Automatic Fan and Light with Human Motion Sensor

Akshay Raju Sutar[1],Jaid Ismail Mulla[1],Virendra Limbaji Shinde[1],Vaibhav Vikas Patil[1]
Mr.S.R.Rasal[1]

[1] Computer Science & Engineering Yashwantro Chavan polytechnic ,Ichalkaranji

Abstract

This research presents an innovative approach to enhance energy efficiency and user comfort in indoor environments through the implementation of an Automatic Lights and Fans Control System. The proposed system integrates human motion and temperature sensors to intelligently regulate lighting and ventilation based on real-time occupancy and environmental conditions.

The human motion sensor detects the presence or absence of individuals within a specified area, while the temperature sensor measures the ambient temperature. These sensors work collaboratively to optimize energy consumption and maintain a comfortable environment. When motion is detected, the system activates or adjusts the lighting and fans accordingly. Additionally, the temperature sensor helps in determining the appropriate level of ventilation and cooling required to ensure optimal comfort.

1. Introduction

Today the technological worlds is fast growing towards the innovative technology have centralize idea to automate the thing for simplicity and comfort in life, providing security, saving electric power as well as time. In the home automation is one of the preceding things to automatically on and off the household appliances (i.e. lights and fan).Home automation can be define as a method for doing something without human interference. Home automation can be characterized as a mechanism removing as much human interaction .Electricity is an important weapon to providing as much comfort the human life. it's a heart of innovating technology because without electric power world's couldn't work. To providing a great comfort to human in their daily life cycle we have used IOT based Home automation technology. When there is regulate of all the lights and fans together with the use of internet and detection of temperatures and presence of human by human motion recognition. In this project, we have Design and Development of Home Automation System via the web or android application using Raspberry pi. A lots people are too busy also they are in hurry so they are forget to turn OFF the lights and fans before the leaving room. In

such situation , this system are frequently used because this system play an important role in reduction of power consumption and save the electric power by human motion recognition to detect presence of human and detecting temperature in room , and lights and fans be automatically ON or OFF . This automatic system leverages human motion and temperature sensors to control lights and fans, aiming to address industry and user needs. It promises energy efficiency, improved comfort, and automation in buildings, retail, and homes, but faces challenges in sensor accuracy, privacy concerns, and implementation complexity

2. Literature survey for problem identification and specification

[1][V T Widyaningrum1 , Y D Pramudita2 1 Department of Mechatronics, University of Trunojoyo Madura, Jl. Raya Telang, Kamal, Bangkalan, Madura 69162 Indonesia 2 Department of Informatics Engineering, University of Trunojoyo Madura, Jl. Raya Telang, Kamal, Bangkalan, Madura 69162 Indonesia]

Automation systems at home today has been developed. Automation can be generally described as a process following pre-determined sequential steps with a little or without any human exertion. Automation is provided with the use of various sensors suitable to observe the production processes, actuators and different techniques and devices [1]. Smart home automations gives the owner of a home an ultimate control over his or her home by automated lighting system, dimming, and electrical appliances. This advanced technology is used to do automation of a house activities, so it is also can be called as home automation.

[2][R.Monisha , K.Mythili, P.R.Nivedha , P.Radhiga Assistant Professor, Student, Department of Computer Science and Engineering, SNS College of Technology, Coimbatore (India)]

Power is wasted by human resource and power consumption is a major issue. Automatic smart fan controller is used to reduce power consumption and automatically sense human movement using ultrasonic sensor, to save electricity. Mainly, automatic ON/OFF fan system also can be made based on the presence and absence of the human inside the room. Flexibility and reliable functioning without human intervention. The automatic ON/OFF of fan system also based on the presence and absence of the human inside the room. The system is developed with the help of the at mega 328 microcontroller. Automatic under wi-fi through android apps from any Smartphone, home automation using a digital control and home automation

system. An automatic control solution is suggested to control the fan ON/OFF condition . The system provide support in order to fulfill the needs of elderly and disabled in home. It has been a significant development in the area of an individual's routine tasks and be automated. Analyzing the current android phone market, most users are opting for Android based phones. Home Automation System (HAS) has been designed for mobile phones having Android platform to automate the wi-fi interfaced arduino controls a number of home appliances like lights, fans using on/off relay. The most efficient technology for short range wireless communication is used here to automate the system.

3. Proposed detailed methodology of solving the identified problem with action plan-

- Action Plan

Programming is done with PYTHON language. There are several platforms for developing android applications for smart phone such as Windows Mobile, Symbian, IOS and Android. In this system, the Android platform mobile Application software is develop by using AppGeyser it provide open source platform to develop application software without coding the software application. AppGeyser is a free web platform that uses template system allows to convery any web page into an Android Application to create customized application without consisting any code . It is an Android application development platform that create codeless apps and users develop template mobile apps b pulling content from webpages.

There are three steps to create are

1. you can enter the URL of any mobile-formatted website and it will be wrapped up into an app.
2. You can enter the HTML for any Web widget code and get it turned straight into an app.
3. Use a tool on the site which can ‘Grab’ chunks of Web pages to turn them into apps

-Application Dataflow/Workflow

The subsequent diagram will illustrate the operational functionality of the application, essentially depicting its operational workflow of Computer Based Application.

