ISSN No:-2456-2165

Automated Guided Vehicle with Scissor Lifting Mechanism Using Arduino INO Program

Aditya Ghadigaonkar
Department of Automobile Engineering
Saraswati College of Engineering,

Vignesh Tamse
Department of Automobile Engineering
Saraswati College of Engineering

Rohan Chavan
Department of Automobile Engineering
Saraswati College of Engineering

Abu Rafe
Department of Automobile Engineering
Saraswati College of Engineering

Abstract:- These locations have left their supply distribution centre in ruins these days as a result of the remarkably increasing demand for assembly parts. In a similar way, human error has a negative impact on capability and security. These vehicles therefore perform precisely, expertly, and without error. The correct concept of an AGV may then be introduced, namely that it is a driverless vehicle in which the required materials are obtained by the machinery itselfand then circulated to the designated location in the distribution centre. Therefore, this facilitates movement inside as much as possible while also doing so with legal accuracy and without causing any injury.

I. INTRODUCTION

The Automated Guided Vehicle (AGV) is a generic term that includes all vehicle components capable of operating autonomously. Robotic guided vehicles offer a plethora of uses in the modern world. AGVs are currently used in a variety of adventures, with the main limitations on their application arising from the components of the objects to be transported or spatial considerations. AGVs can be used in many different ways, but the decision to buy and implement such systems is typically based on financial considerations. In a typical transportation community, productivity is managed by human flourishing. In view of distant correspondence, the AGV is unusually adaptable. Its ability to communicate with different autonomous cars enables predictable behaviour. Vehicle cooperation between them continues to work

II. LITERATURE REVIEW

The first Automated Guided Vehicle was acquaintwith the world in 1950s and the first large advancement for the AGV business was the presentation of a unit load vehicle in the mid 1970's. Suman Kumar Das, M.K. Pasan Right now kinds of aides methods for AGV's are examined. The sorts are Wire Guided Vehicle, Magnetic Guided Vehicle, RailGuided Vehicle and Laser Guided Vehicle.

Right now recognition and situating is proposed. AGV ought to explore the way accurately which is requestedby the administrator, and it ought to likewise maintaina strategic distance from the obstructions coming in the middle of for example in a distribution center if a laborer goes over the way of AGV, it ought not slam into the specialist, it is possible that it should pass by the specialist by finding another way breaking down the encompassing or it should stop for some time and hold up until the laborer passes. Now and again a minimal effort camera is added to catch the ongoing pictures to figure out the encompassing to keep away from crashes. By the blend of profundity data from the picture taken by the camera and 2D facilitate framework would be useful to ascertain the constant separation along AGV's, gear and articles precisely to decrease position mistake.

Right now improvements and consequences of research are examined. Segments of AGV are vehicle, stationary control framework, fringe framework parts and on location framework segments. Vehicle is the fundamental control component of the AGV and plays out the real transportation task which is requested. Stationary control framework is the organization of transportation request. Enhancement of calendars and the board of multi AGV framework are overseen by stationary control framework. Fringe framework partsspeak to the partner to different on board gear of the vehicle, for example battery stacking stations and burden move systems. On location framework parts are the parts of the site's basic plan that affects the AGV, for example the ground, doors, lift, etc.

Essential Automated Guided Vehicle innovation is definitely not another innovation. Fifty years prior when AGV's were first utilized they were called driverless frameworks. After certain years, headways in gadgets have prompted changes in thevehicles. In any case, structuring an AGV that can really move and capacity isn't a simple errand. The vast majority of them in ventures are worked utilizing electric force and moved by the utilization of electric engine. The engine is additionally associated with gears by means of a pole and afterward to the wheels for speed varieties. Through this system the AGV can move tothe necessary way. In light of these elements, the connection between absolute loads that the AGV can withstand with the force provided is Significant.

Roger Bostelman attended the North American Material Handling Show at Cobo Hall in Detroit, MI, to gain background information for the Industrial Autonomous Vehicle Project. This informative show focused on industrial material handling equipment such as Automatic Guided Vehicles (AGVs), pallet lifters and jacks, lifting equipment,

