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Follow Me Suitcase

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***Abstract*: In several years many modifications have been made on how you transport your luggage. With the modifications such as light suitcase and trolley suitcase the problem still remains for old people, women with infants and pregnant women for carrying the luggage at crowded places such as airport and station. A follow me suitcase which follows you were ever you go. Now the problem of carrying your luggage where ever you go can be solved with this robot.**

***Keywords*: Bluetooth, Compass, GPS, Motor driver.**

1. Introduction

Bluetooth interfacing with Arduino is utilized in the venture. The portable area is shipped off GPS module through Bluetooth to Arduino. The robot at that point explores the area of versatile by contrasting it and its own area and follows you. The robot interfaces with your cell phone through Bluetooth and utilizations GPS organizes gushed from your telephone to follows the area. It is moderate and exceptionally valuable for elderly folk's individuals and pregnant women who are voyaging alone.

2. Literature Survey

From the past few years many modifications have been done to luggage carrier suitcase such as making it light and adding trolley to it. Also, at airports many trolleys are available to carry the luggage. But the problem still remains for old people, handicapped people, women with infants, pregnant women and handicapped people who are not able to carry their luggage on their own and have to depend on others for this. Follow me suitcase is the right solutions as the luggage follows the user where ever it goes. There are many existing projects:

1. Electronic luggage follower, the bag which self-localizes and avoid the obstacle in path.
2. Smart bag, where the bag detects human and follows them.
3. Solar panel bag – bag has a solar panel on it, it does not need battery to run on.

3. Ease of Use

1. Use of the project is very easy, just place the suitcase on the base.
2. We have created an app on mobile, user have to turn on the Bluetooth of their device and then connect it to the Bluetooth module.
3. As soon as it gets connected the bot follows the mobile phone.

4. Hardware Requirement of Proposed System

A. Arduino Uno

Arduino Uno is a microcontroller based on ATMega328P.The board features 14 digital pins and 6 analog pins. It can be programmed using Arduino IDE via a type B USB cable. It also contains a 16MHz quartz crystal, a ICSP header and a reset button. To power it simply connect it to a computer using USB cable or power it with an external 9V battery, though it accepts voltages between 7 and 20 volts.

B. HC-05 Bluetooth Module

HC-05 Bluetooth Module is a simple Bluetooth SSP module designed for wireless serial connection setup. It can be used in master and slave mode. This serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Blue core 04-External single chip Bluetooth system with CMOS technology and with AFH (Adaptive Frequency Hopping Feature). HC 05 is a Master/Slave module which by default has a slave configuration. It can be configured only by AT commands

C. NEO 6M GPS Module

The NEO-6M GPS module is a well-performing complete GPS receiver with a built-in ceramic antenna, which provides a strong satellite search capability. With the power and signal indicators, you can monitor the status of the module. Thanks to the data backup battery, the module can save the data when the main power is shut down accidentally. Its mounting holes can ensure easy assembly on your aircraft, which thus can fly steadily at a fixed position, return to Home automatically, and automatic waypoint flying, etc. Or you can apply it on your smart robot car for automatic returning or heading to a certain destination, making it a real "smart" bot!

D. HMC 5833L Compass

The HMC5883L is a multi-chip module designed for low-field magnetic sensing. The HMC5883L includes our state-of-the-art, high-resolution HMC118X series magneto-resistive sensors plus an ASIC containing amplification, automatic degaussing strap drivers, offset cancellation, and a 12-bit ADC that enables 1° to 2° compass heading accuracy. The I2C serial

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bus allows for easy interface. Applications for the HMC5883L include Mobile Phones, Netbooks, Consumer Electronics, Auto Navigation Systems, and Personal Navigation Devices.

E. L298N Motor Driver

It is a high voltage, high current dual full-bridge driver designed to accept standard TTL logic levels and drive inductive loads such as relays, solenoids, DC and stepping motors. Double H driver module uses ST L298N dual full-bridge driver, an integrated monolithic circuit in a 15- lead Multiwatt and PowerSO20 packages. Two enable inputs are provided to enable or disable the device independently of the input signals. The emitters of the lower transistors of each bridge are connected together and the corresponding external terminal can be used for the connection of an external sensing resistor. An additional supply input is provided so that the logic works at a lower voltage.

