SMART, SECURED AND SOLACE LUGGAGE BAG USING INTERNET OF THINGS AND COMPUTER VISION

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Abstract - *An S3 luggage bag is an application-specific design that can be useful for almost everyone in the society, especially for old matured people. This paper illustrates the design and implementation of an intelligent S3 luggage bag. With recent technological advancement, face recognition technology (FRT) has recently received significant attention which allows face detection and tracking algorithm in real time camera environment. This technology has emerged as an attractive solution to address the needs for identification and the verification of identity claims. Nowadays people are expecting more location based services for being advanced and to save time. GPS is a Radio Navigation system which is already developed and implemented with a GPS device to calculate the location from the information taken from a GPS. Trailing the bag is becoming difficult task through different traveling stations, therefore the paper outlines a system where the movement of the luggage bag is controlled through an android application which can be utilized by following a set of protocols. Hence the design gives an idea about an intelligent S3 luggage bag that can be tracked in real time by the owner, bag locking/unlocking system using FRT and automated or smart control of the movement of S3 luggage bag.*

*Key Words***:** Arduino UNO, FRT, Google Assistant, GPS/GSM Module, L293d Motor Driver, Raspberry pi and TeamViewer.

1. INTRODUCTION

In a nutshell, the Internet of Things is the idea of interfacing any device to the Internet and to other associated devices. The IoT is a giant network of connected things and environment– all of which gather and analyze information about the manner in which they are utilized. IoT incorporates a phenomenal number of objects of every kind of imaginable – from smart microwaves, which consequently cook your food for the correct period of time, to self-driving vehicles, whose complex sensors recognize objects in their way, to wearable wellness gadgets that measure a person's pulse and the quantity of steps taken that day, then use that information to suggest exercise plans tailored to individual. With Google Assistant and the Actions on Google developer platform based on IoT, we characterize the different abilities, or "qualities," of our device and the

assistant naturally handles all the various expressions that clients can say to control it. At the end of the day, Google gives our regular language understanding out of the hub. In IoT, each device acts as a little piece of a web hub and each hub connect and convey. Recently, surveillance cameras are used in order to build safe places, homes, and urban communities. In any case, this innovation needs an individual who identifies an issue on the edge taken from the camera. In this paper, an Internet of Things is united with computer vision so as to distinguish the essences of individuals. Embedded systems are a vital part of each cutting edge electronic segment. These are low power utilization units that are utilized to run explicit undertakings, for instance, remote controls, clothes washers, microwaves, RFID labels, sensors, actuators and indoor regulators utilized in different applications, organizing equipment. For example, switches, modems, cell phones, PDAs (personal digital assistant), and so forth. Usually, embedded devices are a part of a larger device where they perform a specific task of the device.

2. BLOCK DIAGRAM
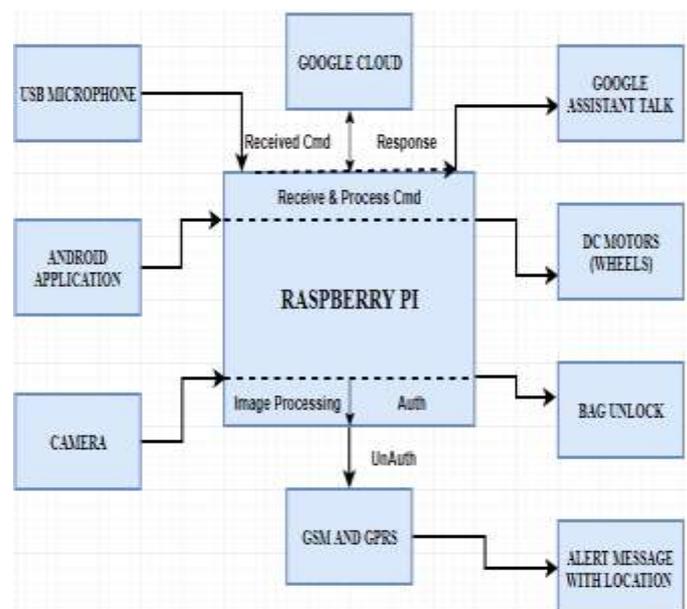
Fig -1: Block Diagram

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3. WORK DESCRIPTION

The core element of our design is raspberry pi, made capable enough to execute the programmed features. The usb microphone starts receiving commands from the user when it gets triggered as "Ok Google" or " Hey Google". Then the received command from the user is being processed in google cloud via raspberry pi, the processed output is given back to the raspberry pi which is executed as a voice through speakers. The user can start controlling the motion of luggage bag by accessing the android application linked to raspberry pi with the different commands depending on which the dc motors comes into action. Than coming on to the security of the luggage bag, which is based on the FRT for which the input is taken through the camera which captures the face of an person and stores it in the form of frame. Once this frame is been processed and recognized, the bag gets unlocked or else an alert notification is sent to the user using GSM/GPRS module which notifies the user the real time location of the luggage Bag.

