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A Result on Automated Guided Vehicle

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ABSTRACT: The main purpose of developing this robot is for monitoring human activities. To war zone or rescue operation reduce enemy side attacks. The robot has a night vision wireless camera which can broadcast war zone videos order to avoid any damage and loss Human life. Military men are at great risk. Their lives when entering the unknown region. The robot will act as one suitable machine for defense area Reduce the loss of human life and also prevent illegal actions. It will all help to get to know the military people and the armed forces Its position before entering the territory. It can also be used in various defenses man power and operations to save examine the dangerous situation. The main advantage of this project is that we can easily control the robot using Android mobile via. Smart cell IP is a phone with web cam application mounted on a robot body for espionage. Aim even in complete darkness using Infrared light this will send the video wirelessly on the transmitter side (laptop). This type of robot can be useful for espionage intended to and from the battlefield Reduce attacks.

KEYWORDS: IR SENSOR, AGV, ARDIONO NANO, MOTOR DRIVE.

I. INTRODUCTION

An automated guided vehicle is programmable line follow vehicle. The automated guided vehicle is used in industrial application to move material around a manufacturing facility. The AGV are capable of transportation task fully automated at low expanses. AGV have to make the system automatic by following line. This is done through different method path selected mode etc. The Arduino nano system of AGV is issue the steering command and speed command. For the pre defined manufacturing environment the map is saved in the AGV memory and control by stationary control unit of warehouse. It is battery operated vehicle which is use in flexible manufacturing. It is provided unmanned transportation it is control by human along system. Day by day world going towards new technology this type of robotic system use in industry, this type of system provides chip transportation which is help full for industry financial condition. This type of AGV mostly used in industrial to move heavy material or product around a big industrial area such as, a warehouse or. Factory

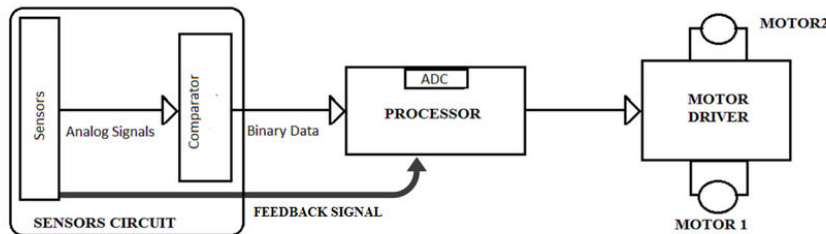
II. LITERATURE SURVEY

Mandyam M. Srinivasan A , Yavuz A. Bozer B & Myeonsig Cho(1994) presented a general purpose analytical model to compute approximate throughput capacity of trip based material handling system used in manufacturing setting. The author claimed that model would be useful in early design phase and prior to simulation. Yang and Peters (1997) use a modified quadratic set covering problem formulation to solve the fab layout design problem. They propose a network flow formulation to determine the number and location of shortcuts for the inter bay transport system in a spine layout fabrication. Their objective function minimizes construction cost and the decrease in material handling costs. Meller (1997) proposes a mixed integer and dynamic programming approach to determine an optimal layout. Ting and Tanchoco (2001) propose two rectilinear layout configurations, single spine and double spine (where the two spines are perpendicular), and they present mathematical models to optimize both configurations. Agrawal and Heragu (2006) and MontoyaTorres (2006) discuss various approaches for automated materials handling in semiconductor manufacturing and review the literature on various aspects of factory design, such as facility layout, AMHS design and AMHS operational issues. Dima Nazzal a & Leon F. McGinnis(2008) did analysis of the throughput performance of a closed-loop multi-vehicle automated material handling system (AMHS) used in highly automated 300 mm wafer fabrication facilities (fabs). A numerical example is analyzed and simulated using AutoMod to demonstrate and validation of the stochastic model 27 papers are found much more relevant for the intersection of AGV based material handling and its various methodologies. Among the various factors influencing the design and operation performance of AGV four major factors are undertaken for study i.e. throughput, Unit load, Flow path design and Fleet size. As such, the review



in this study is includes papers from following journals

III. IMPLEMENTATION



IV. PROPOSED SYSTEM DEVELOPMENT

A. Arduino Uno

A particular task is performed in each section which a programmer divides specific code into various sections. An Arduino is the most commonly used device for a physical computing platform & interactive developing environment. Arduino software performs standalone platform on the computer. In the Arduino software, there is an Arduino IDE (Integrated Development Environment). Arduino IDE is used for programming purposes. In the market, Arduino Uno is the most commonly used development board. It is a microcontroller based on ATmega328P. Arduino includes the crystal oscillator, communication protocol, voltage regulators, etc. There are 14 input/output ports, from which 6 can be used for PWM and 6 are analog ports. The Harvard architecture is used in Arduino so, to run program code and use separate code. In data memory, the board code is stored. In the market, there are various types of Arduino boards; they are Arduino Leonardo, LilyPad Arduino, Red Board, Arduino Mega (R3), but we use Arduino Uno (R3).



