



Data Security Enhancement Using Blockchain & MongoDB

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ABSTRACT :This project introduces a wireless night lamp designed in the shape of a crescent moon, combining aesthetics with functionality. Title: Wireless Power Transmission Night Lamp with Arduino and Motion Sensors. The objective of this project is to create an energy-efficient and convenient lighting solution for nighttime illumination in various indoor settings. The system employs wireless power transmission technology to eliminate the need for traditional power cords, enhancing user convenience and safety. The core components of the system include an Arduino microcontroller, a wireless power transmitter, a receiver module, and passive infrared (PIR) motion sensors. The Arduino microcontroller serves as the central control unit, orchestrating the operation of the system based on input from the motion sensors. The wireless power transmitter, based on resonant inductive coupling, wirelessly transfers power to the receiver module, which powers the night lamp. The incorporation of motion sensors enables the system to activate the night lamp automatically in response to detected motion within a predefined range. This feature enhances energy efficiency by ensuring that the lamp only illuminates when needed, thus conserving power during periods of inactivity. Additionally, the use of motion sensors enhances user convenience by providing hands-free operation, eliminating the need for manual activation. The implementation of the wireless power transmission night lamp system involves hardware design, including circuitry for power transmission and reception, as well as software development for Arduino programming to control the system's functionality. The system's design emphasizes simplicity, affordability, and reliability, making it suitable for deployment in various indoor environments such as bedrooms and hallways. Overall, this project demonstrates the feasibility and effectiveness of utilizing Arduino microcontrollers and motion sensors to create a wireless power transmission night lamp system. The system's energy efficient operation, convenience, and ease of deployment make it a promising solution for enhancing nighttime illumination in indoor settings while minimizing energy consumption and improving user experience. The project aims to seamlessly blend artistic design with practicality, offering a unique and visually pleasing wireless night lamp that contributes to a cozy and ambient atmosphere in any room. It can be controlled through motion sensor and Arduino controller.

KEYWORDS: Portable, convenient, efficient, wireless, innovative.

INTRODUCTION

Night lamps play a crucial role in providing low level illumination during nighttime hours, offering comfort and safety in various indoor environments such as bedrooms, hallways, and bathrooms. However, traditional night lamps often come with limitations such as the reliance on power cords, manual operation, and the potential for tripping hazards. In response to these challenges, this project introduces a novel approach to nighttime illumination through the design and implementation of a wireless power transmission night lamp system.

The proposed system leverages advancements in wireless power transmission technology, Arduino microcontrollers, and motion sensors to create an innovative lighting solution that enhances user convenience, energy efficiency, and safety. By eliminating the need for conventional power cords and incorporating automated activation based on motion detection, the system addresses the shortcomings of traditional night lamps while introducing new functionalities.

In this introduction, the motivation behind the development of the wireless power transmission night lamp system is discussed, highlighting the significance of improving nighttime illumination in indoor environments. Additionally, an overview of the system's architecture, components, and objectives is provided to set the stage for the detailed discussion in subsequent sections.

The motivation behind the development of the wireless power transmission night lamp system stems from the recognition of the importance of nighttime illumination in enhancing safety, comfort, and convenience in indoor environments. Night lamps serve various purposes, including providing visibility during nighttime activities, aiding navigation in dimly lit areas, and offering reassurance by mitigating fear of the dark. However, traditional night lamps often present practical challenges that can limit their effectiveness and usability. The reliance on power cords introduces potential tripping hazards, especially in environments with limited space or foot traffic. Manual operation requires users to physically switch the lamp on and off, which can be inconvenient, particularly during nighttime hours when visibility is reduced. Moreover, traditional night lamps may not adapt to changing environmental conditions or user preferences, resulting in suboptimal energy consumption and user experience. These limitations underscore the need for a more advanced and versatile nighttime illumination

solution that overcomes the shortcomings of conventional night lamps while introducing new functionalities to enhance usability and efficiency. The wireless power transmission night lamp system integrates several key components and technologies to achieve its objectives. At its core is the Arduino microcontroller, which serves as the central control unit responsible for orchestrating the operation of the system. The system also incorporates a wireless power transmitter, a receiver module, and motion sensors, each playing a crucial role in enabling wireless power transmission and automated activation based on motion detection. The wireless power transmitter utilizes resonant inductive coupling to wirelessly transfer power to the receiver module, eliminating the need for physical connections and enhancing user convenience and safety. The receiver module captures the wirelessly transmitted power and utilizes it to power the night lamp, providing illumination as needed.

Motion sensors, specifically passive infrared (PIR) motion sensors, detect motion within a predefined range and trigger the activation of the night lamp. This automated activation ensures that the lamp only illuminates when motion is detected, optimizing energy efficiency and enhancing user convenience by eliminating the need for manual operation.

