

Efficient Iblink Checking And Shocking System

SP. Vijaya Vardan Reddy^a, R.V. Rajasundari^b, Kongara Mounika^c, T.Suresh^d, Y. Deepika^e

^aAssistant Professor/ECE R.M.K. Engineering College, Chennai.

^bFinal Year B.E., ECE, R.M.K. Engineering College, Chennai.

^cHead of the Department/ECE, R.M.K. Engineering College,

^dTesting Engineer, Tata Consultancy Services, Chennai

Abstract

Facial paralysis disease is due to nerve damages affects people face .People suffers a lot with this disease will have face drop at one side .It affects the eye region due to enclosure of eye at that paralyzed part of the face .To avoid this we work on machine learning algorithm .This will make an eye of affected part to be open and close symmetrically.

Keywords: Smart device; facial paralysis

1. Introduction

Facial paralysis disease is severely affected by people who have nerve damages. This makes them eye drop. If we not undergone any treatment mean, It makes the patient's life in danger's, we have to know more about the disease and its demerits.

This disease can be cured by giving shocking treatments. It was done by detecting the person's affected face and comparing with normal part of the face.

Symptom of Bell's palsy is given below:

- One side of face is drop and it is paralyzed due to loss of facial movement.
- Unable to blink eye at one side of face due to nerve damages.
- Slow tearing
- Mouth part is affected due to this facial paralysis disease
- Change in taste sense
- Low speech
- Unconscious and sometime mentally unstable
- There will be pain at the side of ear
- On the affected side sound is hypersensitivity
- Unable to eat or drink.

2. Related Works

Kim et al. used a smart device for facial paralysis. This was proposed to get asymmetric index. By evaluating the index, we can get the expression of the face through smart device. But the accuracy is just 89%. To overcome this slow application, we use an efficient iBlink system. Smart devices are now available in this environment for facial protection and to avoid frequent systems. Our work is focused on eye protection for the patients. Power consumption of certain devices may get reduced and this is done to make the applicable device temperature resistant. It is important to make an efficient device to control facial paralysis disease. This paper was published and also posted.

3. Design And Challenges

The eye blink system consists of Camera, Stimulating circuit, Raspberry pi. It also has software layers. First layer is input layer.

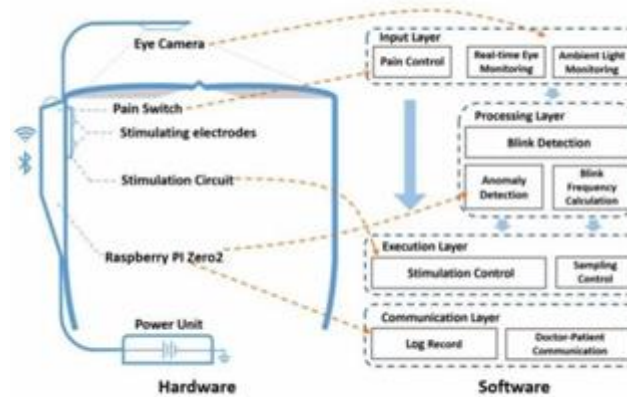


Figure 1: Design challenge of eye blink

The challenge of designing this eye blink system is based on the devices we use and the software system to perform. The first important one to design is Raspberry pi hardware component will take the coding part as input and gives electrical output. The United Kingdom found that this device is maintained highly.

The organization has performed a small series of tools that does not require any peripheral devices. It is similar to a computer system but does not require any active device to use. The device we use in this challenge is a USB camera that will allow us to detect both the eye movements from the user. These challenges made the designer to work on the tools to accommodate. It is very important that both the challenges are highly performed with the help of software part also. This will make one to understand the impact of the design to make in this system.

4. Existing Model

In this existing system, eye blink of facial paralysis patient is done by using smart devices which help to detect patient's eye movement.

The eye movements are detected based on SVM machine learning algorithm. It has trained data sets to make the eye images.

