Milestone 2: Cat Caller

https://github.com/isthisangela/149

Progress so far:
Connect Sparkfun nRF52832 breakout to the basic board. Using Arduino IDE to implement the function that can use BLE to turn the port on nRF52832 on and off. Using the switch (transistor), connect it to the Sparkfun breakout, to control the LED on and off through BLE. Adding Arduino compatibility to SparkFun nRF52832 breakout and Nordic nRF52832 DK.
Video:https://drive.google.com/file/d/1jd2YGBNKBctAshnzP4O44n1z8y5SvshR/view?usp=sharing

Modifications to goals and project scope:

We are modifying the application of the UWB ranging technology from robot platooning to a cat tracking device with a live video feed. Updated proposal. We are adding LoRa long range, low power communication for talking to the Sparkfun nRF52832 breakout. We need to control switches for the camera, UWB ranging, and GPS, as well as receive GPS coordinates. (The same with milestone 1)

List of needed resources (code, parts, expertise, etc.):

GPS (on order).

Make flash SparkFun nRF52832 breakout and Nordic nRF52832 DK using Arduino IDE.

Connect GPS and Camera to the transistor and Sparkfun, so we can use BLE to control them

Get GPS and UWB ranging working and display info on buckler.

Schedule of the remaining time, with team member-task assignments:

• November 22: Sarah and Angela continue adapting LoRa Arduino library to nRF52832. Wendy will make a compact circuit for tracking device and test switching the camera on and off over BLE or LoRa. Francis will continue on UWB ranging and displaying output on Buckler, possibly start GPS as time allows.

• November 29: If there is time, implement GPS and/or WiFi positioning system with Mozilla Location Service.

• December 6: Testing: find someone with a cat and see if the device is usable/useful. Determine which technologies are helpful, what radio protocol offers the best performance, if the battery life is realistic, and if the device can be made small enough.

• December 17: Demonstration video and poster made, powerpoint prepared. Project Expo.

• December 20: Final report

Identification of major risks:

While we may not be able to get reliable wireless communication with all the physical obstructions in the real world, we are minimizing our risk of project failure by having redundancy in wireless communication technologies. BLE and LoRa both allow for two-way communication. BLE we are familiar with but has shorter range. LoRa has a longer range but we have no experience using it and current libraries are written for Arduino, not nRF52832. We could also use UWB for the two-way communication as well as ranging, however the connection distance is similar to BLE. We expect adapting existing Arduino libraries for the nRF will make up the bulk of the project, but in the event it is easy, we have other features we can add: GPS, WiFi positioning system, camera power and range optimization, or night vision with infrared LED. The Cat Caller device may even be useful with just one of the proposed features. GPS or WiFi positioning could be useful for determining the approximate location of a pet, or UWB or a live video stream alone could be enough to locate and ensure the safety of a feline friend. In addition, LoRa should provide adequate range but BLE may be sufficient for this use case.