MP3 sound control

This simple project will use a mp3 player, a simple, recycled speaker, and arduino and a HLK-LD2420 human motion sensor to play sounds when a human walks past the device.

sketch code:

```
/*
 * Arduino Sketch for Motion-Activated MP3 Playback, Servo Control, and Display
 *
 * This code interfaces with an LD2420 MMWave Sensor to detect motion. Upon
 * detecting motion, it commands a DF Player Mini to play an MP3 file, controls
 * an MG996R servo motor to rotate 45 degrees, and updates an SSD1306 I2C
 * display. The system uses an Arduino Nano as the main controller.
 */

#include <SoftwareSerial.h>
#include <DFRobotDFPlayerMini.h>
#include <Servo.h>
#include <Wire.h>
#include <Adafruit_SSD1306.h>

// Pin definitions
#define SERVO_PIN A7
#define DFPLAYER_RX_PIN A2
#define DFPLAYER_TX_PIN A3
#define SENSOR_PIN A6
#define OLED_RESET -1
#define SCREEN_WIDTH 128
#define SCREEN_HEIGHT 64

// Create objects
SoftwareSerial mySoftwareSerial(DFPLAYER_RX_PIN, DFPLAYER_TX_PIN);
DFRobotDFPlayerMini myDFPlayer;
Servo myServo;
Adafruit_SSD1306 display(SCREEN_WIDTH, SCREEN_HEIGHT, &Wire, OLED_RESET);
```

```
void setup() {
  // Initialize serial communication
  mySoftwareSerial.begin(9600);
  Serial.begin(9600);

  // Initialize DFPlayer
  if (!myDFPlayer.begin(mySoftwareSerial)) {
    Serial.println("Unable to begin DFPlayer Mini");
    while (true);
  }
  myDFPlayer.volume(20);  // Set volume level (0-30)

  // Initialize Servo
  myServo.attach(SERVO_PIN);
  myServo.write(0);  // Set initial position

  // Initialize sensor pin
  pinMode(SENSOR_PIN, INPUT);

  // Initialize display
  if (!display.begin(SSD1306_I2C_ADDRESS, 0x3C)) {
    Serial.println("SSD1306 allocation failed");
    for (;;);
  }
  display.display();
  delay(2000);
  display.clearDisplay();
  display.setTextSize(1);
  display.setTextColor(SSD1306_WHITE);
  display.setCursor(0, 0);
  display.println("System Ready");
  display.display();
}

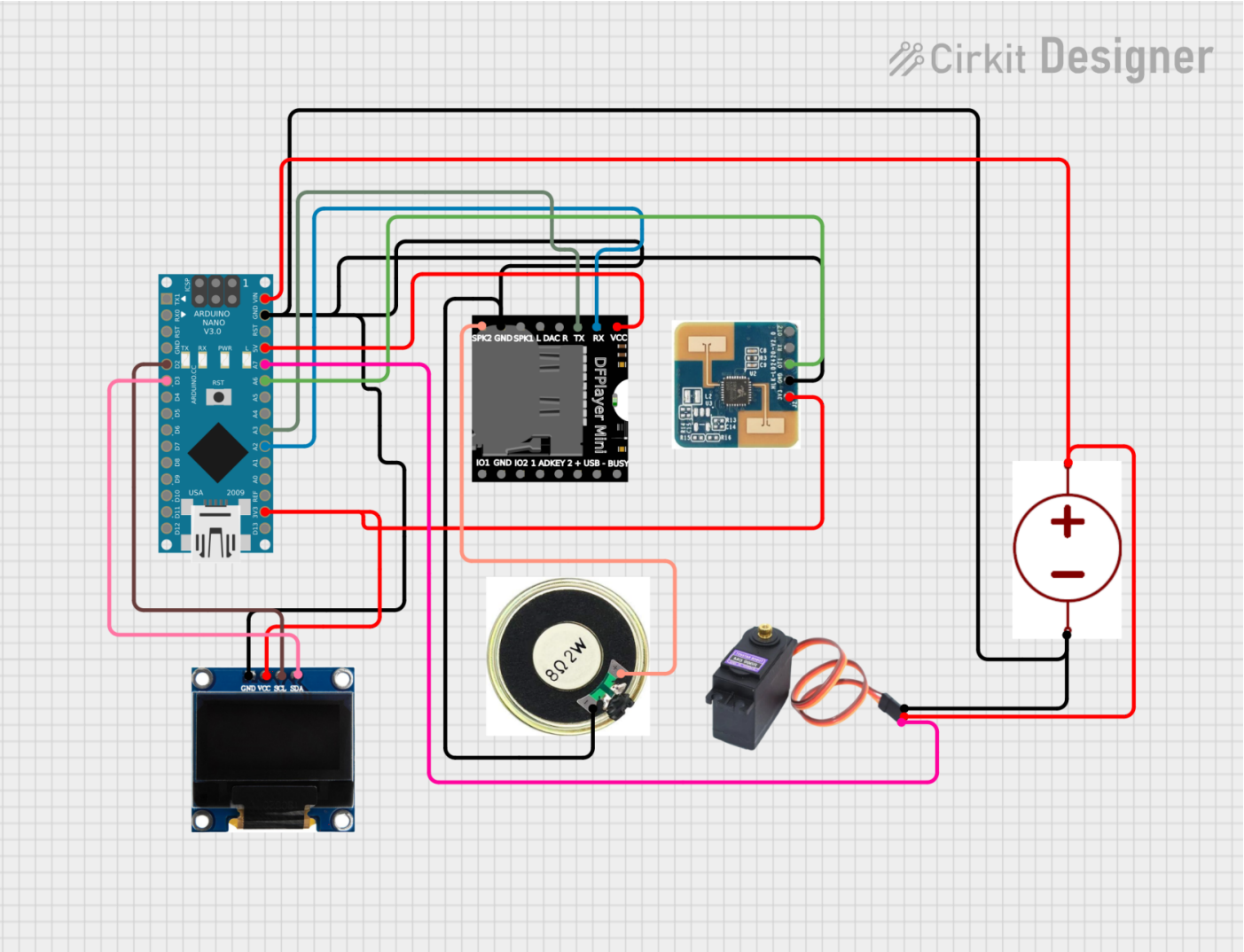
void loop() {
  // Check for motion detection
  if (digitalRead(SENSOR_PIN) == HIGH) {
    // Play MP3 file
    myDFPlayer.play(1);  // Play the first track
```

```
    // Rotate servo 45 degrees
    myServo.write(45);
    delay(1000);  // Wait for 1 second

    // Return servo to initial position
    myServo.write(0);
    delay(1000);  // Wait for 1 second

    // Update display
    display.clearDisplay();
    display.setCursor(0, 0);
    display.println("Motion Detected!");
    display.display();
    delay(2000);
    display.clearDisplay();
    display.setCursor(0, 0);
    display.println("System Ready");
    display.display();
  }
}
```

Basic Wiring



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