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# IMPLEMENTATION OF AN EFFICIENT ENERGY GENERATING SYSTEM USING HUMPS WITH AUTOMATIC STREET LIGHT USING IOT

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## Abstract

These days renewable power source and energy recuperation are viewed as the most proficient methodologies to lessen the money related and natural disadvantages of the over the top usage of fossil fuel. In any case, the vast majority of the examinations have been focusing on solar energy, wind energy and wave energy. Keeping in mind the end goal to take care without bounds power demand without hurting the nature, it is important to concentrate more on renewable power source and capricious hotspots for electricity generation. The usage of waste energy can likewise be useful for diminishing reliance on ordinary hotspots for power age. In this system, the electricity generation by using the active energy of moving vehicles over speed breaker is exhibited. The proposed framework is intended to extricate the motor energy of moving vehicles which changes over into mechanical energy through rack and pinion instrument. The mechanical energy drives the pole which goes about as prime mover for DC generator. A proto kind model of the proposed framework has introduced in this undertaking which needs alteration for substantial scale power age.

**Keywords:** Internet of Things, IOT, Hybrid Energy Harvesting, Wireless Networks, Smart Cities.

## Introduction

Enhanced management of cities brings a new paradigm, named as Smart Cities , which achieves environment sensing and better utilization of city resources. Particular application areas of Smart Cities are intelligent transport systems, Smart Grid, Smart Home, smart agriculture and structural health. The realization of them requires utilization of cutting edge technologies such as the Internet of Things (IoT). Sensing and controlling features of the IoT are key enablers of this realization. Using IoT, the physical world can be observed, and information related to the surroundings is gathered, such that the physical world is digitized. Using IoT technology, we can access to this digitized world via the Internet connection, and move one step closer to the Smart City concept. In order to achieve continuous monitoring and control, an auxiliary or even a completely distinct power source should be equipped to the sensors.

However, even this option may or may not be applicable in some cases mostly due to size constraints or design restrictions. Hence, energy harvesting (EH) methods come into prominence to alleviate the problems of energy constrained wireless networks by exploiting a stray source or converting energy from one form to another. There are numerous potential alternatives to collect energy, but their availability depends on the environmental variables, ambient parameters, or other time-varying and highly random external factors. The ongoing limits on the power extraction capabilities force wireless devices for an energy trade-off between proper system operation and the desired network lifetime, whereby an upper bound is placed on the communication reliability.

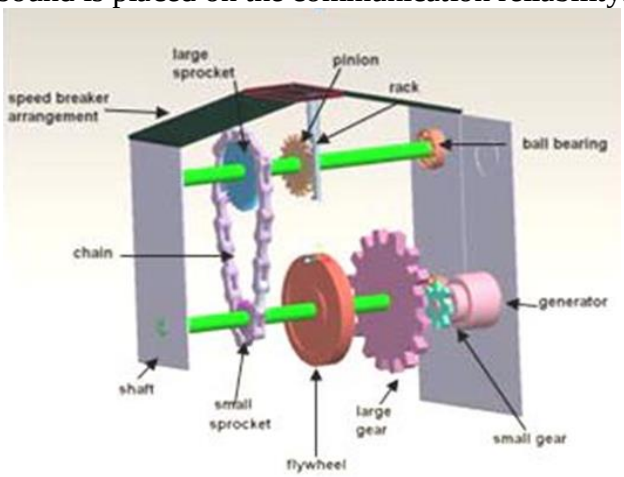


**Fig.1 Functional Arrangement of Speed Braker**

Due to this reason, hybrid energy scavenging approaches possess a great potential to extend the lifetime of wireless devices by operating in a complementary manner. A power supply fed by multiple available sources will eventually enhance the overall functionality, reliability, and efficiency of both the system and communication. The hybrid EH wireless smart nodes sense the parameters of interest, process the collected data, and report the resulting information to a base-station and/or coordinator and/or gateway over an Internet connection where the conditions of application area are monitored, stored, and relevant authorities are alerted.

