

SADAS-DEI

System for Automatic Detection of Availability for the
Secretary of Department of Informatics Engineering

Capstone Project - PE51

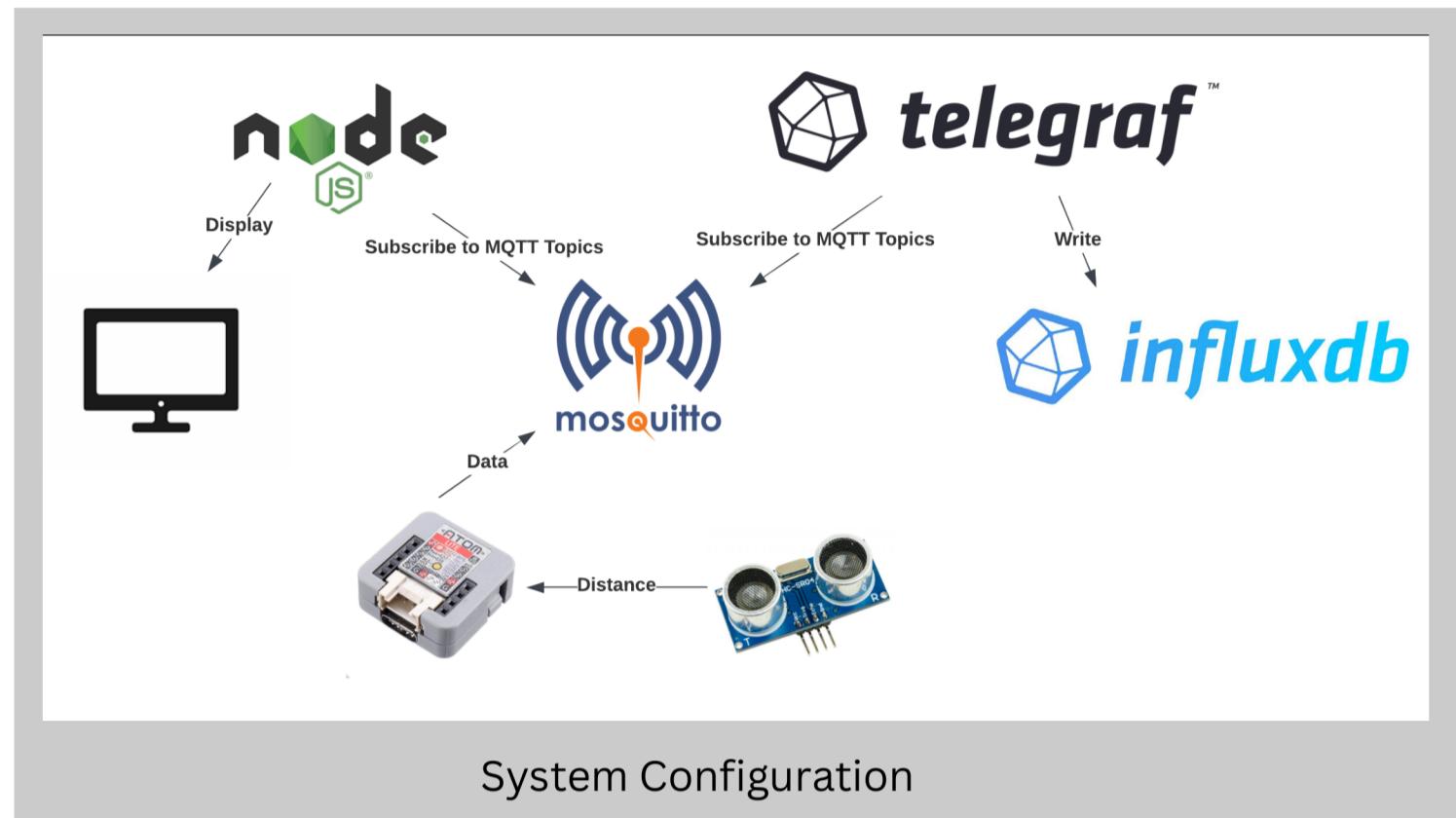
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INTRODUCTION

The SEC DEI plays an important role in helping and supporting computer engineering education and research within the institution. However, one notable issue that arose is the lack of visibility from the exterior of the office to determine if they are available to attend students, staff and visitors.

OBJECTIVES

Recognizing the importance of optimizing workspace utilization, the project aimed to develop a solution that would enable individuals to be aware of the attendant availability status before entering the office area.



3-SENSOR MODEL

- The 3-sensor model involves a box enclosure containing three sensors positioned to cover the zone where the attendee would typically be located during attendance. One sensor was directed towards the chairs zone, while the other two sensors had different radius.
- In the setup, each proximity sensor was connected to the same micro-controller responsible for managing the connections and readings.