Fig 1. Arduino UNO

The Arduino Uno R3 pin diagram is shown below. It comprises 14-digit I/O pins. From these pins, 6-pins can be utilized like PWM outputs. This board includes 14 digital input/output pins, Analog inputs-6, a USB

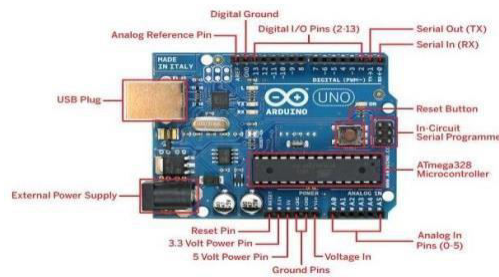


Fig 1.1 Shows Detail pins of A



B. IR Sensor

IR sensor module includes mainly the IR Transmitter and Receiver, Variable Resistor (Trimmer pot), output LED in IR LED Transmitter. Light emit by IR LED in the range of Infrared frequency. Wavelength of IR light is invisible to humans (about 700nm - 1nm). IR sensor is one kind of transmitter that emits IR radiations. This LED looks similar to a standard LED and the radiation which is generated by this is not visible to the human eye. Infrared receivers mainly detect the radiation using an infrared transmitter. These infrared receivers are available in photodiodes form. IR Photodiodes are dissimilar as compared with usual photodiodes because they detect simply IR radiation. Different kinds of infrared receivers mainly exist depending on the voltage, wavelength, package, etc. Once it is used as the combination of an IR transmitter & receiver, then the receiver's wavelength must equal the transmitter. Here, the transmitter is IR LED whereas the receiver is IR photodiode. The infrared photodiode is responsive to the infrared light that is generated through an infrared LED. The resistance of photo-diode & the change in output voltage is in proportion to the infrared light obtained.

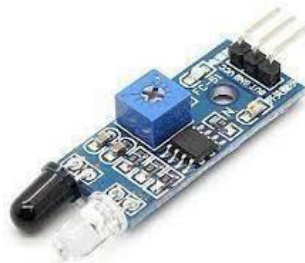


Fig 2. Shows IR Sensor

C. Wheels

Wheeled robots are robots that navigate round the floor the utilization of motorized wheels to propel themselves. This sketch is easier than the usage of treads or legs and by means of the usage of the use of wheels they are less difficult to design, build, and software program for action in flat, now not-so-rugged terrain. They may also be moreover larger properly managed than distinctive types of robots. Dangers of wheeled robots are that they cannot navigate well over limitations, alongside with rocky terrain, sharp declines, or areas with low friction. Wheeled robots are most famous some of the customer market, their differential guidance affords low charge and simplicity. Robots may additionally have any range of wheels, however three wheels are adequate for static and dynamic stability. Extra wheels can add to balance; however, greater mechanisms would possibly be required to preserve all of the wheels interior the ground, when the terrain is not usually fla

D. Battery

A lithium-ion battery is a rechargeable battery in which lithium ions pass from the poor electrode thru an electrolyte to the superb electrode at some stage in discharge, and again when charging. lithium –ion batteries use an intercalated lithium compound as the fabric at the superb electrode and normally



Fig 3. Battery



- The operating voltage is 12V.
- The utilization of current is 1mA with no backlight

E. Motor driver

The L293D IC receives indicators from the microprocessor and transmits the relative sign to the motors. It has two voltage pins, one of which is used to draw contemporary for the working of the L293D and the different is used to follow voltage to the motors. The L293D is a twin H-bridge motor driver built-in circuit (IC). The Motor drivers act as cutting-edge amplifiers due to the fact they take a lowcurrent manage sign from Arduino and furnish a higher-current and greater voltage signal. This greater cutting-edge sign is used to pressure the motors. The pin 4, 5, thirteen and International Journal of Scientific Research and Engineering Development— Volume X Issue X, Year Available at www.ijared.com ISSN : 2581-7175 ©IJSRED: All Rights are Reserved Page 4 12 of the L293D IC are grounded whilst pins 1, sixteen and 9 are related to 5V DC and pin eight is immediately linked to Battery. The pins 15, 2, 7 and 10 of this motor driver IC are related to pins 5, 2, three and four of the Arduino board. The DC motor connected to proper wheel is related to pins eleven and 14 whilst motor connected to the left wheel is linked to pins three and 6 of the motor driver IC. The pins 15, 2, 7 and 10 are enter sign pins of the motor driver IC. These are related to Arduino pins. On altering digital common sense at the Arduino pins, the good judgment at the enter pins of the motor driver IC is additionally changed