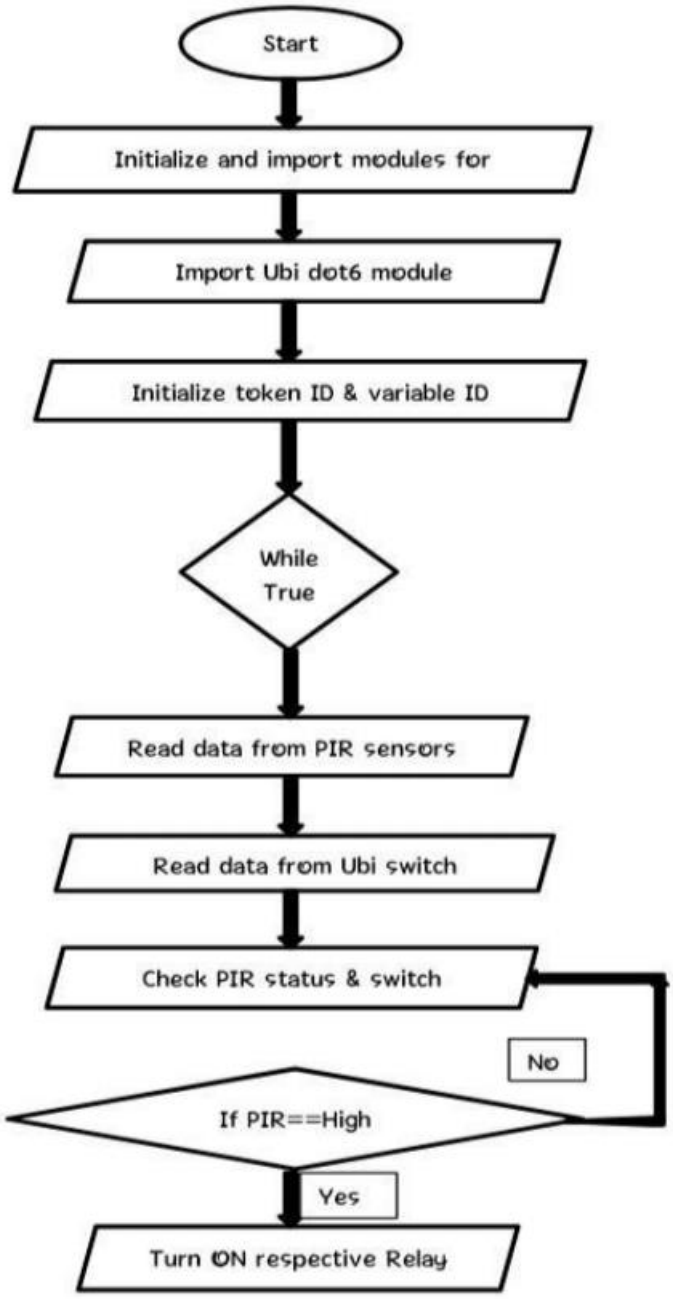

Fig. Computer Based Application Workflow

- **Technologies and Tools Used to Develop Application**

Sr. No.	Title	Description/Version
1	Visual Stadio	17.5
Technologies for Frontend		
3	Visual Stadio.NET	17.5
Technologies for Database		
6	MySQL	8.0
Tools		
7	Visual Studio	17.5
8	XAMPP	3.3.0

- Requirements to Run Application

Sr. No.	Title	Description/Version
Requirements for Computer Based Application		
1	CPU/Processor	Intel Pentium or Above
2	RAM	2 GB
3	Disk Space	Min. 100 GB
5	Operating System - Windows	Windows XP or Above

4. Advantages & Limitations

- Advantages

1. Energy Savings
2. Enhanced Comfort & Convenience
3. Increased productivity in workspaces due to improved comfort and lighting
4. Multi-sensor fusion with CO2 or humidity data for even smarter control strategies.
5. Hands-free operation eliminates the need for manual switching.

- Limitations

1. Sensors might misinterpret movement (pets, shadows) as occupancy, leading to unnecessary light/fan activation and energy waste.
2. May not cover entire rooms, requiring multiple sensors or strategic placement, impacting effectiveness.
3. May not detect slow movements or low body heat, potentially leaving occupants in darkness or discomfort.
4. Users might be uncomfortable with constant monitoring, especially in bedrooms or private spaces.
5. Measures need to be in place to ensure collected data is protected from unauthorized access or misuse.

5. Future scope

The field of automatic light and fan control with motion and temperature sensors is brimming with exciting possibilities for the future. Here are some key areas of potential exploration In the future extensions to this project, the smart DoorBell can be made by implement through voice and video calls by the person standing right outside the door and the owner remotely.

Thereby increasing the safety quotient of the system use of sensors that can be used to handle, monitor and secure the home..

6. Conclusion

The aim of the paper is to design a home automated system by using Raspberry pi. So, the people are able to operate the home appliances i.e. light and fan easily by use of smart phones or by an automation. This project is based on the Raspberry pi and having the interconnections between the electronic gadgets (Light and fan) also has various sensors for handelling and monitoring the device. It is a system that having different technologies as well as its applications that can be efficiently provide control and security of the home.

7. References

Sr. No	Weblink
1	Automatic room light intensity detection and control using a microprocessor and light sensors, Ying-Wen Bai; Dept. of Electron.Eng., Fu-Jen Catholic Univ., Taipei; Yi-Te Ku
2	International Journal of Technical Research and Applications e-ISSN: 2320-8163: PISSN:2321-7332 www.iitra.com Volume 3, Issue 6 (NovemberDecember,2015), PP.161-164.
3	. D. Norris, The Internet of Things: Do-It-Yourself at Home Projects for Arduino, Raspberry Pi and BeagleBone Black. Tab Electronics, 2015.