Automation of Automotive Industry Using Robot Sensor's

K.Govinda[1] Yashveer[2] Vibhuti Narayan Singh[3]
[1]SCSE University [2, 3]SENSE, VIT University
[1, 2 ,3] Vellore India

Abstract---This paper presents new method for robotic area sensing system developed for industrial manufacturing in assembly of the equipments & other objects. This will remove the need for humans to work in hazardous or unsafe environments, as well as environmental benefits, in the form of more energy efficient production processes. Robot sensors are now days widely used in different field of works. For example, some industrial robots which are used for transportation of the goods. Robots are flexible in that they can easily change their function in order to meet the demands of the manufacturer or the client. In doing so, robots essentially perform three tasks, as they "sense" by drawing, then "think" by using pre-set algorithms and finally "act", using the robots' to pick up and place an objects. Today, robotics affects a broad sector of economic activities from automotive and electronics industries. Our project concerns with the uses of such sensors in larger fields of automation, transportation, etc. In this we deal with the uses of robots with sensors for transporting entities from place to place in automotive industry or fixing the machine parts in the industry. It also shows that use of robot in the industry reduce the human efforts & time of completion of a task.

I. INTRODUCTION

In the 70s, robots have been introduced for the automation of a wide spectrum of tasks such as: assembly of cars, white goods, electronic devices, machining of metal and plastic parts, and handling of work pieces and objects of all kinds. Automation is labor saving technological change which is supposed to increase labor productivity, but does it create or destruct jobs? In this report we use cross country and cross industry data on the use of industrial robots to analyze how the use of sensor robots reduce the human efforts & time. In the last 10 years. This development has been driven by progress in innovative sensors and actuators, and the increasing performance of computer systems, including embedded systems for controls.

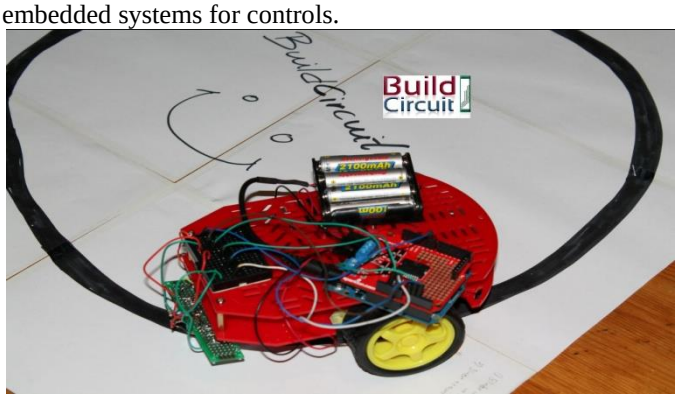

Fig. 1: Line follower Robot

This report pays significant attention to the field of components and instruments for control including sensors, actuators, embedded systems and communications. Robotics is relatively new field in science and engineering. The broadly accepted definition is that robotics is an intelligent connection of perception to action. Robot perception is performed by sensors. Sensors allow robots to sense and interact with the changing environment.

Finally it should be noticed that report also discussed that implication of robot with the use of sensors. In this report robot work in the industry with the help of the sensors for placing goods from one place to another. It also uses for the implementation of goods and cars and circuits. The yellow line will be created on the road and the sensors are put in front of the robot.

While the robot is connected with batteries suddenly the Arduino board helps to flow the current to the sensors. When the current reached to the sensors it allows the light to flow & if the light gets reflected back & trace by the sensor with the required frequency than the current flow in the whole circuit. Due to the current flowing in the circuit the robot start moving in the direction of directed line.

The light reflected by the black color does not have required frequency, such that the current will not flow in the circuit. Hence the robot will not work. This also shows that the robot will follow the direction of the required color & does not deviate from its path & carry the load from one place to another place. The robot consist of two big machines, two tires, one big battery, one Arduino board, 2 sensor board, etc. This kind of robot mainly called as line follower robot. The figure shown is the basic structure of the robot. This figure basically displays the idea of the working & construction of the robot which are used as line follower robot.