Energy modeling is crucial in any harvesting mechanism, as optimal transmission policy directly depends on the energy model. Hybrid EH enhances energy availability, and therefore, improves the energy model of the system. Moreover, in order to survive in the most dire circumstances of Smart Cities, data management protocols, specific to Internet of Hybrid Energy Harvesting Things (IoHEHT) are needed. Furthermore, hybrid EH proposal for IoT-enabled Smart Cities requires novel approaches in each network layer to overcome the challenges posed by IoT and Smart Cities to enable seamless operation. Hence, we lay the foundations of battery-free IoHEHT networks. In this paper, we first present existing EH techniques, and then propose a new EH framework for IoT paradigm. It is called hybrid EH, and copes with randomness of harvestable resources by utilizing different EH methods together. Furthermore, an applicable design for a hybrid EH sensor system is presented. We also model energy and data, and mathematically study the decrease of harvestable energy variance by the hybrid approach.

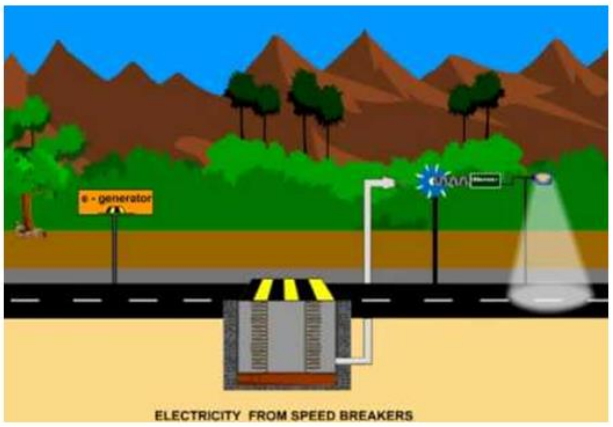


**Fig.2 Electricity Generation from Speed Breaker**

**Problem Summary**

In Existing system there is no efficient method of utilization of energy generation. The human work is needed for maintaining the park zones for watering purposes. To provide an efficient and automatic method, we are going to deal with the new techniques. In proposed system while moving, the vehicles possess some kinetic energy and it is being wasted. This kinetic energy can be utilized to produce power by using a special arrangement called Power Hump. It is an Electro-Mechanical unit. The power generation and storage was done by utilize mechanical technologies and electrical techniques.

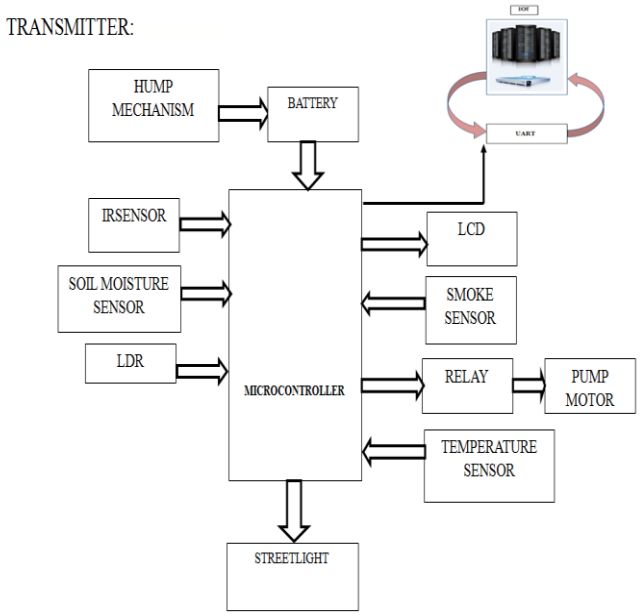


**Fig.3 Block Diagram - Transmitter End**

Power Hump appears to be dome like structure.Whenever the vehicle is allowed to pass over the dome it gets pressed downwards and electricity is produced and stored to the battery. The generated energy is stored in a battery and used for various purposes. We also utilize the concept of IOT for continuously monitoring the soil moisture in the park zones. The temperature sensor here is used to

indicate the temperature in case any fire occurs. Whenever the soil moisture is dry we can control the pump motor manually through IOT or automatically for watering purpose in the park zones with the water source present inside the parks.

