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International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com

Vol. 17, Issue 2, 2024

EMOTION DETECTION IN IT PROFESSIONAL BY IMAGE PROCESSING AND MACHINE LEARNING

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ABSTRACT

The main motive of our project is to detect Emotion in the IT professionals using vivid Machine learning and Image processing techniques. Our system is an upgraded version of the old Emotion detection systems which excluded the live detection and the personal counselling 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.

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1.INTRODUCTION

Emotion management systems are crucial for navigating disruptions caused by fluctuating emotion levels in our socio-economic landscape. Stress, highlighted by the WHO as a prevalent mental health issue, permeates life, resulting in socio-fiscal challenges, compromised work clarity, strained relationships, and in severe cases, depression and suicidal tendencies. Tackling stress requires counseling and preventative measures, but current methods rely heavily on medical experts and subjective self-reporting, prompting a need for automated emotion detection tools leveraging physiological signals.

Studies exploring Emotion detection methodologies utilize diverse physiological markers such as respiration, heart rate, and GSR, alongside advanced technologies like machine learning and image processing. These approaches offer

International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com

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promising avenues for automated Emotion detection, facilitating timely interventions. For example, research underscores the importance of respiration-related features in Emotion detection, while others have explored standalone stress-sensing hardware integrating GSR sensors.

Recent advancements integrate image processing and machine learning to analyze stress patterns among employees. By leveraging computer vision for facial expression analysis and machine learning algorithms for classification, researchers aim to develop robust frameworks for identifying and addressing stress, enhancing individual well-being and fostering healthier work environments.

Challenges persist in managing stress in organizational settings. While some offer mental health support schemes, stress prevalence remains a concern.

2.LITERATURE SURVEY

Title: Stress and anxiety detection using facial cues from videos

Authors: G. Giannakakis, D. Manousos, F. Chiarugi

The goal of this research was to provide a method for analysing video-recorded face signals to identify emotional states associated with stress and worry. Using a wide range of internal and external stressors, a comprehensive trial strategy was created to make deliberate changeability in the three close to home states (nonpartisan, quiet, and pushed/restless). With an end goal to all the more dispassionately survey the depiction of feeling, the examination basically centered around non-intentional and semi-deliberate facial signs. The features that were examined included events pertaining to the eyes, the mouth, parameters of head movement, and heart rate as measured by camera-based photoplethysmography. Classification techniques were used in each experimental phase to distinguish between neutral, stress/anxiety, and relaxed states, with an element determination process used to pick the most hearty qualities. Moreover, a rating change in view of self-reports was recommended to concentrate on the connection between face credits and members' accounted for levels of pressure and nervousness. As per the discoveries, certain facial signals that depend on eye developments, lip expressions, head movements, and heart rate as detected by a

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camera may accurately distinguish between anxious and stressed states.

Title: Classification of acute Emotion using linear and non-linear heart rate variability analysis derived from sternal ecg

authors: Tanev, G., Saadi, D.B., Hoppe, K., Sorensen, H.B

In order to forecast and lessen the likelihood of cardiovascular disease, chronic stress monitoring is a crucial component. An approach for the short-term detection of psychophysiological alterations using aspects of heart rate variability (HRV) is the primary focus of this pilot investigation. This pilot project aims to identify potential characteristics for detecting psychophysiological alterations brought on by chronic stress and to acquire understanding into these features. Using the wireless wearable ePatch® recorder to collect electrocardiograms (ECGs), this research distinguished four distinct forms of arousal: visual, auditory, cognitive, and resting. Test entropy, detrended vacillation investigation, and standardized high recurrence highlights accomplished the best ID rates for the impartial stage (90%), intense pressure stage (80%), and benchmark stage (80%). A vital perspective in further developing the order results was found to normalize non-straight HRV factors for every person.

Title: HealthyOffice: Mood recognition at work using smartphones and wearable sensors

AUTHORS: Zenonos, A., Khan, A., Kalogridis, G., Vatsikas, S., Lewis, T., Sooriyabandara

There are substantial monetary costs associated with the negative effects of workplace stress, anxiety, and depression on both health and productivity. Test entropy, detrended instability examination, and normalized high repeat features achieved the best ID rates for the unbiased stage (90%), extreme tension stage (80%), and benchmark stage (80%). A crucial viewpoint in additional fostering the request results was found to standardize non-straight HRV factors for each individual. To supplement our model with real data, we also provide a mobile app called "HealthyOffice" that allows users to systematically self-report. We gather data from wearable sensors in an office setting and utilize it in a small-scale user research to assess our system. Various kinds of observed emotions may be consistently recognized by our research, which show encouraging outcomes..

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Title: Detection of emotion Using Image Processing and Machine Learning Techniques

AUTHORS: Nisha Raichur, Nidhi Lonakadi, Priyanka Mural

An unpleasant condition of emotional arousal, stress is something everyone experiences from time to time, especially while doing things like sitting at a computer for lengthy periods of time. We are more vulnerable to the ups and downs that computers bring about since they have become an integral part of our daily lives. If you're worried about your stress levels, you can't simply stop using computers altogether, but you can limit how much time you spend on them. It is vital to keep an eye on a person's mental state if they are going to be sitting in front of a computer for lengthy periods of time. In this study, we record people's emotions in real time without being invasive so that we may analyze their facial expressions to determine their emotional state. We assign a stress level based on the number of hours of recorded footage after we identify a distinct emotion in each frame. We use a method that lets us train a model and compare its feature prediction accuracy. A deep learning algorithm based on a linear regression model, Theano is a Python framework with the dual goals of reducing the algorithm's development and execution times. Experiments with a generic model of people of varying ages demonstrate that the created system performs well.