ISSN No:-2456-2165

automated storageand retrieval systems (AS/RS), Automatic ID Systemsand Data Collection Equipment, and many other smaller parts and equipment. The main focus for Bostelman was on AGVs and sensor technology (laserand ID systems). In short, the trip was a very useful information-gathering venture for this and other ISD projects with applications in material handling and/or mobility. Also, all (vendor) company representatives that Bostelman talked to are interested in: becoming involved with the IAV project, ISD hosting a workshop, and ISD becoming move involved in the industry. There were about twenty AGV-related booths, several displaying their AGVs statically or in motion. The two guidance technologies displayed were wire and laser guidance ASRS/AGV Users Conference, Reno, NV, June 12-14, 2000 Maris Juberts and Roger Bostelman attended the ASRS/AGV User's Conference at John Ascuaga's Nugget Hotel in Reno, NV, from June 12-14 as background information for the Industrial Autonomous Vehicle Project. This informative conference joined both automated storage and retrieval system and automated guided vehicle (ASRS/AGV) users and vendors together for information exchange. It also served as an ASRS/AGV business meeting. ISD provided handoutsincluding a presentation called "NIST and the Industrial Autonomous Vehicle Project," a list of references for previous NIST vehicle research, and an "Intelligent Control of Mobility Systems" program brochure. Our main focus was to learn about navigation and control problems encountered by AGV users and vendors. Several presentations were given along with ASRS- and AGV-focused breakout sessions. The AGV breakout session included only three users and focused on their battery, static-electricity, and forklifts side-by-side with AGV problems. Low session turnout seemed to be due to a low AGV user turnout at the conference (i.e., mostly ASRS users/vendors). Juberts and Bostelman met with June Powers, User's Group President (retiring after this year) and Leslie Cumiford (Sandia Lab's), the Groups Vice-President (future President). Discussed was the possibility of a NIST-hosted Industrial Autonomous Vehicle (IAV) Project workshop. They felt that getting users and vendors to participate/attend a workshop might be unlikely based on the turnout they got for this conference (94 total attendees = 56 users + 32 vendors + 6 academic/government). Conference attendees represent 26 users with 23 vendors and 4 government agencies/universities. It was suggested that NIST participate in the next User'sConference, which was planned for June 2001 in Columbus, OH. Also, for near-term AGV user's/vendors needs research, it was suggested that NIST conduct (with assistance from the User's Group)an industry survey. They receive about 90 % returned surveys upon follow-up calls to survey recipients. Without follow-up calls, they receive about 5 % back.As for the positive response to a NIST-hosted IAV Project workshop that Bostelman received, from the vendors at the material handling show in Detroit April2000, Cumiford said they typically hear the same thingand still get lower turn-out than expected.

III. METHODOLOGY

To forward our project, we have decided to use the paint strip method as our argument. The idea behind our product is based on the phenomena of light, whichsets it in motion. We are aware that black absorbs the majority of the light, but white reflects practically all of the light that strikes it. We use Arduino in our AGV. Light is sent and received via IR transmitters and receivers, commonly known as photodiodes. Infrared light is transmitted through IR. Infrared rays that strikea white surface are reflected, picked up by photodiodes, and cause voltage changes. When IR light strikes a dark object

The photodiode does not receive any light or rays since the black surface absorbs light and does not reflect anyof them. Therefore, our AGV sends a signal to Arduino whenever it detects a black line.

The motors are then operated by Arduino in accordance with the sensor's output. The left sensor and the right sensor are the two IR sensors we are employing. Our AGV advances when the left and rightsensors detect white. Our AGV turns to the left if the left sensor crosses the black line. If the right sensors detect a black line, the robot will turn to the right until both sensors encounter a white surface, at which point our AGV will resume moving ahead.
If both sensors come on the black line, then the AGV will stop.

IV. MODELING AND ANALYSIS

- *Model Details*

Fig: 3D Model of A.G.V.

Chassis: A Chassis is the load -bearing framework of an artificial object, which structurally supports the object in its construction. This supports our Scissor lifting Mechanism. The base is made of Aluminum 3003 alloy for this model.

Base Table: It is the part placed on top of the chassis which has been riveted on the chassis. This houses thelead screw assembly and all the computing components.

Scissor Link: The links are used for the scissor lifting mechanism. It supports folding in a Criss-cross position. It is made up of Aluminum because of its lowdensity.

Work Table: Worktable is used to carry the load placed on the chassis. It is connected to the scissor links via bolts.

ISSN No:-2456-2165

Lead Screw: This lead screw is connected to the stepper motor which moves it with certain speed and step size for the motion of the scissor lift.

Mounting: This is used as a guide and support for thelead screw, which helps in the smooth motion of the shaft.

Flexible Coupling: The purpose of this flexible coupling is to transmit the motion from the shaft of rotating shaft to another, while tolerating at the same time a small amount of misalignment. In our case thisis used to connect our stepper motor to the Lead screw.

Wheel: Wheels are used to move the A.G.V. Motion of the wheel connected with the D.C. Motor helps the Model to move. Wheels with good grip are used whichprovides stability and friction

Fig: 3D Model of Final DesignElectronic Components
Arduino Uno L298M Motor Driver D.C. Motor
I.R. Sensors Stepper Motor Micro Step Controller

V. APPLICATIONS

The primary application zones are association of various work territories, request picking, warehousing and get together. The acknowledgment of the material stream forms in the warehousing and request picking division is portrayed by high volume of traffic from characterized sources to characterized goals. This is a standard application region of AGVS which as a rule requests high stacking limits. The heap units are generally institutionalized beds, consequently the vehicles are outfitted with standard stacking gadgets. Because of the mentioned exhibition, these frameworks regularly comprise of in excess of 100 vehicles. This requests a modern focal controlling unit and advancing methodologies for directing and way finding. Another region with a high application pace of AGVS is mechanical production systems. Right now load is inhomogeneous and evolving. In this way the stacking gadgets must befitted to the particular application. The vehicle once ina while not just vehicles the heap starting with one gettogether station then onto the next, yet speaks to a gathering station itself. Right now vehicle can be considered as a portable workbench. AGV can be utilized in a wide assortment of uses to ship a wide range of kinds of material including beds, moves, racks, trucks, and holders. Following are the applications: Taking care of crude materials: AGVs are ordinarily used to move crude materials, for example, paper, steel, elastic, metal and plastic.

VI. CONCLUSIONS

The paint strip method is more viable for Navigation systems. The Programming for the A.G.V.'s Navigation system is running smoothly & The Designof the chassis with the dimensions we choose is safe.

REFERENCES

[1]. International Research Journal of Modernization in Engineering Technologyand Science
[2]. Research gate publication
[3]. Industrial Autonomous Vehicle ProjectReport- Roger Bostelman