# ECTE-250

## FINAL PRESENTATION

### Team D

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# INTRODUCTION


# FALL SAFE

## Fall detection system

- According to WHO, falls are the 2nd leading cause of accidental deaths worldwide and the cause of 684,000 deaths of people annually around the world.

- Most of them are adults older than the age of 60.

- To help tackle this issue, we suggest an Arduino-based fall detection system.

# Project description

System sets up and moves to active monitoring state

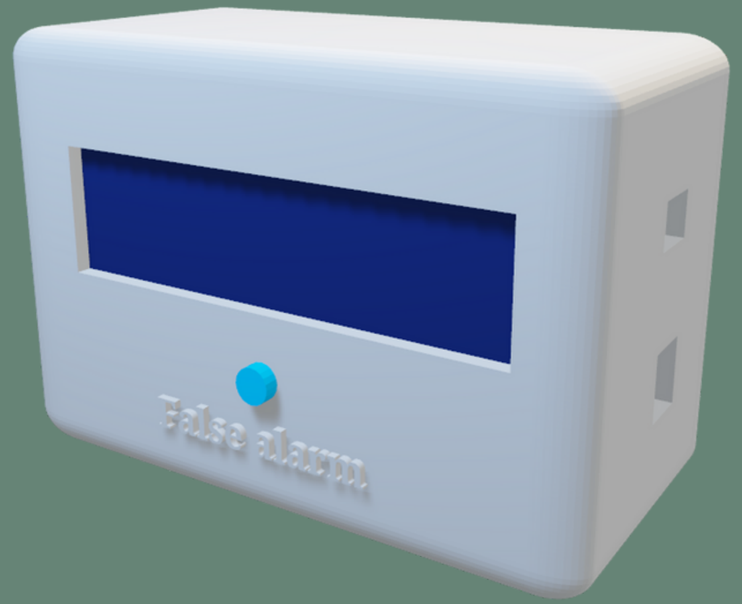
If sensor detects motion, system moves to the fall confirmation state & waits for 8 seconds

If the false alarm button has been pressed in the 8-sec period, system outputs false alarm & goes back to active monitoring

Else, the system will send SMS messages to the emergency contact until a response is received