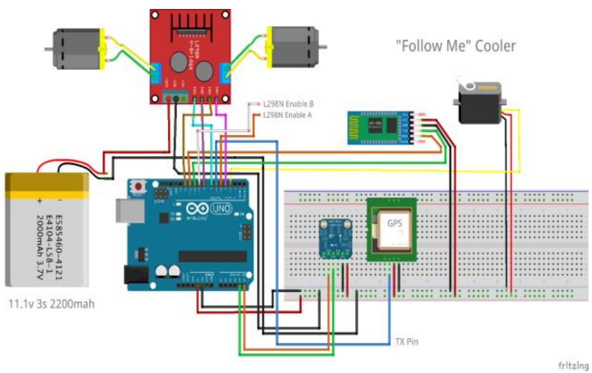

Fig. 1. Circuit diagram [4]

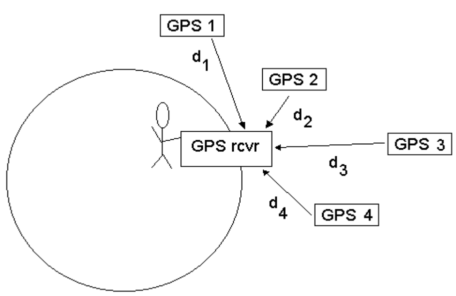

Fig. 2. GPS locating [3]

As you can see in fig. 2, the GPS calculation in the receiver uses four equations in the four unknowns x, y, z, t_c, where x, y, z are the receiver's coordinates, and t_c is the time correction for the GPS receiver's clock. The four equations are:

$$d_1 = c(t_{t,1} - t_{r,1} + t_c) = \sqrt{(x_1 - x)^2 + (y_1 - y)^2 + \sqrt{(z_1 - z)^2}}$$

$$d_2 = c(t_{t,2} - t_{r,2} + t_c) = \sqrt{(x_2 - x)^2 + (y_2 - y)^2 + \sqrt{(z_2 - z)^2}}$$

$$d_3 = c(t_{t,3} - t_{r,3} + t_c) = \sqrt{(x_3 - x)^2 + (y_3 - y)^2 + \sqrt{(z_3 - z)^2}}$$

$$d_4 = c(t_{t,4} - t_{r,4} + t_c) = \sqrt{(x_4 - x)^2 + (y_4 - y)^2 + \sqrt{(z_4 - z)^2}}$$

Where

1. c = speed of light (3×10^8 m/s)
2. $t_{t,1}$, $t_{t,2}$, $t_{t,3}$, $t_{t,4}$ = times that GPS satellites 1, 2, 3, and 4, respectively, transmitted their signals (these times are provided to the receiver as part of the information that is transmitted).
3. $t_{r,1}$, $t_{r,2}$, $t_{r,3}$, $t_{r,4}$ = times that the signals from GPS satellites 1, 2, 3, and 4, respectively, are received (according to the inaccurate GPS receiver's clock)
4. x_1, y_1, z_1 = coordinates of GPS satellite 1 (these coordinates are provided to the receiver as part of the information that is transmitted); similar meaning for x_2, y_2, z_2, *etc.*

The receiver solves these equations simultaneously to determine x, y, z, and t_c.

