Mappa Signa

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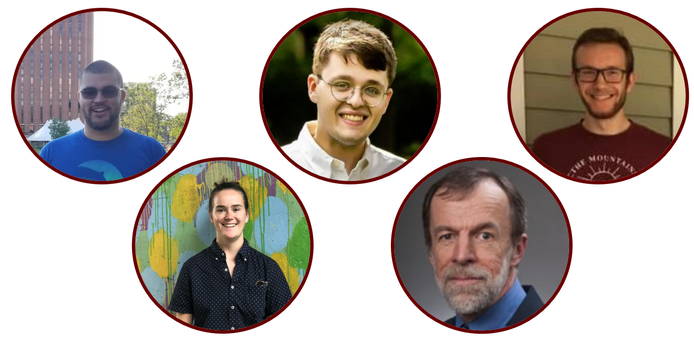
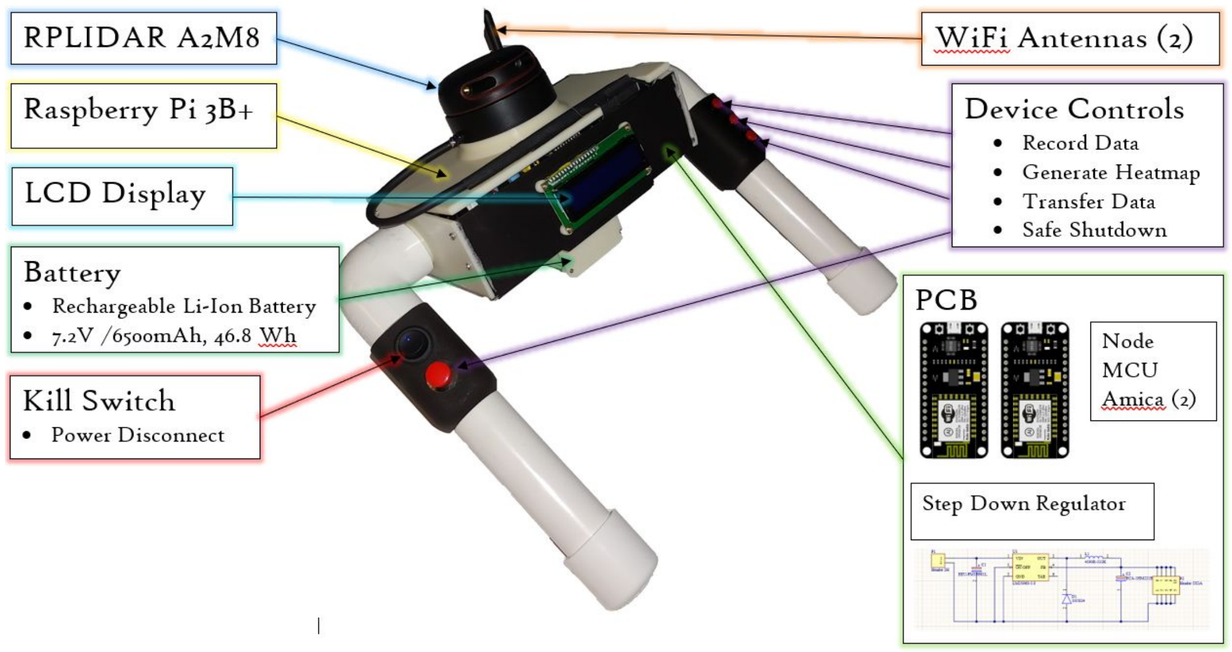