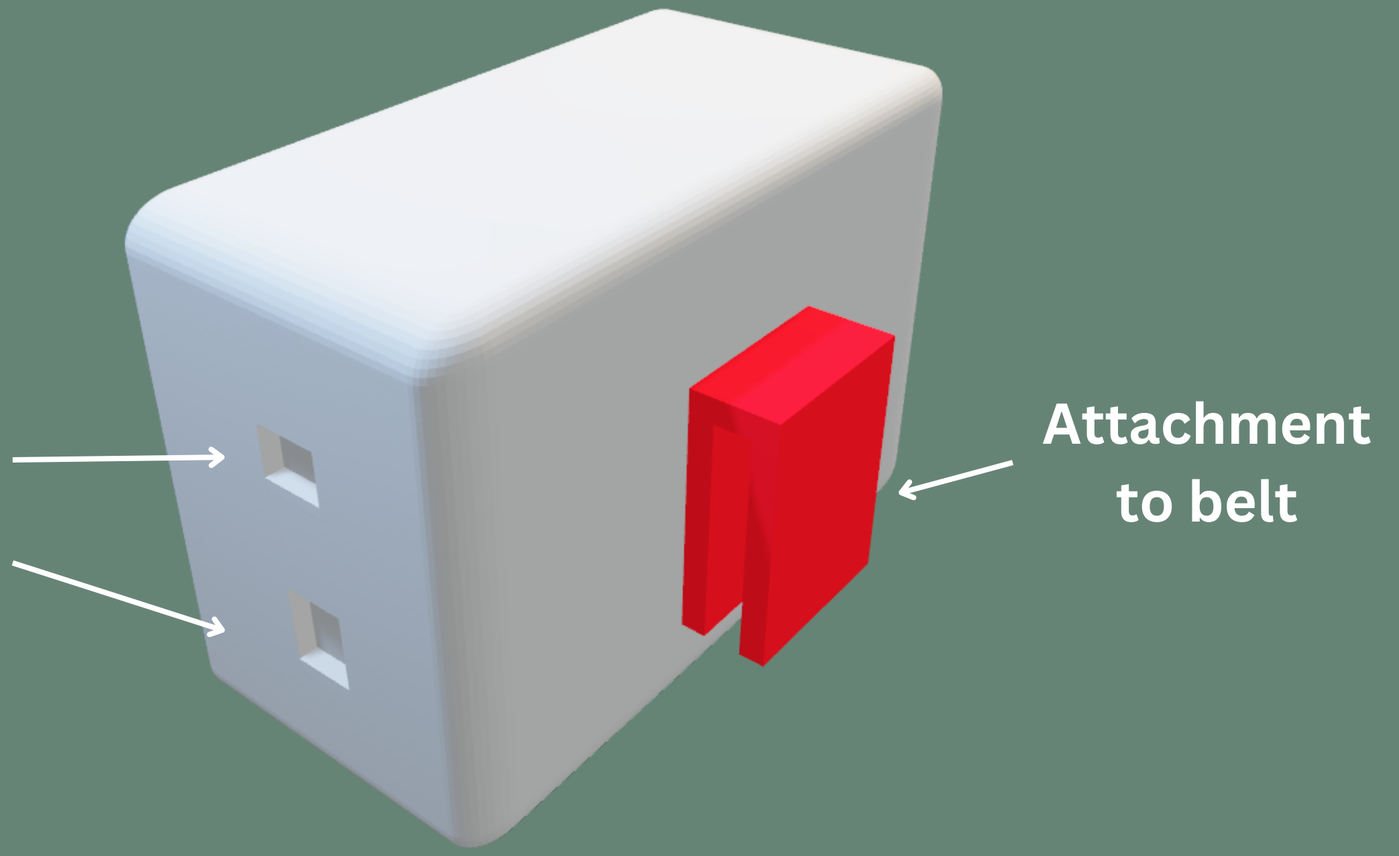
# DESIGN

# 3D MODEL (FRONT)

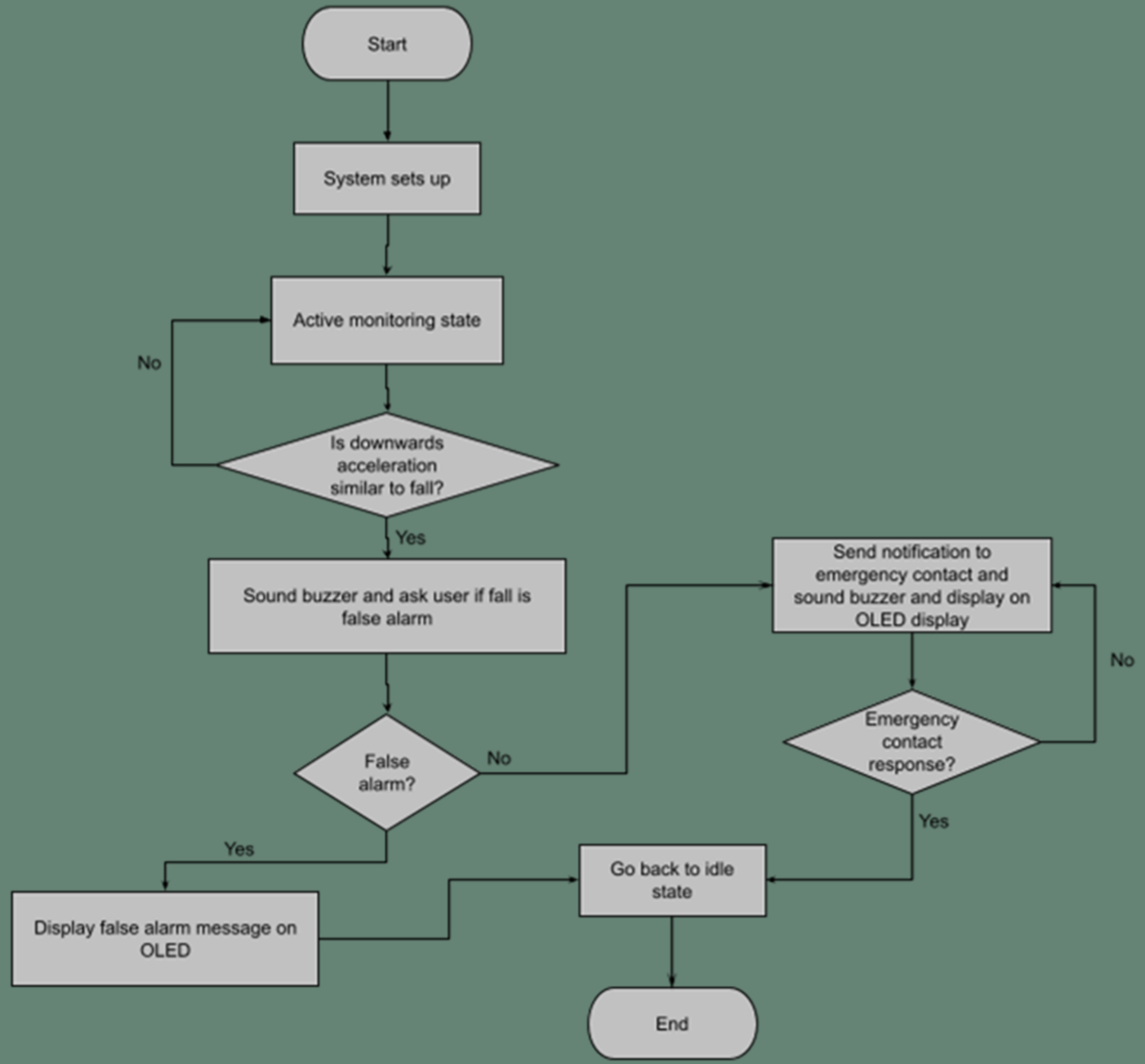



| Measurement | Value |