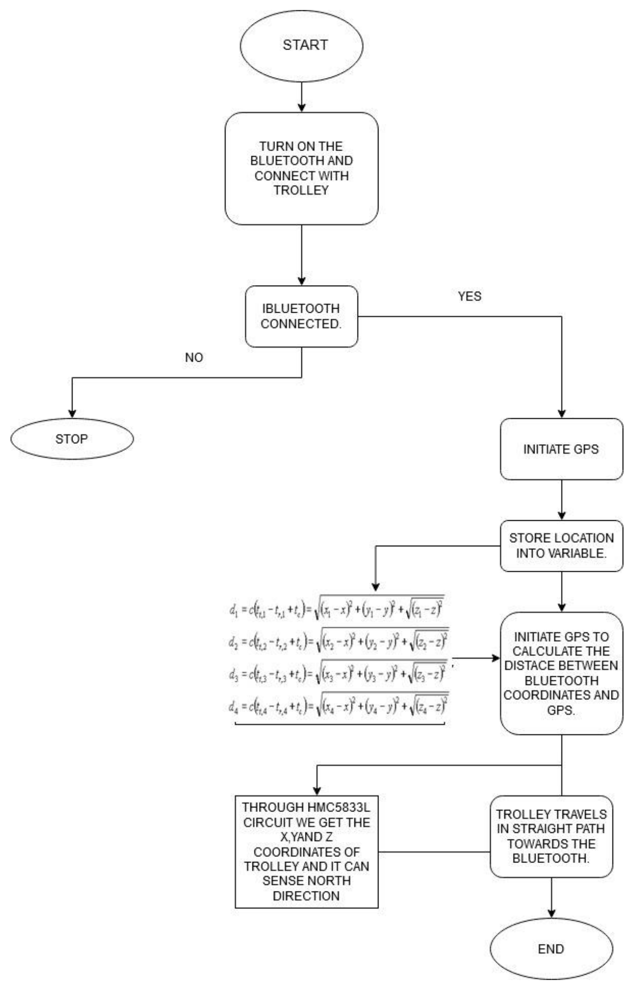

Fig. 3. Block diagram

5. Conclusion

Shrewd pack is an imaginative lightweight bag that makes life simpler and smoother. Conveying baggage is the primary trouble looked by every single traveler. This follows me bag tackles this fundamental issue of conveying weighty packs. This is a minimal effort purchaser item usage, so the general creation cost of a programmed client following sack will be less.

References

[1] E. A. Topp and H. I. Christensen, "Tracking for following and passing persons," in Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst., Edmonton, AB, Canada, 2005, pp. 2321–2327

[2] Muhammad Ali Mazidi Sarmad Naimi Sepher Naimi, "the avr microcontroller and embedded system"

[3] Kwan-Hoon Kim; Jun-Uk Chu; Yun-Jung Lee "Steeringby-Tether and Modular Architecture for Human Following Robot" SICE-ICASE, 2006. International Joint Conference, 2006, pp. 340–343.

[4] Sebin J. Olickal, Amal Yohannan, Manu Ajayan, Anjana Alias, "Smart bag."

[5] Theiss, A, David C. Yen, and Cheng-Yuan Ku. (2004), "Global Positioning System: an analysis of applications, current development and future implementations", 2004.

[6] Rabbany A. (2002), "Introduction to Global Positioning System", Artech House, INC.

[7] McNeff, J. (2002), "The Global Positioning System", IEEE Transactions on Microwave theory and techniques, vol. 50, no.3, March 2002.

[8] Wikipedia (2007), "Global Positioning System", the free encyclopedia.

[9] Shaw, Micheal. Levin, Peter. Martel, John. (1999), "The DoD: Stewards of a Global Information Resource, the Navstar Global Positioning System", IEEE, vol. 87, no. 1, Jan 1999.

[10] MacDonald, Keith, "The Modernization of GPS: Plans, New Capabilities and the Future Relationship to Galileo", Navtech Consulting, Alexandria, July 2002.

[11] Hoffmann-Wellenhof, B., H. Lichtenegger, and J.Collins, Global Positioning System: Theory and Practice, 3rd ed., New York: Spring – Verlag, 1994.

[12] Klobuchar, J. A., "Ionospheric Effects on GPS", GPS World, Vol. 2, No. 4, April 1991, pp. 48-51.

[13] Zhao, Y., Vehicle Location and Navigation System, Norwood, MA: Artech House, 1997.

[14] Bauer, W.D., and M. Schefcik, "Using Differential GPS to Improve Crop Yields," GPS World, vol. 5, no. 2, February 1994, pp. 38-41.

[15] Anonymous, Satellite to profile weather, improve forecasts through GPS, Science Daily, 2002.

[16] Weill, L. R., "Conquering Multipath: The GPS Accuracy Battle," GPS World, vol. 8, no. 4, pp. 59-66, April 1997.

[17] Bureau of Oceans and International Environmental and Scientific Affairs Washington, DC August 29, 2006.

[18] Rockwell Collins, http://www.rockwellcollins.com/about/innovation/atc/technologies/comm_and_nav/index.html.

[19] Kowoma, 2005, http://www.kowoma.de/en/gps/signals.htm