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# Advanced Footsteps Power Generation System with RFID

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**ABSTRACT:-** Utilization of power turns to be necessary for every work in today's world. To comfort our daily routines the devices are used in large numbers. The benefits of roadway energy harvesting systems are potentially excellent. Energy harvesting is defined as capturing minute amounts of energy from one or more of the surrounding energy resources. To generate the power through footsteps as a source of renewable energy sources that we can obtain while walking on a certain arrangement like stepping foot on piezoelectric tiles. an advanced footstep power generation system proposed here uses the piezoelectric sensors. To generate a voltage from footstep the piezo sensors are mounted below the platform. To generate maximum output voltage the sensors are placed in such an arrangement. This is then forwarded to our monitoring circuitry. The circuit is the microcontroller based monitoring circuit that allows users to monitor the charges and voltage a connected battery to it and this power source has many applications. It also displays the charge generated by our footstep and displays it on an LCD. Also, it consists of a USB mobile phone charging point where a user may connect cables to charge the mobile phone from the battery charge. The current is distributed using (radio-frequency identification) RFID cards so that only an authorized person can use the generator for charging. Thus we charge a battery using power from footsteps, display it on LCD using a microcontroller circuit and allow for mobile charging through the setup. Our project model cost is effective and easy to implement and also it is green and not harmful to the environment.

**KEYWORDS:** Piezoelectric sensor, renewable resources, Arduino UNO, battery, LCD, RFID, USB.

## I. INTRODUCTION

Energy is nothing but the ability to do work. Power has turned into help for the human populace nowadays. Its request is expanding rapidly. In day to day, life innovation needs an immense measure of electrical power for its different activities. Power generation is the single largest wellspring of contamination in the world. Due to which numerous energy resources are produced and wasted. Electricity is generally generated from resources like water, wind, coal, etc. for generating the electricity from these resources development of big plants that are needed having high maintenance and high cost. In like manner, it is the target of the present development to give the technique for electrical power generation from which regularly expanding human populace that does not adversely affect the natural resources. This innovation depends on a rule called the piezoelectric effect impact, in which certain materials can develop an electrical charge from having weight, the strain applied to them. The piezoelectric effect is the effect of specific materials to generate the electric charge in response to applied mechanical stress on it.

The effect in which mechanical vibrations, pressure or strain applied to the piezoelectric material are converted into electrical form. Piezoelectricity alludes to the capacity of a few materials to produce an electric potential in light of connected weight. The inserted piezoelectric material can give the enchantment of the changing overweight applied by moving individuals into the electric current, which is stored in a battery and further distributed using RFID cards.

## II. RELATED WORK

The projects on energy harvesting systems using piezoelectric sensors for generating electricity from footsteps. One such project is the "Smart Floor: A Practical Energy Harvesting System for Human-Powered Sensors" by researchers at the University of Virginia, which uses piezoelectric tiles to generate electricity from human foot traffic.

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Another similar project is the "Footstep Power Generation System Using Piezoelectric Sensor for Rural Areas" by researchers at the National Institute of Technology, India. This project also uses piezoelectric sensors to generate electricity from footstep pressure and aims to provide power to rural areas where access to electricity is limited.

Furthermore, there have been initiatives to implement energy harvesting systems in public areas such as shopping malls, train stations, and airports. For instance, the Tokyo Railway Station has installed energy harvesting floors that use piezoelectric technology to generate electricity from the footsteps of commuters.

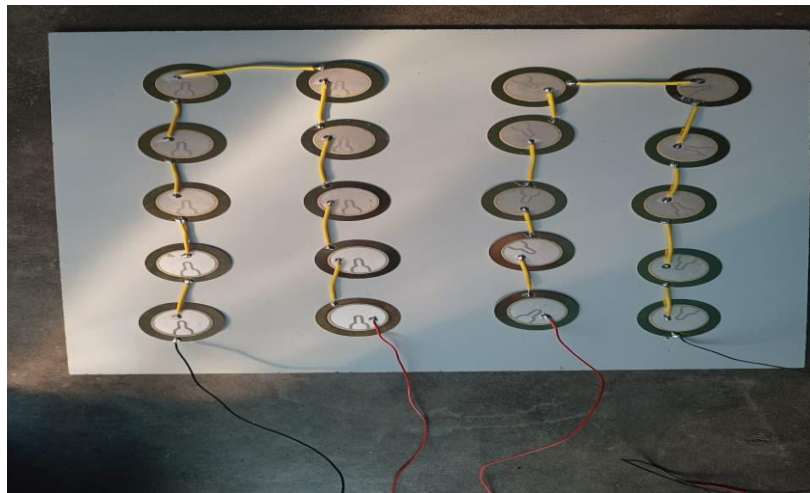
Overall, there is a growing interest in energy harvesting systems that utilize piezoelectric sensors, and research in this field is ongoing.

### III. METHODOLOGY

The system designed here, is relatively efficient and also affordable. The advantage of our model is that the system provide charging to the user within a limited time as allocated to the system software. Our methodology for the project: Creating an idea for design and construction of a Advanced Footstep Power Generation using RFID for Charging. Designing a block diagram and circuit diagram to know which components to be connected/implemented in hardware. Implementing all the components according to circuit diagram and programming the Arduino by using Arduino IDE to control the whole system. Assembling all the blocks in a board and to run the system and for checking purposes. Finally, to get the work done such as mobile phone charging, this is main task/output of the proposed system.

