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#include <Adafruit_GFX.h>
#include <Adafruit_GrayOLED.h>
#include <Adafruit_SPITFT.h>

#include <Adafruit_SSD1306.h>

#include <Wire.h>
const int trigPin = 12;
const int echoPin = 13;
const int buzzerPin = 8;
const int redPin = 3;
const int greenPin = 5;
const int bluePin = 6;
const int safeDistance = 100;
const int warningDistance = 40;
    long duration;
    float distance;
#define SCREEN_WIDTH 128
#define SCREEN_HEIGHT 64
Adafruit_SSD1306 display(SCREEN_WIDTH, SCREEN_HEIGHT, &Wire, -1);

void setup() { // Initialize LCD
if(!display.begin(SSD1306_SWITCHCAPVCC, 0x3C));
for(;;);
display.clearDisplay();
display.setTextSize(2);
display.setTextColor(SSD1306_WHITE);
display.setCursor(0,0);
display.println("BOOTING...");
display.display();
delay(1000);
Serial.begin(9600);
    pinMode(trigPin, OUTPUT);
    pinMode(echoPin, INPUT);
    pinMode(buzzerPin, OUTPUT);
    pinMode(redPin, OUTPUT);

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    pinMode(greenPin, OUTPUT);
    pinMode(bluePin, OUTPUT);
}

void checkDistance() {

    digitalWrite(trigPin, LOW);
    delayMicroseconds(2);
    digitalWrite(trigPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigPin, LOW);
    duration = pulseIn(echoPin, HIGH);
    distance = duration / 74 / 2;
    delay(10);
    Serial.println(distance);
}

void setColor(int red, int green, int blue) {
    red = 255 - red;
    green = 255 - green;
    blue = 255 - blue;
    analogWrite(redPin, red);
    analogWrite(greenPin, green);
    analogWrite(bluePin, blue);
}

void loop() {
    checkDistance();

    display.clearDisplay();
    display.setTextSize(2);
    display.setCursor(0,0);

    display.print("Dist: ");
    display.print(distance);
    display.println("cm");

{
    if (distance > 40) { // SAFE

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        display.println("SAFE");
        setColor(0, 204, 0); //pure green
        digitalWrite(buzzerPin, LOW);
        delay(200); // Small delay for stability }
    }

    else if ((distance < 40) && (distance >15)) { // WARNING
        display.println("Status: WARN ");
        setColor(125,153,102); //yellow
        digitalWrite(buzzerPin, LOW);
        delay(200); // Small delay for stability
    }

    else if ((distance <15) && (distance >5)){ // INTRUDER
        display.println("Status: ALERT ");
        setColor(180, 102, 102); //red
        digitalWrite(buzzerPin, HIGH);
        delay(200);
    }

    else if (distance <5) { //DANGER
        display.println("Status: ALERT ");
        setColor(180, 102, 102); //red
        delay(1000);
        setColor(180, 102, 102); //red
        delay(1000);
        digitalWrite(buzzerPin, HIGH);
    }
}
}

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