# Human Emotion Recognition System

[1] Akhil Sabu Varughese, [2]Ganesh Chandran, [3]Nithin Mathew, [4]Seles Luiz

Amal Jyothi College of Engineering Kanjirappally, Koovappally(P.O),

Kottyam 686518, Kerala India.

*Abstract:* The facial recognition method for identifying the human emotions was developed and used now a days. This method is not reliable, it has many flaws. One of the flaws is that fake emotions will be detected by the signal processor. The recognition system we are introducing manipulates facial emotions and body vitals. The fake emotions can be identified from the body vitals like pulse and body temperature. In this project we are using combination of ECG and Temperature sensor to identify human emotions. Combination of these sensors and Open CV (open source platform for image processing) helps to identify the proper emotions of the person. The proper emotions is primarily identified and stored in databases. These databases are developed from EEG analysis from music therapy.

*Keywords:* EEG, fractal dimension, SVM, emotion recognition, Open CV, Face recognition, ECG, music therapy.

## I. INTRODUCTION

Emotions play a vital role in people's everyday life. It is a mental state that does not arise through will and is often accompanied by physiological changes. Therefore monitoring these changes is important as they are perceptions of emotional changes and can help in identifying matters of concern at an early stage before they become serious. Emotion recognition has become an important subject when it comes to human-machine interaction. Various methods have been used in the past to detect and evaluate human emotions. The most commonly used techniques include the use of textual information, facial expressions, speech, body gestures and physiological signals. These signals are obtained from a skin temperature sensor, a heart rate sensor and a skin conductance sensor. The amplified and filtered signals from the sensors is the input into the microcontroller then transmits the data to a computer where it is stored for analysis and feature extraction for emotion recognition.

## II. NEED FOR EMOTION DETECTION

Improving human health has been the subject of many research investigations. Recent research studies have been focused on improving the quality of human life in terms of health by designing and fabricating sensors which are either in direct contact with the human body or indirectly. These sensor based systems would have a positive impact on the annual medical cost and the health management system as it would allow for early detection of physiological and emotional changes. Emotions play critical role in rational and intelligent behavior. The main objectives are to design a real time monitoring system, capable of monitoring data in a comfortable and unobtrusive manner, with the ability of wireless communication. The data processing is carried out using a microcontroller and Bluetooth technology is used for wireless data transmission. A graphical user interface is developed for real time monitoring, its analysis and emotion recognition. Parameters for emotion recognition are set based on training data collected from healthy individuals. The system is developed to analyze the test data based on the provided training data to recognize the emotional states of the humans.

## III. DRAWBACKS OF EXISTING SYSTEM

Emotion recognition using text: The emotion recognition using text is most popular these days, especially when it comes to human-machine interaction. Textual information is not only an important communication medium which exists in books, newspapers, websites, e-mails etc. but also a rich source of emotions. The most common approach uses natural language processing technique which extract emotions and sentiments by analyzing the input text. The system extracts emotion occurrence condition based on emotions contained inn words and sentence meanings and estimates the emotion of a speaker or writer. A pattern matching method is used to find the negative implications resulting from negative words in sentences. The sentences containing negative words and emotion information are collected to construct a corpus. This method provided a new train of thought to deal with the speed and motor speed to the synchronous speed. Motor speed can be measured by an optical tachometer, which has a low intrusion level. Input problem of emotion recognition in negative sentences and achieved a high precision recognition. From above review it can be seen that emotion recognition using text is applied to words o sentences in a particular language. This is a major drawback when it comes to developing a universal system.

10

### 2. *Emotion recognition using facial expressions:*

This method plays a vital role when it comes to developing multi-cultural visual communication system for emotion translation between cultures. The basic idea of emotion recognition using facial expression is to segment facial images into various regions of interest. The common regions taken into account include movements of cheek, chin, wrinkles, eyes eyebrows and mouth. Different classification techniques are then applied to differentiate between different types of emotions. In a method external stimulus was used to excite specific emotions in human subjects whose facial expressions were analyzed by segmenting and localizing the individual frames into regions of interest. Selected facial features such as eye opening, mouth opening and the length of eyebrow constriction are extracted from the localized regions and mapped onto an emotion space. Even though emotion recognition using facial expressions has many advantages, the facial expressions can be consciously controlled. So it cannot be placed under a universal system of emotion recognition.

