KOC UNIVERSITY
College of Engineering

Cluster Based Home Sensor Network Infrastructure for IoT Applications

Students: Oğuzhan Uz
Ömer Dönmez
Supervisor: Hakan Ürey
Assistant: Ali Cem

E-mail: ouz13@ku.edu.tr, odonmez13@ku.edu.tr

Project Description

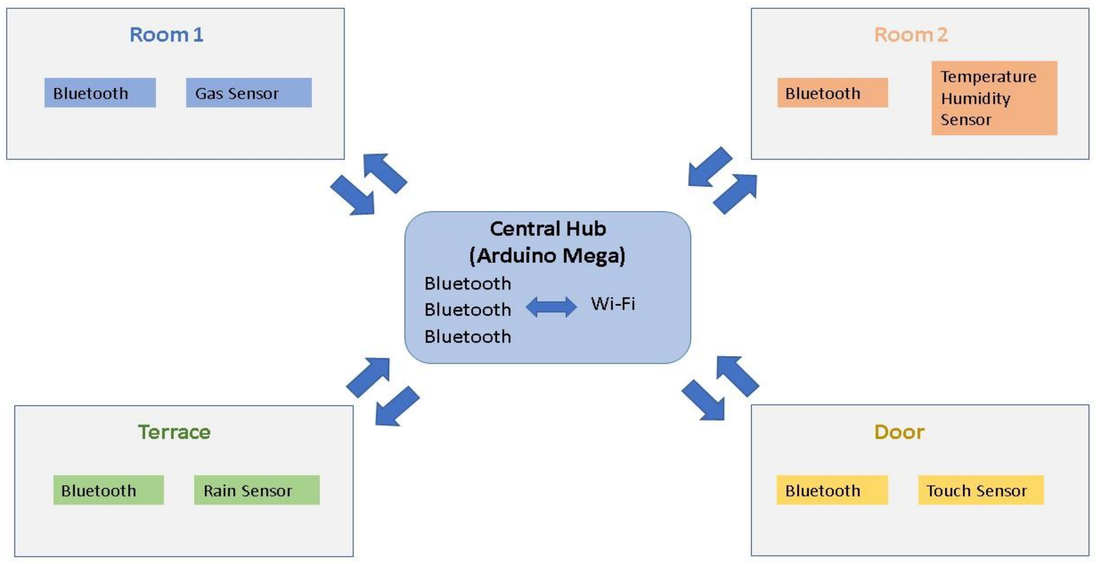

Figure 1: Summary of the System

- We have created a wireless home sensor network which includes multiple Bluetooth modules to communicate each other continuously.
- In order to reduce power consumption, sensor data are transmitted via Bluetooth when user is at home and data are transmitted via Wi-Fi when user is outside.

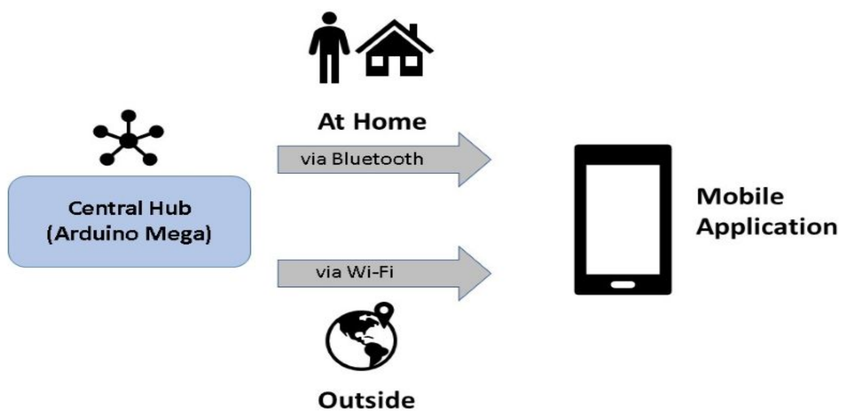

Figure 2: Transition between Bluetooth and Wi-Fi

Software Design

- Sensor data from different modules are shown seperately to user.