This system is used to make eye asymmetric.

5. Proposed Model:

In the planned system, it is employed to find eye blinking count enforced by Raspberry Pi.

This system is used to CNN algorithm for checking eye movement and also eye count. If the patient doesn't blink their eye, the electric stimulate circuit will give automatic pulse to the patient's eye.

6. Working Procedure: Facial Image Processing

The eye movements are detected through the USB camera. After several captures of images, it is monitored through the input images. From the input image, both the eyes are monitored and detected for checking process. The normal side is left-right flip and paralyzed side of face image is single eye images. Then it is allowed to model selector. Next process is to apply machine learning algorithm for checking eye movement.

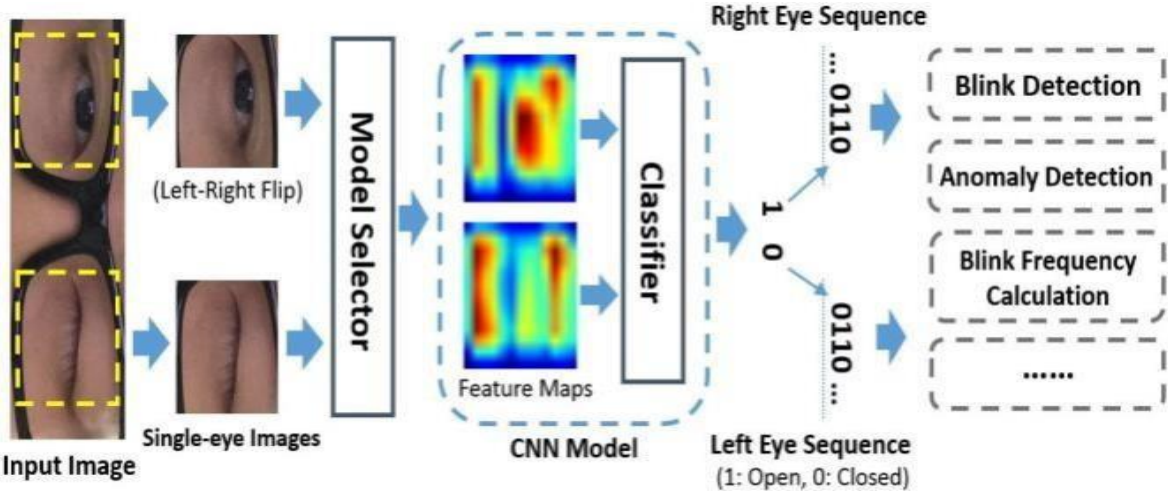


Figure 2: Working process of facial image processing

If sequence of eye is 0 mean the eye is closed and 1 mean the eye is opened.

