



ORIGINAL RESEARCH PAPER

Engineering

SMART TRAVELLING BAG USING IOT

KEY WORDS: Digital locks; RFID; Power bank; IoT

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ABSTRACT

Now a day's travelling of peoples are increasing With their life style so as dimmed of smart travelling luggage bag are come in forward. This paper is on review of technology are come in to account of fabric and how to solve complex problem of smart travelling with covering most of need of peoples. While Digital locks, RFID tag, and Power bank are added in making bag smarter but now things are change up to finding location on IoT. Smart Luggage bag/travelling bag is a very innovative idea with many interesting features. It consist of wheels which will be used for charging purpose of battery, Bluetooth ,GPS, GSM module and Wi-Fi for tracking purpose and theft sensor for theft detection also the wheels having motor which will generate energy for the system battery charging .

INTRODUCTION

Day by day technology has changed and that technology we have to add in things for solving our problems travelling bag is very important in most of movements. Nowadays there's revolution in field of technology and the world is developing at faster pace. Due to changes in lifestyle and surroundings, the needs of the people are changing according to needs thus new inventions and innovations come into picture. As we use smart phones it drains a lot of battery due to use of high graphics and internet etc. So the idea of charging our phones using solar energy. Also security has become a prime concern due to rise in criminal activities like kidnappings rapes etc. thus safety feature is necessary. Approximately 1 billion people travel each year by air on the many domestic and international airlines. On U.S. air carriers alone, it has been predicted that in the coming two decades, the number of passengers will double. A global increase in air travel, as well as a growing aged population in many countries, makes it reasonable to assume that there will be a significant increase in older passengers and passengers with illness. Because of a growing interest by the public of health issues associated with commercial flying, the Aerospace Medical Association prepared this monograph for interested air travellers. It is informational only and should not be interpreted by the reader as prescriptive. If the traveler has any questions about fitness to fly, it is recommended that he or she consult a physician. The authors sincerely hope that this publication will educate the traveler and contribute to safe and comfortable flight for passengers. [1]

Literature review

Problem of luggage bag are too complex on airport so people are still work on how to sol that same problem on identification of bag at delivery end effectively so this paper is also define on IoT based bag tracking The proposed research work focuses on research to develop a working model of a baggage handling system using RFID tag and IoT which will track bags, assist in locating bags, alert staff if baggage not loaded correctly, identify a bag for security personnel to track, and change the flight itinerary on the tag. The main advantage of the system is that it consumes less time as the passengers don't have to wait for their baggage to turn up on the conveyer belt instead they are routed to different counters and ensures high security due to the unique identification number. It is following the current trend as it is environment friendly, as it is paperless, no printing and paper are needed which is a very important issue currently in the aviation industry. With this design we tend to make the air travel more customers friendly, less time consuming, hassle free, with less queuing and greater security of the passenger. The economic benefits and customer satisfaction results achieved by extensive deployment of RFID in baggage handling are furnished. [4]

In new said of bag research has been introduce like bag may follower of owner person it has studied about human falling and leading mobile robot with RSSI of LF communication. A proposed way has no location constraint and has low power consumption compared with conventional method. And work has incomplete for implementation for real robot controlling and achieve a greater utility. [5]

In article developing a new low cost human following technology to assist low cost consumer product implementation, so that the overall production cost of a automatic user following bag will be less. The inbuilt power bank can provide sufficient power and at the same time share power to users gadgets like smart phone, laptops. [6]

The intelligent suitcase is designed to access all information about bag with serial data from the smart phone and output it to the control system. The RF signal helps the suitcase to follow the Smartphone. The proximity sensor maps the path to be travelled and avoids obstacles. For a security propose a suitcase is digitally locked through the RF signal and Smartphone. This article is show some development of electronics system add in plastic case bag for solving a security and proximity follower of person. [7]

IMPLEMENTATION OF CONCEPT

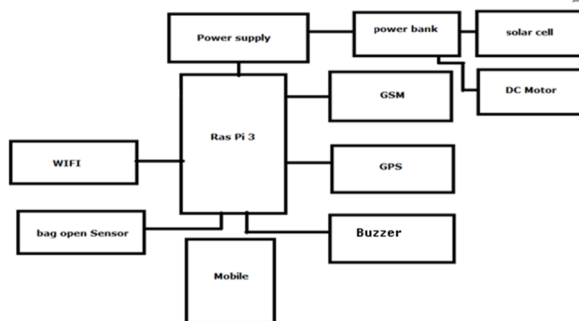


Figure 1: Block diagram of the system.

