

# GESTURE CONTROLLED ROBOT USING Lab VIEW

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**Abstract**— In few years ROBOTS are going to decree the cosmos. Man supremacy is abridged by replacing robots. In the existing system, human hand movements is sensed by the robot through sensors and it imitates the same, but this is made probable by placing the sensor in the accelerometer and which is to be carried by the person(user's hand). As the person moves his/her hand, the accelerometer also moves accordingly which in turn displaces the sensor and this sensor senses the constraints according to the position of hand and this sensed constraints are given to the sensors placed in robotic arm which makes the movements of robot arm accordingly. Hand gestures and even the intact body posture play a very vital role in human communication. The intention of this paper primarily is to generate a script in vision assistant and real time image through the vision acquisition acquired. The acquired image is to be transformed into digital signal using image processing in Lab VIEW. Interfacing the robot with Lab VIEW is processed through MYRIO. The digital indication of the robot is made to control by several hand gestures and drive the robot in different direction

**Keywords**— Gesture, Lab VIEW, MY RIO, Acquisition.

## 1. INTRODUCTION

Computer analysis of hand gestures has become a key research spot in the Human Computer Interface (HCI), which is not restricted to the keyboard, mouse or some other direct input devices. Ubiquitous Computing, Smart Rooms, Virtual Reality and many other important technical fields include gestures as a way of communication; therefore, research on computer analysis of hand gestures and body posture has significant scientific value [1]. IMAQ vision toolbox presents a digital image processing and acquisition functions that improve the project efficiency to get best results in shorter time [2]. A vision based hand gesture interface, where by hand states (open/close) and a class of hand postures in a taxonomy of grass types can be detected and recognized with a single passive camera. Inferring the full articulations of the fingers from a single camera is an exigent problem due to the complexity of the hand articulations, the occlusions of the fingers, and complications in segmentation of the hand from the background image. In the past, several researchers have developed hand pose estimation methods for vision-based gesture interfaces [3]. Using the captured data, several methods have been proposed for the robot to classify human emotions or to follow a human teacher's instruction [4]. In this project we used the technique of edge detection in the vision assistant. The edges of the images are detected by the change in contrast of the image. diverse hand gestures are taken for the faultless recognition of the images. these

gestures are progression to acquire the analog voltage through daq from the nielvis and interfacing it with the robot..

## Problems faced

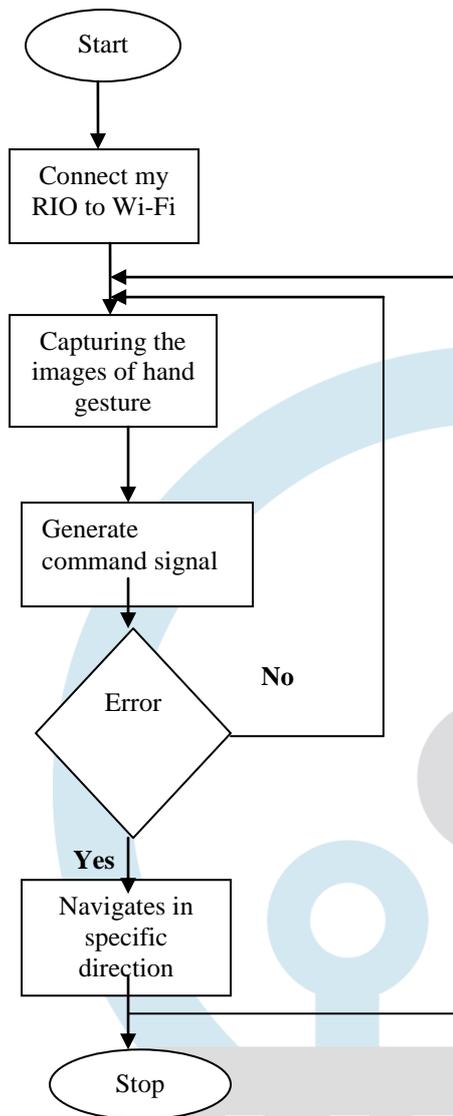
- Wrong object extraction problem raised if the objects larger than the hand.
- Complications in segmentation of the hand from the background image.

## II. GESTURE CONTROLLED ROBOT

1. We propose a system, using which the user can navigate the wireless robot in the environment using various gestures commands.
2. In this system, user operates the robot from a control station that can be a laptop or a PC with a good quality in-built webcam or external webcam.
3. This webcam is used to capture real time video stream of hand gestures to generate commands for the robot.
4. Gesture commands are given using hand palm. Mainly two kinds of gestures are used which are explained further.
5. Image frame is taken as an input and processed using Image Processing.
6. Processed image is then used to extract the gesture command.
7. From this generated gesture command, signal is generated to pass the given command to the robot.

