



REAL TIME PRESENCE DETECTOR

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Abstract : A real-time presence detector is a device that identifies the presence of people in a specific area by using sensors such as infrared, ultrasonic, or motion detectors. It instantly processes this information to perform tasks like turning on lights, sending notifications, or updating occupancy status. This system is commonly used in applications like smart homes, offices, and security setups, helping to save energy and improve convenience. Advanced versions may include artificial intelligence to distinguish between humans and other movements for greater accuracy. Its efficiency, adaptability, and ability to integrate with modern technologies make it a valuable tool for automated systems.

KeY words: PIR Sensor Node MCUESP8266...

I. INTRODUCTION

The integration of Internet of Things (IoT) technology has revolutionized the way we monitor and manage spaces, particularly in educational and office environments. This project focuses on developing a real-time presence detection system using ESP8266 modules and Passive Infrared (PIR) sensors. The system aims to enhance operational efficiency by accurately determining the presence or absence of individuals in designated areas.

ESP8266 modules serve as the core platform for collecting data from PIR sensors, which detect motion and convert it into digital signals. These signals are transmitted wirelessly via Wi-Fi to a central server, where presence data is processed and stored. The system operates autonomously once deployed, reducing dependency on continuous laptop connectivity while ensuring reliable performance through dedicated power supplies.

A user-friendly web or mobile application interface provides stakeholders with real-time updates on occupancy status, displayed through intuitive indicators. Green signifies presence, while red indicates absence, enabling efficient space management and resource allocation. This project exemplifies the practical application of IoT in optimizing workplace productivity and improving user experience through seamless integration of sensor technology and cloud-based data management.

This introduction sets the stage for understanding how IoT-based presence detection systems contribute to smarter, more responsive environments conducive to effective management and utilization of shared spaces.

II. LITERATURE SURVEY

[1] **Analog Signal Processing** A comprehensive review of techniques and technologies for analog signal processing (ASP). It covers the principles of various ASP systems, including phasers and metamaterials, and their applications in signal processing tasks like filtering and phase manipulation. The authors discuss the design and implementation of these systems, highlighting their advantages and limitations compared to digital signal processing.

