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Travel Mate

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Abstract: ***Travel mate is a designed to be operated without using the hands. It follows the owner and sustains a safe following distance behind the user, thus allowing total liberty of movement. The objective is to automate the act of trailing the luggage which is commonly experienced while working through the tedious and regularly comprehensive routines. It is used to study the thorough design and operation of smart suit case from the engineering perspective and to create an upgraded working model of luggage bag consolidated with sensors based on a control system. The aim of obstacle avoidance and target following behavior makes the design very unique. To build an autonomous luggage bearing device that follows the owner wirelessly, we sketch the concept of building a robot that would pursue a specific person through any point and assist the person along with carrying that person's baggage. After our view of the current appliances available for performing these tasks, we have described the proposal that aims to develop a base which would send and receive a signal and would provide a simple and practical way for the robotic device to calculate a path and follow which does not involve the use of internal maps and the potentiality to self-localize.***
Keywords: GPS, luggage, microcontroller, motor, robot.

I. INTRODUCTION

Travel mate- A human following suit case have been researched and evolved actively these decades due to its ample amount of applications in daily life and manufacturing. A human following bag uses several techniques such as human's target detection, robot control algorithm and obstacles avoidance. Various ways of following robotic devices came up earlier for such techniques such as by using ultrasonic sensors, audio recognition sensors, Bluetooth devices, IR sensors or large range sensors, charge-coupled devices, types of camera and many more. These methods are used for detecting the relative position between the following robotic device and a human. Here, we present an approach in analysing location of a bag using GPS for a human following robot. Robotic technology has expanded appreciably in past few years. Such innovations were only a fantasy for some people a few years back. For an automatic robotic device, the interaction between the person and the device is the most important aspect. A major acknowledgment has been observed for the usage of such technologies.

This research has a trivial participation in the development of such robots. A robot that functions fully autonomously should not only complete the jobs that are desired of them but also by any means should create a bond between themselves and the owner. A plenty of analysis has been completed regarding such mechanism but a lot of research still requires to be done. Along with the communication or interaction between the robotic luggage bag and the user, it should also be capable to follow that user. Keeping this in mind, there should be a capacity in the robot to get information from the nearby area while pursuing the required object. The sketching and fabrication of a robotic luggage bag that follows the owner along with tracking its position is the primary goal of this project. Another problem that needs to be handled is to protect the robotic device from collision while following in an open space. Such kind of difficulties can be avoided by using different sensors. All the processing is carried out with the help of microprocessor or microcontroller that integrates all the other sensors together.

II. LITERATURE SURVEY

So far several researches are done on the forms of golem that comes within the class of the "Assisting Robots". Individuals have used totally different ideas and logics to implement their style. All of their primary focus has fully been on the planning of robots that follows the target. Laser sensors were utilized by Burgard in his guide robotic bag that was used for human pursuit. LRF was incorporated by D. Charles M. Schulz to execute the aim of following. Exploiting the higher than explicit technique, they did the research for the detection. Nicola, Husing used a method for remarking the various strategies of movement by exploitation LRF. This information was united with the knowledge obtained by the camera. Depth imaging was utilized by Songmin Jia who tried for the detection [1]. The model of robot was found exploitation the depth imaging. The actual variety of consumer goods was carried by Mehrez Kristou. Multidirectional camera was utilized by him. LRF was conjointly utilized by him within the strategy. A quest

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was in the middle of Wilhelm with the stress on the colour of the actual person's skin. Within the analysis he conjointly used data from totally different sensors [4]. Another analysis work conjointly occurred during this process. Depth imaging using crystal rectifier by Calisi and therefore the target was pursued by coming up with a special algorithmic rule. Ess and Leibe did constant work. They did a vast quantity of work on object pursuit and detection. The largest advantage of their technique was that their algorithmic rule worked even within the complicated environments.