3. EXISTING SYSTEM

Currently, digital signal processing is the backbone of emotion detection in systems that take Galvanic skin response, blood volume, pupil dilation, and skin temperature into account. Additional research on this topic has focused on tracking a person's stress levels while they work by using a combination of visual cues (eye closure, head movement) and other physiological signs. Nevertheless, these assessments are invasive and uncomfortable when used in practice. A stress index, a threshold value for identifying stress, is compared with all sensor data. The current system has a number of drawbacks:

• Non-stationary time performance often pigeonholes physiological signals used for analysis.

An indication of the physiological signals' stress index is provided by the retrieved characteristics. Using the widely-used peak

International Journal of Engineering Research and Science & Technology

ISSN 2319-5991 www.ijerst.com

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j48 technique, the ECG signal is immediately evaluated.

Stress may manifest in a variety of ways for various individuals, and it's difficult to pin down a single pattern that describes the feeling.

Approach: J48 Bayesian Network

3.1 PROPOSED SYSTEM:

We use KNN classifiers and other suggested System Machine Learning methods to categorize emotions. At the first level of detection, the browser provides the employee's picture as input, and image processing is applied. By digitizing images and doing various operations on them, image processing may improve the quality of the picture or extract valuable information from it. The process begins with a picture as input and ends with either another image or some related attributes. Feelings are shown on the circular box. Disgusted, angry, afraid, sad—that's the stress level.

The system's proposed advantages are:

• The final product, which may be an edited picture or a report built on image analysis.
• The Emotion Detection System provides workers with preemptive stress management options to help them deal with the factors that cause stress. Employees will be provided with traditional survey forms after we take their pictures at certain intervals.

Computer program: Kalman Filter (KNN)

4. OUTPUT SCREENS

Home page: It is a welcome page for users.

It is a about us page of website.

User Register page: In this user can be register.

User Login Form: In this section User can be login.

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ISSN 2319-5991 www.ijerst.com

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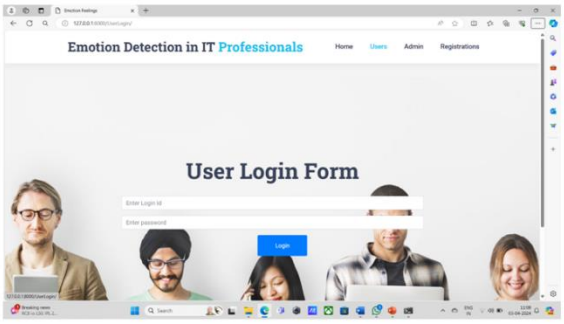
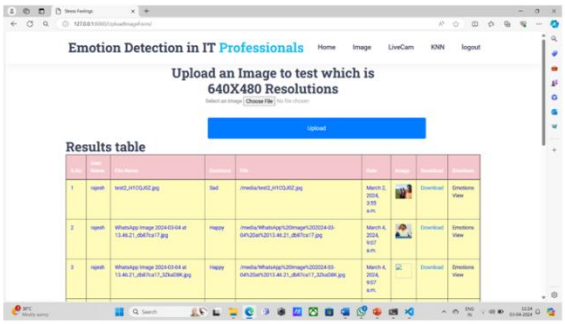
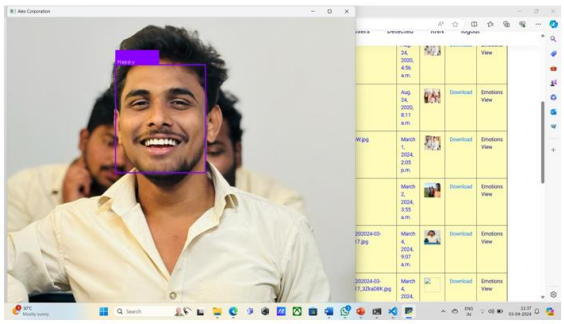


User Home Page: User can view the services.

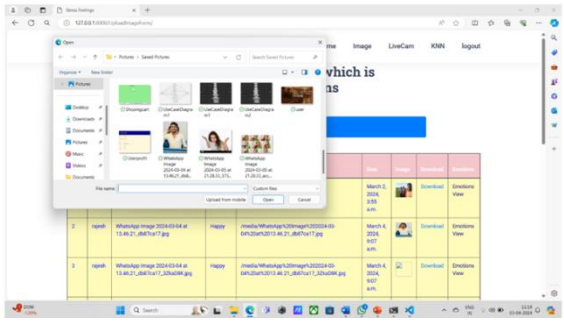


Detected Images: Admin can view the user emotions.

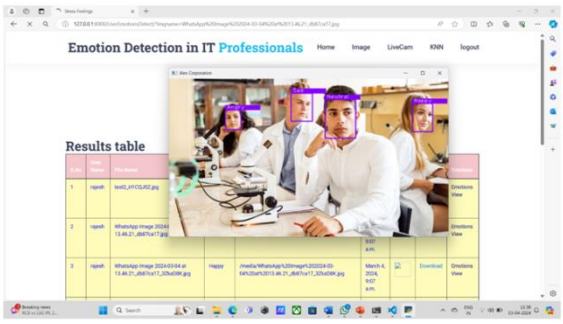
Giving Image as Input: In this section user upload images.



Admin Side Results: Admin side results will be shown here.



Upload Image: In this section user can upload images.



5. CONCLUSION

By keeping an eye on the photos taken by verified users, the Stress Detection System can foretell when workers may start

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ISSN 2319-5991 www.ijerst.com

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to show signs of stress. When an authenticated user logs in after a certain amount of time has passed, the system will automatically capture their picture. Using certain common image processing and conversion algorithms, the recorded photos may be utilized to identify the user's level of stress. The next step is for the system to assess the stress levels utilizing Machine Learning algorithms, which provide more effective outcomes.

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