Smart Trolley

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ABSTRACT

This paper is presented about a system of Smart Trolley. The main aim of growing technology is to make life became easier. To avoid headache like pulling trolley, leaking of important files or documents from one person to another we are introducing new concept that is "Smart Trolley". In this system, we use RFID tags that will be on trolley. In this trolley, a cabin is design to keep the files or product. This project is use to improve the reliability presentation and the tempo. We have used Bluetooth module to drive the trolley and set the path from point A to point B.

Keyword: - Smart Trolley, RFID tag, Bluetooth, Ultrasonic sensor, Encoder Motor, Android application.

1. INTRODUCTION

The modern technology is based on embedded system (which is merging thousands of transistors on single silicon chip) and Automation. The view is placed into compact version of the automated self-checkout set-up on a trolley. In this project, we are using certain motors that can store the path automatically. Previously we have to store the path in it by riding the robot manually. It also contains a storage implementation gadget that will store the track in it.

The Smart Trolley is connect to one application using Bluetooth device. The access of trolley is provide to user by certain application. In which he/she can move trolley or can directly select path and the access of password is accessible on that application. For privacy or security purpose, the system is using RFID (radio frequency identification) tags on trolley. An RFID reader just need to send radio frequency gestures out to the tags and study the gesture that returns from the tag in the form of unusual sequential number.

In this trolley, the function have given is that if some obstacle is detected it will automatically stop the trolley and before stopping the trolley, it will make a noise. If the obstacle is continuously in middle then it will make beep for 20secs after 20secs it will turn left or right (according to path given) otherwise it will send location to sender.

It is also using LCD display-to-display battery indicators red light for wrong RFID tag and green light for right RFID tag, a buzzer and LED lights so that if any obstacle is detected it will beep.

1.1 Motivation

The Smart Trolley plan stood out from many aims presented by the team based on how the aims would be evolved into an interesting technology product which is user-oriented, ease to utilize and methodical, including it being an add-on service for the existing self-checkout structure. As the notion was based on technology, it was salient to get the insight of consumers for which the idea was depicted. The Smart Trolley idea is based on the very fashionable automated self-checkout setup in most of UK retail stores.

1.2 Outcomes

- Smart trolley allows the user to distribute item or object from one place to another.
- It reduces manpower.
- To provide better privacy for confidential files.
- To avoid confusion between different users.

2. LITERATURE SURVEY

The author Bhagat et.al [1], proposed the system that designed a robot to avoid obstacles. The robot is controlled by using the microcontroller AT mega 8. The robot moves in any direction and with the help ultrasonic sensors it detects the object and based on the input the robot changes the direction. The microcontroller changes the direction based on the input of the ultrasonic sensors by giving input to the motor driver.

Borenstein et. al. [2] is developed mobile robot for disabled people to avoid collision by using ultra sonic sensors. Since, the project is highly dependent on the ultrasonic sensors it also has its limitations.

The similar system was introduced by Seema et.al. [3], it make shopping experience more comfortable. In this project the developer uses Arduino, LCD, RFID reader. The project calculates the price and displays the product name on the LCD screen. It aims to minimize the time required you to bill the products.

3. PROPOSED WORK

First switch on the switch button, which is place on the bot to start trolley. After that, we have to connect the trolley to the device through the Bluetooth. The Bluetooth is provide on trolley to connect with a specific device. After connecting the device, we have to add the information of the worker at worker side application and information of user at user side application. After adding the details of user and worker, we have to assign some specific task to the trolley.

Once we assign a task to the trolley, we have to add the path on which the trolley is going to travel. To save the path we have used encoder motor. The encoder motor is been mounted on the trolley. We have to first add the path on the motor using worker application, first we have to drive the trolley manually then the path will store automatically in the motor, in this way we can drive and save many paths on the motor.

To accept the confidential file or product the user have to add his/her details on the worker application that is mandatory to match with the user application and after this the RFID tag will scan and the trolley will get unlocked.

In case any obstacle is detected, the ultrasonic sensor will detect the obstacle and with help of buzzer and LED lights it will buzz and the lights will start blink for 20-50secs and after that it will either turn to left or right (as per given path) and continue on its way.

