Project Synopsis

On

iSmartDeviceController using IoT

[https://ismartdevicecontroller.github.io/]

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1. **Introduction**

   Rapid changes in application and internet technology have been seen the evolution of the internet. Internet of things (IoT) describes a global network of nomadic devices. It integrates ubiquitous and pervasive computing with digital intelligence. The fundamental concept of IoT is interconnecting the physical "things" using wired or wireless digital communication media like Ethernet, Wi-Fi, Bluetooth and let these things exchange information with each other so that they take a smart decision themselves. In this project, we are going to discuss/implement the major requirements for incorporating the IoT paradigm in such organization where a large number of people act on shared electrical devices. We are also planning for Home automation. We propose cost effective IoT framework for an Organization/Home to manage and monitor the electrical devices of an organization. This prevents wastage of electrical energy by turning them off over the network.

   The core idea is to provide a SaaS application like facebook where people can sign-up and control/manage their home appliances with the use of our hardware. Before controlling and

managing the devices, they need to configure our hardware at their home and they will be able to use it after that. We will also interface Temperature sensor with Raspberry Pi, collect the temperature readings and display those readings on the SaaS App. Also we would be maintaining users profiles on the server so that he/she can get a view of all the appliances through browser.

We are going to follow all the software development practices and cutting edge technologies.

2. Literature Survey

2.1 Comparative Table

Paper → Parameter	Paper [1]	Paper [2]	Paper [3]	Paper [4]
Raspberry Pi/IoT	Home Automation using Raspberry Pi 2	REMOTE CONTROL OF APPLIANCES BASED ON RASPBERRY PI	Android Based Home Automation using Raspberry Pi	AN IOT BASED PATIENT MONITORING SYSTEM USING RASPBERRY PI
Home Automation	Raspberry PI Based Smart Home	Improving Smart Home Security; Integrating Logical Sensing into Smart Home	Smart Organization	Using Raspberry Pi and GSM Survey on Home Automation
Smart Organisation	Raspberry PI Based Smart Home	Improving Smart Home Security; Integrating Logical Sensing into Smart Home	Smart Organization	Using Raspberry Pi and GSM Survey on Home Automation

Video Surveillance	Sensorian Hub: An IFTTT-based Platform for Collecting and Processing Sensor Data	Improving Smart Home Security; Integrating Logical Sensing into Smart Home	Using Raspberry Pi and GSM Survey on Home Automation	IoT Based Smart Security and Home Automation System
Smart Gardening	Sensorian Hub: An IFTTT-based Platform for Collecting and Processing Sensor Data	Using Raspberry Pi and GSM Survey on Home Automation	IoT Based Smart Security and Home Automation System	An Efficient Attendance Management System based on Face Recognition using Matlab and Raspberry Pi 2
Sensors(Temperature/Humidity Sensor)	Sensorian Hub: An IFTTT-based Platform for Collecting and Processing Sensor Data	Improving Smart Home Security; Integrating Logical Sensing into Smart Home	Smart Organization	Using Raspberry Pi and GSM Survey on Home Automation
Security	Improving Smart Home Security; Integrating Logical Sensing into Smart Home	An Efficient Attendance Management System based on Face Recognition using Matlab and Raspberry Pi 2	Smart Organization	IoT Based Smart Security and Home Automation System
Cloud Computing (SaaS)	https://www.tutorialspoint.com/cloud_computing/	https://www.javatpoint.com/cloud-computing-tutorial	https://www.guru99.com/cloud-computing-for-beginners.html	http://www.thecloudtutorial.com/
Server Side Technology(Java)	https://www.tutorialspoint.com/java/	https://www.javatpoint.com/java-tutorial	https://www.guru99.com/java-tutorial.html	www.w3resource.com/java-tutorial/
Client side Technology	https://angular.io/tutorial	https://www.codementor.io/commun	www.c-sharpcorner.com/to	www.jasonwatmore.com/post/2017/0

		ity/topic/angular-4-developer	pics/angular-4-tutorials	4/19/angular-2-4-router-animation-tutorial-example
(Angular 4)				

2.2 Explanation about papers

1.Raspberry Pi Based Patient Monitoring System using Wireless Sensor Nodes

The monitoring of the patient wirelessly is a major improvement in the medical domain. The micro sensors when integrated into a wireless communication network, helps to remotely collect physiological signals of patient and avoid monitoring using traditional medical instruments which makes the patient tether. In this project, the monitoring of the patient is done by the doctor continuously without actually visiting the patient. Here, we are using various sensors to sense the physiological parameters like temperature, blood pressure [3] ECG and the level of saline. These sensed signals are transmitted to the Raspberry pi to update the data continuously via ADC which will convert these analog signals into digital signals. Through RF transmitter, the data is sent wirelessly to the monitor screen of the doctor. So, the doctor can visualize the patient's data just by sitting in his cabin. When a critical condition occurs, the visual indications will be sent onto the screen.

