

# SYSC3010 Computer Systems Development Project

## FANS Detailed Design Report

Group L1-G8



[1]

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# 1 Problem Statement

## 1.1 Functional Requirements

1. TODO

## 2 Design Overview

### 2.1 System Overview Design

### 2.2 Communication Protocols

#### 2.2.1 I2C Communication

|        |          |         |             |          |
|--------|----------|---------|-------------|----------|
| Sender | Receiver | Message | Data Format | Protocol |
|--------|----------|---------|-------------|----------|

Table 1: Messages for I2C communication in FANS.

#### 2.2.2 Local Area Network Communication

|        |          |         |             |          |
|--------|----------|---------|-------------|----------|
| Sender | Receiver | Message | Data Format | Protocol |
|--------|----------|---------|-------------|----------|

Table 2: Messages for local area network communication in FANS.

#### 2.2.3 Cloud Database Communication

|        |          |         |             |          |
|--------|----------|---------|-------------|----------|
| Sender | Receiver | Message | Data Format | Protocol |
|--------|----------|---------|-------------|----------|

Table 3: Messages for cloud database communication in FANS.

#### 2.2.4 User Notification Communication

|        |          |         |             |          |
|--------|----------|---------|-------------|----------|
| Sender | Receiver | Message | Data Format | Protocol |
|--------|----------|---------|-------------|----------|

Table 4: Messages for user notification communication in FANS.

### 2.3 Message Sequence Diagrams

#### 2.3.1 Trigger Emergency Use Case

#### 2.3.2 Add New Contact Information Use Case

#### 2.3.3 Change Emergency Threshold Use Case

#### 2.3.4 Emergency Response Use Case

### 2.4 Database Table Schema

## **3 Software Design**

### **3.1 Sensor Data Collection System**

### **3.2 Alarm System**

### **3.3 Notification System**

### **3.4 Haptic Alarm System**

## 4 Hardware Design

### 4.1 MQ2 Smoke Sensor

### 4.2 LCD Display

### 4.3 AudioHat Module

### 4.4 Piezoelectric Buzzer

## 5 GUI Design

### 5.1 Table of Users/Roles

## **6 Test Plans**

### **6.1 End-to-end Communication Demo**

### **6.2 Unit Test Demo**

### **6.3 Final Demo**



## **7 Project Update**

### **7.1 Project Milestones**

### **7.2 Schedule of Activities**

## References

- [1] P. Matoušek, *Thick smoke on black background*. [Online]. Available: <https://www.freeimages.com/photo/thick-smoke-on-black-background-1633270> (visited on 02/11/2024).