The utilized energy is also used to turn ON Street light. The street lights are turned ON only when a person or vehicle is detected in a zone. This increases the battery efficiency and effective utilization of the renewable energy. The smoke sensor is used to monitor the smoke in an area. Whenever the smoke is detected, the update is provided to IOT. Based on smoke sensor value, we can control respective loads connected. The status of various sensors is displayed on the LCD.

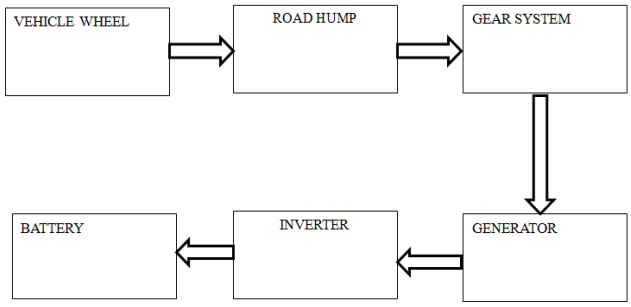


**Fig.4 Power Generation Module**

## Past System Analysis

In existing system many researchers trying to produce the robot based on mind sensors and some of them achieved it, but the only lacking is to achieve the accuracy and sensitivity. As well as all the existing brain controlled robots are wired robots not in wireless manner, we can control the robot. So the past researchers feels lots of difficulties in proposal and producing only partial outcomes during implementations.

## Future Enhancement

The proposed were conducted with and without hearing and visual noise to find out the noise influence in the signal. The brain–computer is used to monitor the brain waves of the human and drive the robot as per the thought of the user. The advantage of this solution is that the EEG pulse located on the user's head and the user can wirelessly control the robot. The data read by the EEG sensors are transmitted to the robot section using the Zigbee transmitter. The Zigbee value receives the signal and drives the robot accordingly. The status of the robot is read with the help of LCD.

## Literature Survey

In the year of 2013, the authors "O. Vermesan and P. Friess" proposed a paper titled "Internet of Things Strategic Research and Innovation Agenda", in that they described such as: the summary expects to give a wide outline of different subjects of the Internet of Things (IoT) from the innovative work needs to empowering advances, design, security, protection, interoperability and mechanical applications. It is planned to be a remain solitary book in an arrangement that covers the Internet of Things exercises of the IERC - Internet of Things European Research Cluster - from innovation to universal participation and the worldwide "condition of play". The book expands on the thoughts set forward by the European Research Cluster on the Internet of Things Strategic Research and Innovation Agenda and presents perspectives and cutting edge comes about on the difficulties confronting the examination, improvement and sending of IoT at the worldwide level. Today we see the reconciliation

of Industrial, Business and Consumer Internet which is uniting the Internet of People, Internet of Things, Internet of Energy, Internet of Vehicles, Internet of Media, Services and Enterprises in framing the foundation of the advanced economy, the computerized society and the establishment for the future learning and development based economy. These improvements are supporting answers for the developing difficulties of general wellbeing, maturing populace, natural insurance and environmental change, the preservation of vitality and rare materials, upgrades to wellbeing and security and the continuation and development of financial flourishing. Entrance of cell phones and advances in nanoelectronics, digital physical frameworks, remote correspondence, programming, and Cloud registering innovation will be the fundamental drivers for IoT improvement. The IoT commitment is found in the expanded estimation of data made by the quantity of interconnections among things and the change of the handled data into information shared into the Internet of Everything. The associated gadgets are a piece of biological systems interfacing individuals, procedures, information, and things which are imparting in the Cloud utilizing the expanded stockpiling and processing power while endeavoring to institutionalize correspondence and metadata. In this specific situation, the up and coming age of Cloud registering innovations should be sufficiently adaptable to scale self-rulingly, sufficiently versatile to deal with continually changing associations and sufficiently strong to face the tremendous streams of information that will happen. In 2025, examiners estimate that there will be six gadgets for each human on the planet, which implies around 50 billion more associated gadgets throughout the following 12 years. The Internet of Things showcase is associated with this expected gadget development from modern Machine to Machine (M2M) frameworks, savvy meters and remote sensors. Web of Things innovation will produce new administrations and new interfaces by making shrewd situations and brilliant spaces with applications running from Smart Cities, Smart Transport, Buildings, Energy, Grid, to Smart Health and Life.