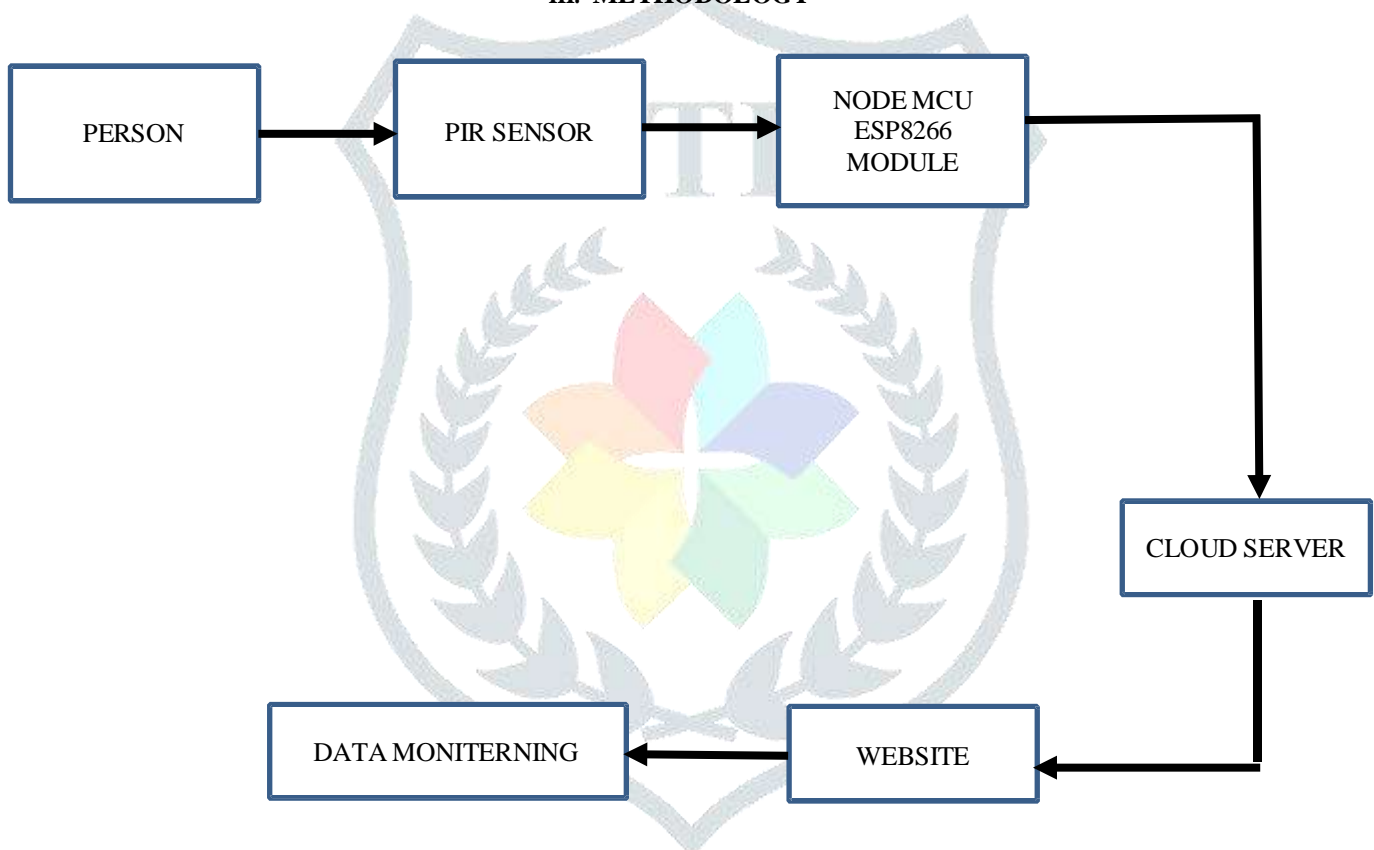
[2] **Continuous-Time Pipelined Analog-to-Digital Converters** The continuous-time pipelined (CTP) ADC is a new type of converter that merges anti-alias filtering and quantization into a single unit, simplifying circuit design. It has a resistive input impedance, making it straightforward to integrate into electronic systems. CTP ADCs require less sophisticated amplifiers compared to traditional designs, aiming to improve efficiency and reduce costs in digital signal processing applications.

[3] **A survey of human-sensing** Person detection poses significant challenges that require advanced pattern-matching approaches for optimal results, with cameras proving especially effective for tracking and identifying individuals. Human traits essential for sensing are categorized into static and dynamic features, where extrinsic traits such as those dependent on carried items like mobile phones play a crucial role in identification processes. Sensor fusion methodologies, utilizing Doppler sensors and UWB radars, are instrumental in enhancing precision for localization and tracking tasks. Additionally, binary sensor technologies like motion sensors and pressure-sensitive tiles offer alternative solutions for detecting presence and tracking movements in various applications.

[4] **Analog Signal and Digital Signal Processing in Telecommunication System** The study explains that in a telecommunication, a digital signal converts an analog signal into digital data, making it easier and faster to process. Digital Systems recognize only two states, usually represented by 0 and 1. The smallest unit of a digital signal is a bit. Signal processing refers to performing operations on a signal. In telecommunication, various types of signals are used to exchange information through a communication system.

[5] **Analog-to-Digital Converter** This paper compares different analog-to-digital converters (ADCs) and analyzes their performance characteristics. It likely discusses factors such as resolution, accuracy, speed, and power consumption. The study could highlight the strengths and weaknesses of various ADC designs and provide insights for selecting the most suitable one for specific applications. Overall, it aims to offer a detailed comparison to guide informed decision-making in ADC selection.

