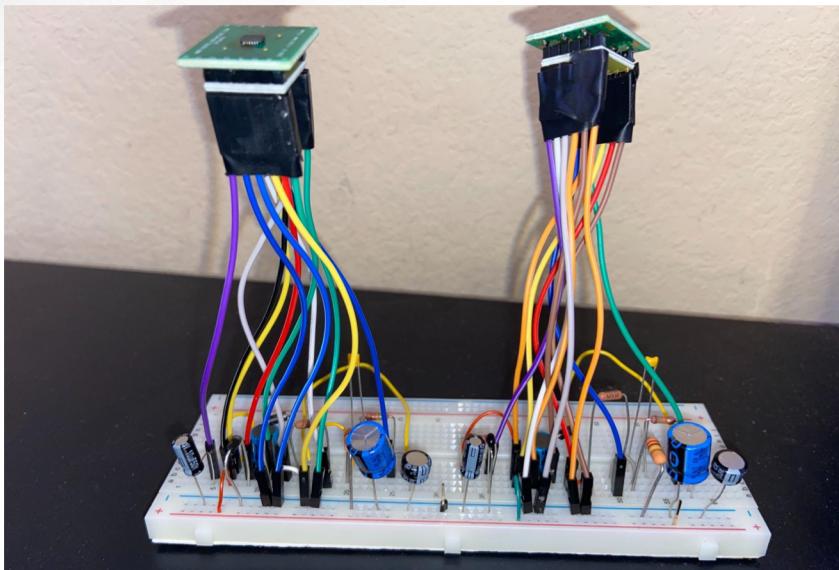
Block Diagram of subsystems





Subsystem #1 Sensors and Actuators

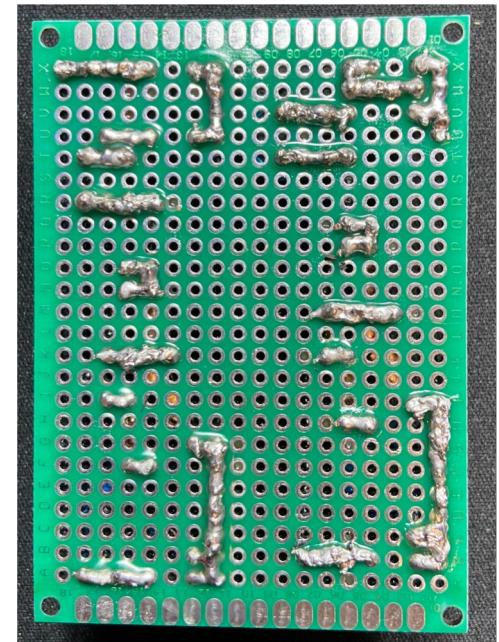
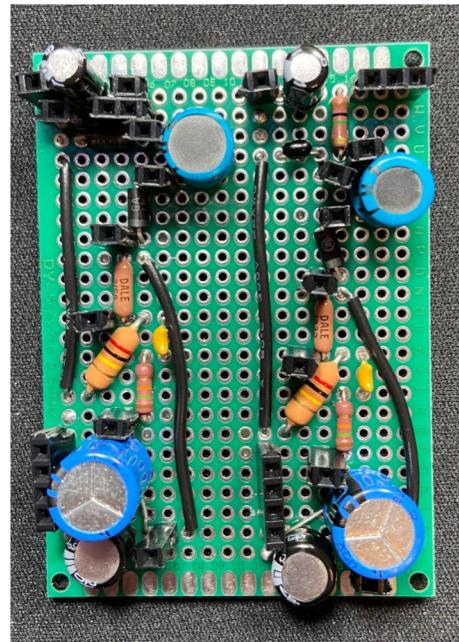
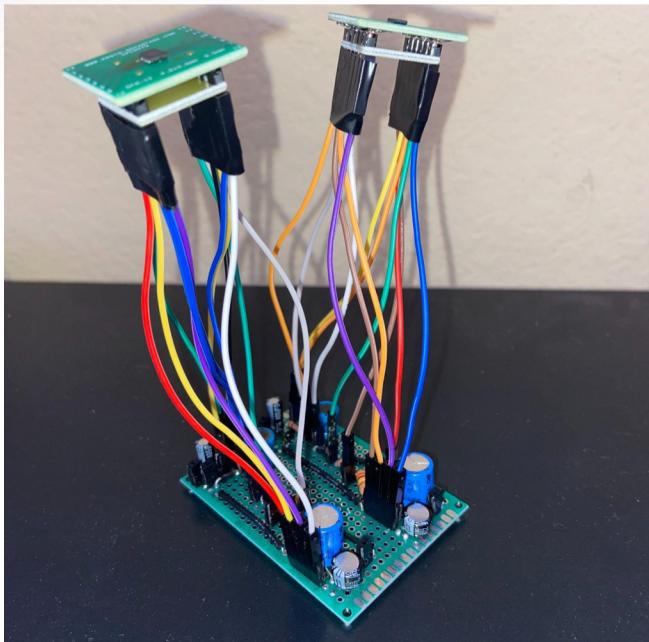
Breadboard