7. Circuit Diagram

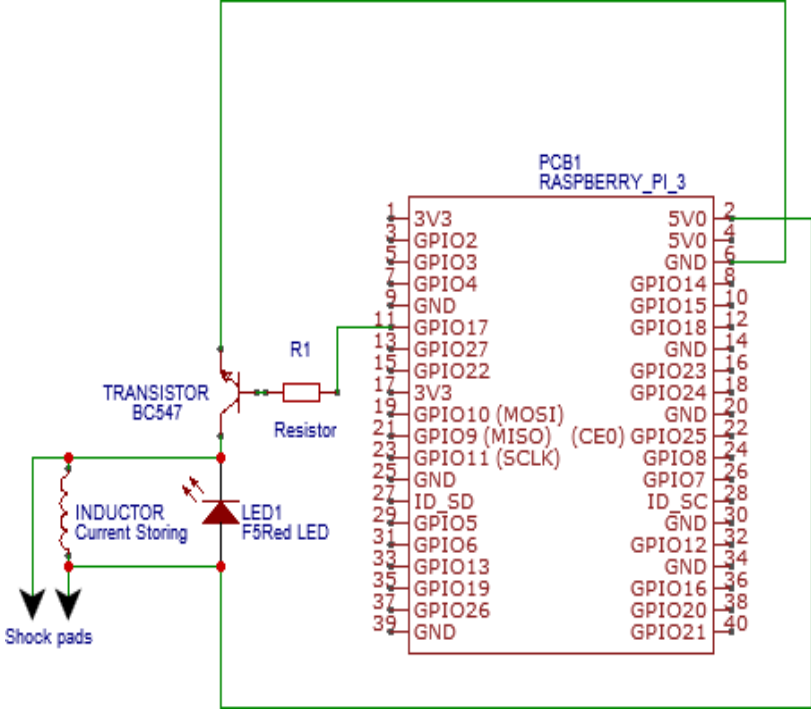


Figure 3: Circuit diagram

8. Block Diagram

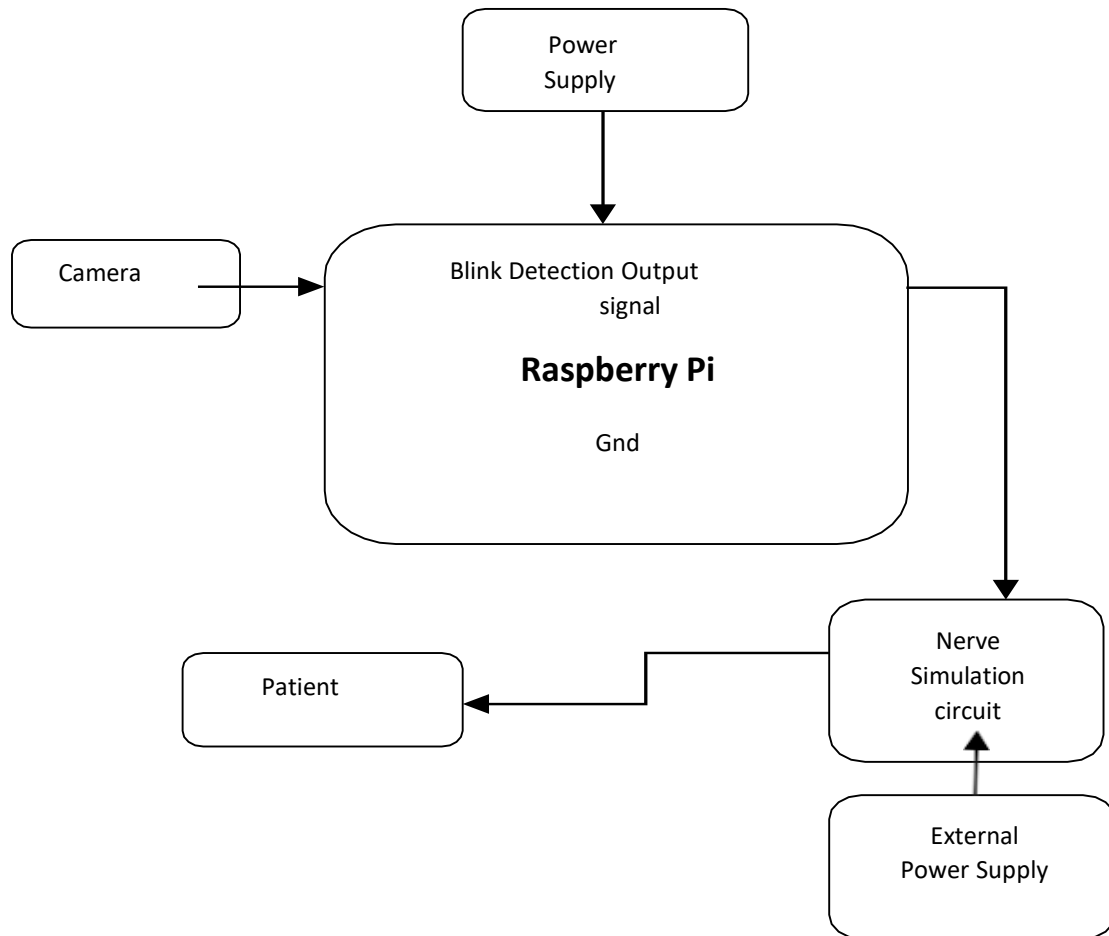


Figure: 4 Block diagram of proposed model BLOCK DIAGRAM DESCRIPTION:

Above the block diagram is containing raspberry pi, USB camera, shocking system and power unit. The USB camera is connect to USB port of raspberry pi. Shocking system is connecting toGPIUO pin of raspberry pi. Power unit is providing power to device. CNN algorithm is usedto detect eye count of user.

Requirements: Hardware Requirements:

- USB camera
- Raspberry pi
- Electric signal stimulating circuit

Software Requirements:

- Language : Python
- Compiler : GCC Compiler.
- OS : Linux

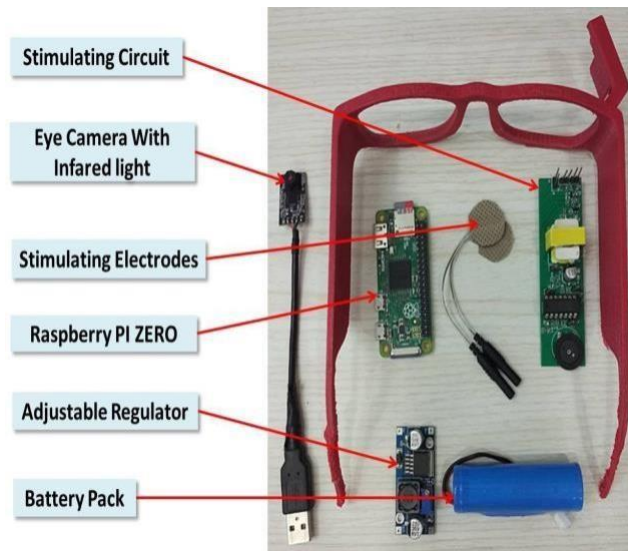


Figure 5(1): Hardware components



Figure 5(2): Prototype of device

9. Advantages

Using only one camera for detecting both two eye count

Using single trained data set for checking eye count in CNN algorithm.

10. Result



Figure 6: Output of Eye Blink



Figure 7: Power Supply



Figure 8: Raspberry pi



Figure 9: USB Camera



Figure 10: Stimulating Circuit

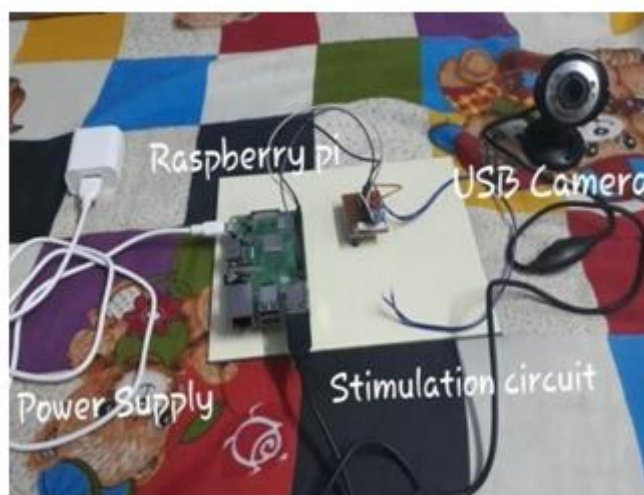


Figure 11: Hardware scheme

11. Conclusion

We have implemented a device which is used to cure facial paralysis disease by using CNN algorithm. This technique is based on machine learning algorithm which scans 30,000 images and the trained data sets are used for detection purpose. Moreover, it takes less time and accuracy is 99%. The detection of an eye movement is calculated continuously.