Solar Cell:

Flexible solar cell research is a research-level technology, an example of which was created at the Massachusetts Institute of Technology in which solar cells are manufactured by depositing photovoltaic material on flexible substrates, such as ordinary paper, using chemical vapor deposition technology.[1].

DC Generator

A dc generator is an electrical machine which converts

mechanical energy into direct current electricity. This energy conversion is based on the principle of production of dynamically induced emf. This article outlines basic construction and working of a DC generator.

Power Bank:

Power Banks are all the rage, they came in various shapes and sizes, but what are they for? We explore their potential, and how to choose the right one. Portable Power Banks are comprised of a special battery in a special case with a special circuit to control power flow. They allow you to store electrical energy (deposit it in the bank) and then later use it to charge up a mobile device (withdraw it from the bank).

Power supply:

All system works on difference types of voltage levels so in this block we are constructing all required voltage level in this block using voltage regulator and rectifiers, filters, and power inductors. Power supply will runs on power bank which is charged by solar cell.

Raspberry pi:

The Raspberry pi is a single computer board with credit card size, that can be used for many tasks that your computer does, like games, word processing, spreadsheets and also to play HD video. It was established by the Raspberry pi foundation from the UK.

Wi-Fi:

Wi-Fi stands for Wireless Fidelity. Wi-Fi It is based on the IEEE 802.11 family of standards and is primarily a local area networking (LAN) technology designed to provide in-building broadband coverage. Current Wi-Fi systems support a peak physical-layer data rate of 54 Mbps and typically provide indoor coverage over a distance of 100 feet just as toxic chemicals are released into surrounding water supplies by oily runoff from Tyre fires. In order to prevent the environmental problem from growing, recycling Tyre is an innovative idea or way in this case. Recycling Tyre is the processes of recycling vehicles Tyres that are no longer suitable for use on vehicles due to wear or irreparable damage (such as punctures).

GPS System:

The Global Positioning System (GPS), originally Navstar GPS, [1][2] is a space-based radio navigation system owned by the United States government and operated by the United States Air Force. It is a global navigation satellite system that provides geo location and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. [3]

GSM:

GSM (Global System for Mobile Communications, originally Grouped Special Mobile) is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe the protocols for second-generation digital cellular networks used by mobile devices such as tablets, first deployed in Finland in December 1991. [2] As of 2014, it has become the global standard for mobile communications – with over 90% market share, operating in over 219 countries and territories. [3]

Sensor:

We are using sensor for identification of bag is open or closed so that we can create security for bag and give alert.

Actuator:

To gives information of alert of missing things it can be like audio or video or alert

SYSTEM ARCHITECTURE

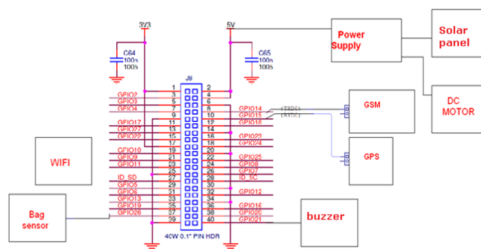


Figure 2: System Architecture

Raspberry Pi 3

The GPU provides Open GL ES 2.0, hardware-accelerated Open VG, and 1080p30 H.264 high-profile decode and is capable of 1Gpixel/s, 1.5Gtexel/s or 24 GFLOPs of general purpose compute. What's that all mean? It means that if you plug the Raspberry Pi 3 into your HDTV, you could watch BluRay quality video, using H.264 at 40MBits/s

The biggest change that has been enacted with the Raspberry Pi 3 is an upgrade to a next generation main processor and improved connectivity with Bluetooth Low Energy (BLE) and BCM43143 Wi-Fi on board. Additionally, the Raspberry Pi 3 has improved power management, with an upgraded switched power source up to 2.5 Amps, to support more powerful external USB devices.

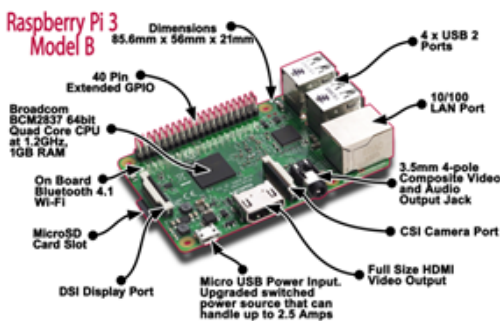


Figure 3 Pin Diagram of Raspberry Pi 3

The Raspberry Pi 3's four built-in USB ports provide enough connectivity for a mouse, keyboard, or anything else that you feel the RPi needs, but if you want to add even more you can still use a USB hub. Keep in mind, it is recommended that you use a powered hub so as not to overtax the on-board voltage regulator. Powering the Raspberry Pi 3 is easy, just plug any USB power supply into the micro-USB port. There's no power button so the Pi will begin to boot as soon as power is applied, to turn it off simply remove power. The four built-in USB ports can even output up to 1.2A enabling you to connect more power hungry USB devices (This does require a 2Amp micro USB Power Supply)