|---|---|
| Height | **80mm** |
| Width | 60mm |
| Length | 115mm |

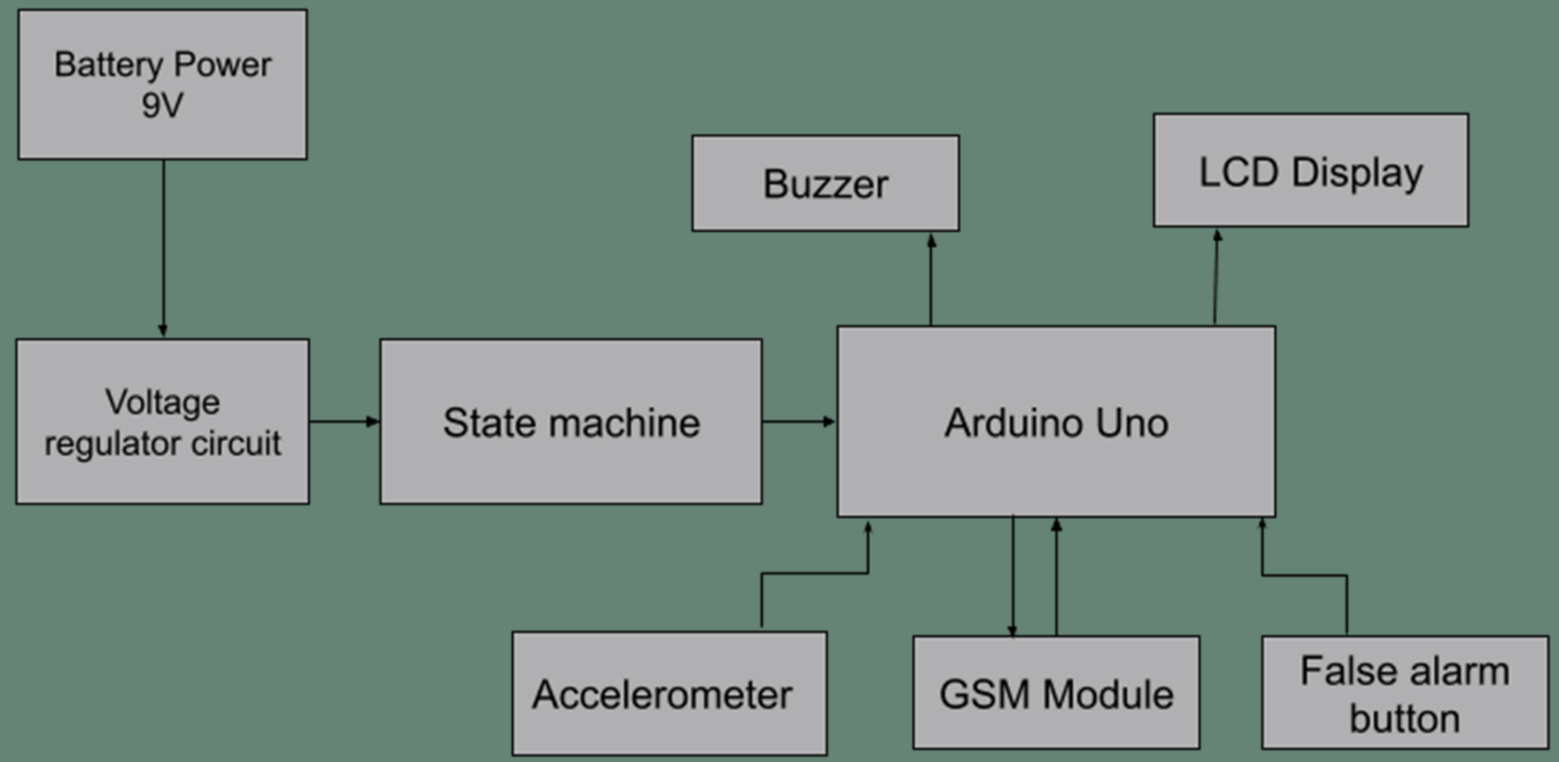
# 3D MODEL (BACK)