OUTCOME

A solution that provides real-time visibility of attending availability, which could be conveniently accessed from the outside the office area through a web page displayed on a television screen.

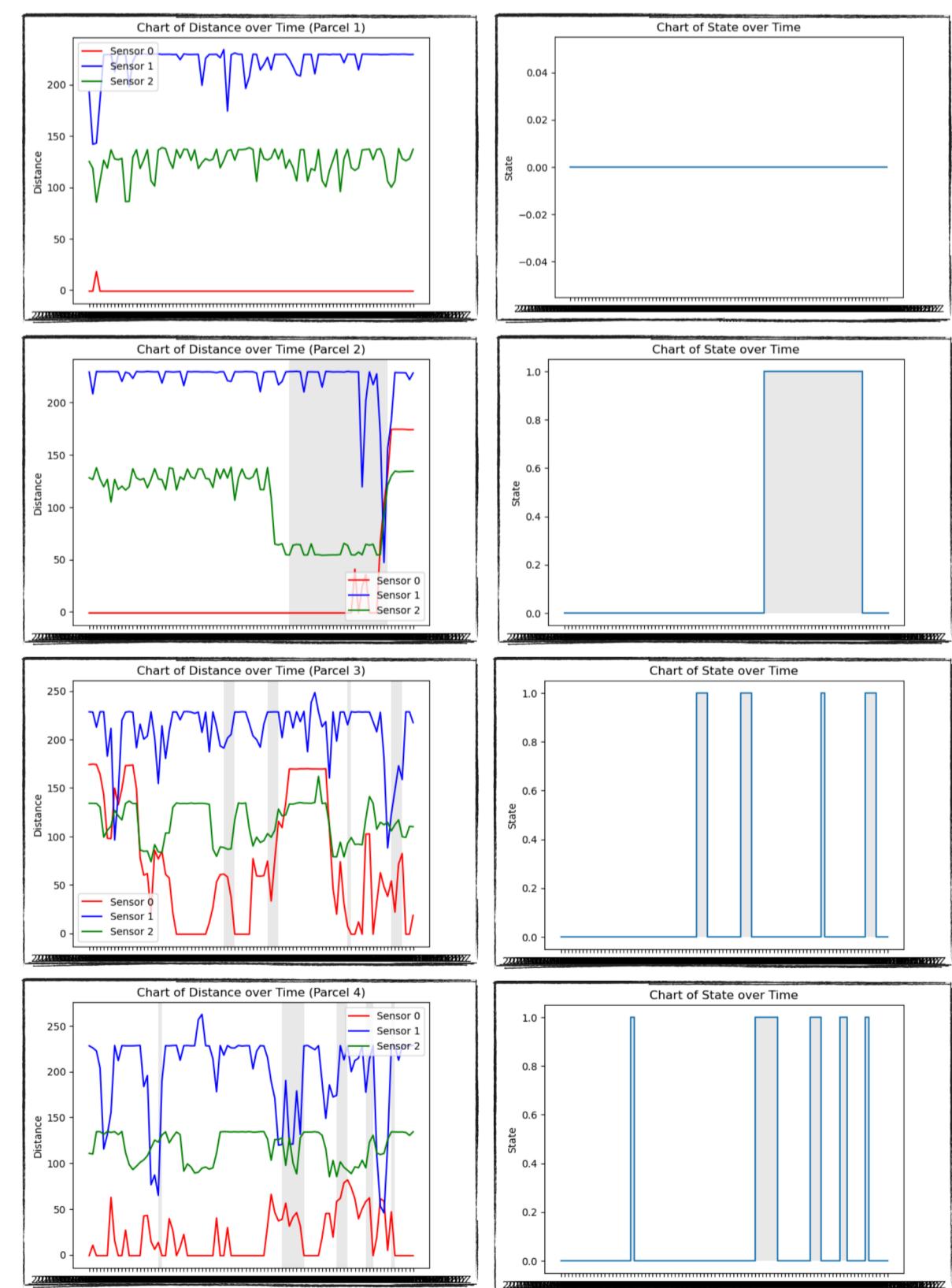
Accuracy:

- Accuracy measured for the 3-Sensor Model on our tests was 88.9%.

Constraints:

- The system's assumption is that a person is in attendance within a certain distance from the table.

- We connected the sensors to the ATOM-Lite micro-controller, which processes the raw data and sent it to the Raspberry PI via a mosquitto MQTT broker.
- The data is then received by a NodeJS server, to display the state of the tables. We also log the data in an InfluxDB database, using Telegraf.
- The state of a table changes when 5 consecutive readings read above or below a certain threshold, indicating the presence or absence of an attendee.



Distances of each sensor and state inference. The color grey in both charts indicates presence of a person in attendance.