INTEGRATED SYSTEM FOR REGIONAL NAVIGATOR AND SEASONS MANAGEMENT

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Abstract — Recently, The Internet of Things (IoT) has become an emerging technology in various fields. The Internet of Things basically makes almost anything “smart”. In our proposed system we are going to design an IoT based Integrated system for umbrella. The smart umbrella not only blocks the rain but also provides a variety of services to the customer. In this innovation, we propose a smart navigation system to guide a way to the customer’s source to destination location. Main thing of this concept that we used LED intimation and Audio responses for right directions to prevent safety accident which occurs when the customer has to see the screen of smartphone for navigation. This approach provides a convenience to customer according to self-navigation. We also propose a weather prediction approach in the integrated system to find the weather conditions. This season management has been analyzed by using Temperature & Humidity sensors connected to the Raspberry pi controller and the weather details are displayed at the smart phone application as a SMS service.

Keywords — Raspberry pi controller, Temperature & Humidity sensors, LED Imitation, Weather prediction, Smart navigation.

I. INTRODUCTION

Recently, the IoT(Internet of Things) has been studied by many researchers in the IT field. The IoT is a technology that makes it possible to interact between various things which a computing and a network devices are installed in [1].

According to increasing smart phones, a number of people use the navigator finding a way to destination while walking. However, the use of smartphone while walking causes a lot of safety accident such as traffic accident, because the customer focuses on smartphone to operate it. Existing smart umbrellas have a variety of features such as weather alarm, loss prevention but they can’t be a solution for safety problems [2].

In this paper, to solve the above problem, we propose a smart navigation umbrella to guide a way intuitively through the interaction between the umbrella and the smartphone. A customer does not need to see the screen of smartphone finding and identifying a way. In our proposed system we are going to design an IoT based Integrated system for umbrella. In this innovation, we propose a smart navigation umbrella paired with mobile application by using WiFi technology to guide a way to the customer’s destination location through the interaction between the umbrella and the smartphone. Main thing of this concept we used the LED intimation and Audio responses for right direction to prevent safety accident. This season management is achieved by Temperature & Humidity sensors connected to the Raspberry pi controller and the weather reports are displayed at the smart phone application.

Figure 1. Existing system with alarm

II. PROPOSED SYSTEM

The Block diagram of the proposed system is based on Raspberry Pi technology[11-16]. The Integrated system consists of two sections Umbrella section where other hardware components connected to Raspberry Pi board and Mobile section mainly deals with the output results in Smart phone device.
A. Umbrella Section

![Figure 2. Block Diagram of Umbrella section](image)

B. Mobile Section

![Figure 3. Block Diagram of Mobile section](image)

In the proposed system Hardware of the system contains Raspberry pi controller, sensors such as Temperature, Humidity, Level and Gas sensors, ICs, LED with board. The system design uses Raspberry pi board as a input and output devices connecting ports. The monitor is connected as a display screen of input and output instructions. Less than 1A power supply connected to the controller.

III. HARDWARE USED AND ITS DESCRIPTION

Here we shall discuss the hardware used in this system briefly and its characteristics

1. Raspberry Pi Controller

Raspberry Pi board is a miniature marvel, packing considerable computing power into a footprint no larger than a credit card. It’s capable of some amazing things, but there are a few things you’re going to need to know before you plunge head-first into the bramble patch. The processor at the heart of the Raspberry Pi system is a Broadcom BCM2835 system-on-chip (SoC) multimedia processor. This means that the vast majority of the system’s components, including its central and graphics processing units along with the audio and communications hardware, are built onto that single component hidden beneath the 256 MB memory chip at the centre of the board. It’s not just this SoC design that makes the BCM2835 different to the processor found in your desktop or laptop.

2. Temperature Sensor - LM35

The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. All paragraphs must be indented. All paragraphs must be justified, i.e. both left-justified and right-justified. You can measure temperature more accurately than a using a thermistor. The sensor circuitry is sealed and not subject to oxidation, etc. The LM35 generates a higher output voltage...
than thermocouples and may not require that the output voltage be amplified.


The Gas Sensor Board is designed to work in conjunction with one of the gas sensors listed below (not included) allowing you to determine when a preset gas level has been reached or exceeded. CO (Carbon Monoxide) Gas Sensor (#605-00007)CH4 (Methane) Gas Sensor (#605-00008)LPG (Propane) Gas Sensor (#605-00009)C2H5OH (Alcohol) Gas Sensor (#605-00011). MQ-2 gas sensor higher sensitivity to liquefied petroleum gas, propane, hydrogen, detection of gas and other combustible vapors are ideal. This sensor can detect a variety of flammable gas, is a low-cost sensors for many applications.

4. Temperature & Humidity Sensor - DHT11

DH11 Temperature & Humidity Sensor has excellent quality, fast response, anti-interference ability, low cost and other advantages. Single Wire serial interface that allows quick and easy system integration. Ultra-small size, low power consumption, signal transmission distance Up to 20 meters, making it to the class of applications and even the most demanding applications is the best choice.

5. Digital Soil Moisture Sensor

The sensor includes a potentiometer to set the desired moisture threshold. When the sensor measures more moisture than the set threshold, the digital output goes high and an LED indicates the output. When the moisture in the soil is less than the set threshold, the output remains low. The digital output can be connected to a micro controller to sense the moisture level. The sensor also outputs an analog output which can be connected to the ADC of a micro controller to get the exact moisture level in the soil. This sensor is great for making water gardening projects, water sensing, etc.

IV. EXPERIMENTAL RESULTS AND OBSERVATIONS

A. HARDWARE RESULT

Hardware of the system contains Raspberry pi controller, sensors such as Temperature, Humidity, Level and Gas sensors, ICs, LED with board. The system design uses Raspberry pi board as a input and output devices connecting ports. The monitor is connected as a display screen of input and output instructions. Less than 1A power supply connected to the controller.
Here the integrated system contains two sections Regional Navigation and Seasons management. The LED is connected to the raspberry pi, Once the source and destination addresses is generated through codes. The LED will glow as a indication that we are moving in the right direction and we can also hear the audio responses which includes, in which direction we should move and what are the landmarks we are crossing. Here the headphones were attached to hear the audio responses through the controller. The weather prediction is achieved by different sensors connected through raspberry pi controller. When the python code is generated the sensor senses the temperature, pollution, smoke, Humidity details of the location and send through SMS service.

B. SOFTWARE RESULT

The python coding are generated to get result in raspberry pi controller. Two different approaches for navigation module and weather prediction are used.
1)sudo python final_google_map.py
2)Sudo python main.py

Figure 10. Screenshot software coding window

The weather details predicted from different sensors displayed in smartphone application via SMS service.

Figure 11. Screenshot of weather details received in SMS

Figure 12. The final prototype of the proposed system

V. CONCLUSION AND FUTURE WORK

Thus we provided a new concept and implemented an IoT based Integrated system for umbrella. we proposed a Regional navigator system to guide a way to the customer’s destination location with LED intimation and audio response for the direction to prevent safety accident which occurs when the customer sees the screen of smartphone for navigation. We also proposed a weather prediction approach as a seasons management in the integrated system to find the weather conditions. In future work, we will study the interaction between the umbrella and various IoT devices to implement it as a “Smart Umbrella Based on Internet of Things” and
the development of detachable umbrella module to increase the usability.

REFERENCES