Fig 4 Moter Drive

F. Jonson Motor

The Johnson Geared motor is wellknown for its compact measurement and large torque. A torque as an awful lot as x3 as in contrast to core shaft additionally shaft has a steel bushing for put on resistance Geared motor is a simple DC motor with gear box



Fig 5. Jonson Motor



G. Battery

A lithium-ion battery or Li-ion battery is a type of rechargeable battery composed of cells in which lithium ions move from the negative electrode through an electrolyte to the positive electrode during discharge and back when charging. Li-ion cells use an intercalated lithium compound as the material at the positive electrode and typically graphite at the negative electrode. Li-ion batteries have a high energy density, no memory effect (other than LFP cells)^[9] and low self-discharge. Cells can be manufactured to prioritize either energy or power density.^[10] They can however be a safety hazard since they contain flammable electrolytes and if damaged or incorrectly charged can lead to explosions and fires.



Fig 6. Battery

Product Chemistry Lithium ion batteries
 Rated Voltage 11.1V
 Rated Capacity 2200mAh
 Rated Power 24.42Wh
 Maximum Allowable Charge 3A
 Maximum Allowable Discharge 3A
 Voltage Range 9.0V to 12.6V
 Charge cut-off voltage 12.6V ± 0.5V
 Discharge cut-off voltage 9.0V ± 0.5V
 Operating Temperature Range 0~45°C
 Storage Temperature Range 0~25°C

Battery Case HS Sleeve Soft Pack Dimension (WxDxH) ± 3mm 60X70X25 Pack Weight ± 0.2 KG 0.150KG

Motor clamp

Johnson/Mini Johnson Gear motor L clamp motor mount bracket is designed for Side Shaft Compact Series and Side Shaft HP Series Johnson Gear motor, making motor mounting conveniently for you. Clamps are the fundamental chassis parts. You can fix your motors with these clamps according to your own wish, based on the type and size of the base you decide to make of the bot. Johnson motor clamp or a bracket is used to mount the motor tightly on any solid surface. Thus it increases the usability of the motor & makes motor mounting very convenient. This clamp or mount bracket is designed for Johnson motors



Fig 7. Motor clamp



I. Charger

An 11.1 V battery will charge at 12.6 volts. LiPo cells are rated at 3.7 nominal volts and they charge at 4.2 volts per cell. So put it on the charger and let it charge all the way up. If you measure the voltage right off the charger, it should be about 12.6 V.



Fig 8. Charger

J. Wheels

Wheeled robots are robots that navigate round the floor the utilization of motorized wheels to propel themselves. This sketch is easier than the usage of treads or legs and by means of the usage of the use of wheels they are less difficult to design, build, and software program for action in flat, now not-so-rugged terrain. They may also be moreover larger properly managed than distinctive types of robots. Dangers of wheeled robots are that they cannot navigate well over limitations, alongside with rocky terrain, sharp declines, or areas with low friction. Wheeled robots are most famous some of the customer market, their differential guidance affords low charge and simplicity. Robots may additionally have any range of wheels, however three wheels are adequate for static and dynamic stability. Extra wheels can add to balance; however, greater mechanisms would possibly be required to preserve all of the wheels interior the ground, when the terrain is not usually fla



Fig9. Wheel

H. Breadboard

A breadboard allows for easy and quick creation of temporary electronic circuits or to carry out experiments with circuit design. Breadboards enable developers to easily connect components or wires thanks to the rows and columns of internally connected spring clips underneath the perforated plastic enclosure

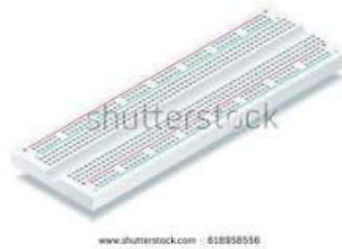


Fig 10. Breadboard

V. FUTURE SCOPE

The global automated guided vehicle market was worth USD 2.41 billion in 2020 and is projected to reach USD 14.18 billion by 2026, recording a CAGR of 31.4% over the forecast period (2021 - 2026). Lights-out automation has been the aimed result for various manufacturing facilities.

VI. RESULT AND DISCUSSION

Our project Vehicle speed detection using Arduino and IR sensors was designed to detects the vehicle speed with the help of IR sensors and monitors the speed on LCD display and active the buzzer if the vehicle speed was high.

