



## Design and Implementing Automatic follower bag

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# Design and Implementing Automatic follower bag

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**Abstract**—Luggage bag used in today’s travelling is manually driven which consumes considerable human energy and does not have safety features. Automatic bag follower will reduce Manual work of passenger and provide safety features. Aim is to develop a luggage bag i.e. robot capable of navigating through obstacles and successfully following its user. For human detection ultrasonic sensor is used which also help in distance measurement. For safety features GSM and GPS are used which help to locate the automatic bag in case its lost. Raspberry pi is used to integrate all the electronic components used in the project. Automatic luggage bag can also support mobile charging and it can derive its power using solar energy.

**Keywords**—Automatic luggage bag, Obstacle detection, GSM, GPS, Dry Batteries, PIC, Raspberry pi.

## I. INTRODUCTION

The luggage bag which is used in today’s world is hand driven posing problems like exhausting human energy and not equipped with state-of-the-art safety features by means of automatic passenger intervention will be reduced to a minimum result of which will reduce the delay time and human efforts in luggage management system. In today’s time everybody carries a luggage bag for travel especially to airport and almost all of them are dragging out heavy luggage bag. Every Passenger has to carry its luggage on its own which most of the time is very slow and tiring process because of heavy nature of luggage and journey becomes unpleasant. Automatic luggage follower bag is solution to this problem. It can also be called as smart luggage because of its automation. Ultrasonic sensor is used for passenger detection and distance measurement. The movement of the luggage is controlled using wheels which in turn are controlled by raspberry pi. GSM and GPS are used for security purpose to help track the luggage bag in case its lost. A message will be sent which will activate GPS and location of luggage bag will be sent using GSM. Minimum distance between the luggage bag and passenger has to be maintained, it is done with help of raspberry pi.

## II. IMPORTANCE OF THE PROJECT

- Luggage bag is part and parcel of travelling, while travelling luggage bag has to be carried which is most of the time heavy to carry. Luggage can

sometimes become problem if not taken care properly. This project helps overcome this problem.

- The luggage can derive power using solar energy instead of battery and can support mobile charging.
- GSM and GPS will provide anti-theft security.

## III. METHODOLOGIES USED

Human detection will be done with help of ultrasonic sensor. Ultrasonic sensor also helps in distance measurement. Security of automatic luggage bag is secured by using GPS and GSM. All components used are controlled and integrated using microcontroller.

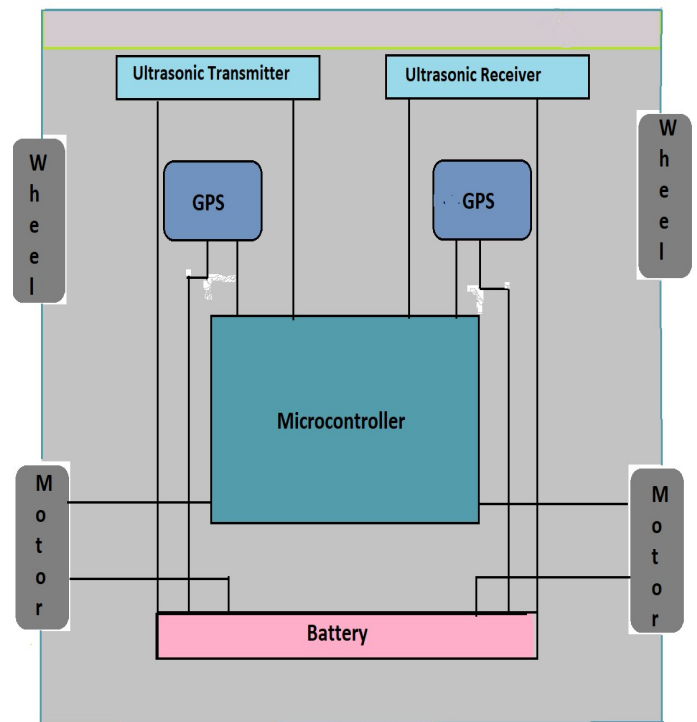


Fig 1. Block Diagram

#### IV. TECHNICAL TERMINOLOGIES USED

##### A. Target Detection:

Detection is the method of finding each user position. The inaudible sensing device is the key element in target detection. Ultrasound detector measures live distance by transmitting ultrasound waves. It supports the properties of acoustic waves with frequency on top of human perceptible range. There are 2 main components within the sensor, a transmitter to transmit the sound waves and receiver to receive echo. Transmitter converts voltage to sound energy and receiver half receives the echo and switch the received echo and received sound waves into voltage and also, the mechanism can move forward, right or left in accordance with the detected human presence. The fundamental principle behind the operation is that the inaudible transmitter emitted the inaudible waves in one direction and began temporal arrangement once it launched inaudible unfold within the air and would come straightaway once it encountered obstacle on the approach. At last, the inaudible receiver would stop temporal arrangement once it received the mirrored waves. because the inaudible unfold rate is 340m/s within the air supported the timer record t. we are able to calculate the gap between the obstacle and transmitter particularly,

$$s = 340t/2$$

This is known as because the time distinction distance measuring principle This is called as the time difference distance measurement principle.

