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Use Of ECG/ EOG/ EEG for the Purpose of Health Monitoring of Partially or Fully Paralyzed Patient and to Communicate with the Patient in Case of an Emergency

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ABSTRACT

It is never felt safe to leave a partially or fully disable person alone with a caretaker, it does not matter how much care is taken by the caretaker. In this paper, three different ways are described how the condition of a partially or fully disabled person can be monitored and in case of any problem, the partially or fully disabled person can communicate with his/ her family members. In the first way using Electrocardiography (ECG) the condition of the heart of the disabled person is continuously monitored and whenever something unwanted has happened a message is sent to his/her caring family member with the help of a microcontroller. This also can be done using Electrooculography (EOG). This can be applied to a partially paralyzed person. Here it is mentioned that the person is partially paralyzed because the EOG works on the movement of the cornea so the person should be capable of moving his/ her cornea. Now if the cornea of the person is bent over a set point a message is sent to a specific person. The same can be done with the help of EEG using brain signals. The brain signals are continuously monitored and in case of any unexpected or absurd signal message will be sent to the disabled person's family member.

KEYWORDS – ECG, EOG, EEG, communication.

1. INTRODUCTION

Every time it's not possible to carry a disabled family member with us everywhere like at the office or at any working place. So for that office time, it always feels unsafe to leave him/her with an unknown caretaker. The aim of our project is to make a disabled or partially disable person able to communicate with his/her caring one. For this purpose in this paper, the use of ECG, EOG, and EEG is mainly focused. Whenever something unexpected wrong happened the ECG is changed undesirably and the brain signals also are changed accordingly. These can be used for continuous monitoring of the condition of a disabled person. Now if a disabled person can move his/ her cornea then communication can be possible using EOG also. The process these monitoring and communication with the disabled person is done is discussed below.

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2. USAGE OF ECG

Electrocardiogram (ECG) was first introduced by Willem Einthoven in 1895. Generally, doctors suggest for an electrocardiogram (ECG) to see the condition of the heart. After ECG a graph is received by the patient as a test report which is a graphical representation of the electric pulse generated during each heartbeat. Electrocardiography generally has a standard waveform for people with normal heart function. Now if there is any case of abnormality such as the patient's heart function is not normal then the electrocardiography is seen to be different from the standard waveform. This waveform also depends on the mental condition of the patient under test. If the patient's mental condition is not stable then also the waveform is noticed to be different from the standard waveform.

2.1. METHODOLOGY

If the decrepit person is able to move his/her finger the implementation can be done in a better way. For getting the ECG signal mainly we used our index finger middle finger & thumb. Two or three motion sensors are connected to his/her fingers which he/she can move. All the motion controllers are connected with a microcontroller and programmed as messages will be sent to different persons for the movement of different fingers. Now if he/she feels something bad and wants to call his/her loving one he/she just has to move the fingers to for which message will be sent to that person. According to the movement of different fingers, messages will be sent to different persons.

3. USAGE OF EOG

In this world, Elwin Marg was the first person who gave us the vision of EOG in 1951. The clinical applications of EOG were first introduced by Geoffrey Arden in 1962. He understood that the Arden ratio was the most valuable information for everyone. It is a technique to see the eye condition of the human body. After EOG, we received a graph through the test which is the graphical representation of the electrical pulse generated during the movement of the cornea. During the test of EOG, the resulting signal is known as Electrooculogram.

3.1. METHODOLOGY

When humans move their eye little then they generate signals which are called EOG signals. we can record or measure these signals to placing the electrodes near the eye. Here we used many different configurations of electrodes to get the EOG signals. To gain the signals we can place the electrodes on the skin near the eye like forehead, up and down or both sides of the eye. One pair of electrodes is placed up & downside of the eye to pick up the voltages during the vertical movement of the eyeball and another pair of electrodes is placed to the left and right or both sides of the eye to record the horizontal movement. For each degree of eye movement, the EOG signal changes very small microvolt. Whenever something unwanted is happening a message is transmitter his/her one family member's phone with the help of a GSM module.

4. USAGE OF EEG

Hens Berger was the founder of electroencephalography (EEG) in 1924. Electroencephalograph is an instrument for recording every electrical activity of the brain.EEG is a method for measurement of brain wave which is known as Berger Wave. To recording every activity of the brain through placing electrodes on the scalp. After EOG, we received a graph through the test which is the graphical representation of electrical activity by skeletal muscles. It is most useful for abnormal people. Using EEG, we can check their conditions of the brains. Though EEG we can also communicate with the paralyzed persons & also known about their health.

4.1. METHODOLOGY

Different types of are used to record EEG like Peel and Stick electrodes, Reusable disks, EEG cups with disks, subdermal needles. The electrodes which are used in ECG are bigger in size than electrodes which are used in EEG. EEG signals picked up by the electrodes which are placed on the scalp. With the help of electrodes, we can record the EEG signals and the output is transmitted as a message to his/her caring one. If a disabled person does not move his/her organ or body part then we used the EEG method to connect with him/her. With the help of this type of technology every time we can easily communicate or monitor with every disabled person who is sharing something with their own person.

5. APPLICATIONS OF ECG, EOG, EEG

Using ECG, EOG, EEG the condition of the disabled person is continuously monitor and whenever something unwanted is occur a message is transmitted to his/her one family member's phone with the help of a GSM module. This total program is controlled by a microcontroller. So, we can easily communicate with them. It can also help us to check the heart, eye, brain condition of any person.

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