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# Advanced Footstep Power Generation System

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**Abstract:** *The demand for sustainable and renewable energy sources has led to increasing interest in harnessing human kinetic energy as a potential power source. This abstract presents an overview of an advanced footstep power generation system designed to harvest energy from the footsteps of individuals. The proposed system utilizes piezoelectric materials integrated into a specially designed flooring mechanism. As a person walks or runs on the floor, the mechanical stress exerted by their footsteps is converted into electrical energy through the piezoelectric effect. This energy is then stored or directly utilized for various applications, offering a promising solution for powering small-scale electronic devices or supplementing existing power grids. The proposed advanced footstep power generation system offers numerous benefits, including its scalability, sustainability, and compatibility with existing infrastructure. By integrating this technology into public spaces, such as airports, train stations, or shopping malls, a significant amount of energy can be harvested from the collective footsteps of people, reducing dependence on fossil fuels and contributing to a greener and more sustainable future. To maximize the efficiency of energy harvesting, advanced control algorithms and monitoring systems are implemented. These systems continuously monitor footstep patterns, energy generation, and power consumption, allowing for adaptive control and optimization of the power generation process. Additionally, the system incorporates user-friendly interfaces to provide real-time feedback and promote user engagement by displaying energy generation statistics and environmental impact data.*

**Keywords:** Piezoelectric sensors; microcontroller; energy storage units; LCD

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