

CS743 Project Proposal

1. Project Title: **Indoor Localization of Wireless devices**

2. Project team members:

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3. Description of project: Our primary inspiration comes from [this](#) project, which focuses on monitoring the flow in the local network and gave us an idea of the capabilities of ESP-32. For localizing, we have a rough plan to solve it:

- a. Sniff packets coming from different wireless devices
- b. Send the RSSI to a host laptop over MQTT/HTTPS. (There are methods which leverage the Channel State Information for better localization, in that case we can send that info too)
- c. The localization logic will be implemented on our host laptop, which will show the position on a canvas

Since we have two ESP32 devices, we speculate that model-based localization using RSS would suffice. We intend to start off with static localization and then proceed towards localizing mobile wireless devices.

4. Software and hardware requirements:

2 ESP32 devices and a laptop in a local network. If we intend to use MQTT, we can make our laptop as the broker and a client as well.

Smartphones and Laptops as wireless devices

5. Plan for evaluation/experimentation, including details of planned locations for experiments:

We intend to conduct our experiment in an empty room and find the accuracy of our localization. Also, one experiment where there is a wall as an obstruction (i.e. localizing across rooms).

6. Progress so far:

We have found some references in the literature where localization is done using RSSI and CSI.

7. Bonus:

We have seen many students registering their attendance on SAFE app by staying outside the classroom. This prototype can be further extended to catch such students too!