**Power Generation from Footsteps Using Piezoelectric Sensors**

**Project Overview**

This project demonstrates how to generate electrical power from footsteps using piezoelectric sensors. The system captures mechanical energy from footsteps and converts it into electrical energy, which can then be used to power small devices or stored for future use. This innovative approach leverages the potential of renewable energy sources in everyday activities.

**Features**

* **Piezoelectric Energy Conversion:** Utilizes piezoelectric sensors to convert mechanical energy from footsteps into electrical energy.
* **Energy Storage:** Captures and stores generated energy for later use.
* **Arduino Integration:** Uses an Arduino microcontroller to interface with the sensors and manage the energy conversion process.
* **Real-Time Data Monitoring:** Monitors and displays the generated energy in real-time.

**Components**

* Piezoelectric sensors
* Arduino microcontroller
* Rectifier circuit
* Energy storage components (e.g., capacitors or batteries)
* LCD display for real-time monitoring
* Connecting wires and a breadboard

**Setup and Installation**

1. **Hardware Assembly:**
   * Connect the piezoelectric sensors to the rectifier circuit to convert AC voltage to DC.
   * Connect the output of the rectifier to the energy storage components.
   * Interface the Arduino with the sensors to monitor the generated voltage and control the energy flow.
   * Connect the LCD display to the Arduino to show real-time data.
2. **Arduino Code:**
   * Download the attached Arduino code file.
   * Open the Arduino IDE and upload the code to your Arduino board.
3. **Libraries Required:**
   * Ensure you have the necessary libraries installed in your Arduino IDE for the LCD display and any other components.

**Usage**

1. **Step on the Piezoelectric Sensors:**
   * Place the piezoelectric sensors on a surface where they can capture footsteps.
   * As you step on the sensors, mechanical energy will be converted into electrical energy.
2. **Monitor the Generated Energy:**
   * The LCD display connected to the Arduino will show real-time data on the energy being generated and stored.
3. **Utilize the Stored Energy:**
   * The stored energy can be used to power small electronic devices or saved for later use.