

Chapter 20

Mental Health Through Biofeedback Is Important to Analyze: An App and Analysis

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ABSTRACT

Many apps and analyzers based on machine learning have been designed to help and cure the stress issue. This chapter is based on an experiment that the authors performed at Research Labs and Scientific Spirituality Centers of Dev Sanskriti VishwaVidyalaya, Haridwar and Patanjali Research Foundations, Uttarakhand. In the research work, the correctness and accuracy have been studied and compared for two biofeedback devices named as electromyography (EMG) and galvanic skin response (GSR), which can operate in three modes: audio, visual and audio-visual with the help of data set of tension type headache (TTH) patients. The authors used some data visualization techniques that EMG (electromyography) in audio mode is best among all other modes, and in this experiment, they have used a data set of SF-36 and successfully clustered them into three clusters (i.e., low, medium, and high) using K-means algorithm. After clustering, they used classification algorithm to classify a user (depending upon the sum of all the weights of questions he had answered) into one of these three class. They have also implemented various algorithms for classifications and compared their accuracy out of which decision tree algorithm has given the best accuracy.

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INTRODUCTION

As we can see that almost everyone is suffering from many kind of stress and we all get some indicators which shows that we are suffering from stress rather it be physical, emotional, personal, sleep or behavioral. But manually the level of stress is difficult to calculate and also the people are much more reliable on medication for getting relief. Many times, the individual is lost in physical pleasure, accumulation of facilities and due to lack of right understanding about the self, one bears the ignorance about one's own being. Due to which they suffer from stress most of the time. These consist of pharmacological treatment, physical therapy, acupuncture, relaxation therapy or alternative medicine. So main focus of our project is to check the stress level of a person and give remedies to them accordingly. We are more focused on giving remedies to people which do not include any kind of medications.(PyCharm, n.d.; Rastogi, Chaturvedi, Satya, Arora, & Chauhan, 2018)

Motivation

The experimental research work done by us has motivated us to use our knowledge and make an effort to reduce the stress level of people. Automation and mechanization is rapidly increasing with intelligent machines. Science has done miracles and almost in all walks of life, most works are being done by scientific gadgets and it has no doubt made the human life simpler. It has helped to handle complex issues but contrary to this, there is a dark side of the picture that it has created some negative aspects and challenging situations too. The present crisis of science to human life is that the stress, tension, depression, anxiety, hatred, headache, frustration, suicidal tendency and violence is increasing in our world day by day. The happiness index has been reduced rapidly everywhere. The Human personality is degraded in terms of value system.(Arora et al., 2017; Chaturvedi et al., 2018; Rastogi, Chaturvedi, Satya, Arora, Yadav et al, 2018)

OBJECTIVE OF RESEARCH

1. To study and compare the correctness and accuracy of Electromyography(EMG) and Galvanic Skin Response(GSR) biofeedback in three modes: audio, visual and audio-visual.
2. Our project is to check the stress level of a person and give remedies to them accordingly, by classifying them into one of the three categories: low, medium & high stress level.
3. Comparing the efficiency of different algorithms used for classification.

SCOPE OF THE RESEARCH WORK

Measuring the effect of various indicators like physical, sleep, behavioral, personal and emotional parameters are indicators of stress on different levels of stress. The purpose is to reduce the use of medication to lower the level of stress. Measuring the accuracy of the range decided to track the level of stress of a person. A runnable system which checks the stress level of a person. The main objective is to develop a system which gives the remedies which do not involve any kind of medication to a person according to their stress level.(Chaturvedi et al., 2017; Satya et al., 2019)

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