



# VOICE OVER COMMANDS FOR PHYSICALLY CHALLENGED AND ELDER PEOPLE USING RASPBERRY PI

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**Abstract:** Nowadays caring disabled and old-age people was very difficult because of someone else need to serve for their basic needs, and we can't be with them always in their room. To resolve this problem. Our major contribution to disabled persons who unable to control their hands. Our development system reads their actions of head like left, right, up and down movement using angle difference in their necks and blinking of an eye opening and closing of eye balls using eye blink sensor. We have some basic need buttons in screen in which the button contains the information of daily needs like food, water etc., they can select their need by moving their necks and blinking their eyes. Increasing delay of blinking will differentiate between normal eye blink with our system selection.

**Index Terms – Raspberry Pi, Accelerometer, Gyroscope, Eye blink sensor, Python Developing.**

## I. INTRODUCTION

Developing a system which enable to communicate person who cannot speak or those who are physically disabled by an accident. Our system uses a general usage device like eye glass which is able to detect the eye blink of the patient. This device can also sense the head movement of the patient by using the accelerometer. The recognized activities of the patient is interfaced with the system using Raspberry Pi in which the python code is already developed. Our system can access the mouse operation of the system by using the general usage device like eye glass.

## II. PROPOSED SYSTEM

It sense the activity of patient based on eye ball and neck movement using blink sensor and MPU6050 in which the blink sensor consists of IR based blink sensor and IR comparator. Blink sensor is given to Raspberry Pi and MPU6050 is connected to Raspberry Pi using I2C cable. Coding has already been developed in Raspberry Pi. The local host screen was set in Raspberry Pi with 15 commands of patients daily needs using a web host. Raspberry Pi has a python code in which the Python reads the data from the blink sensor and MPU6050 from USB and it interfaces the data with the system operation. Python interfaces the data by controlling the mouse operation of the system.

The following components are used in the proposed system:

- Blink Sensor
- MPU6050
- Raspberry Pi
- System or Monitor

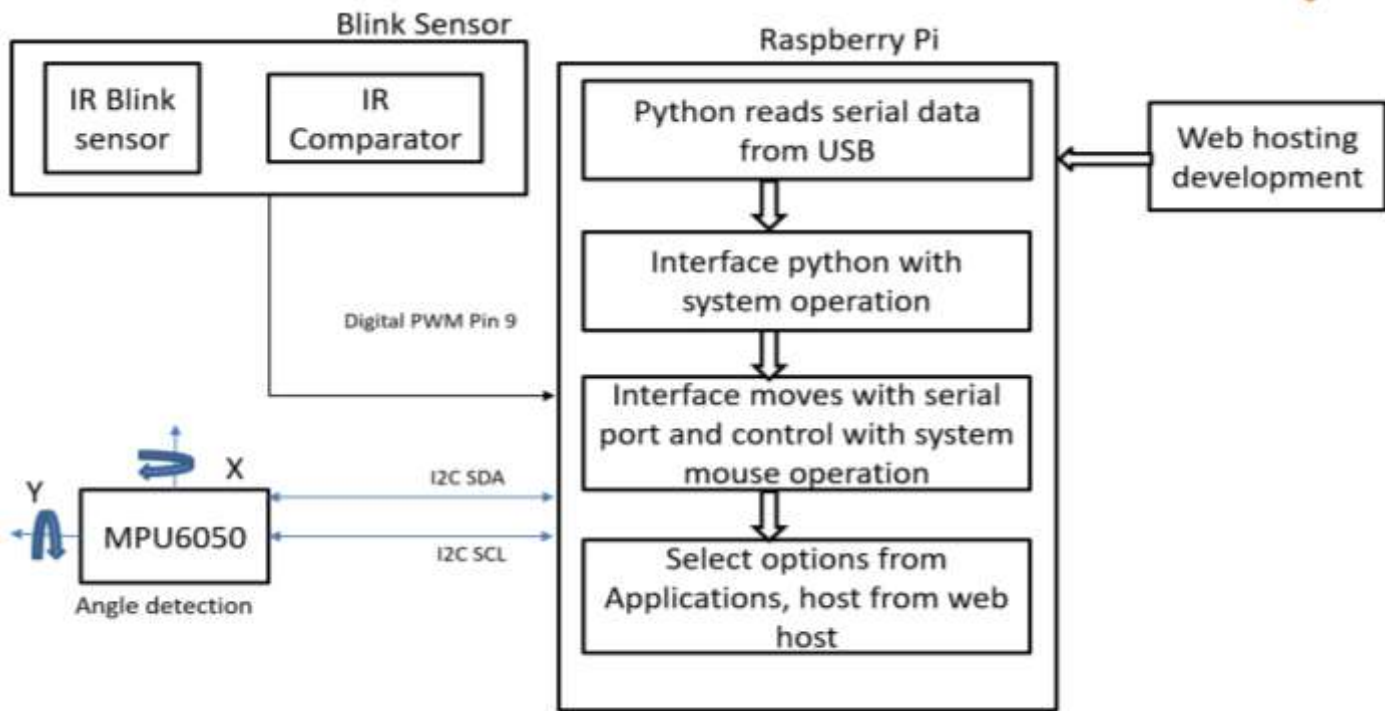
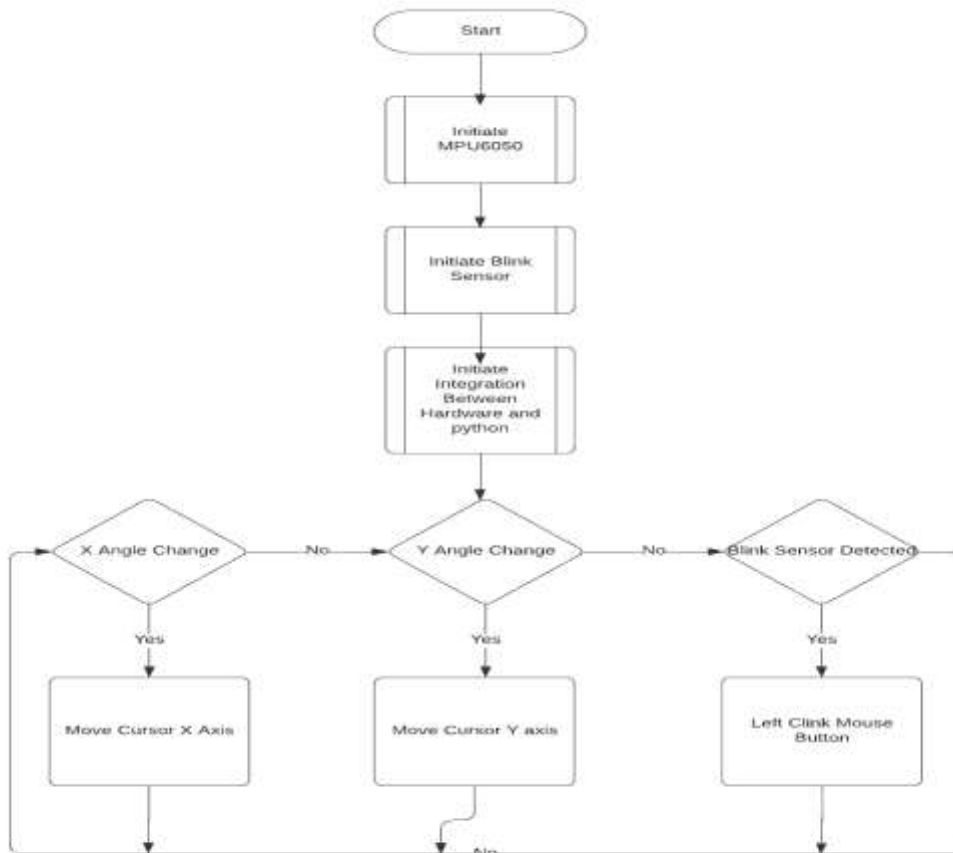


