Detecting Mental Disorders in Social Media through Emotional Patterns The case of Anorexia

D.THIRUMALESH1, G.RITESH2, SAI KRISHNA3, M.SUCHI4, Dr.S.Shiva Prasad5

[1,2,3,4] UG students, Dept of CSE, Malla Reddy Engineering College (Autonomous), Secunderabad, Telangana State

[5]Professor, Dept of CSE, Malla Reddy Engineering College (Autonomous), Secunderabad, Telangana State

ABSTRACT:

The main motive of our project is to detect stress in the IT professionals using vivid Machine learning and Image processing techniques. Our system is an upgraded version of the old stress detection systems which excluded the live detection and the personal counseling but this system comprises of live detection and periodic analysis of employees and detecting physical as well as mental stress levels in his/her by providing them with proper remedies for managing stress by providing survey form periodically. Our system mainly focuses on managing stress and making the working environment healthy and spontaneous for the employees and to get the best out of them during working hours.

Keywords: stress detection, IT, survey, mental stress.

1. INTRODUCTION

Stress management systems play a significant role to detect the stress levels which disrupts our socio-economic lifestyle. As World Health Organization (WHO) says, Stress is a mental health problem affecting the life of one in four citizens. Human stress leads to mental as well as socio-fiscal problems, lack of clarity in work, poor working relationship, depression and finally commitment of suicide in severe cases. This demands counselling to be provided for the stressed individuals cope up against stress. Stress avoidance is impossible but preventive actions helps to overcome the stress. Currently, only medical and physiological experts can determine whether one is under depressed state (stressed) or not. One of the traditional methods to detect stress is based on questionnaire. This method completely depends on the answers given by the individuals, people will be tremulous to say whether they are stressed or normal. Automatic detection of stress minimizes the risk of health issues and improves the welfare of the society. This pavesthe way for the

necessity of a scientific tool, which uses physiological signals thereby automating the detection of stress levels in individuals. Stress detection is discussed in various literatures as it is a significant societal contribution that enhances the lifestyle of individuals. Ghaderi et al. analyzed stress using Respiration, Heart rate (HR), facial electromyography (EMG), Galvanic skin response (GSR) foot and GSR hand data with a conclusion that, features pertaining to respiration process are substantial in stress detection. Maria Vieira et al. describes mental stress prediction using a standalone stress sensing hardware by interfacing GSR as the only physiological sensor. David Liu et al. proposed research to predict stress levels solely from Electrocardiogram (ECG). Multimodal sensor efficacy to detect stress of working people is experimentally discussed in. This employs the sensor data from sensors such as pressure distribution, HR, Blood Volume Pulse (BVP) and Electrodermal activity (EDA). An eye trackersensor is also used which systematically analyses the eye movements with the stressors like Stroop word test and information related to pick up tasks. The authors of performed perceived stress detection by a set of non-invasive sensors which collects the physiological signals such as ECG, GSR, Electroencephalography (EEG), EMG, and Saturation of peripheral oxygen (SpO2). Continuous stress levels are estimated using the physiological sensor data such as GSR, EMG, HR, Respiration in. The stress detection is carried out effectively using Skin conductance level (SCL), HR, Facial EMG sensors by creating ICT related Stressors. Automated stress detection is made possible by several pattern recognition algorithms. Every sensor data is compared with a stress index which is a threshold value used for detecting the stress level. The authors of collected data from 16 individuals under four stressor conditions which were tested with Bayesian Network, J48 algorithm and Sequential Minimal Optimization (SMO) algorithm for predicting stress. Statistical features of heart rate, GSR, frequency domain features of heart rate and its variability (HRV), and the power spectral components of ECG were used to govern the stress levels. Various features are extracted from the commonly used physiological signals such as ECG, EMG, GSR, BVP etc., measured using appropriate sensors and selected features are grouped into clusters for further detection of anxiety levels. In, it is concluded that smaller clusters result in better balance in stress detection using the selected General Regression Neural Network (GRNN) model. This results in the fact that different combinations of the extracted features from the sensor signals provide better solutions to predict the continuous anxiety level.

2. SURVEY OF RESEARCH

1) Stress and anxiety detection using facial cues from videos AUTHORS: G. Giannakakis, D. Manousos, F. Chiarugi This study develops a framework for the detection and analysis of stress/anxiety emotional states through video-recorded facial cues. A thorough experimental protocol was established to induce systematic variability in affective states (neutral, relaxed and stressed/anxious) through a variety of external and internal stressors. The analysis was focused mainly on non-voluntary and semi-voluntary facial cues in order to estimate the emotion representation more objectively. Features under investigation included eye-related events, mouth activity, head motion parameters and heart rate estimated through camera based photoplethysmography. A feature selection procedure was employed to select the most robust features followed by classification schemes discriminating between stress/anxiety and neutralstates with reference to a relaxed state in each experimental phase. In addition, a ranking transformation was proposed utilizing self reports in order to investigate the correlation of facial parameters with a participant perceived amount of stress/anxiety. The results indicated that, specific facial cues, derived from eye activity, mouth activity, head movements and camera-based heart activity achieve good accuracy and are suitable as discriminative indicators of stress and anxiety.