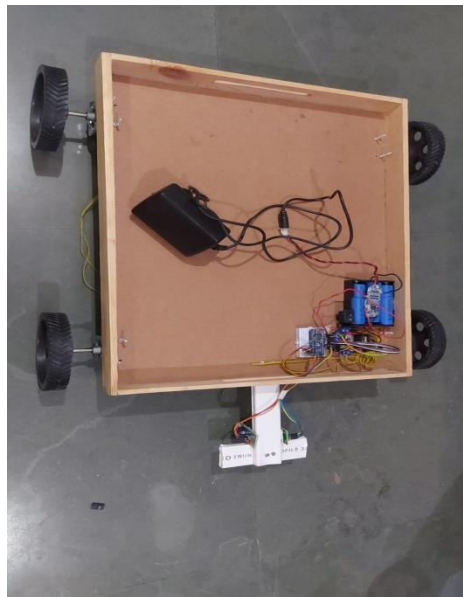
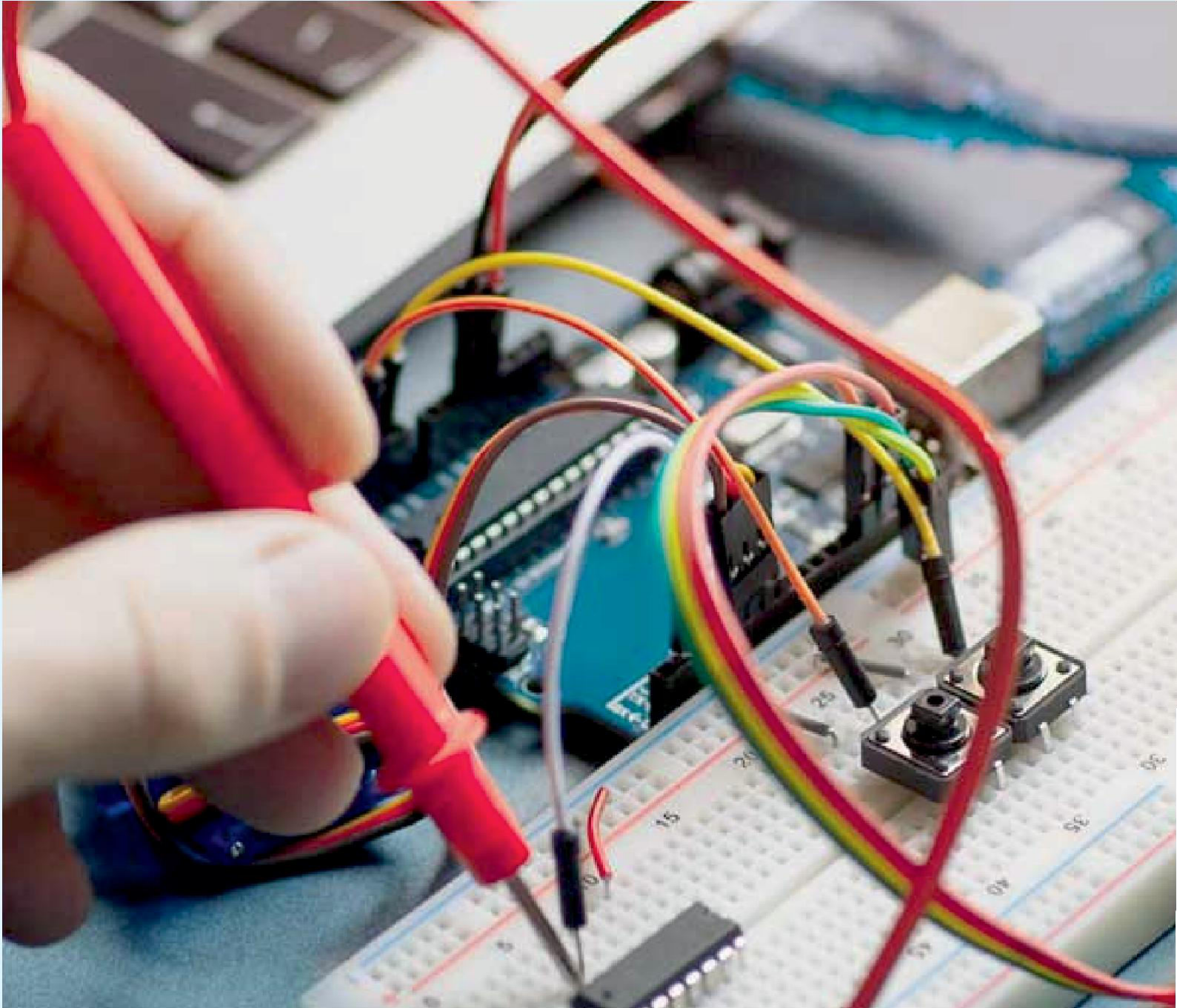


Fig 6. Actual Model of project

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