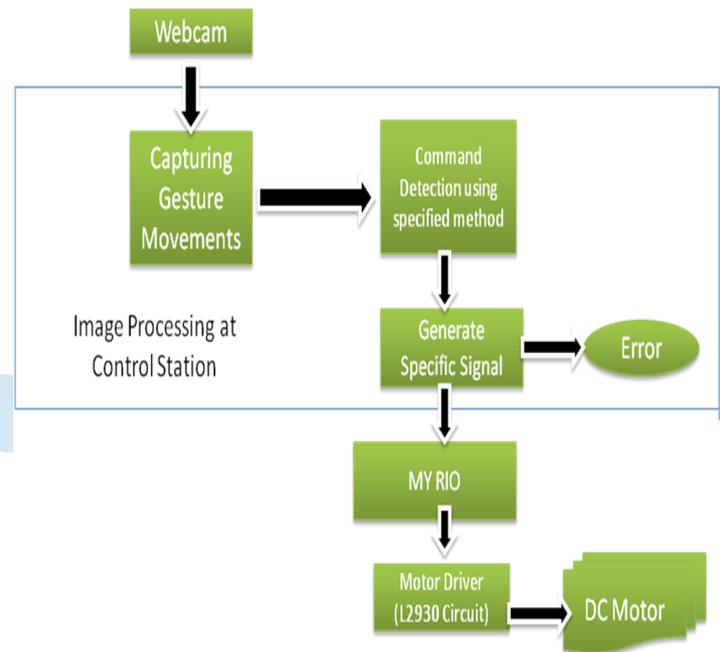
Our system is nothing but the four tyre vehicle which is driven by geared DC motor. According to My Rio program, after some time it will generate signal and moves the robot.

Connect the myrio to nearby Wi-Fi network. From the fig.1 explains initially it captures the images of the hand gestures. Next it will generate command signal and step 2 will be repeated. Step 3 if we get any error it will stop and goes to step 1. If yes the Robot navigates in the specific direction.



**Fig. 1: Flow chart**

Block diagram in fig.2 explains the whole architecture of the robot. We have connected L293D motor driver to myrio which are used to drive the wheels and move the robot.



**Fig. 2 : Block Diagram**

**III. SOFTWARE SPECIFICATIONS**

• **LabVIEW:**

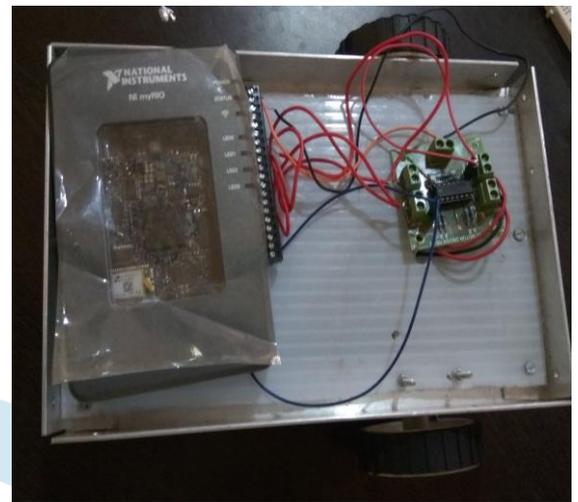
LabVIEW (short for Laboratory Virtual Instrumentation Engineering Workbench) is a platform and development environment for a visual programming language from National Instruments. The graphical language is named "G".

• **My RIO:**

The NI's (National Instruments) myRIO-1900 is a portable reconfigurable I/O device. RIO means the device that students can use to design control, robotics, and mechatronics systems. This document contains pin outs, connectivity information, dimensions, mounting instructions, and specifications for the NI myRIO-1900. The NI myRIO-1900 provides analog inputs and outputs (AI) &(AO), digital input and output (DIO), audio and power output in a compact embedded device. The NI myRIO-1900 connects to a host computer with a USB and wireless 802.11b,g,n.



**Fig.3 MyRIO**



**Fig.4:** Prototype of Gesture controlled robot using Lab VIEW

### Advantages

- It is a robot in which work can be done more accurately and efficiently.
- This robot is very beneficial to carry loads in industries and factories.
- Human stress can be reduced through this robot.

### Disadvantages

- As we are using MYRIO cost will be increased.
- The performance of recognition algorithm decreases when the distance greater than 1.5 meters between the user and the camera.
- Besides that, its variation to lighting condition changes and unwanted objects might overlap with the hand gesture

### IV. RESULT

The proposed system implemented using myRIO and Lab VIEW 2015. The purpose of this paper work is to develop a real time application. The wheels move accordingly (forward, backward, left and right).

### V. CONCLUSION

The autonomous robot vehicle has been lucratively interfaced with the Lab VIEW through MYRIO. The gesture input was rehabilitated into digital pulse signals. These digital pulse signals are given to the dc gear motor. Primarily the robot was tested for forward and reverse movement according to the hand gesture. And it was also effectively tested for movement in all directions. This mission is functional in the places where minimum requirement for substantial exertion is required.

Enormous amount of work has been done on wireless gesture controlling of robots. In this paper, various methodologies have been analyzed and reviewed with their merits and demerits under various operational and functional strategies. Thus, it can be concluded that features like user friendly interface, light weight and portability of android OS based smart phone has overtaken the sophistication of technologies like programmable glove, static cameras etc., making them obsolete. Although recent researches in this field have made wireless gesture controlling a ubiquitous phenomenon, it needs to acquire more focus in relevant areas of applications like home appliances, wheelchairs, artificial nurses, table top screens etc. in a collaborative manner.

### VI. FUTURE SCOPE

This system can be implemented for further use as listed below:

We can also update this robot to work as a vehicle which carries load in industries, laboratories and factories. It can also be used physically by disabled populace, where they will be proficient to control the movement of the vehicle with just their hand gestures without others assistance.

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