A REVIEW PAPER ON ASSISTANCE OF ROBOTS IN E-COMMERCE PACKAGE DELIVERY

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Abstract - A robot is a reprogrammable, multifunctional manipulator designed to move material, parts, tools or specialized devices through variable programmed motions for the performance of a variety of tasks. The community-based robot will involve the establishment of a delivery network, where individuals can sign up to participate in the program as delivery partners . Partners of Delivery will go to required location and give to community and from there robots take care of the delivery reaching safely to the costumers . Delivery may be food , medicines ,etc. This Robot has also a Solenoid (electro magnetism) lock which ensure complete lock of the package in the robot . Only after the lock is opened when the user unlocks the solenoids lock through the web application ,then lock will open and user can take their package from the robot. Thus it ensures safe delivery of the product.

• ***Key Words*:** Packaging delivery Robot; ESP8266; Solenoid lock system ; L298D ; Proximity sensor; DC motor; L-293 Motor

1. INTRODUCTION

Community-based package delivery robots are robotic systems designed to deliver packages within local communities or neighborhoods. These robots represent an innovative solution to the last-mile delivery challenge, which refers to the final leg of the delivery process from a distribution center to the recipient's doorstep. The concept of community-based delivery robots involves utilizing small, electric-powered robots that can navigate sidewalks, pedestrian pathways, and residential areas to transportpackages. These robots are designed to operate autonomously, using advanced sensors, cameras, and mapping technology to navigate their surroundings and avoid obstacles. The primary goal of community-based package delivery robots is to improve the efficiency, speed, and convenience of package deliveries within a community. By leveraging robotic automation, these robots can reduce delivery times, optimize routes, and increase the number of successful deliveries. They offer a promising alternative to traditional delivery methods, such as trucks or vans, which can be limited by traffic congestion, parking challenges, and other logistical constraints in dense urban areas. The deployment of community-based delivery robots can have a significant impact on various stakeholders. For businesses, these robots provide a cost-effective solution for lastmile delivery, improving operational efficiency and reducing delivery costs. Customers benefit from faster and more convenient deliveries, with the flexibility to receive packagesat their preferred time. Additionally, the use of electric-powered robots contributes to sustainability efforts by reducing carbon emissions and promoting eco-friendly delivery practices. Safety is a crucial aspect of community-based package delivery robots. These robots are equipped with advanced collision detection and avoidance systems to ensure safe interactions with pedestrians and other objects in the environment. They are designed to operate within predefined safety parameters and comply with local regulations and guidelines.

2. LITERATURE SURVEY

Muhammad Farhan Mustaffa[1]: This paper discusses the development of a prototype industrial robotic arm. The objective of this work was to determine the design of the robotarm's link and joint, components and actuators. The 4-DOF robot arm has four joints to imitate a human upper arm namely joint 1, 2, 3 and 4 that rotate around x, y, and z axes, respectively. The joints move four arm links to get the required posture of the wrist that will be assembled with the hand in future application.

AMIN. A. Mohammed [2]:

This work presents the kinematics model of an RA-02 (a 4 DOF) robotic arm. The direct kinematic problem is addressed using both the Denavit-Hartenberg (DH) convention and the product of exponential formula, which is based on thescrew theory.

Roshanianfard A. [3]: The agriculture industry has faced various challenges nowadays. This research is the first part of a project that presents the designing process, kinematic modelling, and parameterization of a 4-DOF SCARA-type arm specifically designed for work in an agricultural field in terms of seeding, watering, fertilizing,weeding, harvesting, and transporting.

Elfasakhany [4]: The main focus of this work was to design, develop and implementation of competitively robot arm with improved control and stumpy cost. The robot arm was designed with four degrees of freedom and talented to accomplish accuratelysimple tasks, such as light material handling, which will be integrated into a mobile platform that serves as an assistant for industrial workforce.

Logeswaran [5]: In the recent years, interest in the use of robotics has grown in the various sectors. Automation in the various sectors, starting from process to packing is achieved in few sectors of food industries. It is proposed to introduce automation in the bakery which is the sale point. In the existing method, demand for workers in these days is huge. Workers may spread diseases or infection to the customers through the food items orwhile in person to person contact at the bakery/stores.

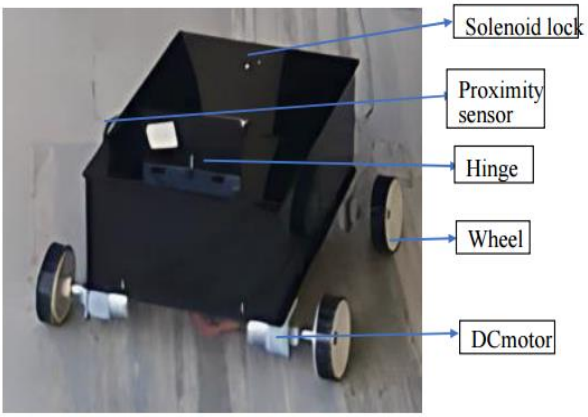
Devang Dave[6]: The autonomous delivery robot is meant to be a substitute for a goods delivery person. The delivery robot is capable of navigating through a cluttered space environment from a home location to a destination point while avoiding obstacles in the process. It uses an ultrasonic sensor to detect if anything has been placed inside the bin and only once when something is placed inside, the robot starts moving from a position to another. Bluetooth beacons are used to represent the start, end and mid-point which will beused by the robot to differentiate the specified locations.

Mamatha KR [7]: 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 driverless 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.