Subsystem #1 Sensors and Actuators

Perfboard

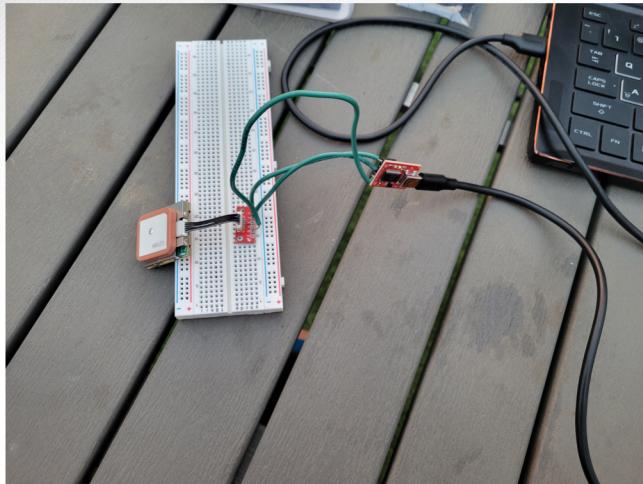


Subsystem #2 GPS and Camera program

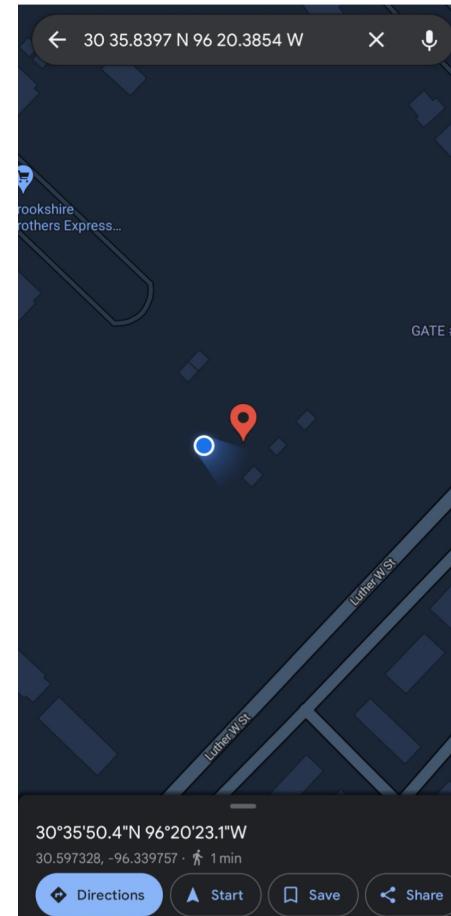


Camera program works and can
be used on password wireless
signal or its own signal

