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Smart Movement using Eyeball Pupil Position

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Abstract*— There are different kind of reasons for which people offer an material of locomotion such as a cursor. The number of students people and others, who need to artificially go with the cursor. Hence implementing a controlled system with which it enables them to change the place without the help of any other hardware. The proposal of eye controls is of actual use of people who suffered a lot with the problem faced daily with natural input and mostly used by the handicapped and disabled. Camera used here is capturing the image and action of eye pupil movement. First detect the pupil centre position . Then the different angle variation on pupil position gives different instruction set for cursor. The signal pass through the PC to automatically cursor move itself. The movement of the cursor capture and control with the direction and enable the cursor to move the different directions such as forward, left, right and stop.

I. INTRODUCTION

The power of automation has a wide range in changing the life of disabilities. Some peoples are not able to operate wheel chair because of an inability to move. The idea of eye controls is of great use of people have a problem with foot, handicapped and other related problems. Also implementing a control system in it with enables them to operate wheelchair without getting a work from another person. It is more compensation idea to handicapped peoples. The project will helpful to operate wheelchair without other help, the idea is most useful for the people can operate by own with the help of pupil movement. Fig.1 shows the block diagram of smart movement and how the command transfer from camera to controlled machine. the block

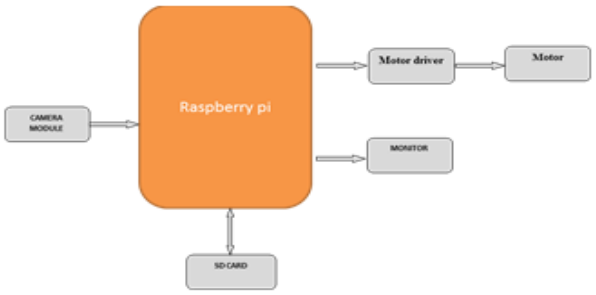

Fig. 1. Block diagram of Smart movement circuit.

II. LITERATURE SURVEY

Richard et.al describes several examinations have demonstrated that the two youngsters and grown-ups advantage considerably from access to a methods for free portability. While the necessities of numerous people with incapacities can be happy with conventional manual or controlled wheelchairs, a fragment of the debilitated network thinks that its troublesome or difficult to utilize wheelchairs autonomously. To suit this populace, analysts have utilized innovations initially produced for portable robots to make "brilliant wheelchairs." Smart wheelchairs have been the subject of research since the mid 1980s and have been created on four main lands. This article exhibits an outline of the present condition of the craftsmanship and bearings for future research. Rakhi Bhardwaj et.al task is explicitly identified with the Smart Android telephone taking care of the wheel seat framework utilizing voice-recognisation framework. The wheelchair System is prescribed to control a wheel seat by utilizing the android application in the cell phone and voice-recognisation framework. The primary focal point of this undertaking or application is to encourage and increment the portability of incapacitated and old matured individuals who are not ready to move well due to their in capacities of organs. Utilizing this wheel seat will enable crippled individuals to carry on with an actual existence autonomously without contingent upon others for their development as an every day need. Discourse acknowledgment innovation is a key innovation which will give another method for human collaboration with machine or devices. In this way the issues that they face can be unraveled by utilizing discourse acknowledgment innovation for the development wheel seat. This can be acknowledged and advanced with utilize the advanced cell gadget as a middle person or interface. In this task interfaces has been structured in this way to build up a program for perceive discourse additionally controls the development of seat and an application which can deal with or deal with the graphical directions.

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This task utilizes arduino pack Microcontroller circuit and DC engines to make the development of wheel seat and IR Sensors to distinguish the obstacles in the middle of wheelchair and the method for course.

III. ELECTRICAL DC MOTOR

A DC motor is the type of electrical machine that converts electrical form of energy to mechanical form of energy. DC motor uses the magnetic forces for the conversion. The internal current flow is periodically changed by using some internal mechanism. The external source of magnetic field is used for production of the rotary motion. The motor works on the same principle that enhance the operation of the driving the wheel of the corresponding machine to convert the flow with movement. There are two types of DC motors. They are brushed DC motors and brushless DC motors. In the project using a brushed DC motor have 12V and 0.6 A current produced to drive the flywheels conversion to make the robot changes the position from one place to other place. The basic portion of DC motor is maintained and structured with proper metal parts and combined with commutated segments, motor gives the movement and postion change over direction.

