"The Internet of Things is about creating a smarter, more connected world, where devices can communicate with each other to make our lives easier and more efficient."

~Eric Schmidt, Executive Chairman of Alphabet (Google)

Smart Gas Leakage System

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Introduction

International for Fire & Rescue Services-2020

24.2% in residential budlings

82% death only in residential budlings

Average 20 incidents per 1000 inhabitants

Objective

An IOT system that can monitor gas leakage and spot potential fires.

Hardware :
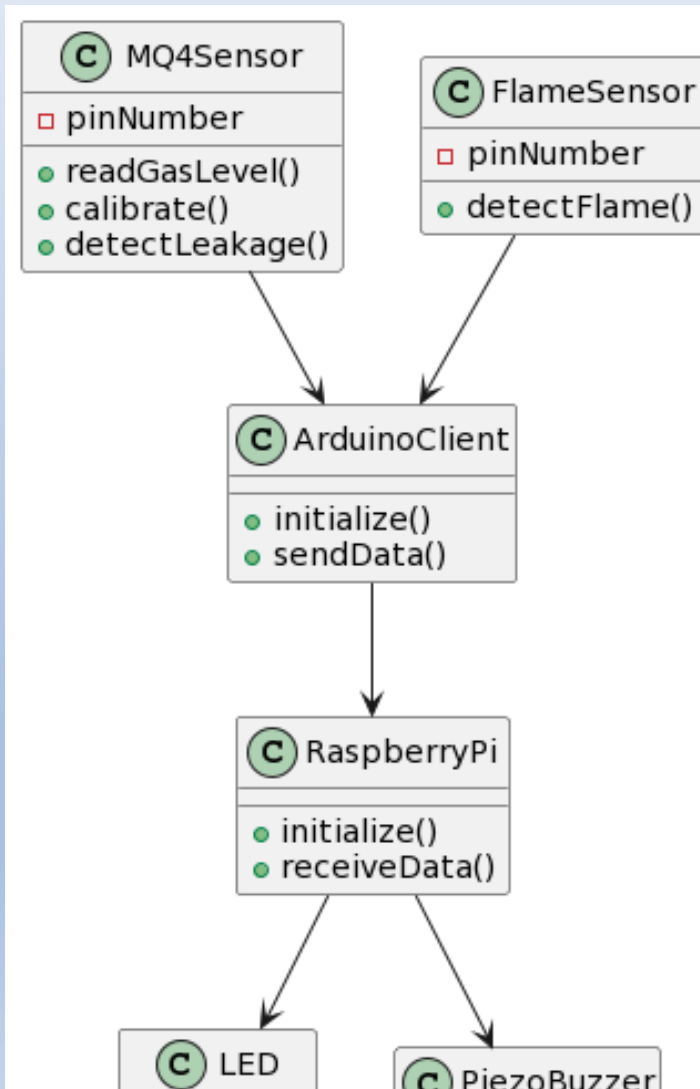
Arduino Uno Wi-Fi Rev 2

Raspberry Pi 3

Sensors and Actuators (MQ4 Gas, Flame sensor ,LED,Piezo buzzer)
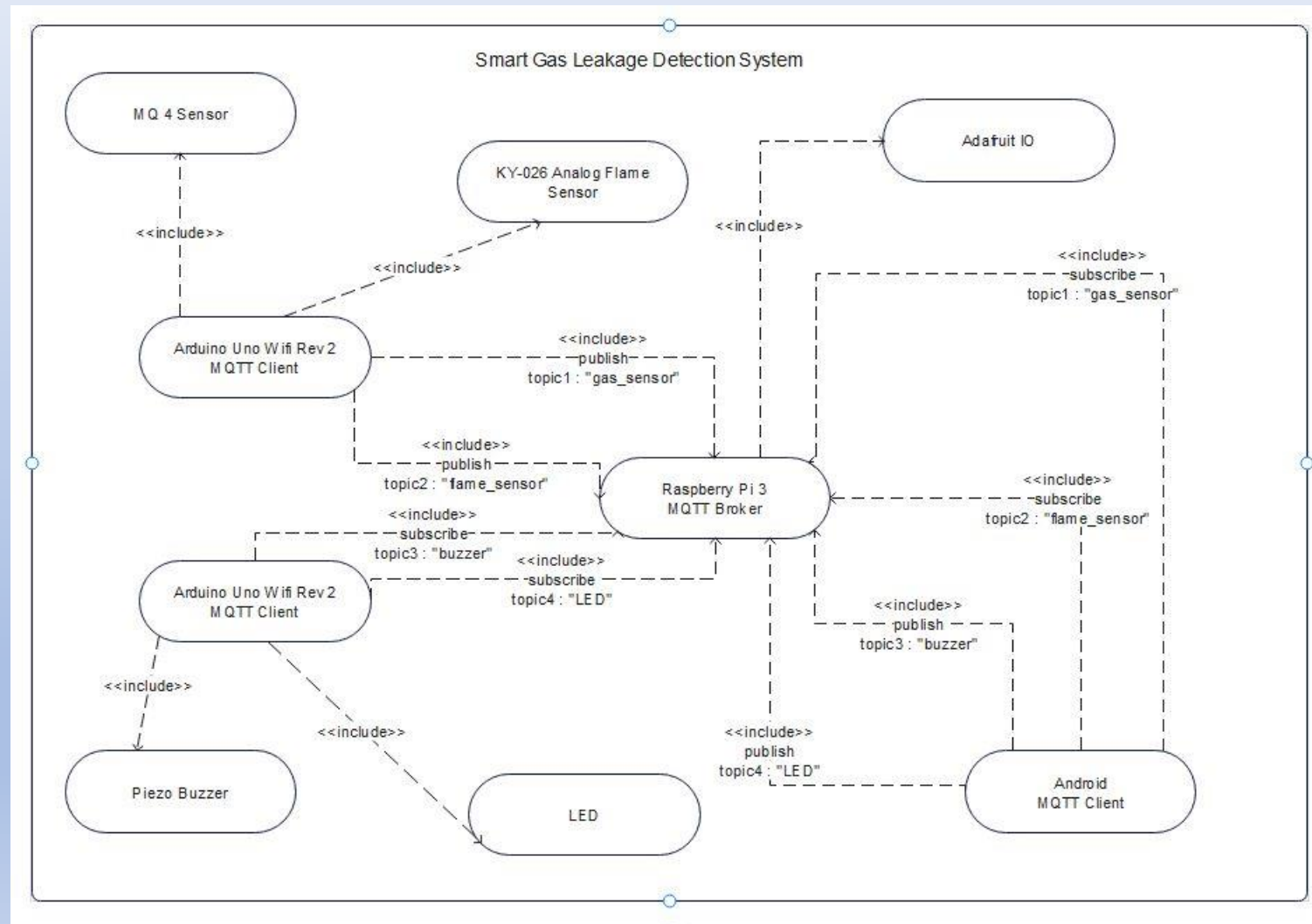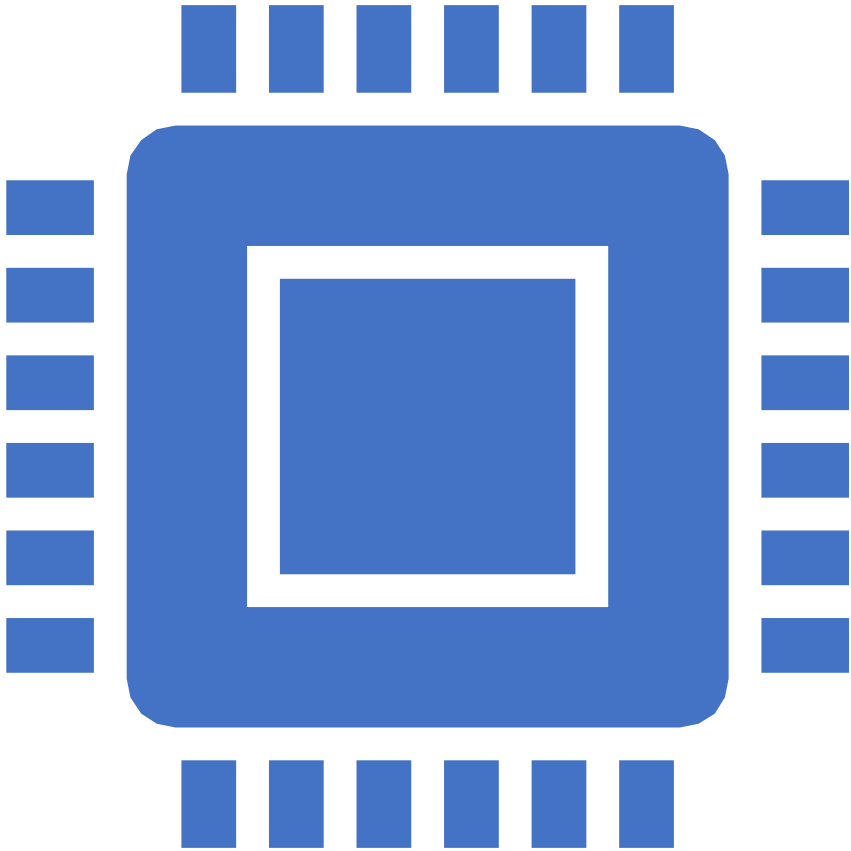
Software:

Arduino Uno IDE

Raspberry Pi Imager

Class Diagram/Use Case Diagram

System Framework

- Block Diagram

Initial Task To Final Rendition

- Programming Arduino for Sensor reading
- Programming Arduino for Actuator control
- Simultaneous Iterations
- Raspberry PI as MQTT broker

OutPut


```
Output    Serial Monitor ×

Message (Enter to send message to 'Arduino Uno WiFi R

Flame Sensor: 4%
Gas Sensor: 3%
Flame Sensor: 4%
Gas Sensor: 3%
Flame Sensor: 4%
Gas Sensor: 3%
Flame Sensor: 4%
Gas Sensor: 3%
Flame Sensor: 4%
Gas Sensor: 3%
Flame Sensor: 4%
Gas Sensor: 3%
Flame Sensor: 4%
Gas Sensor: 3%
Flame Sensor: 4%
Gas Sensor: 3%
Flame Sensor: 4%
```

```
Output    Serial Monitor ×

Message (Enter to send message to 'Arduino Uno WiFi Rev2' on 'COM5')

11:43:52.546 -> Buzzer turned OFF
11:43:53.569 -> LED turned OFF
11:43:53.569 -> Buzzer turned OFF
11:43:54.636 -> LED turned OFF
11:43:54.801 -> Buzzer turned OFF
11:43:55.602 -> LED turned OFF
11:43:55.645 -> Buzzer turned OFF
11:43:56.430 -> LED turned OFF
11:43:56.430 -> Buzzer turned OFF
11:43:57.459 -> LED turned OFF
11:43:57.501 -> Buzzer turned OFF
11:43:58.489 -> LED turned OFF
11:43:58.526 -> Buzzer turned OFF
```

```
Shell
Gas Sensor Reading: 3
Flame Sensor Reading: 4
Gas Sensor Reading: 3
Flame Sensor Reading: 4
Gas Sensor Reading: 3
Flame Sensor Reading: 4
Gas Sensor Reading: 3
Flame Sensor Reading: 4
```

System Visualization

Flame Reading

9

Gas Reading

3

FireAlarm

GasAlarm

Adafruit IO

Challenges

Conclusion

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