



## Materials and its Characterization

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# Autonomous Monitoring and Driving Of Robots with Centralized Control System in Warehouse

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**Abstract.** An autonomous Bot which is a self-piloted vehicle that does not require an operator to navigate and accomplish its tasks. The system is controlled using a microcontroller, a magnetometer and dc motors. The magnetometer determines the vehicle direction by continuously providing measurement of heading. The microcontroller drives the DC motors to move the vehicle to a manually entered destination coordinates. Obstacle detection and avoidance are achieved by incorporating centralized camera to the control station to measure the distance between the vehicle and the obstacle, and avoidance is implemented by the microcontroller. The performance of the vehicle is enhanced with a capability to detect and avoid unexpected obstructions placed in its path. This project is mainly of package separation using given data with Autonomous Monitoring and Driving Of Robots With Centralized Control System In Warehouse.

**Keywords:** Autonomous Bot, Self-piloted vehicle, Microcontroller, Magnetometer, DC motors, Obstacle detection, Avoidance, Centralized camera, Package separation, Autonomous monitoring, Centralized control system, Warehouse.

## 1. INTRODUCTION

At a moment when a number of companies with flipkart and amazon currently out in front, are providing delivery services. Here we are coming up with a different delivery solution using small, wheeled package sorting rover. The work of getting packages from the centre to destination will be done by autonomous drover. It is a ground based delivery system without an operator. The basic idea is that this autonomous delivery rover will carry out sort distances travelling along the pedestrian pavement. The control centre will be able to track the rover's progress. Rover will have centralized control system to observe the environment, and will autonomously make decisions about its behavior.

## 2. BACKGROUND

The objective of this platform is the movement of the space by remote control and monitoring. That is because it was not sufficient to implement only the microcontroller. The aim in this platform is to connect the robotic vehicle to the computer that will be located at the control station via Wi-Fi network. Linking the two will be for the following reasons

- To receive data, mainly commands from the control station
- To convey instructions to microcontroller
- To send video and data to the control station
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- To receive data, mainly commands from the control station
- To convey instructions to microcontroller

## 3. METHODOLOGY

The autonomous bot system consists of a microcontroller, a magnetometer, DC motors, and a centralized camera for obstacle detection and avoidance. The microcontroller drives the DC motors to move the vehicle towards a manually entered destination coordinate. The magnetometer continuously provides the heading measurement to determine the vehicle's direction. The centralized camera measures the distance between the vehicle and obstacles and sends the data to the microcontroller to avoid collision.

## 4. RESULTS

The conclusion of this project has been observed and discussed. The Autonomous Delivery Rover was successfully implemented. The security measures of the rover for the packages were effective and found satisfactory. The maximum distance that can be travelled by the rover on the single charge was satisfactory with some error in the arrival at the final positions according to location. The range of the rover for delivery purposes can be increased by incorporating solar charging of the rover batteries enabling it to charge on the go and travel farther. The Collision avoidance can be improved by using algorithms with larger range finding capabilities. The expected results or the outcome of the project work could be summarized as follows:

- The rover will monitor its location constantly using centralized camera then and travel to the destination using heading and collision avoidance algorithms
- The centralized camera predicted location of the rover is stored over the database and it is directed autonomously to the destination.
- The rover will expect a security pin before delivering the package to the recipient and failure to provide it will result in the rover not delivering the package, thus securing the package.

## 5. CONCLUSION

The autonomous bot is a self-piloted vehicle that has significant potential for use in a warehouse setting for package separation. The system is controlled using a microcontroller, a magnetometer, and DC motors, and obstacle detection and avoidance are achieved through a centralized camera. The system works efficiently, and the vehicle can detect and avoid unexpected obstructions in its path

## 6. FUTURE WORK

The following are the feature scope of Autonomous Monitoring and Driving of Robots with Centralized Control System in Warehouse.

- The Automated Guided Vehicle Market size was valued at 4.02 billion in 2021 and is predicted to reach 8.66 billion by 2030 with a CAGR of 8.9%.
- The Automated Guided Vehicle is mainly intended to sort the packages without any human intervention.
- This project finds its major application in any kind of warehouse, medica; storage area with high caution, cold storage etc.
- This assures us with more reliable and confident sorting system

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