III. METHODOLOGY



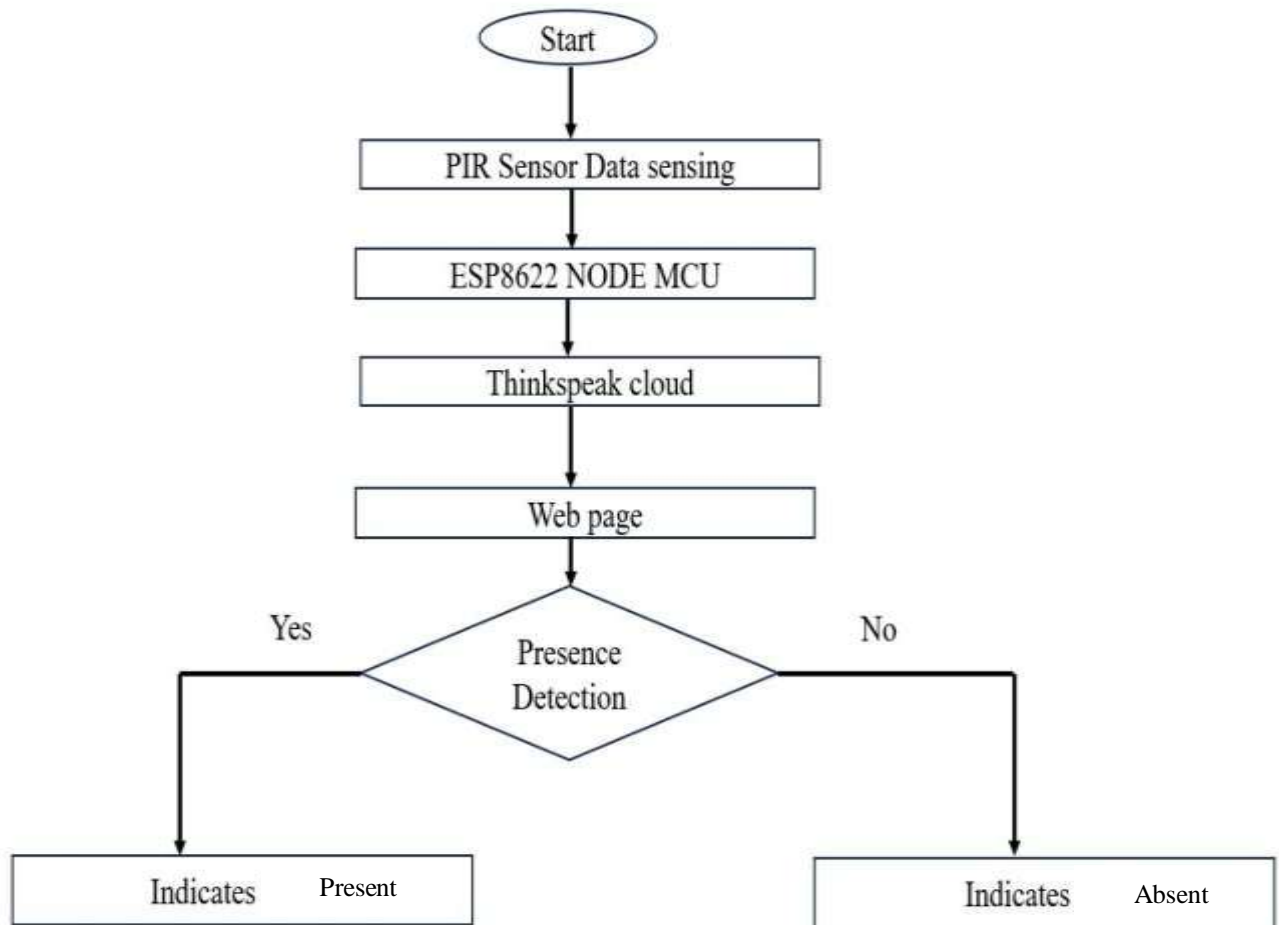
A. BLOCK DIAGRAM

Figure 1 represent the block diagram represents the block diagram of Real time presence detector we have used the components like PIR Sensor, NODE MCU ESP8266 Module

B. WORKING

The real-time presence detector using a PIR sensor and NodeMCU ESP8266 works by leveraging the PIR (Passive Infrared) sensor to detect human motion based on heat emitted by the body. The PIR sensor identifies changes in infrared radiation levels when a person moves within its range and sends a signal to the NodeMCU ESP8266, a Wi-Fi-enabled microcontroller. The NodeMCU processes the signal and performs predefined actions, such as sending data to a server, triggering alerts, or controlling connected devices. With its Wi-Fi capability, the system integrates seamlessly into IoT applications, enabling remote monitoring and real-time responses through a network.