Miguel Figliozzi [8]: E-Commerce and package deliveries are growing at a fast pace and several start- ups have already began pilot studies to deliver packages and groceries to consumers utilizing Autonomous Delivery Robots (ADR).

Andrea De Capitani Da Vimercate[9]: Autonomous Robots are an innovative technology deployed with the objective of alleviating the existing pressure on last mile delivery. In thestudy, the technology is studied under the logistic operations perspective in the context of Food Delivery industry.

3.WORKING PRINCIPLE



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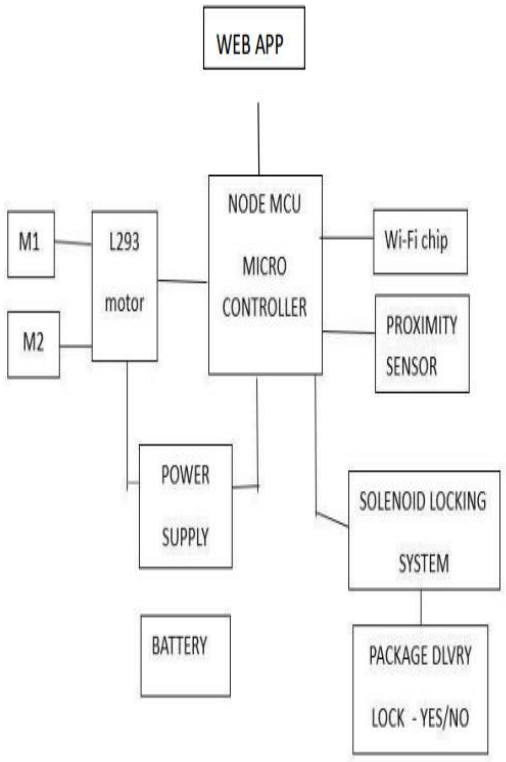
A current carrying conductor, when kept in a magnetic field, gains torque and develops a tendency to move. c motor work

A DC Motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. The main principle behind its working is that “whenever a current carrying conductor is placed in a magnetic field, it experiences a mechanical force” The speed of a DC motor can be controlled by changing the voltage applied to the armature or by changing the field current.The introduction of variable resistance in the armature circuit or field circuit allowed speedcontrol. Modern DC motors are often controlled by power electronics systems called DC drives.

4. PROPOSED SYSTEM



4. IMPLEMENTATAION

The working of this robot is as follows: • Firstly, the robot must be given a power supply of 9V – 12V for switchingON the device. • Once the connection is established, we must send some Wifi variables suchas

1)R – for right turn

2) L – for left turn

3) B – for backward

4) F – to go front

5) S – to stop.

• These variables must also be declared at in the program for accurateoperation.

• Arduino receives the data and sends the information to motor driver wheretwo motors are connected. Therefore wheels come into action.

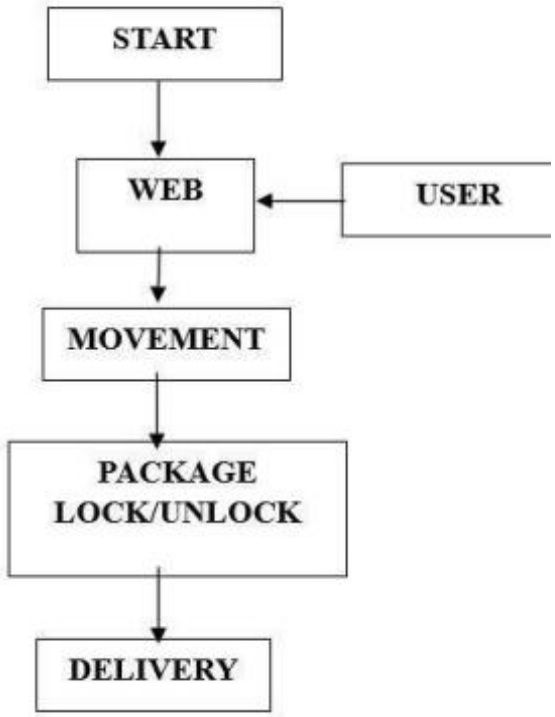
• We have a Proximity sensor which helps in package presence info throughthe web application used by the User. • And we have a Solenoid lock , which locks and unlocks the package insidethe robot.

• As when the robot is turned on through the battery connection , hotspot isgenerated and user connects to it and opens the web 192.168.4.1 .

• User controls the movement of the robot , where to go and check for theobstacles.

• If needed , we can use a camera and connect to the robot which makes usercheck for the going robot to delivery

• User can also control the robot locking and unlocking.



5. CONCLUSION

Community-based package delivery robots offer a promising solution for improvinglastmile delivery efficiency and convenience. They have the potential to transform the way packages are transported within communities, providing benefits for businesses, individuals, and the environment.

5. FUTURE SCOPE

• The future scope of community-based package delivery robots is promising, with severalpotential advancements and opportunities. Here are some key aspects to consider:
• Increased Efficiency: Community-based delivery robots have the potential toenhance the efficiency of package delivery operations. They can navigate through neighborhoods, reaching multiple destinations in a single trip, thereby optimizing route planning and reducing delivery times. As technology advances, these robots can become faster, smarter, and more adept at handling various types of packages.
• Cost Reduction: Implementing community-based delivery robots can potentially reduce the costs associated with last-mile delivery. With fewer human drivers and vehicles involved, companies can save on labor, fuel, and maintenance expenses. This cost reduction could translate into more affordable delivery services for customers or increased profitability for businesses.
• Overall, community-based package delivery robots have a promising future.

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