Smart Delivery Bot

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Abstract

Humans are responsible for the majority of deliveries in India. When compared to other delivery systems,robotic systems offer more advantages because they are a large transportation medium capable of transporting huge items across long distances. Automation, such as driver-less robots, is a result of technological growth. This proposed model depicts an automatic robot system that travels from point A to point B without the need for human involvement. The sensors are used to identify obstacles. If there are any obstructions in the path, the robot will stop and restart its travel once the obstacle has been cleared. The basic premise of a self-driving system is to have a robot that can transport physical objects from one area to another. A self-contained delivery robot is a robot that makes deliveries. The self-driving robots uses artificial intelligence technology and stops at the destination after
following the correct path. The robot is used for safe delivery of the packets.

Keywords: *Retinopathy, Segmentation, Image Processing*

1. Introduction :

In India, most deliveries are performed by human beings. The main idea of the self driving system is to have a robot which can transport physical objects from one place to the other. The objective of the robotics field is to create intelligent machines that can assist humans in a variety of ways. The model uses artificial intelligence technology to navigate the waypoint and reach the destination successfully. This technology has the capability of a computer-controlled robot to do the tasks commonly associated with intelligent humans. Artificial intelligence is the simulation of human intelligence processes by machines, especially digital computer systems. Stuart Russell and Peter Norvig defined Artificial Intelligence which differentiates computer systems on the basis of rationality and thinking vs acting. The human approach defines the functionality of the systems that think like humans and the systems that act like humans.

Figure 1: Flow Diagram of Delivery system

2. Literature Survey :

Paper 1:
Smart Shopping Carts Based on Mobile Computing and Deep Learning Cloud Services.

Advantages:
Real-Time Item Recognition, Scalable cloud infrastructure , Automated checkout, Enhanced customer experience.

Disadvantages:
High dependency on network, Concerns complex system integration, High computational costs.

Paper 2:
An Artificial Intelligence of things-Based Picking Algorithm for online Shop in the Society.

Advantages:
Improved efficiency, Enhanced accuracy, Increased automation, Real time inventory management.

Disadvantages:
High implementation costs, Complexity,Data security risks,Maintenance and update requirements.

Paper 3:
Smart Shopping Cart using Machine Vision along with Machine Learning.

Advantages:
Enhanced object detection,Improved classification accuracy, Real time processing, Automated inventory management.

Disadvantages:
High computational complexity, Dependency on high quality images,Vulnerability on adversarial attacks,Requirement for continuous model updates.

Paper 4:
Artificial intelligence,Machine learning and deep learning in advanced robotics.

Advantages:
Enhanced precision, Optimized productivity, Autonomous navigation,Adaptive learning.

Disadvantages:
High computational complexity,Dependency on large databases

Paper 5:
The future of artificial intelligence and robotics in the retail service sector.

Advantages:
Enhanced operational efficiency,Improved customer experience, Data driven insights.

Disadvantages:
Technical debt, Job displacement, Bias and error propagation.

3. Hardware Methodology :

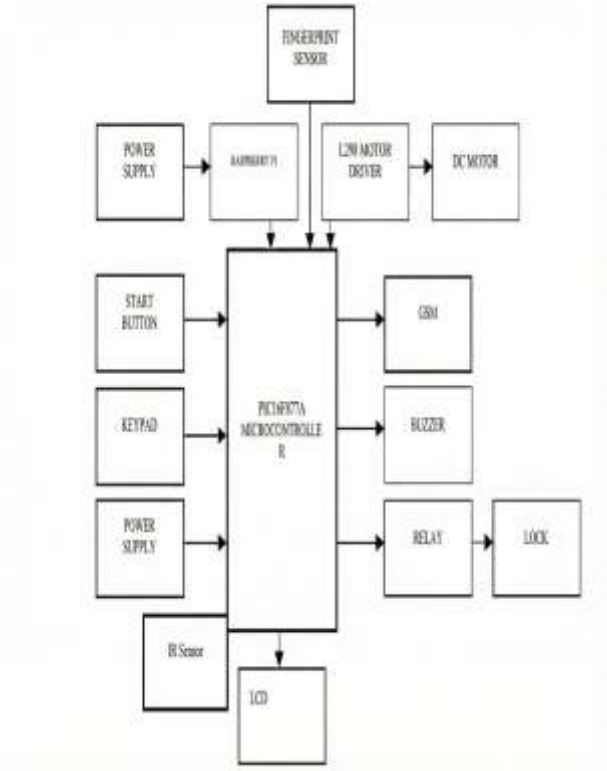

Figure 2 :Block diagram of delivery bot

The above block diagram shows the structure of the delivery bot.The major components used are:Raspberry pi, Arduino uno ,Fingerprint sensor,LCD display, L298N motor driver,Neo GPS module,12V battery and IR sensors.

