CS 437

Final Project Proposal

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Abstract

We all forget to turn off things when we leave a room, or wish we had more fine grain control over home automatons. Today, geo fencing automations in something like HomeKit are limited to a granularity of about a city block. But it would be nice if we could have much more fine grain control of this technology. Where our phone or smart watch (which we have on us nearly at all times) could act as a personal GPS within our home. When we approach the front door it unlocks for us, or music follows us around the home on our smart speakers.

For my final project, I plan to combine the bluetooth & wifi technologies we learned in class with API's of various internet connected devices in my home to automate things as I move throughout my apartment. Using a set of bluetooth beacons (and wifi) I plan to triangulate where I'm at in my home to figure out what room I may be in. Using this data I collect, I can draw geofence lines around certain rooms to automate things like turning off lights when I leave my office or turning on my coffee grinder in the morning when I enter the kitchen.

Timeline

- *Setup bluetooth beacons*. Determine best locations to be placed around the home and make sure all of the dresses of the beacons are recorded (~2 hours)

- *Setup raspberry pi*. This will be used as the device to be carried with me that is interfacing with bluetooth beacons. This will run the algorithm that will determine where I'm at in space based on the signal strengths (~2 hours)

  - *(Optional) Swift App*. If time and resources allow, write a swift app for iPhone that scans for bluetooth beacons and relays that information back to the raspberry pi, instead of carrying the raspberry pi around.

- *Hue Bulbs API*. Setup raspberry pi to communicate with Philips smart bulbs in my home. Using the API's available to interface with smart bulbs I can trigger certain action when conditions are met (~3 hours)

- *Data collection*. Collect data of bluetooth distance as a function of signal strength to write algorithm for triangulating location (~4 hours)

- *Data visualization*. Use algorithm above and map of apartment to show where I am in the home in real time via GUI (~4 hours)

- *Demo*. Combine these pieces together together to show the raspberry pi detecting where I'm at in space, and using at to interface with various things (~2 hours)

- *Report & Video.* Document process from above for submission (~4 hours)

Total hours: ~21

Contributors

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