In the year of 2015, the authors "F. Akhtar and M. H. Rehmani" proposed a paper titled "Energy replenishment using renewable and traditional energy resources for sustainable wireless sensor networks: A review", in that they described such as: as of late there has been a few innovative advances in Wireless Sensor Networks (WSN), however vitality still remains a vital asset. The measure of accessible vitality directly affects the execution, usefulness and lifetime of WSN. Being bound by cost and size, sensor hubs are typically outfitted with restricted measure of vitality and along these lines requires a substitution of batteries periodically. Be that as it may, substitution may not generally be attainable choice and in a few situations may even be restrictive. This shows the requirement for more reasonable arrangements, these include producing vitality at the sensor hubs or have it conveyed to them i.e., vitality reaping or remote vitality exchange. The target of this paper is triple: first we display a study on potential sustainable power source assets alongside their qualities and applications in WSN. Second, this investigation likewise portrays different battery energizing systems and their applications as for WSN. At long last, we talk about imposing issues, difficulties and future research bearings.

In the year of 2017, the authors "O. Cetinkaya and O. B. Akan" proposed a paper titled "Electric-field Energy Harvesting in Wireless Networks", in that they described such as: Electric-field vitality reaping can be considered as a developing and promising option for self-reasonable cutting edge WSNs. Not at all like regular gathering techniques that depend on encompassing factors, EFEH gives more solid and sturdy activity as it is operable with any voltage-connected conductive material. Along these lines, it is more qualified for cutting edge throughput and applications requiring a specific QoS. In this article, we present this recently developing WSN worldview, and center around empowering EFEH innovation for brilliant matrix designs, for example, home, constructing, and close region systems, where the field force is generally low. To this end, a down to earth technique and a general utilize execution system have been produced for low-voltage applications by with respect to convincing plan

issues and testing source shortage. The proposed twofold layer collector show is tentatively assessed. Its execution as far as usage adaptability, sensor lifetime, and correspondence throughput is explored. What's more, ebb and flow challenges, open issues, and future research headings are talked about for the outline of more improved EFEH remote systems.

## Experimental Results

The following figure illustrates the Web Server view of the proposed system.

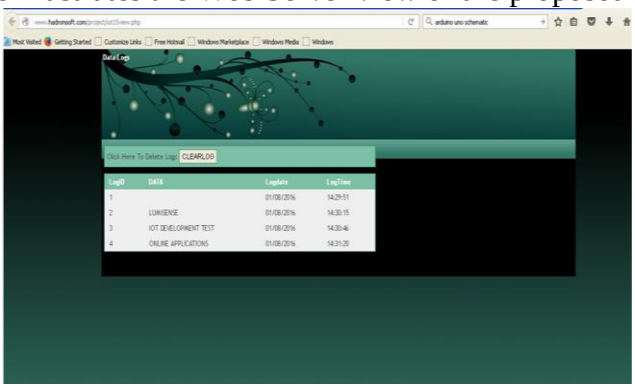

**Fig.5 Web Server**

The following figure illustrates the Online Monitoring and Device Control of the proposed system.


**Fig.6 Online Monitoring and Device Control**

## Conclusion

Hybrid EH is imagined to assume a key part in figuring it out IoT for Smart Cities. This technique clears a path for lightening the imperatives of existing reaping strategies. We accept that this examination will widen the extent of EH methods, and make the battery-less remote gadgets conceivable in the exact not so distant future. In this work, we study diverse EH strategies also, how to join them, keeping in mind the end goal to acknowledge IoHEHT. We examine open issues in IoHEHT interchanges and propose IoHEHT particular equipment. IoHEHT can possibly totally reduce the batteries without lessening the framework execution. Additionally, on account of the Hybrid EH, IoHEHT is a standout amongst other contender to send in unfriendly conditions.

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