Bluetooth Based and GPS Based Follow Me Robot

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Abstract - *Human-Following robots are being actively researched for his or her immense potential to hold out mundane tasks like load carrying and monitoring of target individual through interaction and collaboration. The recent advancements in vision and sensor technologies have helped in creating more user-friendly robots that are ready to coexist with humans by leveraging the sensors for human detection, human movement estimation, collision avoidance, and obstacle avoidance.*

***Key Words*: IoT, Human-Following, GPS, Bluetooth.**

1. INTRODUCTION

Robotic technology has increased appreciably in past couple of years. Such innovations were only a dream for some people a couple of years back. But in this rapid moving world, now there is a need of robot such as "A Human Following Robot" that can interact and co-exist with them. To perform this task accurately, robot needs a mechanism that enables it to visualize the person and act accordingly. The robot must be intelligent enough to follow a person in the crowded areas, vivid environment and in indoors and outdoors places. Typically, human following robots are equipped with several different diverse combination of sensors i.e. light detection and ranging sensor, radio frequency identification module (RFID), laser ranger finder (LFR), infrared (IR) sensing modules, thermal imaging sensors, camera, wireless transmitter/receiver etc. for recognition and locating the target. All the sensors and modules work in unison to detect and follow the target. The capability of a robot to track and follow a moving object can be used for several purpose.

1. To help human

2. To create ease for people

3. Can be used for defence purpose

In this paper, we are not only going to discuss the importance of context in IOT and Artificial Intelligence, knowledge acquisition, machine learning, communication, databases, and ontology. But we are going to work on it with the help of some algorithms.in this project, the topic is to make a robot follow a person. To be able to do that, the project first studies how to make a robot navigate autonomously in a small area and then how to detect and track a human using Bluetooth and GPS based sensors.

2. LITRATURE REVIEW

1. Paper Name: Autonomous Self-Reconfigurable

Floor Cleaning Robot

Author: RIZUWANA PARWEEN

Abstract: The cleaning robots are going through some significant development in recent years, as the demand for better cleaning performance. However, most of the robots have problems covering the total cleaning area given geometric limitations of the platforms in relation to the cleaning stage, given furniture and architecture. In this paper, we describe the h-Trihex platform, which is a self-reconfigurable adaptive robot that attains three different configurations. The change in configuration gives rise to variation in the kinematic model, which in turn changes the behavior of robot locomotion.

The change in configuration and the robot position is evaluated using the measurements from the on-board sensors like the encoders, LIDAR, and inertial measuring unit (IMU). These data are then utilized to develop a new cascade control strategy for motion control of h-Trihex. The control cascade comprises of a robust backstepping controller in the outer loop for tackling the varying kinematic and a conventional PID in the inner loop for speed control. This cascade is appended by a PID controller, for correcting the wheel orientation after each configuration change. The proposed design assures asymptotic path tracking and satisfactory closed-loop performance, which are validated through numerical simulations and experiments.

2. Paper Name: The Omni-Pi-tent Modular Robot

Author: R. H. Peck,

Abstract: i) Omni-Pi-tent is a new self-reconfigurable modular robot platform with omnidirectional drive, genderless docking, a 2 Degree of Freedom hinge for 3D reconfiguration, a full suite of the onboard sensors needed for autonomous docking, and a Raspberry Pi central computer, ii) It enables a wide range of motions across the ground, this is especially useful for robots docking to an already moving structure, and for enabling structures to continue driving regardless of the orientation that robot modules may have been in when joining the structure, iii) Computation is done with an onboard Raspberry Pi, running a C program to interface with lower level microcontrollers which handle real-time aspects of Omni-Pi-tent's actuators, sensors and communication hardware.

3. Paper Name: Bluetooth Remote Controlled Shopping Cart Using Arduino

Author: Aayush Soni, Aditya Singhai, Akshat Singh Poras

Abstract: Bureau of Labour Statistics (USA) in a May 2017 researched at 50 most common jobs and their scope of automation in near future. In this report labourers, freights, stock and material movers (which is the #7th most common job in the US) had 85% chances of automation in near future. This will primarily be done by the use of IoT. Manual Labour or carrying of heavy loads requires at least some level of human involvement. This human interference can easily be replaced with machines. This will vastly reduce the costs of companies that require labours. It focuses on one particular aspect of this future automation i.e., shopping carts. The aim of this project is to bring us one step closer to automation. Although not entirely automated Blue-Kart. considerably reduces user's efforts nonetheless. We use Arduino Uno microcontroller to save the source code, HC-05 Bluetooth module to connect with user's smartphone and use L298N motor driver IC to control the motors. Through this setup we are able to implement the prototype for this project