C. FLOWCHART



IV. RESULTS

The prototype of the proposed system is shown in figure 3

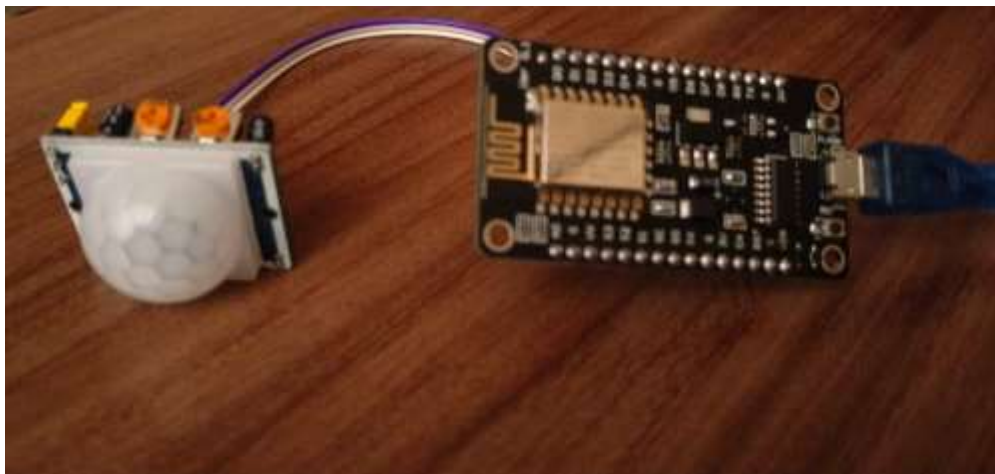


Figure 1: System of the project with complete connections



Figure 2: Final output

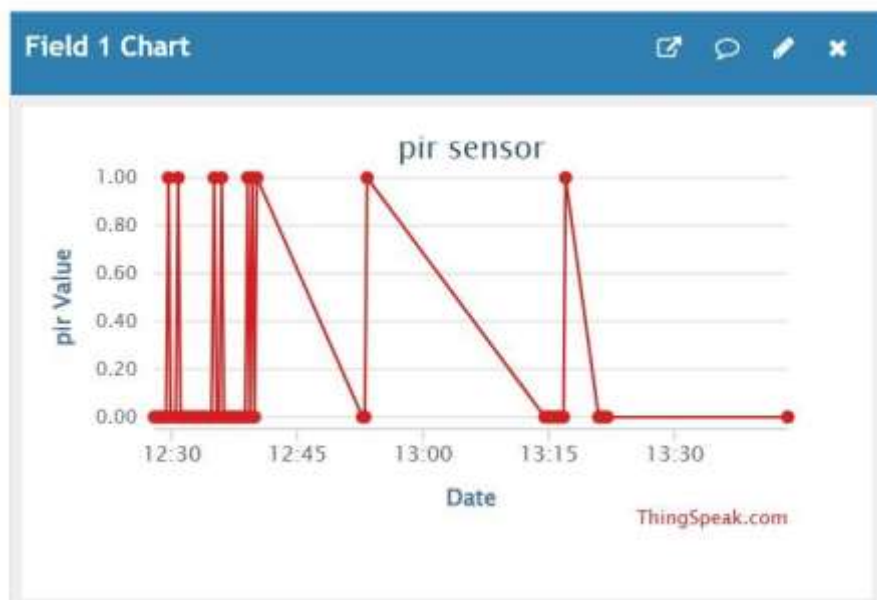


Figure 3: Data uploaded to thin speak loud

V. APPLICATIONS

Use in Corporate Companies and Government Offices

Corporate Companies:

- Workplace Monitoring
- Security Management
- Productivity Insights

Government Offices:

- Attendance Tracking
- Facility Management

VI. REFERENCE

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