2) Detection of Stress Using Image Processing and Machine Learning Techniques AUTHORS: Nisha Raichur, Nidhi Lonakadi, Priyanka Mural Stress is a part of life it is an unpleasant state of emotional arousal that people experience in situations like working for long hours in front of computer. Computers have become a way of life; much life is spent on the computers and hence we are therefore more affected by the ups and downs that they cause us. One cannot just completely avoid their work on computers but one can at least control his/her usage when being alarmed about him being stressed at certain point of time. Monitoring the emotional status of a person who is working in front of a computer for longer duration is crucial for the safety of a person. In this work real-time non-intrusive videos are captured, which detects the emotional status of a person by analysing the facial expression. We detect an individual emotion in each video frame and the decision on the stress level is made in sequential hours of the video captured. We employ a technique that allows us to train a model and analyze differences in predicting the features. The ano is a python framework which aims at improving both the execution time and development time of the linear regression

model which is used here as a deep learning algorithm. The experimental results show that the developed system is well on data with the generic model of all ages.

3) Machine Learning Techniques for Stress Prediction in Working Employees AUTHORS: U. S. Reddy, A. V. Thota and A. Dharun Stress disorders are a common issue among working IT professionals in the industry today. With changing lifestyle and work cultures, there is an increase in the risk of stress among the employees. Though many industries and corporates provide mental health related schemes and try to ease the workplace atmosphere, the issue is far from control. In this paper, we would like to apply machine learning techniques to analyze stress patterns in working adults and to narrow down the factors that strongly determine the stress levels. Towards this, data from the OSMI mental health survey 2017 responses of working professionals within the tech-industry was considered. Various Machine Learning techniques were applied to train our model after due data cleaning and preprocessing. The accuracy of the above models was obtained and studied comparatively. Boosting had the highest accuracy among the models implemented. By using Decision Trees, prominent features that influence stress were identified as gender, family history and availability of health benefits in the workplace. With these results, industries can now narrow down their approach to reduce stress and create a much comfortable workplace for their employees.

EXISTING SYSYEM:

In the existing system 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. Every sensor data is compared with a stress index which is a threshold value used for detecting the stress level.

DISADVANTAGES OF EXISTING SYSTEM:

➢ Physiological signals used for analysis are often pigeonholed by a non-stationary time performance.

➢ The extracted features explicitly give the stress index of the physiological signals. The ECG signal is directly assessed by using commonly used peak j48 algorithm

➢ Different people may behave or express differently under stress and it is hard to find a universal pattern to define the stress emotion.

Algorithm: Bayesian Network, J48

Proposed System: The proposed System Machine Learning algorithms like KNN classifiers are applied to classify stress. Image Processing is used at the initial stage for detection, the employee's image is given by the browser which serves as input. In order to get an enhanced image or to extract some useful information from its image processing is used by converting image into digital form and performing some operations on it. By taking input as an image and output may be image or characteristics associated with that image. The emotion is displayed on the rounder box. The stress level indicating by Angry, Disgusted, Fearful, Sad

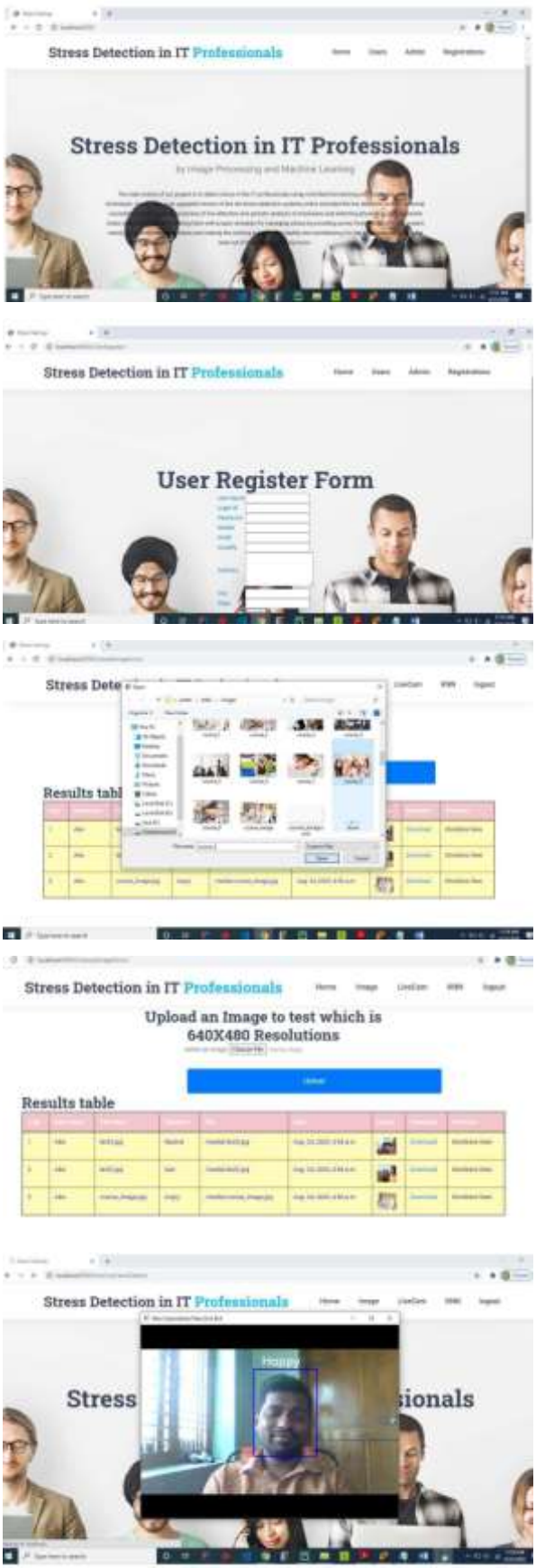
ADVANTAGES OF PROPOSED SYSTEM:

➢ Output in which result is altered image or report that is based on image analysis.

➢ Stress Detection System enables employees with coping up with their issues leading to stress by preventative stress management solutions.

➢ We will capture images of the employee based on the regular intervals and then the tradition survey forms will be given to the employees

Algorithm: K-Nearest Neighbor (KNN)



CONCLUSION

Stress Detection System is designed to predict stress in the employees by monitoring captured images of authenticated users which makes the system secure. The image capturing is done automatically when the authenticate user is logged in based on some time interval. The captured images are used to detect the stress of the user based on some standard conversion and image processing mechanisms. Then the system will analyze the stress levels by using Machine Learning algorithms which generates the results that are more efficient.

Further Enhancement

Biomedical wearable sensors embedded with IoT technology is a proven combination in the health care sector. The benefits of using such devices have positively impacted the patients and doctors alike. Early diagnosis of medical conditions, faster medical assistance by means of Remote Monitoring and Telecommunication, emergency alert mechanism to notify the caretaker and personal Doctor, etc. are a few of its advantages. The proposed work on developing a multimodal IoT system assures to be a better health assistant for a person by constantly monitoring and providing regular feedback on the stress levels. For future work, it would be interesting to enhance this work into the development of a stress detection model by the addition of other physiological parameters, including an activity recognition system and application of machine learning techniques

REFERENCES

[1] G. Giannakakis, D. Manousos, F. Chiarugi, “Stress and anxiety detection using facial cues from videos,” Biomedical Signal processing and Control”, vol. 31, pp. 89-101, January 2017.

[2] T. Jick and R. Payne, “Stress at work,” Journal of Management Education, vol. 5, no. 3, pp. 50-56, 1980.

[3] Nisha Raichur, Nidhi Lonakadi, Priyanka Mural, “Detection of Stress Using Image Processing and Machine Learning Techniques”, vol.9, no. 3S, July 2017.

[4] Bhattacharyya, R., & Basu, S. (2018). Retrieved from ‘The Economic Times’.

[5] OSMI Mental Health in Tech Survey Dataset, 2017

[6] U. S. Reddy, A. V. Thota and A. Dharun, "Machine Learning Techniques for Stress Prediction in Working Employees," 2018 IEEE International Conference on Computational Intelligence and Computing Research (ICCIC), Madurai, India, 2018, pp. 1-4.

[7] https://www.kaggle.com/qiriro/stress

[8] Communications, N.. World health report. 2001. URL:

http://www.who.int/whr/2001/media_centre/press_release/en/.

[9] Bakker, J., Holenderski, L., Kocielnik, R., Pechenizkiy, M., Sidorova, N.. Stess@ work: From measuring stress to its understanding, prediction and handling with personalized coaching. In: Proceedings of the 2nd ACM SIGHIT International health informatics symposium. ACM; 2012, p. 673–678.

[10] Deng, Y., Wu, Z., Chu, C.H., Zhang, Q., Hsu, D.F.. Sensor feature selection and combination for stress identification using combinatorial fusion. International Journal of Advanced Robotic Systems 2013;10(8):306.

[11] Ghaderi, A., Frounchi, J., Farnam, A.. Machine learning-based signal processing using physiological signals for stress detection. In: 2015 22nd Iranian Conference on Biomedical Engineering (ICBME). 2015, p. 93–98.

[12] Villarejo, M.V., Zapirain, B.G., Zorrilla, A.M.. A stress sensor based on galvanic skin response (gsr) controlled by zigbee. Sensors 2012; 12(5):6075–6101.