4. TECHNICAL SPECIFICATIONS

Fig -2: Arduino UNO

The Arduino UNO is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.
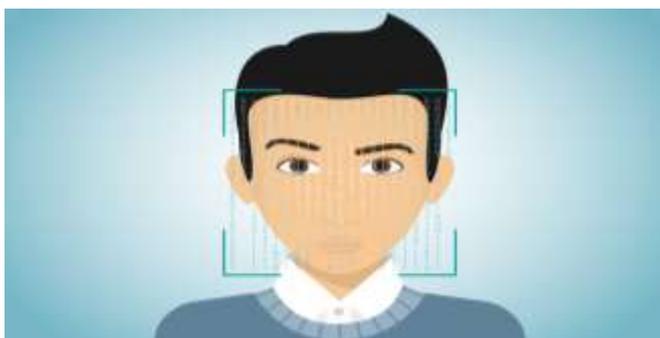
Fig -3: Facial Recognition

A facial recognition system is a technology capable of identifying or verifying a person from a digital image or a video frame from a video source. There are multiple methods in which facial recognition systems work, but in general, they work by comparing selected facial features from given image with faces within a database. It is also described as a Biometric Artificial Intelligence based application that can uniquely identify a person by analyzing patterns based on the person's facial textures and shape.

Fig -4: Neo 6m GPS module

The NEO-6M GPS module is a well-performing complete GPS receiver with a built-in 25 x 25 x 4mm ceramic antenna, which provides a strong satellite search capability. With the power and signal indicators, we can monitor the status of the module.
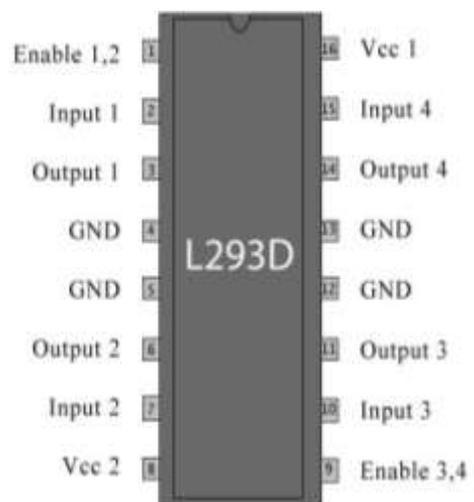

Fig -5: L293D Motor Driver

L293D is a dual H-bridge motor driver integrated circuit (IC). Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors. In its common mode of operation, two DC motors can be driven simultaneously, both in forward and reverse directions.

Fig -6: Raspberry pi Model 3 B+

The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python. It's capable of doing everything you'd expect a desktop computer to do, from browsing the internet and playing high-definition video, to making spreadsheets, word-processing, and playing games.

4. RESULTS AND DISCUSSION

In the wake of envisioning the essential issue of each voyager, we analyzed and noted the challenges accordingly, and started working in that direction. With all our imagination and endeavours we have built up a model has appeared in the figure 1.

Fig -7: Interactive Window for User

Fig 7, represents the UI (User Interference) window through which the owner can easily order the system to play out an assignment. The first frame is displayed on to the screen of user when the raspberry pi gets powered-up, and the second frame follow the first frame.