### IV. EXPERIMENTAL RESULTS

- Piezoelectric sensors – Parallel Connection :

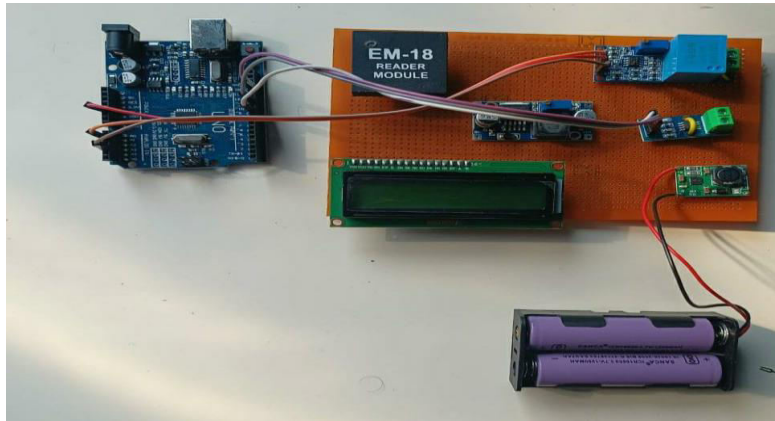


(a)

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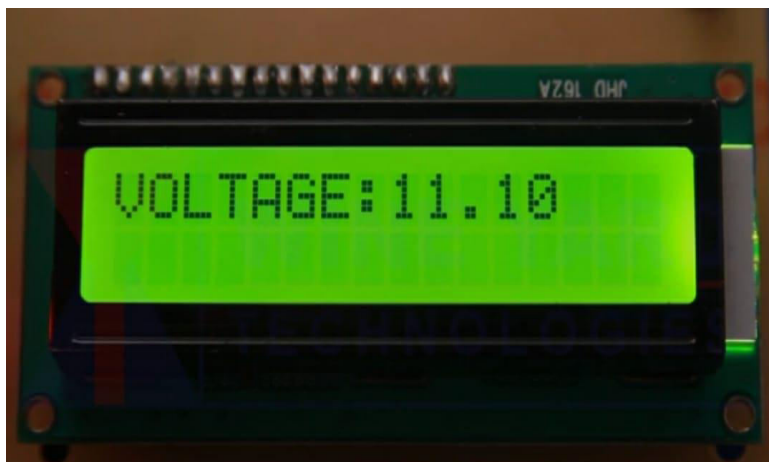
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- The Result is Displayed :



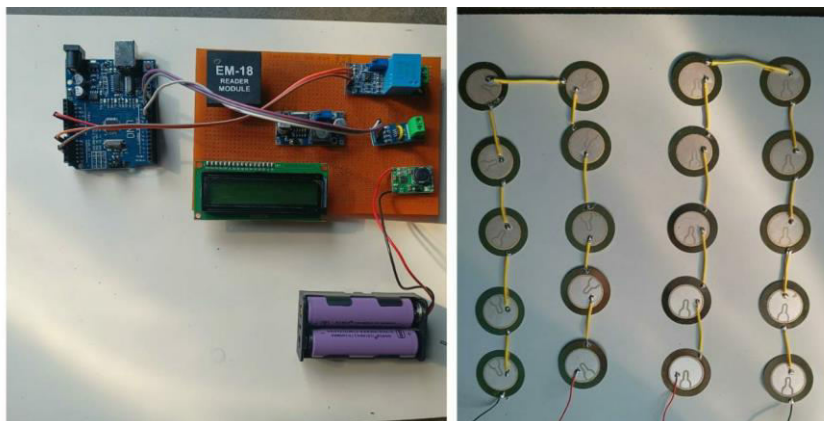
(b)

- LCD Output :



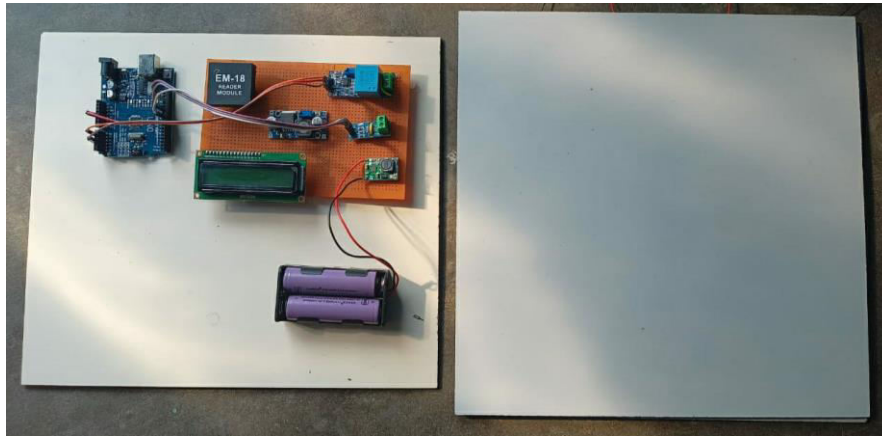
(c)

- Power is generated in the piezoelectric sensor and given to the receiver side :



(d)

- Foot steps power generation system Overview :



(e)



(f)

## V. CONCLUSION

The project undertaken is effectively tried and actualized which is the best conservative, reasonable vitality answer for average citizens of our country. This can be utilized for some applications in rustic zones where control accessibility is less or thoroughly truant. As India is a creating nation where vitality administration is a major test for the gigantic populace. By utilizing this task we can drive both A.C. and besides, D.C loads as indicated by the power we connected on the piezoelectric sensor. This technique gives an effective power generation in very populated nations as it diminishes control request without contamination. As a reality, just 11% of sustainable power source adds to our essential vitality. On the off chance that this undertaking is sent at that point not just, we can conquer the vitality emergency issue yet, besides make a solid worldwide ecological change.

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