Stereo vision was dispensed by Y. Salih so as to attain the detection. This technique enabled him to pursue the desired target with associate operative manner. The mixture of knowledge from several sensors was employed by him. R. Munoz used sensors to urge the information regarding the target to be tracked. Besides using totally different sensors, he additionally used stereo vision to get correct data. The information of the sensors united with the data from the camera evidenced to be very corroborative in ending the task [2]. Several algorithms are being developed by the researchers for the detection method. Bluetooth was utilized in an enquiry to work the design of the moving legs beside camera that was accustomed to find a selected target or someone. An awfully simplified technique was additionally utilized in an enquiry. The person used distance sensors during this technique on the device and hence follows the person. These sensors radiated radio waves and were detected by the sensors with the person to be followed. In this way the machine tracked the desired target.

Johann Borenstein et al had performed immense number of experiments, within which the owner follower team progressed on an awfully puzzling path of generally wiggly streets and even additionally on steep slopes. Experiments took around 9-15 minutes. The device perpetually uses its on-board device to spot and path the leader excluding once line-of-sight was momentarily interrupted when the leader twisted around a corner. The device's distance to the leader was perpetually short that accustomed be perpetually in between 5-2 m. As a result, direct line-of -sight downside was typically terribly less on the order of 1-3 seconds. It used direct line-of-sight based mostly device that wasn't appropriate once a user goes around a corner. Young jinn Hong et al. introduced a home automaton to retain track of moving folks in home environments. A FTO vary device is operated in lightweight due to its high industrial viability. The sensors ordinarily have comparatively short activity and low resolution at an extended distance. These shortcomings enhanced few issues that the option of recognition by method that offers various human legs candidates creating it tough to differentiate the $64000 human legs from alternative patterns .The sensors typically have comparatively short activity and vary resolution for an extended distance [3].

III.DESIGN AND DESCRIPTION

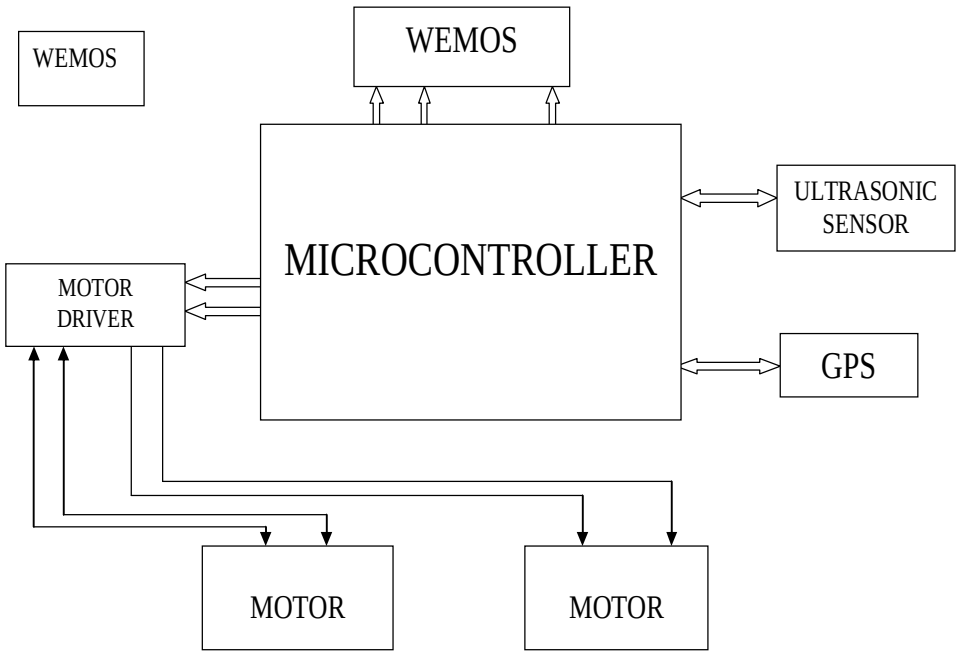


Fig. 1 Block diagram

A. *Microcontroller:* It is a tiny computer on a single IC. The microcontroller comprises of one or more processor including with memory and input and output options. In this project, Arduino mega is used to integrate and communicate with all the sensors, components and modules together.