IV. DRIVER

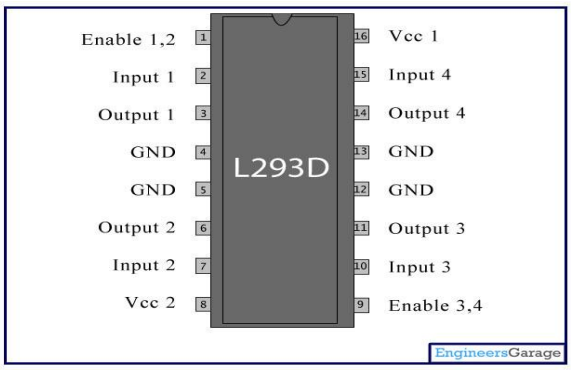

Fig. 2 Pin diagram of Driver

Fig. 2 shows the pin diagram of driver. L293D is a dual H-bridge and motor driver integrated circuit (IC). The motor driver act as current amplifiers with which it take a low-current with control signal and it gives the output of higher-current signal. The higher current enabled signal is used here to drive the electrical motors.

L293D have two inbuilt based H-bridge and driver circuits. In the common mode of operation, two DC motors can be driven in same time with different direction and, both in forward and backward direction. The motor operation of two different motors have to controlled by input logic of different structural pins 2 & 7 and 10 & 15. The logic 00 or 11 will stop and control the corresponding motor. Logic 01 and 10 control and will rotate it in clockwise and opposite directions, respectively. Enable pins 1 and 9 should be used here high for the motors to start functioning, this kind of principle followed in the project and it gives the operation related to that logic.

V. RELAY CIRCUIT

Relays act as switches that may be used as open and close the switches electronically. It control one form of electrical circuit by open and closing the contacts in another linked circuit. As diagrams below show, when the relay contact is normally open (NO), and there is having open contact when its relay is not correctly energized. The relay circuit used to take the corresponding options from other circuit to all circuit and it works normally with normal current , it gives the corresponding opening and closing of switches by which movement of wheel occur in the project. Fig. 3 shows the relay circuit of the work.

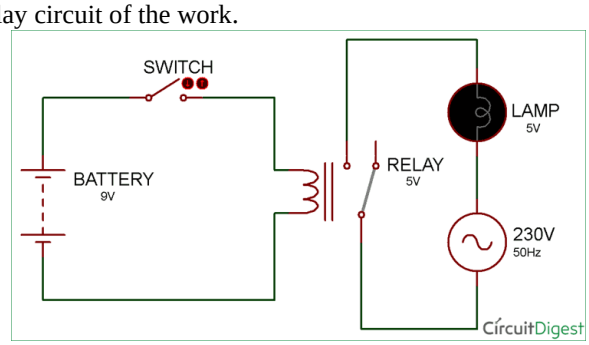

Fig. 3 Relay Circuit

VI. SOFTWARE PART

Open CV is an open form of source with C++ library used for image processing with the enabled computer vision, developed by the Intel and worked by the programme, created the machine which will use by handicapped people. It is mainly used for developing advanced image processing and computer vision applications. Open CV-Python have makes and use of the Numpy, which is the highly recognized library for the numerical operations and with a MATLAB- a style syntax. The Open CV with array structures were converted to solutions and from the Numpy arrays. It makes very easier to integrate with the other libraries of that use Numpy , SciPy with Matplotlib. Image Processing with Open CV and Image processing are used to perform some problems related to the image, in order to get some useful and information and study from it.

VII. LANGUAGE

Python is a mediator programming language. It is utilized to learn, incorporated with other programming, proficient to get to information structures in abnormal state. It is a viable methodology of article arranged programming. It conveys sentence structure free and composing runtime with deciphered nature to make ground-breaking and basic program. It is likewise connected for scripting and quick application improvement of issue. It is uninhibitedly accessible. It bolsters all working framework to execute and assess the program.

Application:

- BIO-GADGETS applications
- Human-computer interaction in universal computing
- Motor driver
- Eye trackers
- Controlling wheelchair.

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VIII. PERFORMANCE EVALUTION & RESULTS

The different types of pictures and movement captured by high end camera , these picture and movements are compared with already stored pictures and movement by which the direction of wheel chair enabled by the motor direction . Based on pupil left movement, the wheel moves in left side and pupil right movement the wheel moves in right side, no movement in pupil indicates forward direction of wheel, double movement of pupil indicates the wheel to stop. Reverse switch is used to move the wheel in backward direction. If there is any obstacles found in front of movement , the action taken is stopped automatically without knowledge of pupil movement for secure purpose , then after it decides the action to move forward or reverse based on pupil movement .

IX. CONCLUSION

In this determining the idea of capture the movement of pupil and small changes define the corresponding action, it shows the movement of any object through motor driver and can use to wheel chair control of people who suffered a lot with low budgets. To extend the project with high level of programming and structure can use with medium and high level of budgets.

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