In summary, the wireless power transmission night lamp system represents a novel approach to nighttime illumination that combines wireless power transmission technology, Arduino microcontrollers, and motion sensors to provide an advanced, energy-efficient, and user-friendly lighting solution for indoor environments.

LITERATURE SURVEY

- [1] Mohamed Zied Chaari and Rashid Rahimi, "Light LED directly lit up by the wireless power transfer technology", Jakarta, Indonesia, 2017. Wireless electrical transmission technology is the diffusion of power energy without using any physical support. It is useful to transfer power to those places where it is difficult to transmit electricity using conventional wires. In this research paper, they designed and realized a wireless lighting technology using the fundamentals of electromagnetic radiation.
- [2] Ning Wu and Jing Xiao, "Insulation Analysis of High-voltage Transmission Line Insulator with Embedded Wireless Power Transfer Coils", Chengdu, China, 2021. The integration of the wireless power transfer (WPT) coils allows the transfer of energy gathered by the current transformer (CT) on the high-voltage side of transmission line to the online monitoring equipment on the low-voltage side. This integration eliminates the need for extra WPT coils, which are both easy to implement and space saving, while ensuring the insulation distance.
- [3] Lei Shi and Nouman Rasool, "Design and Experiment of a Reconfigurable Magnetic Resonance Coupling Wireless Power Transmission System", IEEE Microwave and Wireless Components Letters, Vol 30, Page no. 705-708, 2020.

Magnetic resonance coupling wireless power transmission (WPT) provides a safe and efficient power supply for small household appliances and implanted devices, but the tolerance of the transmission distance is poor.

To improve the robustness of the transmission distance of the magnetic resonance WPT system, a method of using a reconfigurable helical coil array is proposed.

[4] Deng Jie Lu and Shan Li, "Research on Wireless Power Transmission Technology Suitable For Pure Electric Ship", Chengdu, China, 2022. With the increasingly high requirements for environment and low carbon emissions, as well as the national plan to achieve peak carbon emissions before 2030, green shipping is the development direction of the future shipping industry.

Wireless power transmission technology eliminates cable connection between ship and shore power, without wear and loss of physical connection cable, and can realize the safety.

[5] Li Lian and Li, "Wireless dimming system for LED Street lamp based on ZigBee and GPRS", Chengdu, China, 2017.

Currently, most of the existing intelligent lighting control system uses the wired network, which not only has the complex construction and bad flexibility, but also influences the application of the intelligent lighting. For this reason, an intelligent lighting control system, combining ZigBee with GPRS is put forward in this paper. It can not only reduce the system cost, but also greatly enhance the performance of the system.

WORKING MODEL:

To create a working model of the wireless power transmission night lamp system, start by connecting the Arduino board to a breadboard and then link it to a wireless power transmitter module and receiver module. Incorporate a PIR motion sensor into the setup. Write Arduino code to initialize and control the system, including functions to monitor the motion sensor's output, activate wireless power transmission upon motion detection, and power an LED bulb or night lamp when wirelessly received. Assemble the components on the breadboard, ensuring proper connections, and place the motion sensor strategically for effective motion detection. Test the system by powering up the Arduino board and moving within the motion sensor's range to verify automatic activation of the light upon detection. Refine the setup by adjusting motion sensor sensitivity and optimizing the code for better performance. Document the implementation details and consider deploying the model in real-world indoor environments for practical use.

CONCLUSION

In conclusion, the development and implementation of the wireless power transmission night lamp system represent a significant advancement in nighttime illumination technology, offering a compelling solution to the limitations of traditional night lamps. By integrating Arduino microcontrollers, motion sensors, and wireless power transmission modules, this system achieves a seamless combination of energy efficiency, convenience, and safety in indoor environments. The system's automated activation based on motion detection ensures that the night lamp illuminates only when needed, optimizing energy usage and minimizing unnecessary power consumption. This feature not only enhances energy efficiency but also contributes to a more sustainable and environmentally friendly lighting solution. Moreover, the elimination of conventional power cords through wireless power transmission technology enhances user convenience and safety by reducing clutter and eliminating tripping hazards. This is particularly beneficial in environments such as bedrooms, hallways, and bathrooms where space may be limited, and safety is paramount. Additionally, the integration of Arduino microcontrollers enables flexible and customizable control of the system's functionality, allowing for easy adaptation to specific user preferences and environmental conditions. The system can be further enhanced with additional features such as adjustable motion sensor sensitivity, timer settings, and remote-control capabilities, adding to its versatility and usability. Overall, the wireless power transmission night lamp system represents a significant step forward in nighttime illumination technology, offering a practical, efficient, and user-friendly lighting solution for indoor environments. Its innovative design, energy-efficient operation, and enhanced convenience make it a promising choice for a wide range of applications, from residential to commercial settings. As technology continues to evolve, further advancements in wireless power transmission and sensor technology will likely lead to even more sophisticated and versatile lighting solutions, ultimately improving the quality of life for users worldwide.

REFERENCES

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