Subsystem #2 GPS and Camera program



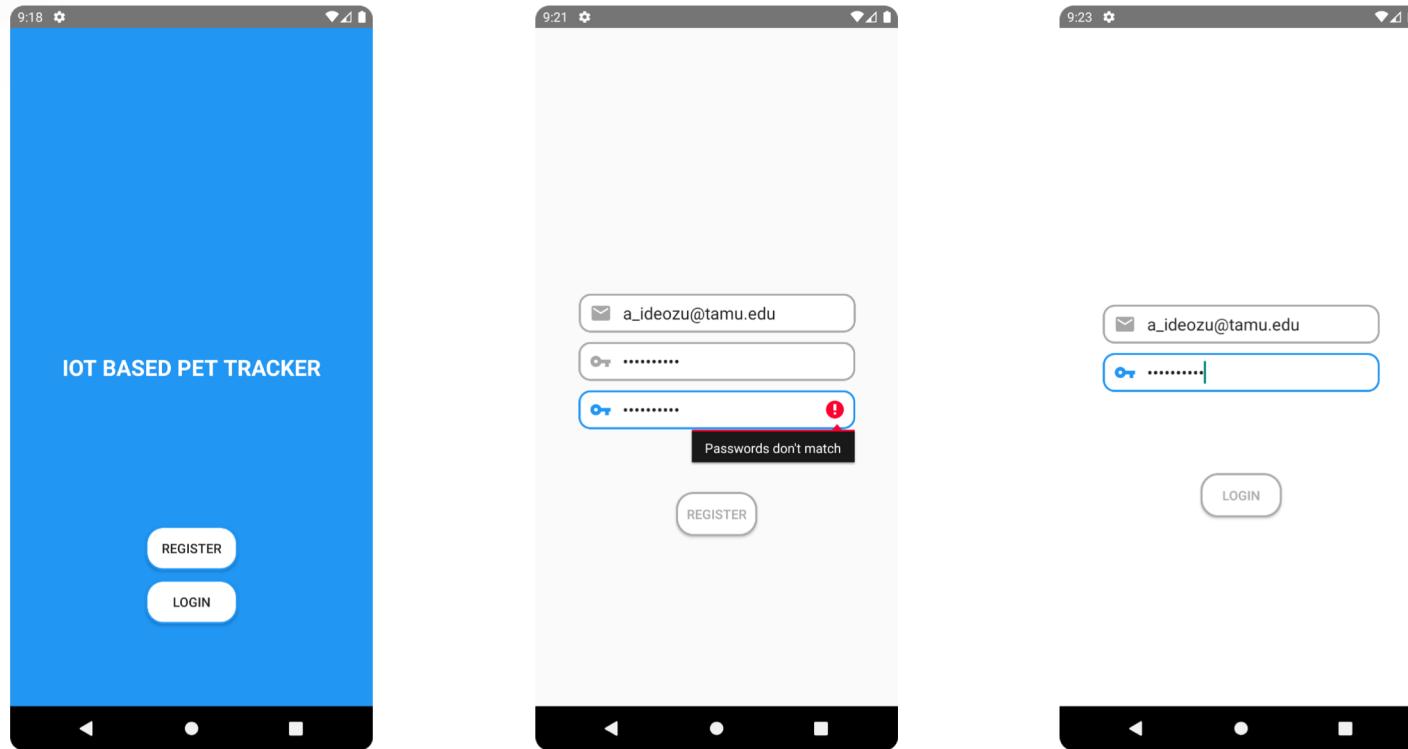
GPS setup finalized and GPS location data accurate



