Overview of Yodel Mesh Networking Project (Yodel)
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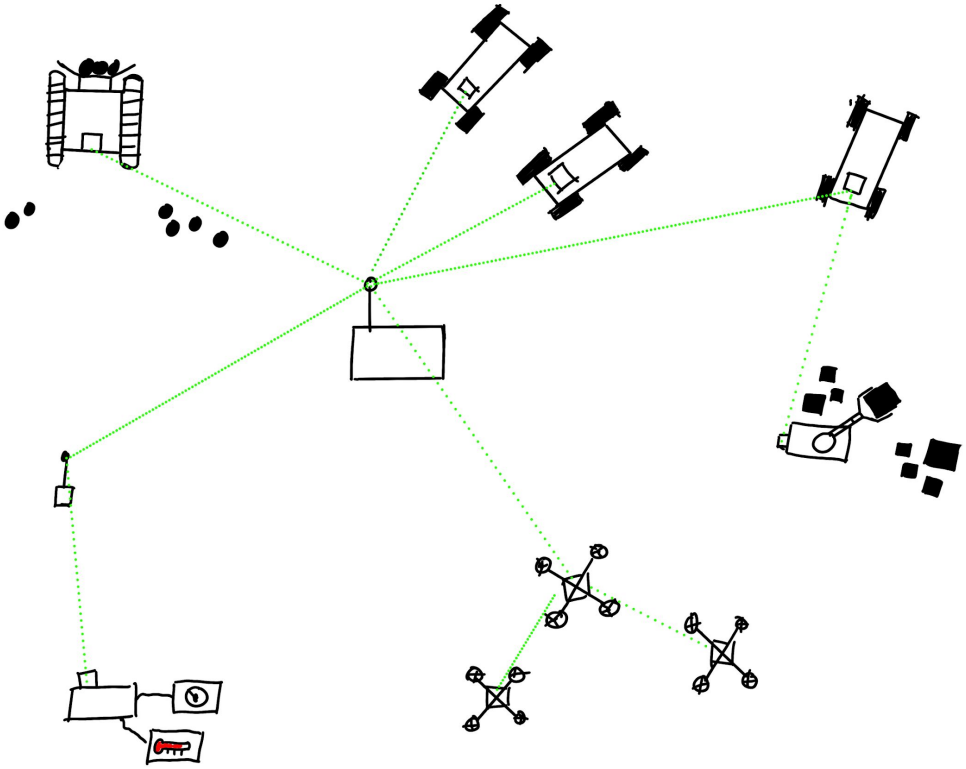

Code & Documentation:
[Yodel repository]

Overview:

The goal of Yodel is to create a system through which robots can be easily remote controlled by a computer without specialized hardware such as RC specific external antennas. Yodel is able to take advantage of the fully functioning radios already built into modern computers for handling WIFI and Bluetooth. Yodel repurposes these built in radios to communicate with robots.

Technical Overview

Despite using the WIFI hardware, Yodel does not use WIFI, rather, it interacts directly with the lower level systems one layer below WIFI. I decided to implement it this way because it has a multitude of benefits as compared to a purely WIFI based system that say an internet printer would use. The first benefit is that devices using Yodel do not need the overhead that WIFI requires. Another benefit is by using these lower level systems Yodel is able to gain far greater control over internal radios; for example, Yodel is able to directly manipulate radio broadcast frequency and broadcast power. Lastly, they allow Yodel to both have a range around 2-3x that of WIFI, and enable mesh networking between robots.

Why I Created This Project

I created Yodel as part of an internship with the company Pi-top. Pi-top is a company that makes peripherals, sensors and other products that make Raspberry-pi computers more accessible for a classroom environment. As part of this internship they asked me to essentially "do something neat" with their product. Since wireless protocols and remote control are areas I have been meaning to explore, I figured that creating a fully functioning system for remote controlling Pi-top's tech and their associated peripherals would be both something neat and a fantastic excuse to dive into the fundamentals of wireless communication. As of now, I have worked on Yodel for about 3 months and it's largely done. I recently published Yodel to the Python Package Index (pypi) under an MIT open sources license and it can be found here.