SOFTWARE OPERATION

Format your SD card Go to official website of Raspberri pi <https://www.raspberrypi.org/downloads/> Raspbian is the Foundation's official supported Operating System. Download it

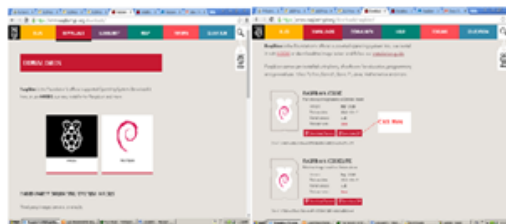


Fig. 4 Official Web page of Raspberry pi

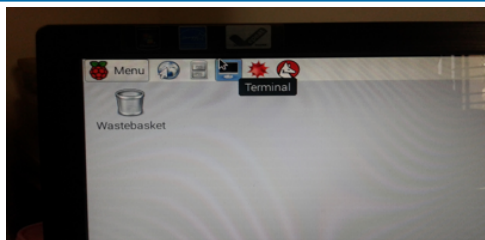


Figure 5 Raspberry Pi 3 OS on screen

Python3 IDE is built-in in OS so we can on select for coding easily. We have use python for backend coed and for frontend html connectivity is between by flask

FIRST STEP: RASPBERRY PI SETUP.

We're gonna use the Raspberry Pi as web server as well as "communication point" with the outside world, so we need to install some things.

Obviously, we have to install some Linux flavour, the one I use it's the most popular one available for Raspberry Pi: Raspbian. If you don't have experience on how to do that, you could check the official Raspberry Pi NOOBS setup guide. Then, we need to check if the RPi.GPIO library it's installed (is installed by default in Raspbian). To make sure that it is at the latest version:

```
pi@raspberrypi:~$ apt-get update
pi@raspberrypi:~$ apt-get install python-rpi.gpio python3-rpi.gpio
```

or using pip:

```
pi@raspberrypi:~$ pip install RPi.GPIO
And finally, we have to install Flask, just by executing:
pi@raspberrypi:~$ pip install Flask
Ok, let's code some Python!
```

STARTING OUR WEB APPLICATION

On our Raspberry Pi, we're going to create a folder where we'll have all of our code. We can create it wherever we want, e.g., on the user folder:

```
pi@raspberrypi:~$ mkdir flask-internet-of-things-app
pi@raspberrypi:~$ cd flask-internet-of-things-app
Let's start with the "Hello world!" of Flask, so we're going to create a file named main.py:
pi@raspberrypi:~/flask-internet-of-things-app$ touch main.py
```

and put the following code there:

```
from flask import Flask
app = Flask(__name__)
@app.route("/")
def hello():
    return "Hello World!"
if __name__ == "__main__":
    app.run(host="0.0.0.0", debug=True)
```

Save the file, and then execute it from the terminal like so:

```
pi@raspberrypi:~/flask-internet-of-things-app$ python main.py
```

You can see that something is going on here, and if you go to your web browser and enters the URL http://your-raspberrypi-ip:5000 you'll see what is going on: it shows the text "Hello world!". Let's stop here for a moment to understand how it works:

With from flask import Flask we're importing the main object Flask which is the one that give us all the power. We initialize one Flask instance with app = Flask(__name__), having on the app variable the instance that we're going to use on the entire file.

@app.route it's the decorator that Flask give us to be able to do all our routing to bind a function to an URL. In this case, we're binding the "/" route (the index) to the hello method.

And finally, the last piece of code on this "Hello world!" thing ensures that we're executing the Flask object properly. We can import the content of the main.py file on other files by doing the from whatever import * thing, and in this case we don't want to be able to start a server. That's the reason of the if __name__ == "__main__" condition, it checks that the file it's invoked by executing python main.py from the terminal, and only in this case it will start the server.

app.run starts the server, and we can pass some parameters, like in our case host and debug. We need to specified the parameter host to 0.0.0.0 to be able to access to the web application outside the Raspberry Pi (from our computer), and debug=True for obvious reasons.

Ok, once we understand this little things, we're going to do some fancy things to make our web application looks good (render text may be enough beautiful, but it's much better to render some pretty good looking HTML: D).

WORKFLOW OF PROGRAM:

When system will Start, OS will on Initiate ports as input and output. Initiate web server, wait for GPS and GSM connection Give input form terminal feed it to system Check the given input process on decision has to taken If action is up move motor forward If action is dawn move motor revers If action is left move motor left If action is right move motor right If action is get location motor get location for GPS send SMS If bag is open send alert to web server and mobile.