Some of the major parts required to create a robot are explained below.

A. Ardunio: Arduino is a single-board microcontroller to make using electronics in multidisciplinary projects more accessible. The hardware consists of an open-source hardware board designed around an 8-bit Atmel AVR microcontroller, or a 32-bit Atmel ARM. ...It was designed to give students an inexpensive and easy way to program interactive objects. It comes with a simple integrated development environment (IDE) that runs on regular personal computers and allows writing programs for Arduino using C or C++.

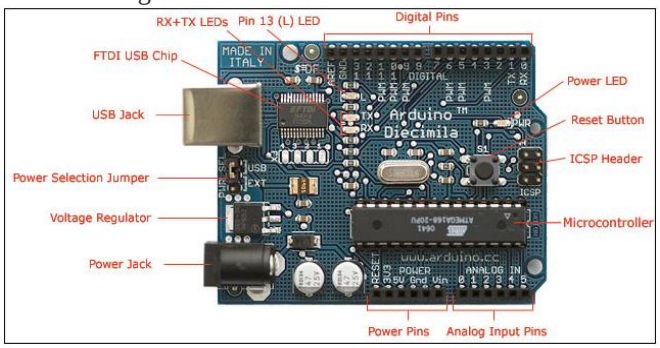

Fig. 2: Arduino board

B. Sensors: A sensor is a converter that measures a physical quantity and converts it into a signal which can be

read by an observer or by an instrument. Sensors are used in everyday objects such as touch-sensitive elevator buttons and lamps which dim or brighten by touching the base. There are also innumerable applications for sensors of which most people are never aware. Applications include cars, machines, aerospace, medicine, manufacturing and robotics. A sensor is a device, which responds to an input quantity by generating a functionally related output usually in the form of an electrical or optical signal.

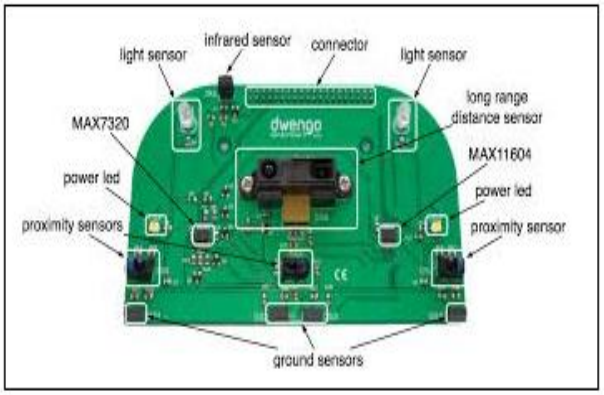

Fig. 3: Sensor board

Sensors are the main part of robots. They help to complete the circuit by observing the frequency of light reflected back to it. In today world every electronic items containing sensors. It is basically increase the effectiveness of the circuit.

This sect oral report reflects the shared views of a number of industrial experts working in robot automation. It aims at formulating a common long-term vision (15 years ahead) of industrial robotics towards novel robot systems and their applications in manufacturing. After a short review of the current situation in robot automation, the report describes opportunities and obstacles towards a sustained competitiveness of the European robotics industries. We estimate a simple model and find that automation has a significant impact on labor productivity; both in the short and in the long run. With respect to employment, we find that automation tends to lower employment in the short run, whereas it tends to raise employment in the long run. In contrast to the statistically significant and positive productivity effects, the employment effects of automation change overtime and are barely significant. We tend to implement a model developed by ourselves on large scale like industries, public transport etc. The study and small scale working model concerns with the reduction of human arm and time in production industries

The study also aims to find the way to increase accuracy in various fields. Large scale implementations of study will in turn give huge amount of profits.

II. LITERATURE REVIEW

A. Line Detection Techniques: To detect the yellow line several methods have been tested and Edge detected. Here the canny edge detection [3] is tested over the sample images. The Hough transform [4] is a feature extraction technique used in image analysis, computer vision, and digital image processing. The purpose of the technique is to find imperfect instances of objects within a certain class of shapes by a voting procedure. The classical Hough transform was concerned with the identification of lines in the image, but later the Hough transform has been extended to identifying positions of arbitrary shapes, most commonly circles or ellipses.