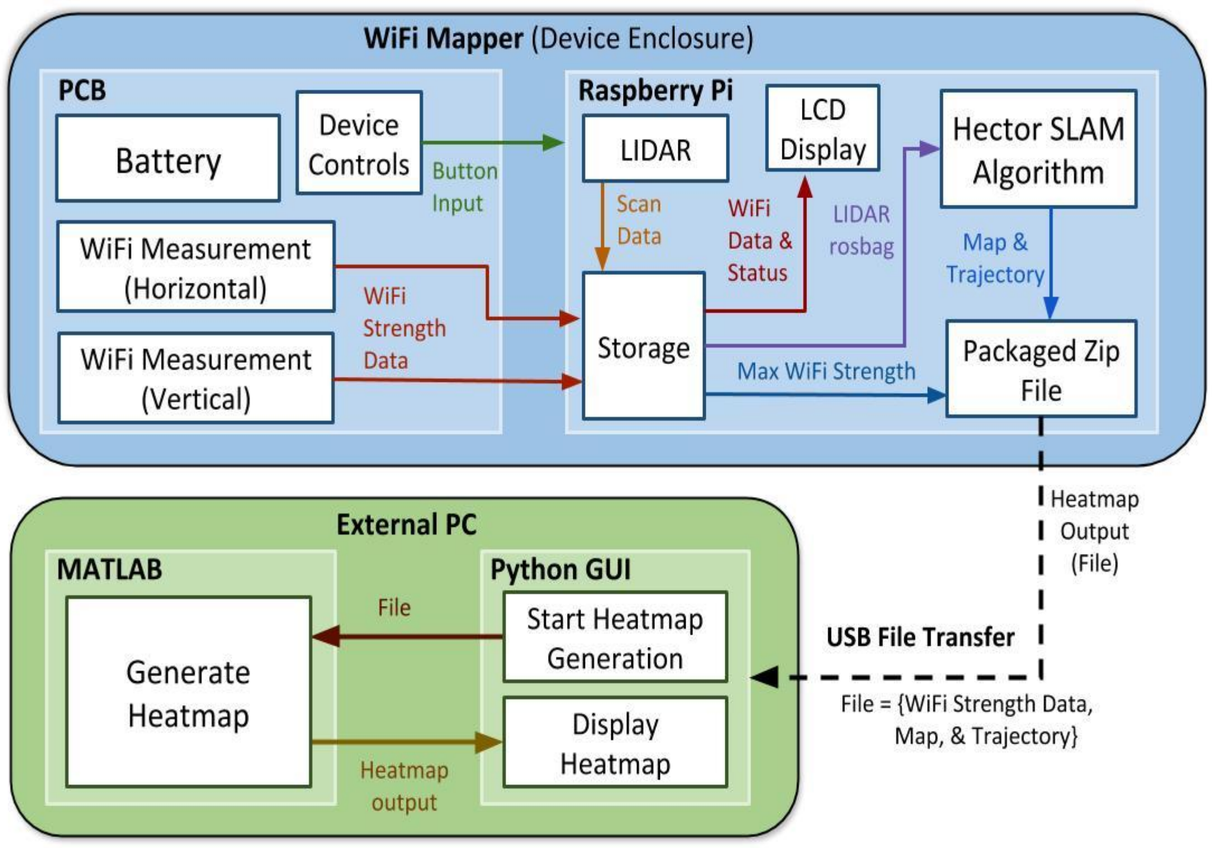
Abstract

Throughout many homes, offices, and buildings the consistency of wifi signal strength wavers significantly. However, by creating a wifi signal strength heatmap of the room(s), users can strategically place signal boosters that optimize their wifi signal strength throughout an area. Earlier approaches to this issue require users to have a pre-made map in addition to supplying copious user input as they traverse the room. To make the process of heatmap generation and signal booster placement easier, Mappa Signa provides a handheld device which simultaneously maps the room, marks the user's location, and measures the wifi signal strength at the user's current location. The data collected by the handheld device is then offloaded to an external PC nearby which generates the heatmap while also recommending the optimal placement for a wifi signal booster.

System Overview



Block Diagram

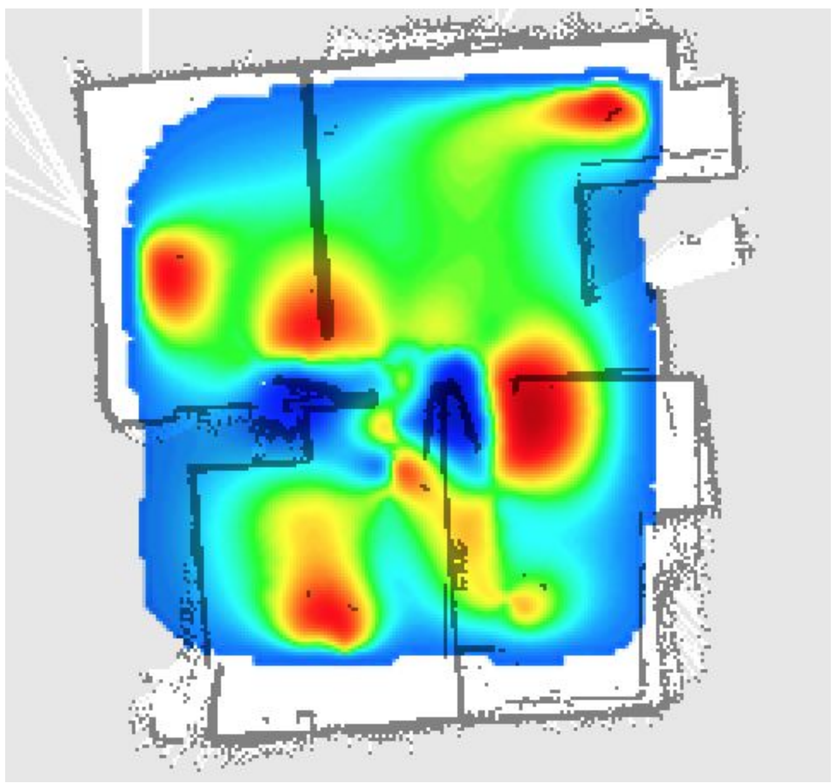


Specifications

Requirement	Specification
Battery	Lasts ≥ 3 hours of continuous use or long enough to map entire building.
Map	Map creation and trajectory estimation without user input of pre-existing map.
Heatmap	Uses LiDAR and NodeMCU Amica data to create heatmap of Wifi signal strength.
Signal Booster	Suggest optimal signal booster placement based on heatmap results.
Functionality	Turn on and go, no user intervention until data analysis.

Results

Mappa Signa has created a fully portable hand held device capable of creating a map of an area and an overlaid heatmap of WiFi signals. After about a minute of boot up, the device is ready to record and begins with the touch of a button. Similarly, ending the record and transferring files is as easy as pushing a button. On our computer application, there's another button to generate and overlay the heatmap.



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