Highlights in frame two resemble 1. ADD NEW USER-enables proprietor to include an approved client. 2. OPEN BAG-enables access to luggage bag by perceiving the client's face. 3. LOCK BAG-permits locking of the bag. 4. CONTROL BAG-this element permits evasion of trailing of luggage bag. 5. The END-if client needs to finish up with the highlights.
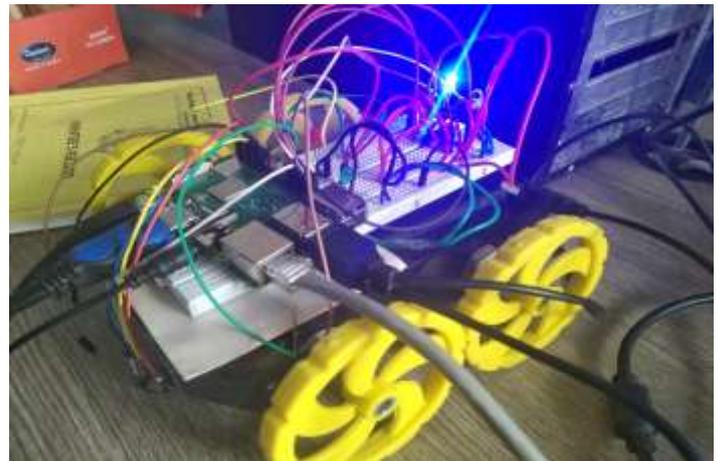

Fig -8: Motor Driver Interfaced With Raspberry pi For Movement of Luggage Bag

Fig 8, gives a general portrayal of the working of dc motor which is controlled by the android application over Wi-Fi connectivity.
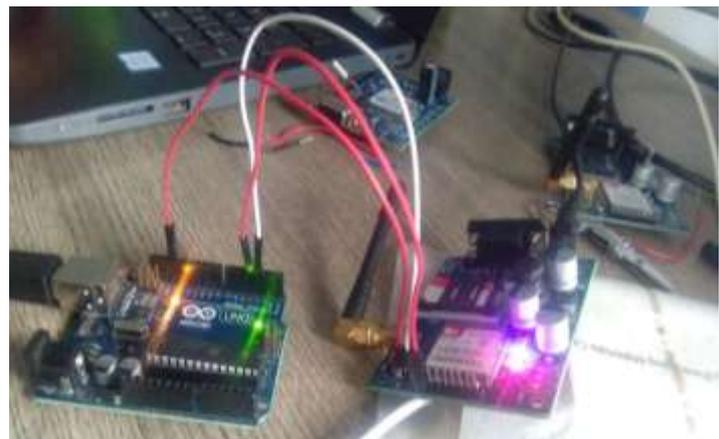

Fig -9: GSM/GPRS Module Interface

In figure 9, there is an interfacing of GSM/GPRS to send a warning notification (SMS) to the proprietor of the bag, if the unapproved individual is attempting to get to the luggage bag. Also, in the event that on the off chance that the bag gets stolen or lost, at that point with the enabled element of GPRS we can track it.
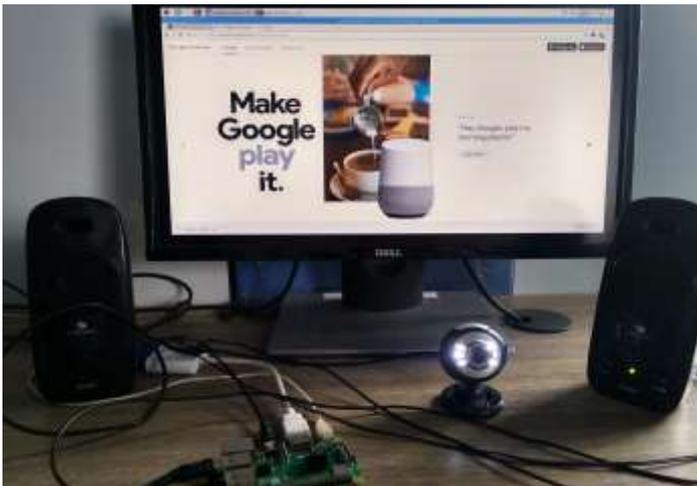
Fig -10: Interactive Google Assistant

The USB receiver begins getting directions from the client when it gets activated as "Ok Google". At that point the got order from the client is being processed in google cloud by means of raspberry pi, the response is feed back to the raspberry pi which is executed as a voice through speakers. This component is empowered so the voyager can appreciate the adventure.

The outcomes were expectations based. Still, we have a vision of modernizing it to high-level extent which includes security and more user friendly.

5. CONCLUSION

S3 Luggage bag is an innovative carry on suitcase that makes life easier and smoother. Carrying luggage is the main difficulty faced by each and every traveller. Here we tried to reduce the dragging of luggage bag, and providing better security and intelligent features that are suitable for modern era. We developed a new low cost S3 luggage bag to assist low cost consumer product implementation, with high end security system i.e, face recognition technique and real time GPS tracking of the luggage Bag.

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