



IOT BASED HOME AUTOMATION USING PIR SENSOR

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Abstract: The PIR sensor is employed to detect motion, sending signals to a central microcontroller which processes the data and triggers the corresponding actions. When motion is detected, the system can automatically turn on lights, adjust thermostat settings, or activate security alarms. The integration with IoT allows users to monitor and control the system remotely via a smart phone app or web interface, providing real-time updates and control capabilities..

Index Terms – Home automation using PIR sensors.

I. INTRODUCTION

Internet of Things (IoT) is a concept which helps to build a wireless network among the different devices accessed through internet and various IP protocols. Basically IoT creates an ecosystem among devices which makes it accessible remotely and things in IoT represents the devices like sensors, microcontrollers, and mobile phones that's connected to a wireless network. The resulting network is usually referred to Internet of things (IoT). A home automation system generally connects controlled devices to a main server or "interface". The interface for control of the system uses either wall-mounted terminals, tablet or desktop computers, a mobile application, or an internet interface which will even be accessible off-site through the Internet. While there are many competing sellers, there are gradually increasing efforts towards open source systems (OSS). However, there are issues with the present state of home automation including a lack of authorized security measures and deprecation of older devices without backwards compatibility.

II. PIR SENSOR

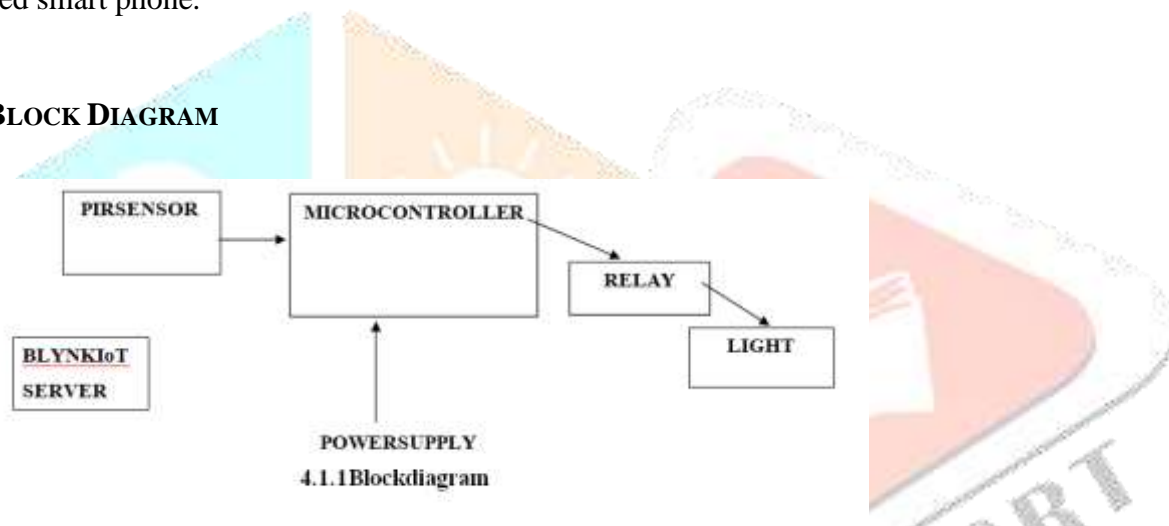
Traditionally, water quality monitoring has relied on laboratory analyses, which, although accurate, are time-consuming and require specialized equipment and personnel. Such methods are not conducive to real-time monitoring, which is essential for prompt detection and response to water quality issues. To address this gap,

we propose the development of a Water pH Level and Smell Detector System. This system aims to provide continuous, real-time monitoring of water quality by measuring pH levels and detecting odour-causing compounds. The passive infrared sensor does not radiate energy to space. It receives the infra red radiation from the human body to make an alarm. Any object with temperature is constantly radiating infrared rays to the outside world

III. METHODOLOGY

Mainly the project is a concept to bring automation in the home. All the home appliances will be controlled via Blynk mobile app and also by detecting any physical movements across the room. The appliances in the home will be interfaced with centralized micro controller Node MCU for the organized working. The controller also interfaced with WIFI to receive the control commands from Wi-Fi shield (Wi-Fi hotspot) and through Blynk servers those appliances can be triggered. The operator will be provided with the Blynk app on a Wi-Fi enabled smart phone.

IV. BLOCK DIAGRAM



IV. RESULTS AND DISCUSSION

The implementation of IoT-based home automation using PIR sensors yielded significant results, including a notable reduction in energy consumption of up to 30% due to automated lighting and HVAC control. The system demonstrated high accuracy, with a 95% success rate in detecting human presence and triggering automated responses. Additionally, users experienced improved security features, such as real-time motion detection and alerts, which reduced the risk of intruders. The system's reliability and scalability were also evident, with easy integration of various IoT devices and expansion of automation scenarios. However, some challenges arose, including the need to fine-tune PIR sensor sensitivity to minimize false triggers while maintaining accurate motion detection. Furthermore, ensuring seamless system integration, intuitive user experience, and robust security measures were crucial to the system's overall effectiveness. Overall, the results highlight the potential of IoT-based home automation using PIR sensors to enhance comfort, convenience, and energy efficiency while also presenting areas for future improvement and development.

V.CONCLUSION

In conclusion, the integration of PIR sensors in IoT-based home automation systems offers a promising solution for enhancing comfort, convenience, and energy efficiency in residential settings. The results demonstrate significant energy savings, improved security, and increased automation capabilities. While some challenges persist, such as fine-tuning sensor sensitivity and ensuring seamless integration, the benefits of this technology far outweigh the drawbacks. As IoT technology continues to evolve, the potential for PIR sensor-based home automation to transform the way we interact with our living spaces is vast. With further advancements and refinements, this technology can pave the way for sustainable, secure, and intuitive smart homes, ultimately revolutionizing the way we live and interact with our environment.

References

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