3.1 System architecture of smart trolley

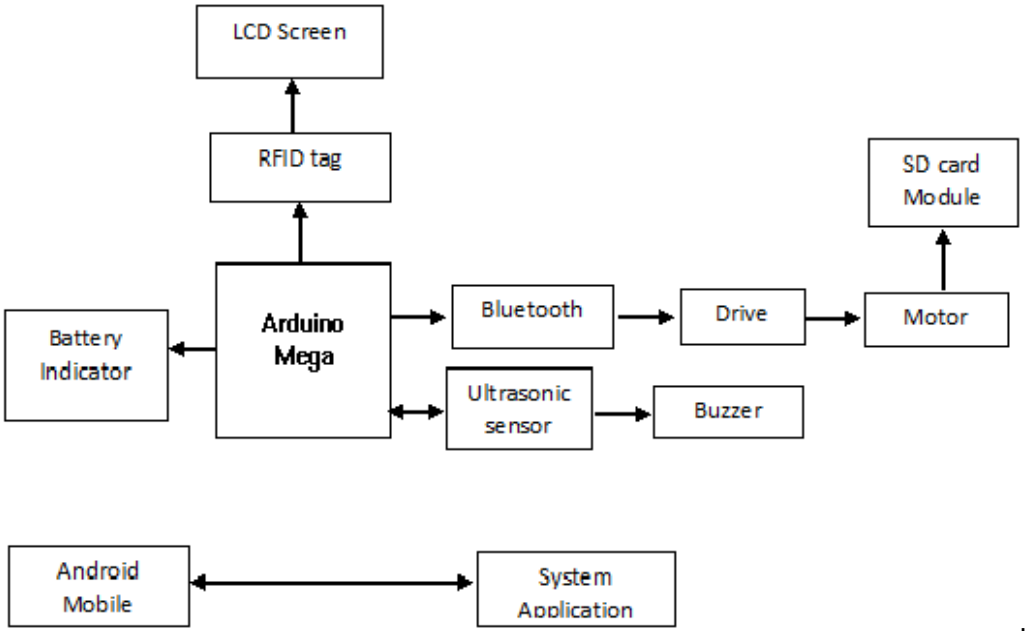

Fig -1: Block Diagram of smart Trolley [5]

The requirements of the setup are as follows:

A. RFID tag: At uncomplicated level, RFID system consists of four main components. An RFID reader just need to dispatch radio frequency signals out to the tags and reads the signs that come back from the tags in the form of a unique sequential number. A tag made up of a microchip with an antenna will transmit data to RIFD reader, when information gets receive. The reader sends out electromagnetic waves and then coverts the radio waves to more serviceable format of data. The microchip and the reader do not need to be in each other's line of sight to work properly, and the reading process is ultra-rapid. RFID mainly enables data to be trap and circulate it to a system without needing a person to be imply. [3]

B. Ultrasonic Sensor: An ultrasonic sensor is an instrument that calculates the interval to an object using ultrasonic sound waves. An ultrasonic sensor uses transducer to send and receive ultrasonic pulses that relay back information about an object's proximity. In these sensors high-frequency sound waves reflect from borderline to construct clear-cut echo layouts. In the design of robot, we are using ultra sonic sensors for obstacle detection and avoidance.[4]

C. Bluetooth HC-05 Module: We have used HC 05 Bluetooth module in which data is sequentially transplant to the Bluetooth receiver. In Smart Trolley system, the Bluetooth is use to be as interface connecting application and trolley.

D. Android Application: - MIT App Inventor is an impulsive, optic programming environment that allows one and all to build functional apps for the smartphones and tablets. Blocks-based coding programs inspire intellectual and creative empowerment. The MIT App Inventor project seeks to democratize software development by sanction to all people, typically young people, to move from technology utilization to technology construction.

E. Encoder Motor: - A rotary encoder, also called a shaft encoder, is an electro-mechanical device that transmute the angular position or motion of a shaft or axle to analog or digital out-turn signals. The rotary encoder is categorized in: incremental and absolute. The outturn of an absolute encoder indicates the current shaft position, making it an angle transducer. The outturn of an incremental encoder assigns information about the motion of the shaft, which usually is handle elsewhere into details such as orientation, tempo and distance.

3.2Advantages

1. Reduce manpower [3]
2. Ease to use and doesn't require any specific schooling.
3. Easy to pinpoint.

3.3 Future scope

In future, robotic arm and robotic legs can be implemented as well as concept of gas sensors can also be upgraded. Even the planning of an integrated global positioning system and global system for mobile communication (GPS and GSM) is developed to track and control vehicles from remote places to assure the maximum security [6]

4. CONCLUSION

Our proposed system will solve the problem of security with the use of RFID tag. We are connecting all components (RFID, Battery Indicator, Motor, etc.) to Arduino and code the Arduino in such a way that it will co-ordinate all functions simultaneously and fluently.

5. REFERENCES

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