B. *GPS:* A satellite oriented radio navigation technique is employed by the Global Positioning System (GPS). It is a world-wide navigation satellite system which provides the exact location and time information to any of the GPS receiver.

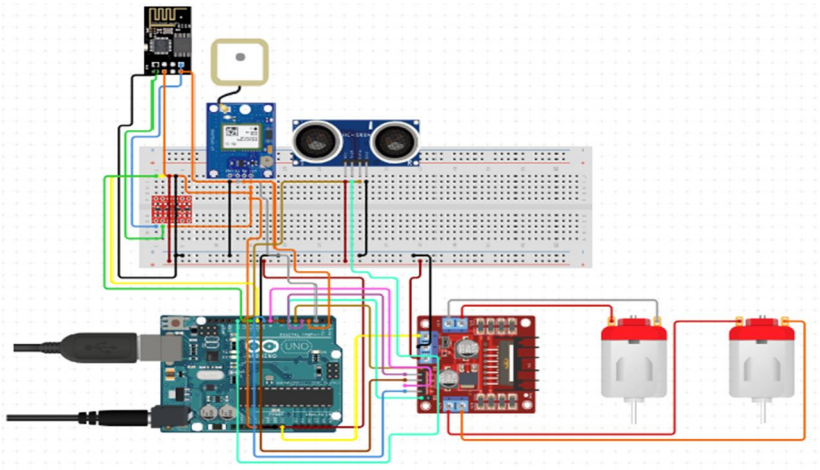
C. *Motor:* A motor is a device which is designed to transmute one formation of energy into mechanical energy. We have used motor for rotating the wheels of the luggage bag in the required direction.

D. *Motor Driver:* For the proper working and management of motors, motor drivers are used along with motors. These drivers are often employed for motor driving as well as interfacing. These driver circuits are easily connected with the motors and they are selected according to the type of motor being used in a circuit.

E. *Ultrasonic Sensor:* Distance will be calculated by these ultrasonic sensors. Calculation of path can be accomplished with the help of ultrasonic waves. The ultrasonic waves are emitted from the header section and the received waves are reflected towards the header section. Ultrasonic Sensors calculates the displacement between the source and the target by analysing the time in between the emission as well as reception. One ultrasonic device is employed for each emission and receiving purpose.

F. *Wemos:* This module permits microcontrollers and microprocessors to establish a connection with the Wi-Fi network by building a straightforward TCP/IP connection. It is used to achieve the feature of anti- theft facility by integrating it in such a way that it would alert the owner of the bag if the bag goes out of range.

IV. WORKING METHODOLOGY



. Fig. 3 Circuit Diagram of the system

The microcontroller integrates every component and modules of circuit together. The motors used to rotate the wheels are connected and operated along with the motor driver. The main purpose of project is to follow the owner. It is attained with the help of ultrasonic sensors. The following robot is programmed in such a way that it would maintain a particular distance behind the owner and this distance is calculated using ultrasonic sensors.

GPS would give the location of the bag to its owner. Wemos is a Wi-Fi module. Two wemos are used, one in the circuit contained in the suit case and another with the owner of the suit case. Wi-Fi network is used by them for the communication purpose. If a luggage bag is robbed, misplaced or is out of range then an alert can be created by this system. Power source for all the connections in the device are given through an inbuilt 12V rechargeable Li-ion battery.

V. CONCLUSION

Smart bag is an innovative carry bag that makes life easier and smoother. Carrying luggage is the main issue faced by each and every traveler. Here an attempt of solving the dragging of heavy luggage bag difficulties is given. It also provides better security and intelligent features that is suitable for the trendy era. In this project we have developed a low cost human following technology to help low cost consumer product implementation. This makes the overall production of a programmed user following bag to be less costly. The intrinsic power bank will offer adequate power and at a similar time share power to varied gadgets like phones, laptops etc.