A 12 Volt battery used for the boot up of the delivery bot. Raspberry Pi is single boarded computer developed by Raspberry Pi Foundation.It is built around a broad-com system on chip that includes ARM processor, GPU, and basic RAM.Here, in our system used for the purpose of the operating system between the hardware components and the web application for the usage of the user,admin.
Arduino uno is a microprocessor which consists of micro controller ATmega328P.It operates at 16 MHz with 32 KB of flash memory and 2KB of SRAM.The flash memory is available for the dump of C code for any system,SRAM provides an environment for the real time execution.The board provides 14 digital I\O pins and 6 PWM pins.here, in our system is used for the interface of the hardware components with the Raspberry Pi.
L298N motor diver is a dual H-Bridge motor that can control two DC motors.Here, in our system we have used L298N motor for the control of the two DC motors which

are connected to the front wheels of the delivery system.
A 16X2 LCD is interfaced with the Arduino Uno for the corresponding output to be displayed for the user and admin.
Neo GPS module is interfaced with the raspberry pi, which is used in this system to find out the current exact location of the bot.

4. Software Methodology:

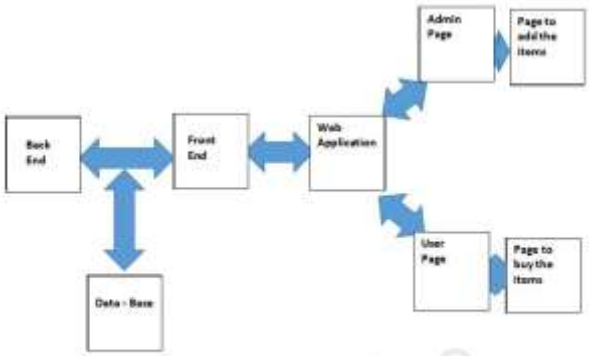

Figure 3 : Software Application design Flow

The major software used are:

For the back end end: Python

For the front end:HTML,CSS,Java-script

For the database:SQL Lite

Back end development handles the server side logic that powers a application.It typically uses languages Python,Java ,Node.js etc. In our web application we have used Python for the back-end development.
Front end development focuses on the visual and interactive parts of the web application.In our web application we have used CSS for style,HTML to structure content and JavaScript to add interactivity.
Data base development is the process of designing,building,and maintaining structured data stores for applications.We have used SQL lite for the development of the database for the maintenance of the user and admin data.
In our web application it first asks the registration for admin and user.After the registration the page asks the user/admin for login using the required credentials given during the registration.After the registration the admin can add his products to sell and the user the can buy the required products available.

5. Conclusion :

The integration of AI technology in delivery bots has revolutionized the logistics and delivery industry, enhancing efficiency, speed, accuracy, and customer satisfaction while reducing labor costs and environmental impact. With advanced navigation, real-time traffic updates, and autonomous decision-making, these bots are poised to transform the way goods are transported and delivered. As the technology continues to evolve, we can expect even more innovative applications, further solidifying the role of AI-enabled delivery bots in shaping the future of logistics and delivery.

6. References:

1.Muhmmed Asif, Yousef Awwad, Daraghmi, Kuan Wen Liu, "Smart Shopping Carts Based on Mobile Computing and Deep Learning Cloud Services", 2020.

2.Muslikhin, M., Horng, J.R. Yang, S.Y.Wang, M.S. Awaluddin. "An Artificial Intelligence of things-Based Picking Algorithm for online Shop in the Society " , 2021.

3.Rakshit Shetty, Darshan Pawar, Rishika Poojari, Ritvik Patel, Dr. Jyoti Mali,"Smart Shopping Cart using Machine Vision along with Machine Learning", 2021.

4.Mohsen Soori, Behrooz Arezoo, Roza Dastres, "Artificial intelligence,Machine learning and deep learning in advanced robotics.", 2023.

5.Stephen M. Noble,Martin Mende,"The future of artificial intelligence and robotics in the retail service sector", 2023.