# FLOWCHART


Start
System sets up
Active monitoring state
No
Is downwards acceleration similar to fall?
Yes
Sound buzzer and ask user if fall is false alarm
False alarm?
No
Send notification to emergency contact and sound buzzer and display on OLED display
Emergency contact response?
No
Yes
Yes
Display false alarm message on OLED
Go back to idle state
End

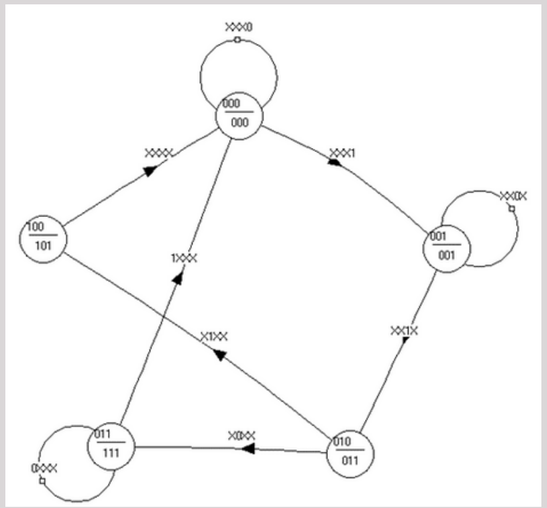
# BLOCK DIAGRAM



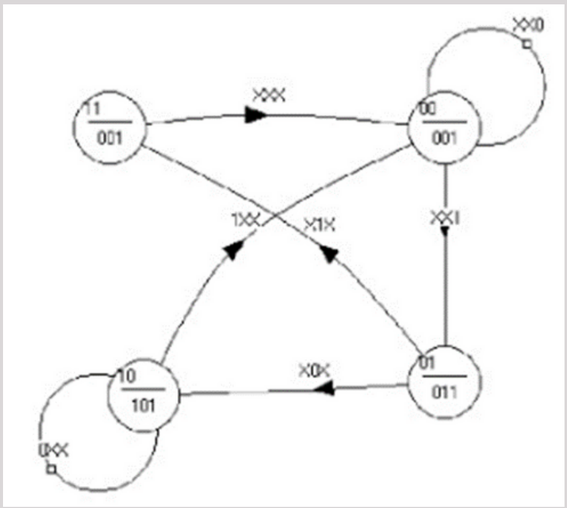
# MODIFICATIONS FROM ORIGINAL DESIGN

# Changes to Original State Machine Design

- Removed the Idle State
- Removed the activation button




Initial State Machine




Final State Machine

# Changes to Original Budget

- Removed logic gate ICs (states coded in)
- Removed NEO-6M GPS module
- Removed voltage regulator and NE555 timer
- Changed back from Arduino Nano to Arduino Uno

| Component | Amount | Total Price (AED) |
|---|---|---|
| Arduino Uno | 1 | 50 |
| MPU6050 Accelerometer | 1 | 32 |
| SIM900A GSM Module | 1 | 54 |
| I2C LCD display | 1 | 32 |
| | Total | 168 |

# Current Prototype

# MARKETING

# TARGET CUSTOMERS

1. Elder care facilities and nursing homes
2. Home health care providers
3. Senior living communities and retirement homes
4. Rehabilitation centers for patients recovering from falls or similar injuries
5. Individuals or families with elderly loved ones who want to ensure their safety and wellbeing

# Marketing Strategy For Innovation Fair

| Already Set Up | Needs to be done |
| --- | --- |
| • Instagram Page for our business<br>• Poster for our stall<br>• Short animated video of the product in action | • Set up stall for Innovation Fair<br>• Do demonstration of product for potential customers<br>• Make brochure or leaflet for potential customers |

# Rate of return and Net present value

| | Amount (AED) |
|---|---|
| **Total outflow** | 259,000 |
| **Cash inflow per year** | 400 x 200 = 80000 |
| **Rate of return** | 80000/259000 = 30.9% |
| **Payback period** | 3.24 years = 3 years 2 months |

| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Total |
|---|---|---|---|---|---|---|---|
| Outflow | 259000 | | | | | | -259000 |
| Inflow | | 80000 | 80000 | 80000 | 80000 | 80000 | 400000 |
| Net inflow | -259000 | 80000 | 80000 | 80000 | 80000 | 80000 | 141000 |

$$NPV = I_0 + \sum_{t=1}^{n} \frac{F_t}{(1+k)^t} = -259000 + \sum_{t=1}^{5} \frac{80000}{(1.15)^t} = \underline{15138.53\ AED}$$

# Thank you for listening