Sensor based robot uses IR sensors to sense the line. As an example let's take an array of 8 IR LEDs [2] and sensors facing the ground which is a common method used. The output of the sensors is an analog signal which depends on the amount of light reflected back, this analog signal is given to the comparator to produce 0s and 1s which are then fed to processing.

L4 L3 L2 L1 R1 R2 R3 R4

Starting from the center, the sensors on the left are named L1, L2, L3, L4 and those on the right are named R1, R2, R3, and R4. Let us assume that when a sensor is on the line it reads 0 and when it is off the line it reads 1. The next move is decided as to the position of the robot such that, L1 and R1 both read 0 and the rest read 1.

L4 L3 L2 L1 R1 R2 R3 R4

1 1 1 0 0 1 1 1

Left Center Right

Desired State L1=R1=0, and Rest=1

When we started the project we did not have much understanding in which language we were going to do the project. We had several options such as C#, C++ and java. But after considering the relative performances of the languages we decided to go with C++. Hence we had to study the language as none of us had used the language before, especially the pointers, references and memory allocation and freeing. This had taken us some time to adapt to the language.

B. Open Source Computer Vision Library (Opens) : We have decided to use the Opens library for the image processing task so have done some research on it to get familiar with the functionalities in it. Open source computer vision library is developed in C/C++ and it is optimized and intended for real-time applications [5]. Also it is OS/hardware/window-manager independent. It has functionality like generic image/video loading, saving, and acquisition.

C. C++ Threading Using Windows Threading API: C++ directly doesn't support threading functionality. We have to implement that. So we have to study the windows thread API and implement threading functionality in our application. We have to write the code that refers to the thread API of Windows [1] and then write the actual functionality we want to get done.

III. PROPOSED METHOD

The technique of line follower robot concentrated with some basic parts which are softly aggregated together in our proposed method. Basic descriptions of some parts are described below.

A. Sensor: This is used for completion of the circuit & make the current able to flow in the circuit by reflect the light with the required frequency such the robot follow the required path and make able to move from one place to another.

B. Arduino Board: To make the specified circuit we would like to introduce some convenient materials such wheels, batteries, etc. Connecting wires are used to complete the basic circuit by connecting it to a battery. When the required

frequency light comes, a current flows through the sensor and then the LED indicates on.

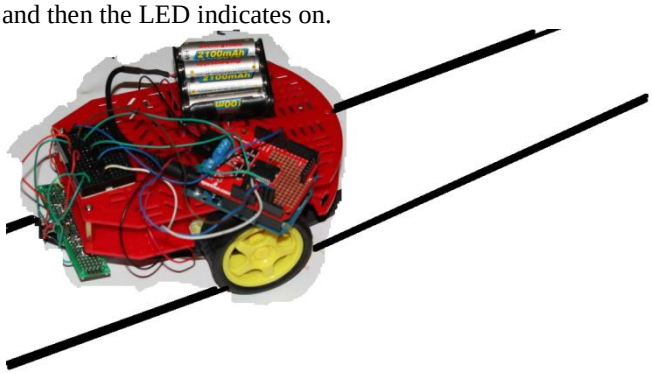

Fig. 4: line follower robot model using sensors.

For a wireless monitor system the sensor circuit is connected with Arduino board which has various keys with the different functions. The Arduino board is connected to thaw wheels and the batteries which make robot to move.

IV. CONCLUSION

Water is one of the most important basic needs for all living beings. But unfortunately a huge amount of water is being wasted by uncontrolled use. Some other automated water level monitoring system is also offered so far but most of the method has some shortness in practice. We tried to overcome these problems and implemented an efficient automated water level monitoring and controlling system. Our intension of this research work was to establish a flexible, economical and easy configurable system which can solve our water losing problem. As a future work this automation can be integrated through web to monitor remotely.

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