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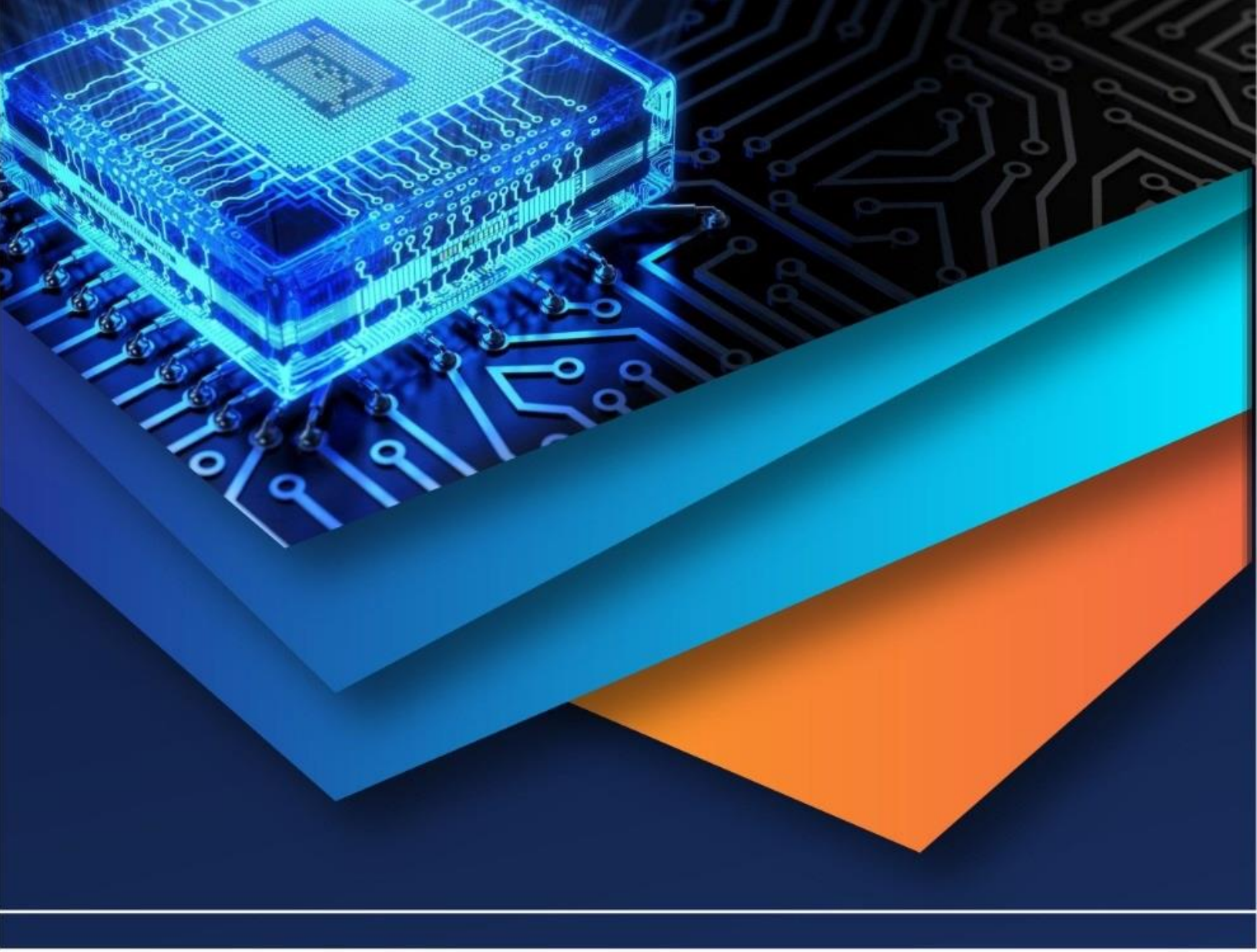

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