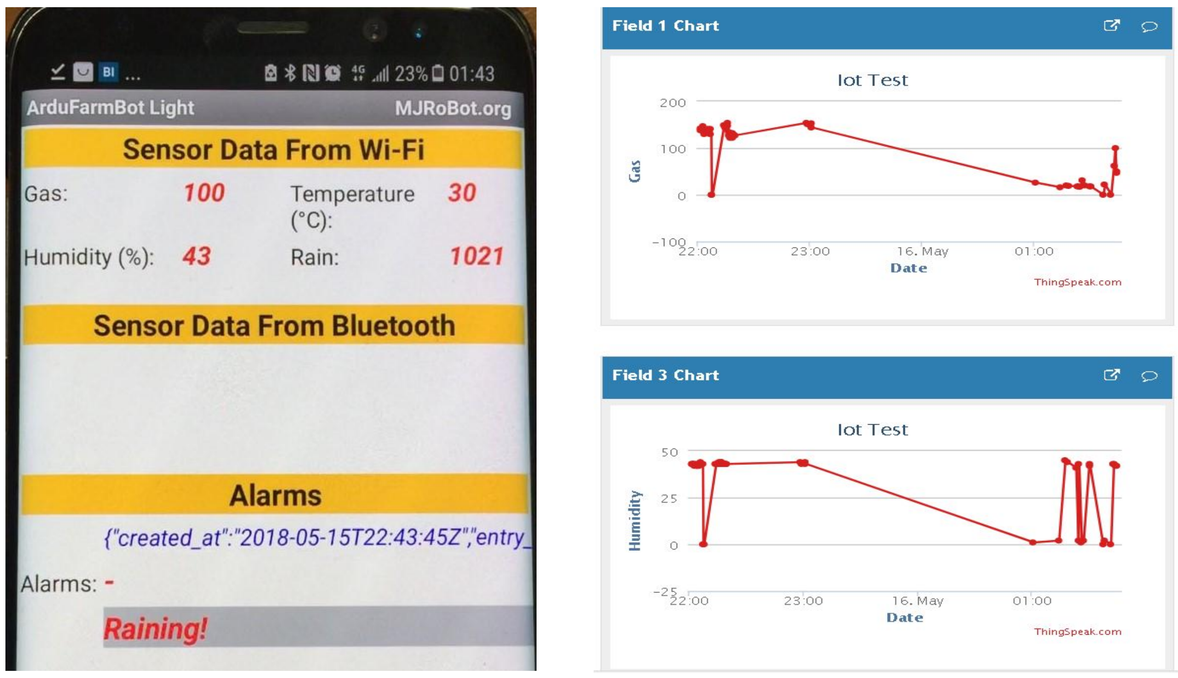

Figure 3: Android Application and Web Server

- Android application is capable of three main functions:

1) Showing current sensor data clearly.
2) Transition between Bluetooth and Wi-Fi smoothly.
3) Warning user in extreme conditions (gas leakage, rain etc.)

Group Members' Photo

Hardware Design

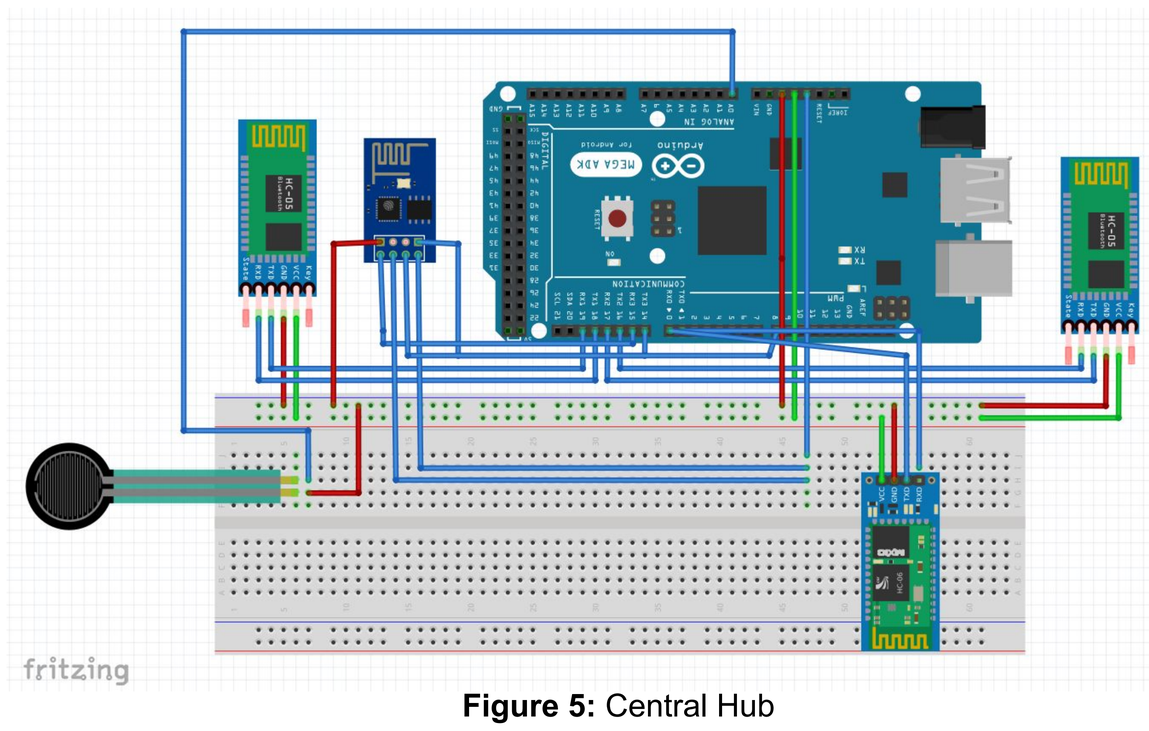

Figure 5: Central Hub

- We used 3 different sensors for different rooms and each sensor has its own Hc-06 Bluetooth module on its own Arduino Nano.
- Each Hc-06 Bluetooth module is communicating with its paired Hc-05 on the Arduino Mega.
- Esp8266 Wi-Fi module is connected to the central hub.
- Rain sensor is located outside, gas and temperature sensor are located inside and touch sensor is located at the door.

Figure 5: Hardware Design

References:

[1] M. S. Mahmoud and A. A. H. Mohamad, "A Study of Efficient Power Consumption Wireless Communication Techniques/ Modules for Internet of Things (IoT) Applications," Advances in Internet of Things, vol. 06, no. 02, pp. 19–29, 2016.