### 3. *Emotion recognition using speech:*

Speech not only contains what is being said but it also contains information like speaker's emotion, real intention and meaning. It can be used in applications like call center conversation analysis, entertainment, indexing of audio files based on emotions. Even though the method is non-invasive and simple way of emotion recognition using speech it has the disadvantage of not being able to be used universally because of the language barrier.

### 4. *Emotion recognition using body movements and gestures:*

Research shows that features of some emotions exist in whole body posture and movement quality. The non-propositional movement qualities like amplitude, speed and fluidity of movement, to infer emotions and investigate the role of movement expressivity versus shape in gesture. This method analyzed emotional behavior based on direct classification of time series on a model that provides indicators describing dynamics of expressive motion cues. This type of emotion recognition is not a reliable method because the evaluation is based on specific actions assigned and naturally occurring.

### IV. EMOTION RECOGNITION USING PHYSIOLOGICAL SIGNALS

Emotion recognition using biosensors has become popular because they have the advantage of monitoring physiological parameters of the body that are directly controlled by the autonomous nervous system which are affected by emotions. These sensors can collect signals including heart rate, blood volume, and temperature evaluate emotions based on the changes taking place. The Blood Volume Pulse (BVP) sensor uses photoplethysmography (PPM) to detect blood pressure in the extremities. PPM is a process of applying a light source and measuring the light reflected by the skin. At each contraction of the heart, blood is forced through the peripheral vessels producing engorgement of the vessels under the light source thereby modifying the amount of light to the photo sensor. The resulting pressure waveform is recorded. The electromyography (EMG) sensors measure the electromyography activity of the muscle, amplify the signal and send it to encoder. Electro dermal activity (EDA) is another signal that can easily be measured from the body surface and represents the activity of the autonomic nervous system. It characterizes changes in the electrical properties of the skin due to activity of the sweat glands and is physically interpreted as conductance. Sweat glands distributed on the skin receive input from the sympathetic nervous system only and this is a good indicator of excitation level due to external sensory and cognitive stimuli. Skin temperature (SKT) variations mainly comes from localized changes in blood flow caused by vascular resistance is modulated by smooth muscle tone, which is mediated by the sympathetic nervous system. The mechanism of arterial blood pressure variation can be described by a complicated model of cardiovascular regulation by the autonomic nervous system. Thus SKT variation reflects autonomic nervous system activity and is another effective indicator of emotional status.

### REFERENCE

[1]PsychoPy Analysis' url: http://www.psychopy.org/api/ microphone.html '

[2]Microsoft health watch 'url: http://bits.blogs.nytimes.com/2014/11/02/microsofts -new-fitness-tracking-device-is-a -welcome-surprise/'

[3]Open CV Analysis and studies 'url: http://www.opencv.org'

[4]Arduino connected with Raspberry Pi: ' duino-Connection/step6/Software-Part-1-Arduino-send s-data-to-Pi/'

[5]Jasper audio recognition: 'http://jasperproject.github.io/'

[6]Genetic Algorithm and Neural Network for Face Emotion Recognition**,** M. Karthigayan, M. Rizon, R. Nagarajan and Sazali Yaacob, School of Mechatronics Engineering, Universiti Malaysia Perlis (UNIMAP), 02600 Jejawi, Perlis, Malaysia

[7] Classification of Human Emotions from Physiological signals using Machine Learning Algorithms,Eun-Hye Jang, Byoung-Jun Park, Sang-Hyeob Kim, Myoung-Ae Chung BioHeath IT Convergence Research Department, IT

[8]Pulse Sensor url: 'http://pulsesensor.com/pages/code-and-guide'

• • •