Example of GPS coordinates found displayed on Google Maps

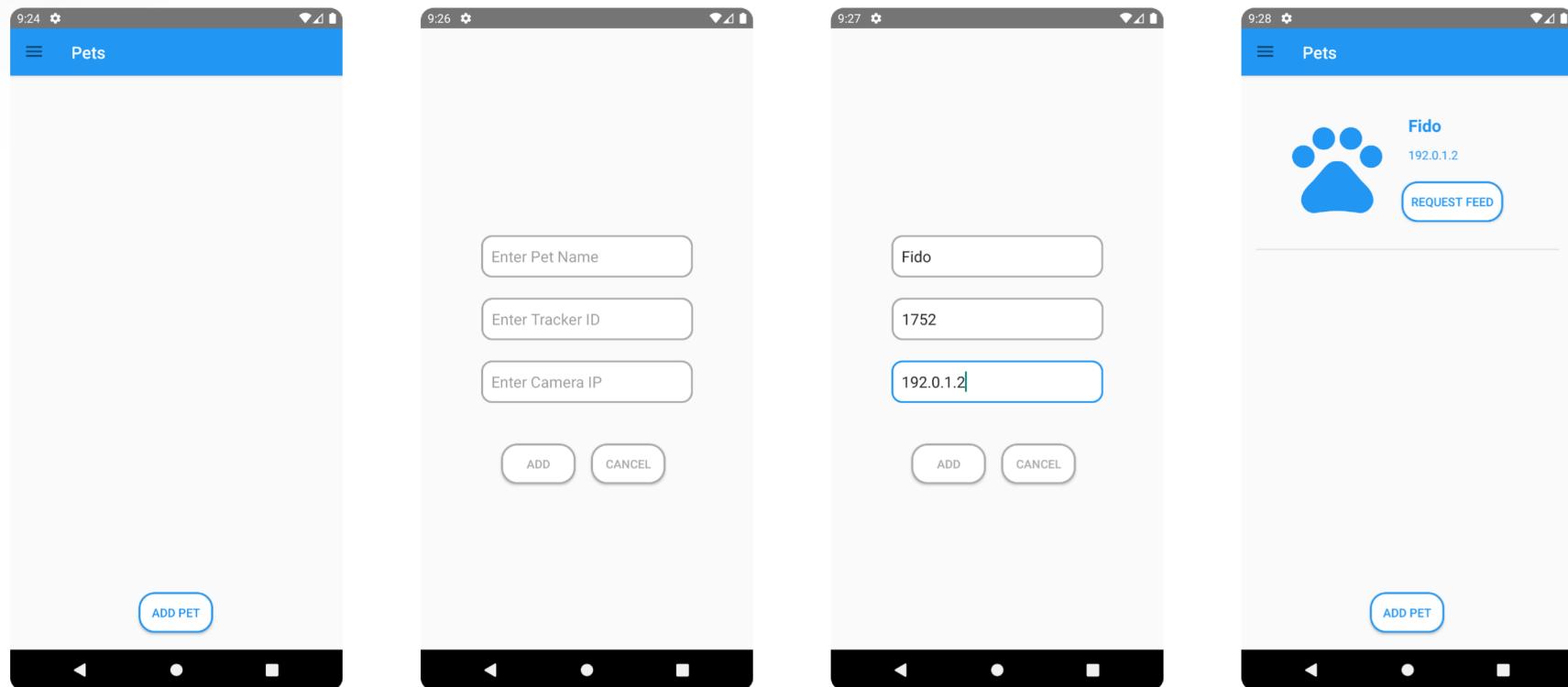
Subsystem #3: GUI - Accomplishments

Launcher, Login, Register



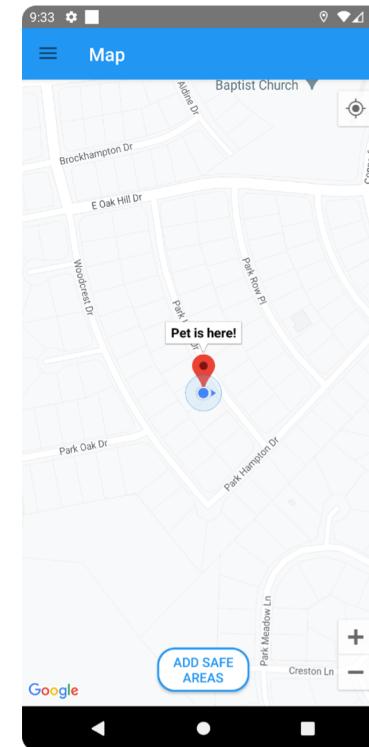
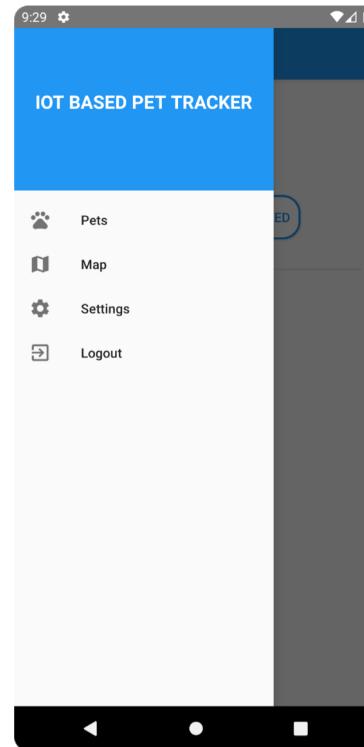