Fig.1 Block Diagram of Proposed System

### III. DESIGN FLOW

The following diagram is the design flow of our system



#### IV. DEVICE REQUIREMENTS

All the device requirements including both hardware and software components are listed below,  
BLINK SENSOR:



It sense the eyeblink of the patient using infrared.. If the eye ball is closed then the output will be high otherwise the output will be low.

MPU6050:



It consists of 3 axes(X, Y and Z axis) of accelerometer and gyroscope and these 3 axes is used to detect the neck movement of the patient.

RASPERRY PI B+:

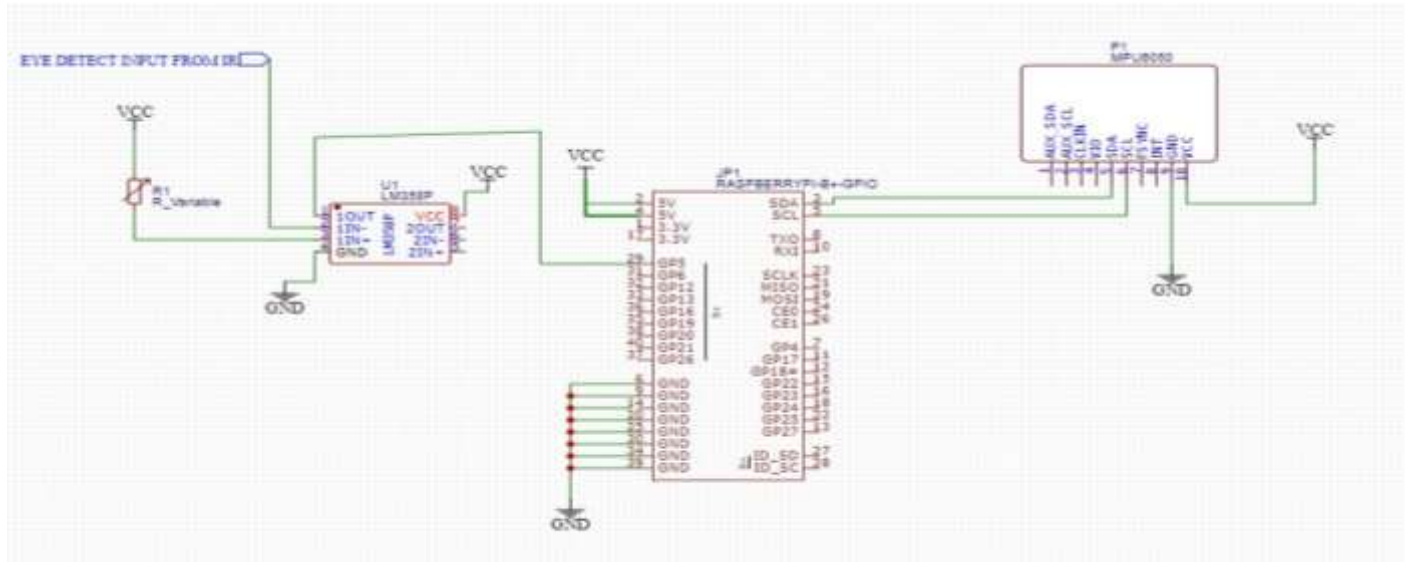


It is a hardware used to interface the system with the software.



## V. CIRCUIT DIAGRAM

The below diagram shows the pin connection of the system



## VI. IMPLEMENTATION OF MODEL

The normal activity of the patient like eye blinking and head rotation can be removed by setting a threshold value and the system senses when the activity of the patient overcomes the threshold value. The input from the blink sensor and the accelerometer was given to the Raspberry Pi and it interfaces with the system mouse operation. The blink sensor input is detected when the eye ball is closed and the light will turn off and the input from the accelerometer is detected by head movement when it overcomes the threshold value and it consists of X and Y axes in which the X axis is used for the up and down movement and the Y axis is used for the right and left movement. The python code in the Raspberry Pi interfaces these data with the system mouse operation. The mouse cursor move along with the head rotation and the commands can be selected by eye blink. The commands been set into the Raspberry Pi. The Raspberry Pi and the system is connected to a hotspot and it forms an intranet. Using the wireless network watcher application, we can find the IP address of the Raspberry Pi. This IP address is copied and it was opened In the virtual network computing viewer and it connects the Raspberry Pi with the system

Our proposed system is implemented in real time as depicted in the figure given below,

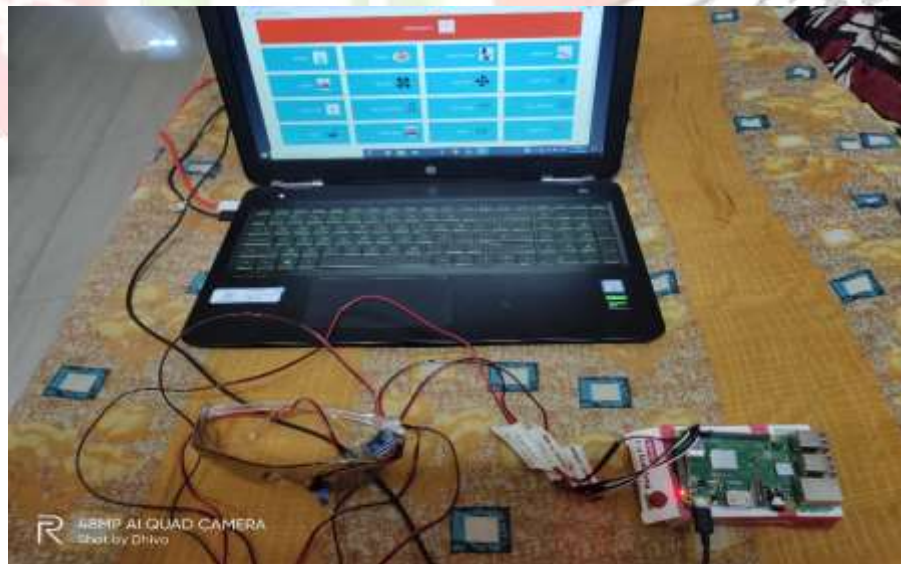


Fig.3 Hardware Implementation

## VII. CONCLUSION

Eye blink and head movement of the patient was sensed using blink sensor and MPU6050 and using this the patient can select the commands on the screen which is placed in front of them. The selected command will be voiced out by the speaker connected to the Raspberry Pi. This will be helpful to the person who is taking care of the patient. The future scope of this project is that we can connect the blink sensor and MPU6050 with the Raspberry Pi using wireless network and it will be more efficient

**REFERENCES**

1. Mai K. Galab, H.M.Abdalkader, Hala H. Zayed, “*Adaptive Real Time Eye-Blink Detection System*” International Journal of ComputerApplications, 2014.
2. Sushil Chandra, Saloni Malhotra, “*Eye Tracking based Human Computer Interaction*” International Conference on Man and Machine Interfacing (MAMI), 2015.
3. Aniwat Juhong, T. Treebupachatsakul and C. Pintavirooj, “*Smart Eye Tracking System*” King Mongkut’s Institute of Techonology Ladkrabang (KMTIL), 2018.
4. Vandana Khare, S. Gopala Krishna, Sai Kalyan Sanisetty, “*Cursor Control Using Eye Ball Movement*” International Conference on Science Technology Engineering and Mathematics (ICONSTEM), 2019.

