Project Title: WIFI and Spatially Aware Navigation System

Introduction: The project goal is to create a model application that will make a 2D of an area using WIFI signals and the 3D lidar. GPS signals can be blocked and or effected by the materials within walls. As a result, GPS is an unreliable form of navigation inside a building. I have been in communication with a student that developed an WIFI GPS mobile application. The application records multiple readings of WIFI signal strengths in a room. The application is then able to guess where the user by averaging WIFI strength recorded each individual router and comparing it a sample scan of the WIFI signals where the user is. The difference between the averages and the sample scan is used to calculate the distance between the user’s position and other rooms. The closest room is then applications guess of where the user is. This application could be combine using the 3D lidar to create an 2D map. The application could further the robotics industry by becoming significantly improving a robot’s ability to self-navigate. It could be applied to a robot to navigate between the building while avoiding impact with walls or humans. Furthermore, this technology could spur a line of robotic assistance for blind individuals. Robotics chairs could be created to help transport those with blindness and described to them their surroundings. I hope to develop this application to make these possibilities a reality.

/\*Possible benefits

* Help blind individuals navigate
* Help people navigate buildings
* Help innovate drone delivery

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Methods and Process:

1. Modify WIFI GPS
   1. Figure how to determine direction using the lidar and WIFI application
   2. Enable it to use 3D lidar
   3. Figure out how to store lidar information in a 2D fashion
   4. How to store step 1b information in a map
   5. Determine how to connect pieces of information
2. Determine lidar range
3. Figure out a suitable range to move so the map captures
4. Wear lidar / put lidar on a cart / determine appropriate way to move lidar.
5. Move forward the distance determined in step 2
   1. While moving record live lidar information
6. Make another WIFI scan to determine location
7. Update map
8. Repeats steps 4-6 until entire map is created

Budget:

3D lidar (loaned)

A cart

1. Raspberry pi x6
2. ][

The project concept is combining the 3D lidar with an WIFI GPS app to develop 2D maps. GPS signals can be blocked and or effected by the materials within walls. As a result, GPS is an unreliable form of navigation inside a building. I have been in communication with a student that developed an WIFI GPS mobile application. The application records multiple readings of WIFI signal strengths in a room. The application is then able to guess where the user by averaging WIFI strength recorded each individual router and comparing it to a scan of the WIFI signals where the user is. The difference between the averages and the sample scan is used to calculate the distance between the user’s position and other rooms. The app guesses that the closest room is where the user is. This application could be combine using the 3D lidar to create an 2D map and then be used to develop an autonomous robot2werf5h7j