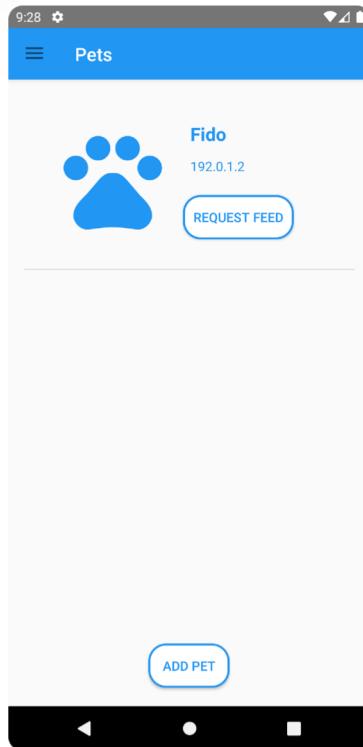
Subsystem #3: GUI - Accomplishments

Pet Creation



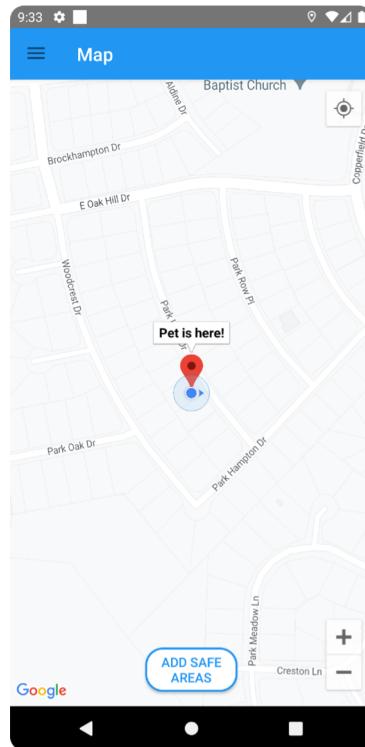
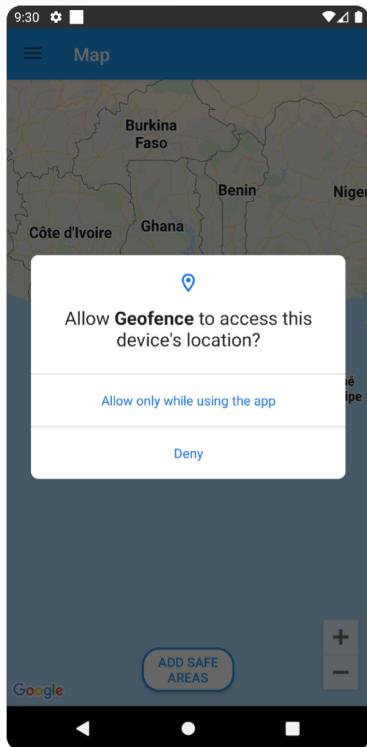
Subsystem #3: GUI - Accomplishments

