PHYSICAL STRESS DETECTION USING FASTER R-CNN

Dr.E.Thenmozhi[1], Ms.V.Keerthana[2], Ms.Praveena S[3]

[1]*Assistant Professor, Department of Information Technology, Panimalar Institute of Technology, Chennai, India*

[2,3]*Student, Department of Information Technology, Panimalar Institute of Technology, Chennai, India.*

amulpavi@gmail.com[1],vkeerthana311@gmail.com[2],praveenaselvam970@gmail.com[3], mouriyasivakumarvj@gmail.com

---

Abstract: *Now days, Psychological problems are becoming a major problem to people's life. It is predominant to detect and manage stress before it turns into a severe health issue. Nowadays people share their feeling in social media regularly. It becomes easy to detect the stress of the users based on their social behavior. Also, traditional stress detection methods like Electroencephalography (EEG), Electromyography (EMG), Electrocardiography (ECG) are time consuming and costly. In this project, we are going to detect the stress states of user by monitoring the facial expression using faster RCNN which comes under deep learning technology.*

Keywords: Stress, Facial expression, Framework, R-CNN, Data sets.

I. INTRODUCTION

Most of the researchers focused on detecting stress involved in a person, which causes in a person several emotional problems like anxiety, grief, low self-esteem and other mental health problems. Recent studies have shown that stress can also affect the aspects of your life, including your thinking ability and physical health. To reduce riskiness from being stress and affected with its adverse effects, it is crucial to detect such emotions and take certain actions to relax them. Most of the previous work on stress detection is based on the digital signal processing, taking into consideration Galvanic skin response, blood volume, pupil dilation and skin temperature. And the other work on this issue is based on several physiological signals and visual features (eye closure, head movement) to monitor the stress in a person while he is working. However these measurements are intrusive and are less comfortable in real application. In this work we develop a stress detection system based on the analysis of the facial expression. The system is Non - intrusive and is able to run in real -time. A camera is used to capture the near frontal view of the person while he is working in front of the computer. The camera is mounted facing a person. Video captured is divided into three sections of equal length and set of equal number of image frames are extracted from each section correspondingly and are analyzed. The image analysis includes the calculation of the variation in the position of the eyebrow from its mean position. The displacement of eyebrow from its position is calculated by scanning the image for the eyebrow co -ordinates. If the person is found stressed in the consecutive sections of the time intervals which was previously divided, the decision for stress detection is made for a person working in front of the computer With the obtained results we employ the technique of deep learning which is a branch of machine learning which gives the computer an ability to learn without being explicitly programmed.

II. EXISTING SYSTEM

In existing system they have used Electrocardiography (ECG) to detect stress level of the user which is implemented using logistic regression algorithm.

To reduce energy of the proposed classifier, two design techniques –

1. Use time-domain (TD) features for classification,

2. Use reservoir_x0002_computing architecture that mimics highly energy efficient computation ability of the brain cortex. The Normal to Normal (NN) intervals are calculated from distances between peaks in the ECG signal and they have achieved 93% accuracy.

III. PROPOSED SYSTEM

With the development of social networks like Twitter more and more people are willing to share their daily events and moods, and interact with friends through the social networks. In our proposed work we have used latest deep learning approach to detect user stress level by using faster R-CNN to attain high accuracy. The proposed method is effective and efficient on detecting psychological stress from micro blog data.

IV. METHODOLOGY

The two main phases of the system architecture that is the training and the testing phases is shown, Training phase starts with taking the images from the dataset. Multiple images are given to the training phase so that the images are well processed and enhanced so that the amount of data to be handled gets reduced. As the number of images to be trained increases the performance of the system also increases. The segmentation technique removes the noise and other disturbances present in the images. The segmented image is further enhanced by extracting only the necessary features and is classified by using a classifier.

V. ARCHITECTURE

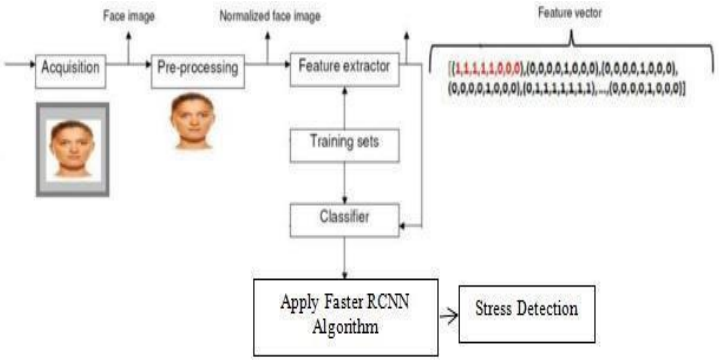

Fig . The Proposed Architecture

VI. CONVOLUTION LAYER

It is the initial stage and it receives the input signal. Convolutional layer apply convolution operation on the input layer, passing the results to next layer. A convolution operation is basically computing a dot product between their weights and a small region they are connected to in the input volume. This will change the dimensions depending on the filter size used and number of filters used in the network.

VII. POOLING LAYER

Pooling layer will perform a down-sampling operation along the width and resulting in the reduction of the dimensions. The purpose of pooling is to reduce spatial dimensions. There are various types of pooling in which the most common is Max Pooling, i.e. taking the maximum element from the window. This layer reduces the size of the image by extracting the maximum pixel value from the activation layer.

VIII.CONCLUSION

In this paper, we presented a model for detecting the psychological stress level of the users. Employing real-world social media data as the basis, we studied the correlation between user psychological stress states and their social interaction behaviors. In this work, we also discovered several intriguing phenomena of stress. Our future work will include

classification based on the tweet text and images. The visual attributes will also be included in the process of detecting user stress.

REFERENCES

1. Blueprint to Workplace Stress Detection Approaches, Sami Elzeiny; Marwa Qaraqe, 2018
2.Study on the relationship between the shape of stress crack and its detection signal, Liang Xue;Chang'an Hu; Shutong Luo; Jieji Li; Jiangang Li,2020
3. A Research on Stress Gradient for HIP in Ultrasonic Nondestructive Testing Technology, Quan-wen Li; Chun-guang Xu; Zhi-xiang Li, 2018
4. Intensity feature for speech stress detection, Laszlo Czap; Judit Maria Pinter,2015
5. A Comprehensive Review on Stress Detection Techniques, G. Shanmugasundaram; S. Yazhini; E. Hemapratha; S. Nithya, 2019
6. Application of BP neural network and genetic algorithm in stress prediction of anchor bolt, Hui Xing; Xiaoyun Sun; Mingminig Wang; Haiqing Zheng,2015
7. Study on Internal Detection in Oil–Gas Pipelines Based on Complex Stress Magnetomechanical Modeling, Bin Liu; Simeng Zheng; Luyao He; He Zhang; Jian Ren,2019
8. Reliability Evaluation of Stress in the Direction of Thickness Based on Ultrasonic Measurement Method, Kun Zhou; Qinxue Pan; Chang Shao; Ruipeng Pan,2018
9. Remote Detection and Classification of Human Stress Using a Depth Sensing Technique, Yuhao Shan; Tong Chen; Liansheng Yao; Zhan Wu; Wanhui Wen; Guangyuan Liu,2018
10. A Smart Sensor in the IoMT for Stress Level Detection, Laavanya Rachakonda; Prabha Sundaravadivel; Saraju P. Mohanty; Elias Kougianos; Madhavi Ganapathiraju, 2018