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AUTONOMOUS FREIGHT TRANSPORT VEHICLE FOR INDOOR ORGANISATIONS USING ANDROID APPLICATION

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Abstract-Due to the Increase of pollution and future shortage of Fuels we need to take different decision on transportation field. And one of the decision is using Electrical Vehicles. Now the awareness about electrical vehicles are growing up and it is important one also. Specifically, for industries and other indoor organizations. In industries we should also consider the productivity also. productivity means not only increasing production.it is also increasing final profit.so Automation is one of the key item of increasing productivity. So aim of this project is to automate the freight transport in indoor organizations using lane following technology. lane following technology is widely used in many areas but the way is different. commonly lane following technology uses pre-loaded images. and also there are many other techniques like LIDAR, Localization. But There are many drawbacks like cost consumption, memory consumption etc.so in our project we introducing Infrared sensory vision with lane following to achieve automation in an effective way.it will reduce the amount of cost and time when comparing to previous ideas. and it also can operate without using pre-guided maps that is it can move dynamically across the organization according to the user voice command or destination input through the android application.

Keywords: Lane following, Infraredensory vision,Localization, Freight, productivity, Pre-guided maps.

I.INTRODUCTION

Implementing Automation in transportation is most focusable field in now days. Because of reducing manpower. specifically, in industries rather than spending more money for salaries for those who are all operating the vehicles inside the industries. In industries the goods are transferred from one area to another area using vehicles. If we use petroleum vehicles, it will not suitable one for indoor organizations. So in indoor organizations the usage of electrical vehicles is being improved day by day. The next move on this is Automation. In our project the Automation in freight and goods transport using Infrared sensory version with lane following is proposed it will be time and cost efficient.so in order to increase productivity it will be a good option for the indoor organizations which are all have an idea of implementing automation in their circumstances.

II. LANE FOLLOWING

The important technology used in our project is Lane following. The following components are coordinately used for this technology.(Img(II.1))

(above image is only a model like our project)

Arduino mega 2560:

\Arduino mega 2560 is widely used for complex projects. It has 54 digital I/O pins. Arduino mega has 256KB of flash memory for storing programs.

Motor shield L293D:

Motor shield L293D is used to control motors used in our project. In our project 4 12v DC motors are used.

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IR Sensors:

IR sensors ensures that the vehicles following the lane or not. the IR sensor emits the radiation and detects the reflected radiation. If it is the black surface then it will not reflect the radiation. if it is other colors then the radiation will be reflected.(Img(II.2))
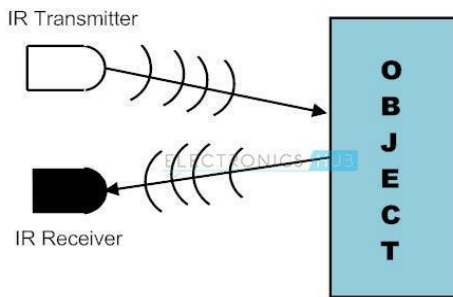
HC-05 Bluetooth module:

Bluetooth module used for android application to arduino communication

Bluetooth module's range is very short that is around 10 meters. But when we come to real project we should use WiFi module.

Ultrasonic Sensor:

Ultrasonic sensors are used to identify the barriers by using reflected ultrasound signals.

Camera: Camera is used to reading the navigation boards to reach the destination.

DC motors:

      Here 4 12v DC motors are used for the model vehicle.(Img(II.3))

Direction	Input1	Input2
Standby	0	0
Stop	1	1
Clockwise	0	1
Anti-clock	1	0

Img(II.3)

Android Application:

In our project we use an Android Application for making communication between user and vehicle. first we need to pair the robot with our application ,then we can access the robot.(Img(II.4))


3. LITERATURE SURVEY

As a result of Automation of transportation is contiguously in growing phase many projects are proposed in past days. There are many projects which are from simple to higher technologies which are unique to each other. But There is more advantages as well as disadvantages. So discussing previous pros and cons we can develop our own idea.