Navigation



Subsystem #3: GUI - Accomplishments

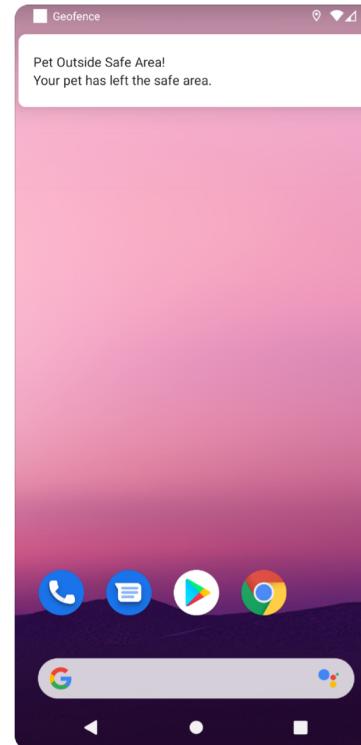
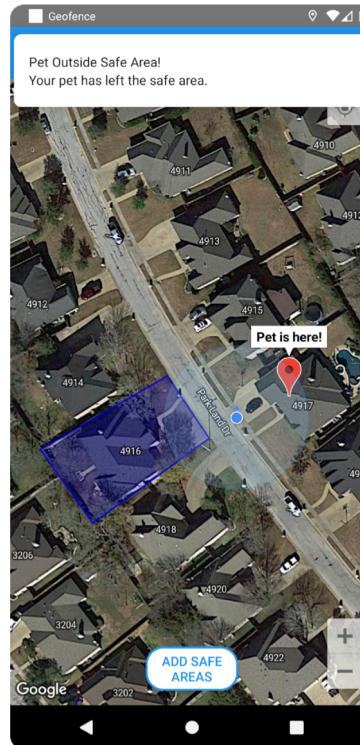
Maps/Geofencing





Subsystem #3: GUI - Accomplishments

Notification



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	One minute of pet exiting geofence	code will ensure the user will be notified when the pet moves out of safe zone through the gps program	Not Tested	Richard Taylor
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	In Progress	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 2.12 W consumption	Perform a power up to stable test	In Progress	Evan Lingo
3.2.3.1.2	Output Voltage Level	Outout voltage level of 3.3V and 5V	Line regulation and load regulation test	In Progress	Evan Lingo
3.2.3.1.3	Data output	Sends data from MCU to database	GPS data will be transmitted between the mcu and the database to ensure the user will be able to keep track of their pet at any time	In Progress	Richard Taylor
3.2.3.2.2	Diagnostic output	Control interface	the GPS data will be recorded so the user can know the patterns of the pet's daily and weekly activities	In Progress	Richard Taylor
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
3.2.4.1	Thermal Heat Sinks	Thermal heat sinks on PCB to maintain a tempertaure of the whole system at $90^{\circ}\text{F} \pm 5\%$	Use of external thermometer to measure heat of IPT while active	Not Tested	Evan Lingo
3.2.5.1.1	Failure detection	Detects failure and notifies internet database	If an error occurs during the runtime of the GPS program, the user will be sent a notification via the internet database	In Progress	Richard Taylor

What remains to be completed

Subsystem 1:

- Testing of perfboard for desired outputs

Subsystem 2:

- Decode GPS data for validation

Subsystem 3:

- Video Feed Request Test
- Database Structure
- Maps Activity UI
- Minor Bugs

What will be completed in 404

Subsystem 1:

- Fabrication and assembly of final PCB
- Integrate all parts into the circuit
- Build housing for PCB and battery to be attached to a collar

Subsystem 2:

- GPS connected to database via MCU, Camera connected to database, buzzer and LED connected to MCU, MCU connected to database

Subsystem 3:

- Communication with MCU Programs via Database
- Polish UI
- Miscellaneous Bug Fixes