##### B. Raspberry Pi :

Raspberry Pi serves as the project's microcontroller and will be wired to all other sensors. It is a low-cost, credit-card-sized device that attaches to a computer monitor or TV and uses a regular mouse and keyboard. It is a small capable device that allows people of all ages to explore programming, and learn how to program in languages such as Scratch and Python. An SD card inserted into the board's slot acts as the Raspberry Pi hard drive. It is operated by USB, and you can hook the video output up to a conventional RCA TV set, a more modern monitor, or even a TV using the HDMI port. The Raspberry Pi has found its way into the hobbyist computing market, but it is also very powerful for other business as well as personal use. An extremely low power draw, low form factor, no noise, solid state storage and other features make it an attractive solution for a thin, lightweight server

##### C.GPS:

The Global Positioning system is one in every of the systems that square measure space-based radio navigation system created from a minimum of twenty-four satellites. it's nothing however a world navigation satellite system that has geo-location and also the time info to a GPS receiver anyplace on or close to the world wherever there's AN unobstructed line of sight to four or additional GPS satellite. If we would like to calculate 2-D position (latitude and longitude) and track movement, a GPS receiver should be fastened on to the signal of a minimum of three satellites. The GPS system doesn't need the user to transmit any of the

information, and it operates severally of any telecom or web reception, though' these technologies will enhance the quality of the GPS positioning info.

##### D. DC Motor:

A DC motor is any of a category of rotating electrical machines that converts electrical energy voltage into energy. the foremost common sorts place confidence in the forces created by magnetic fields. The speed DC motor are often controlled by varied the availability voltage or by dynamic this in its coil The circuit use a one hundred rate twelve V DC motors with gear case, 6mm shaft diameter with internal hole, a hundred twenty five weight unit weight, Stall force = one.5 Kg/cm force, No load current = sixty mA (max), and cargo current = three hundred mA(max). This was the difficult portion for America to implement AN formula which ends up the rigid automaton body to trace the associated transmitter holder moreover because the user. because the correct usage of ultrasound sensing element is just ready to offer with the space of the situation of the user however not the precise position of the user.

##### E.GSM Module:

GSM or Global System for Mobile Communication is a Wireless Communication standard for mobile telephone systems. A sim card is put on GSM module which will help in tracking the luggage bag. A message is sent which activates GPS module and location can be tracked. It is a TDMA (Time division multiple access) based network technology. The digital system has an ability to carry 64 kbps to 120 Mbps of data rates. One key feature of GSM is the subscriber identity module commonly known as a SIM card. It operates at 850 MHz, 900 MHz, 1800 MHz and 1900 MHz frequency bands.

##### F. Bluetooth Module:

Bluetooth helps in collecting all the data and always maintain connectivity with the automatic luggage bag. Bluetooth requires a system of electronic components to receive, process, transmit and present collected data on user interface.

##### G. Proposed Diagram

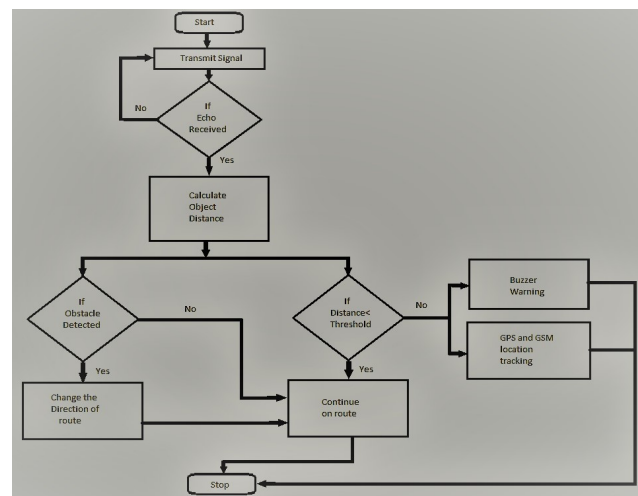


Fig 2. Procedure flow diagram

## V. EXPECTED OUTCOME

Luggage carrying smart bag will be capable of following its user automatically after its connection is successful using technologies like ultrasonic sensor, GSM, GPS, Bluetooth, raspberry pi.

## VI. RESULT

In day to day life when we are traveling and luggage carrier can become big problem. Using automatic following bag, we can overcome this problem. A security system that the user can be free of worries of its luggage being stolen or left behind. In future features like headphone points, USB point, Wi-Fi technology, fingerprint system for security purpose can be added and focus on to make less expensive and easy to handle.

## VII. CONCLUSION

The limitations of the traditional luggage will overcome with Smart Luggage. The market is still new and has potential to accept the new face of luggage. Know the weight of your Luggage at any time and pack accordingly. Move the luggage easily using autonomous and manual modes. The smart luggage will ensure its safety and builds security for its user. From built-in scales to GPS tracking and mobile apps, these bags won't make hauling stuff any lighter, but they could make the experience less harrowing.

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