Intelligent Home Security System Based on Nodemcu And Web Frame Work

Abstract

This project presents a home security monitoring system that uses a NodeMCU microcontroller to monitor temperature, humidity, door and window status, and detect any unauthorized movement. When unauthorized movement is detected, the system sends a warning message to the owner's Telegram account. The project aims to provide an affordable and effective solution for homeowners to monitor their homes remotely and prevent unauthorized access.

Introduction

The security of homes has become an increasingly important issue in recent years, with homeowners looking for ways to monitor their homes remotely and prevent unauthorized access. Traditional security systems can be expensive and difficult to install, and may not be accessible to everyone. This project aims to address this issue by providing an affordable and effective solution that can be easily implemented by homeowners.

The home security monitoring system presented in this project uses a NodeMCU microcontroller to monitor the temperature, humidity, and door and window status of a home. The system also includes a motion sensor that can detect any unauthorized movement in the home. When unauthorized movement is detected, the system sends a warning message to the owner's Telegram account, allowing them to take appropriate action.

Literature Review

The use of microcontrollers in home security systems has become increasingly popular in recent years, with many homeowners looking for affordable and effective solutions to monitor their homes remotely. NodeMCU microcontrollers are a popular choice due to their low cost, versatility, and ease of use.

Several studies have explored the use of microcontrollers in home security systems. For example, a study by Al-Qutayri et al. (2020) presented a home security system that used a Raspberry Pi microcontroller to monitor the home environment and detect any unauthorized access. The study found that the system was effective in detecting unauthorized access and could be easily implemented by homeowners.

Methodology

The home security monitoring system presented in this project consists of several hardware and software components, including:

- NodeMCU microcontroller: The microcontroller is used to control the system and communicate with the various sensors and devices.

- DHT11 temperature and humidity sensor: The sensor is used to monitor the temperature and humidity of the home environment.

- Reed switch sensors: The sensors are used to detect whether doors or windows are open or closed.

- PIR motion sensor: The sensor is used to detect any unauthorized movement in the home.

- Telegram API: The API is used to send warning messages to the owner's Telegram account.

- Programming: The system is programmed using the Arduino IDE and the ESP8266WiFi library.

The NodeMCU microcontroller is connected to the various sensors and devices using jumper wires. The DHT11 temperature and humidity sensor is connected to the NodeMCU's GPIO2 pin, while the reed switch sensors are connected to the NodeMCU's GPIO4 and GPIO5 pins. The PIR motion sensor is connected to the NodeMCU's GPIO14 pin.

The system is programmed using the Arduino IDE and the ESP8266WiFi library. The code is written in C++ and consists of several functions that read the sensor data, detect unauthorized movement, and send warning messages to the owner's

Telegram account. The code is uploaded to the NodeMCU microcontroller using a USB cable.

Results

The home security monitoring system presented in this project was tested in a home environment to evaluate its performance and effectiveness. The system was able to monitor the temperature and humidity of the home environment, detect whether doors or windows were open or closed, and detect any unauthorized movement in the home.

When unauthorized movement was detected, the system sent a warning message to the owner's Telegram account. The warning message included information about the location of