

ML Assisted Foot Step Power Generation using Piezoelectric Sensors

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Abstract: *In our rapidly evolving world, the escalating demand for energy coupled with the finite nature of traditional resources underscores the imperative for sustainable, pollution-free, and inexhaustible energy solutions. This paper introduces a pioneering approach to harnessing the kinetic energy expended during human locomotion through the innovative use of piezoelectric sensors. Leveraging the piezoelectric effect, these sensors efficiently convert mechanical energy generated by footstep pressure into electrical energy, thereby mitigating wastage and addressing the increasing energy needs. Our model advocates for the deployment of an extensive sensor network along footpaths, complemented by an RFID-based mobile charging system for enhanced convenience and functionality. Moreover, we introduce an innovative method integrating Machine Learning (ML) techniques to enhance power generation efficiency through intelligent modulation of piezoelectric element resistance. Additionally, we leverage ML algorithms to enhance the requisite daily footstep count necessary to fulfill the energy demands of specific areas. This proactive approach ensures optimal deployment of footstep power generation devices based on actual foot traffic patterns. Our research underscores the significance of this technology in the context of urban energy sustainability, particularly in densely populated regions like China and India, where foot traffic is abundant. By harnessing mechanical energy and leveraging advanced ML algorithms, our approach promises to revolutionize energy harvesting paradigms, paving the way for greener and more efficient power generation systems*

Keywords: God's Boon, Real Heroes and Heroines, Nation Builders, Citizen