As we discussed earlier this project overcomes the some issues from the previous projects. The important one is time and cost efficient. The time and cost efficient achieved by the way of using suitable technologies in the appropriate areas. Compared to previous projects like LIDAR, Mapping and Localization etc.

While using Mapping, LIDAR like technologies the execution time is high due to the space occupied by the program, images and data used.
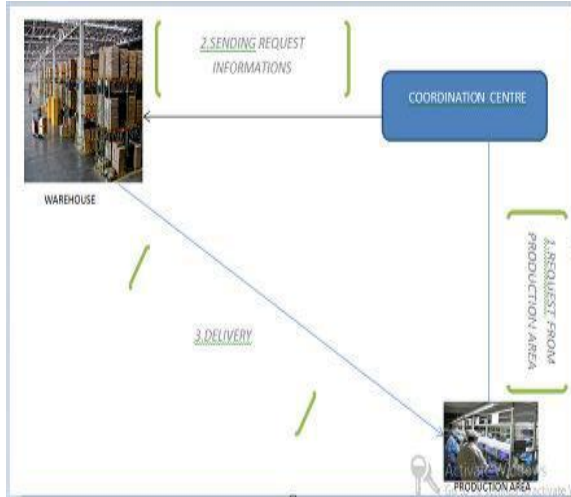
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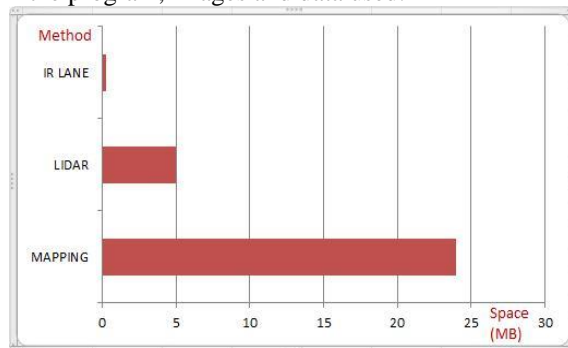
This will achieve efficiency of this project when comparing to other projects.

4. ARCHITECTURE OF PROJECT

Architecture of our project contains three major areas.

1. Production Area
2. Warehouse
3. Coordination center

Img(IV.1)

1. Initially from production area the request will be send to the coordination center. the coordination center receives requester details and needed goods details.

2. The request details will be send to warehouse with requester information and requested goods information.

So, Using IR sensors for lane following will reduce the execution time also.

In India the vehicle automation is not suitable one for public or outdoor transportation. But for indoor organizations it is suitable one by made adapt to the environment. So this project can be used for
indoor organizations for increasing productivity.

Automation of transportation will rule the world in coming days.

8. REFERENCES

3. The requested products will be send to production area through the automated lanefollowing vehicle by giving voice command or destination through android application.

This is the overall architecture of our project.

5. ADVANTAGES & DISADVANTAGES

Advantages:

1) Automation of transportation will reduce the spending amount such as salaries etc.
2) Automated vehicles doesn't need a rest.
3) System's error ratio is always less than human's error ratio.

Disadvantages:

1) Humans may loss employments.
2) When any technical issues happened it may cause harmful accidents.

6. FUTURE WORK

In this project the workers of warehouse needs to load the goods on the vehicle.in future it may be automatic.

7. CONCLUSION

As already discussed our project will be efficient one from other projects. the whole world moving towards automation, and specifically in industries automation is must needed one in order to improve productivity.

As in the below comparison chart of the execution space of various projects we can clearly understand our project is an efficient one.

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- Pathfinder—Development of Automated Guided Vehicle for Hospital Logistics JÁN BAČÍK1,2, FRANTIŠEK ĎUROVSKÝ1, MILAN BIROŠ1, KAROL KYSLAN 1, (Member, IEEE), DANIELA PERDUKOVÁ1, AND SANJEEVIKUMAR PADMANABAN 3, (Senior Member, IEEE)

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- A Sensor-Fusion Drivable-Region and Lane-Detection System for Autonomous Vehicle Navigation in Challenging Road Scenarios Qingquan Li, Long Chen, Ming Li, Shih-Lung Shaw, and Andreas Nüchter, Member,IEEE.
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