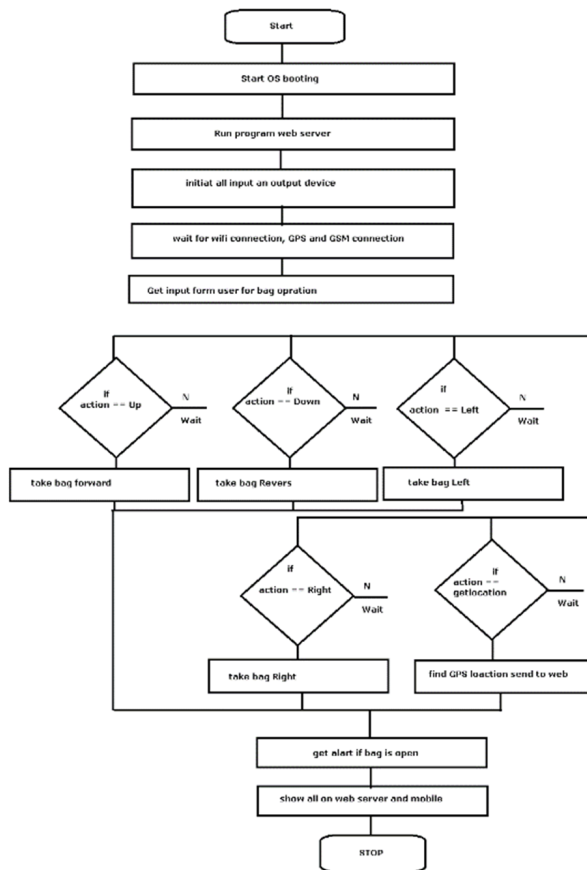


Figure 6: Flowchart algorithm

Experimental results

Installing Raspbian on the Raspberry Pi is pretty straightforward. We'll be downloading Raspbian and writing

the disc image to a micro SD card, then booting the Raspberry Pi to that micro SD card. For this project, you'll need a micro SD card (go with at least 8 GB), a computer with a slot for it, and, of course, a Raspberry Pi and basic peripherals (a mouse, keyboard, screen, and power source). This isn't the only method for installing Raspbian (more on that in a moment), but it's a useful technique to learn because it can also be used to install so many other operating systems on the Raspberry Pi. Once you know how to write a disc image to a micro SD card, you open up a lot of options for fun Raspberry Pi projects.

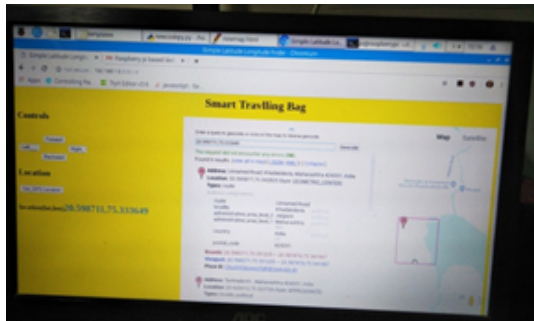


Figure 8: Change of web page in html

Finally we got result with GPS location. we on key this is all optimization code For creating code user friendly



Figure9: Experimental arrangements of hardware

This is grab arrangement of hardware while constructing a project. RPi, GSM, GPS, DC motor driver, and sensor are there in image

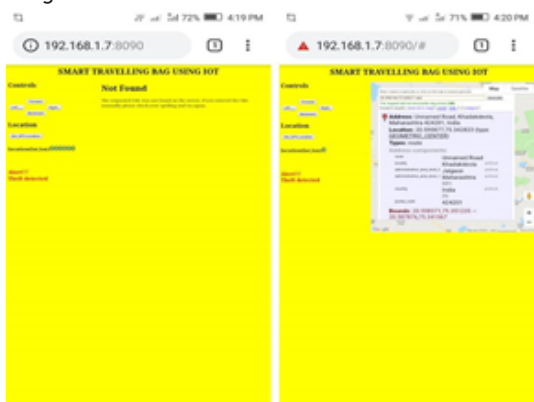


Figure10: Experimental result on Mobile phone

We have use mobile app for controlling and finding result on mobile phone.

CONCLUSION

The proposed system hence made good use of new technology by providing monitoring and tracking using new embedded system. The system plays an important role in real

time monitoring, controlling and tracking of all the smart bag parameters. By using this proposed system we can control many problems related to language carrying system like Airlines security problem, Theft, exchanging, mishandled, crime and etc., so this proposed system will make sure you that your language bag is secure and safe with no worries.

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