4. Paper Name: Working Principle of Arduino and Using it as a Tool for Study and Research

Author: Leo Louis

Abstract: This paper explores the working principle and applications of an Arduino board. This also explores on how it can be used as a tool for study and research works. Arduino board can provide a quick tool in development of VLSI test bench especially of sensors. Main advantages are fast processing and easy interface. Today, with increasing number of people using open-source software and hardware devices day after day, technology is forming a new dimension by making complicated things look easier and interesting. These open sources provide free or virtually low costs, highly reliable and affordable technology. This paper provides a glimpse of type of Arduino boards, working principles, software implementation and their applications.

5. Paper Name: Coverage for robotics – A survey of recent results

Author: Howie Choset

Abstract: This paper explores the working principle and applications of an Arduino board. This also explores on how it can be used as a tool for study and research works. Arduino board can provide a quick tool in development of VLSI test bench especially of sensors. Main advantages are fast processing and easy interface. Today, with increasing number of people using open-source software and hardware devices day after day, technology is forming a new dimension by making complicated things look easier and interesting.

These open sources provide free or virtually low costs, highly reliable and affordable technology. This paper provides a glimpse of type of Arduino boards, working principles, software implementation and their applications

3. SYSTEM ARCHITECTURE

This System consists of Bluetooth Module (HC-05), Arduino Mega as the principle component of our System. To track the human GPS 6M v2 (SIM32EAU) is being used. The Bluetooth of one device is turned ON and paired with our Bluetooth Module. After the connection is established between both the devices, our GPS sensor comes in the action. It usually tracks the distance between our system and human and responds accordingly.

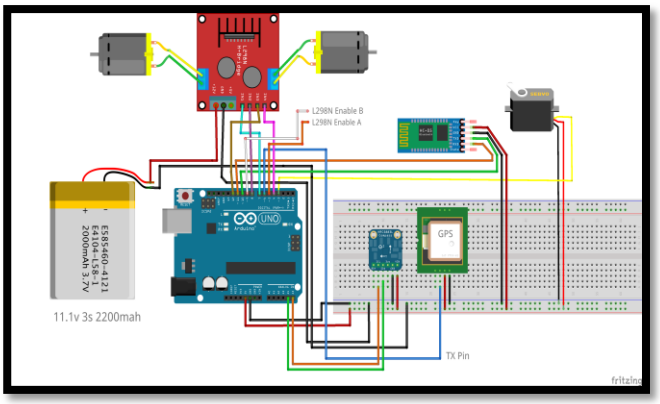

Fig -1: System Architecture

The system is able to track and follow the target in unstructured environments.
It is designed to provide a contactless transport along with the target person.

4. DIAGRAM

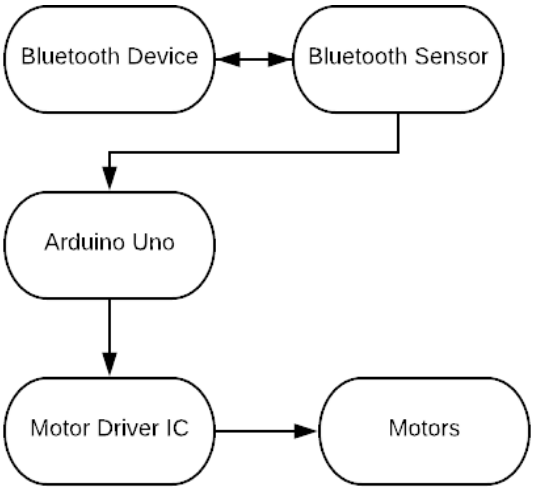

Fig -2: Flow Diagram

5. CONCLUSIONS

The project uses IOT through which we can create several relatively cheap technologies that will be very beneficial to us in the present or near future. Using Arduino and a Bluetooth module we can connect our smartphone easily to our robot. With the help of the connection established it becomes easy to operate. The project uses Arduino IDE for the source code implementation in the Arduino microcontroller. Using HC-05 Bluetooth Module we can connect our smartphone with our robot, The Arduino then will send instructions to the L298N Motor Driver IC which will communicate with the motors making the movement even easier.

6. REFERENCES

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