2.IoT Based Smart Security and Home Automation System

Internet of Things (IoT) conceptualizes the idea of remotely connecting and monitoring real world objects (things) through the Internet. When it comes to our house, this concept can be aptly incorporated to make it smarter, safer and automated. This IoT project focuses on building a smart wireless home security system which sends alerts to the owner by using Internet in case of any trespass and raises an alarm optionally. Besides, the same can also be utilized for home automation by making use of the same set of sensors . The leverage obtained by preferring this system over the similar kinds of existing systems is that the alerts and the status sent by the wifi connected microcontroller managed system can be received by the user on his phone from any distance irrespective of whether his mobile phone is connected to the internet . The microcontroller used in the current prototype is the TI-CC3200 Launchpad board which comes with an embedded micro-controller and an onboard

Wi-Fi shield making use of which all the electrical appliances inside the home can be controlled and managed.

3. Using Raspberry Pi and GSM Survey on Home Automation

In Recent year Popularity of Home automation has been increasing due to low cost and simplicity through Smartphone and tablet connectivity. It is an automation of home or household activity. Raspberry Pi is a small computer, which was introduced in the year of 2012; it is currently a mainstream system subject to extensive availability that can be used in home automation. It is estimated that up to 2020 there will be near about 50 billion internet enabled devices available. Home automation may contain centralized controller which control lightning in the house, HAVC(Heating, Ventilation and air conditioning),Security locks of gates, doors and other system to provide improve comfort, connivance security and energy efficiency. The aim of this Paper is to develop a home automation application using RPi and GSM. Programming has been developed in Python environment for RPi operation.

4. Smart Organization

Rapid changes in application and internet technology have been seen the evolution of the internet. Internet of things (IoT) describes a global network of nomadic devices. It integrates ubiquitous and pervasive computing with digital intelligence. The fundamental concept of IoT is interconnecting the physical "things" using wired or wireless digital communication media like Ethernet, Wi-Fi, Bluetooth and let these things exchange information with each other so that they take a smart decision themselves. In this paper, we discussed the major requirements for incorporating the IoT paradigm in such organization where a large number of people act on shared electrical devices. We propose cost effective IoT framework for an organization to manage and monitor the electrical power consumption of an organization. This prevents wastage of electrical energy.

5. Improving Smart Home Security; Integrating Logical Sensing into Smart Home

The paper explains various security issues in the existing home automation systems and proposes the use of logic based security algorithms to improve home security. The work classifies natural access points to a home as primary and secondary access points depending on their use. Logic based sensing is implemented by identifying normal user behavior at these access points and requesting user verification when necessary. User position is also considered when various access points changed states. Moreover, the algorithm also verifies the legitimacy of a fire alarm by measuring the change in temperature, humidity and carbon monoxide levels, thus defending against manipulative attackers. The experiment conducted in this paper used a combination of sensors, microcontrollers, Raspberry Pi and ZigBee communication to identify user behavior at various access points and implement the logical sensing algorithm. In the experiment the proposed logical sensing algorithm was successfully implemented for a month in a studio apartment. During the course of the experiment the algorithm was able to detect all the state changes of the primary and secondary access points and also successfully verified user identity 55 times generating 14 warnings and 5 alarms.

3. Conclusion and Future Scope

This project will be implemented in JAVA, Spring, Hibernate, Rest, JHipster, Angular, Raspberry Pi, Sensors and many more. This is more kind of product which will be delivered to end user who will need to register/configure his/her device. This will enable the user to control and monitor devices and appliances configured through web browser. We are planning to accommodate Smart gardening in this project in future. We will be providing more UI related functionalities as well. This solution can also be used in many other areas like agricultural field.

4. References

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