

## STRESS DETECTION IN IT PROFESSIONALS BY USING IMAGE PROCESSING AND MACHINE LEARNING

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### 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.

### INTRODUCTION:

**Problem Statement:** Nowadays as IT industries are setting a new peek in the market by bringing new technologies and products in the market. In this study, the stress levels in employees are also noticed to raise the bar high. Though there are many organizations who provide mental health related schemes for their employees but the issue is far from control. In this paper we try to go in the depth of this problem by trying to detect the stress patterns in the working employee in the companies we would like to apply image processing and machine learning techniques to analyze stress patterns and to narrow down the factors that strongly determine the stress levels. Why Stress Detection System is important?

- To check whether the system works under abnormal conditions.
- Displaying acceptable error message once the system is beneath stress.

### Research Objective

The project aim is Stress detection in IT professional by image processing and

machine learning is to Monitoring the emotional status of a person who is working in front of a computer for longer duration. To Detect and reduce stress and create a much comfortable workplace for IT employees. This 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.

### PROJECT SCOPE AND OBJECTIVES:

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**Objectives:**

- To predict stress in a person by the symptoms calculated by monitoring.
- To analyze the stress levels in the employee.
- To provide solutions and remedies for the person to recover his/her stress.

**IMPLEMENTATION OF STRESS DETECTION USING DIGITAL PROCESSING:**

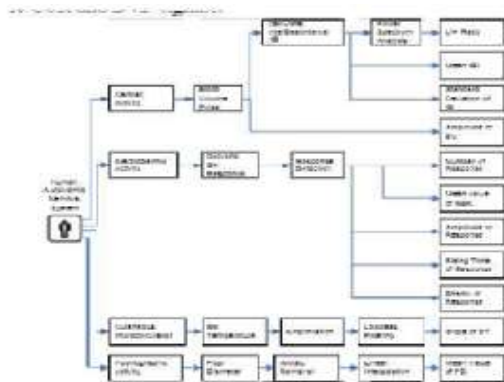


Fig.1 Feature Extracted

- The stress experienced by users is most likely to be mental (as opposed to physical), and moderate in intensity. Physical stressors occur far less frequently.
- The Stroop Color-Word Interference Test, in its classical version, demands that the color of a word designating a different color be named. In our research, the classical Stroop test was adapted into an interactive version that requires the subject to click on the correct answer rather than stating it verbally.
- Each trial word is presented to the subject for only 3 seconds. This additional task pacing of the Stroop test might intensify the physiological response.
- If the subject cannot make a decision within 3 seconds, the screen automatically changes to the next trial.

**Results**

		Classification	
		NS	Stress
Actual	11 Features	NS	85
		Stress	11
	PD Removed	NS	8
		Stress	88
	GSR Removed	NS	51
		Stress	45
	BVP Removed	NS	29
		Stress	67
	ST Removed	NS	85
		Stress	10
	Removed	NS	10
		Stress	86
Removed	NS	88	
	Stress	8	
Removed	NS	12	
	Stress	84	
Removed	NS	86	
	Stress	10	
Removed	NS	11	
	Stress	85	

Fig.2.1 Result

Signals from 32 experimental subjects were collected and divided into 192 data entries, since each participant generated data under three non-stress (Congruent Stroop) segments and three stress (Incongruent Stroop) segments. Eleven attributes (GSRmean, IBImean, IBIsd, etc.) were determined for each data entry. After the feature extraction and normalization stages, the data set from each segment had the structure shown in Figure 1. The classification performance was evaluated using 20-fold cross validation: 20 samples were pulled out as the test samples, and the remaining samples were used to train the classifiers. The goal was to develop and train a system that accepts the various physiological variables as input and indicates the participant's affective state for an unlabeled Stroop segment. The SVM was trained to build a model, which could be used later to identify unlabeled affective states (from the corresponding feature vectors).

**PROPOSED SYSTEM:**

**Objective of Proposed Model:**

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 it 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 images. The emotion are 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 used for Proposed Model:**

**KNN – K Nearest Neighbor:-**

K-Nearest Neighbour is one of the simplest Machine Learning algorithms based on Supervised Learning technique. o K-NN algorithm assumes the similarity between the new case/data and available cases and put the new case into the category that is most similar to the available categories. o K-NN algorithm stores all the available data and classifies a new data point based on the similarity. This means when new data appears then it can be easily classified into a well suite category by using K- NN algorithm. o K- NN algorithm can be used for Regression as well as for Classification but mostly it is used for the Classification problems.



Fig.3. KNN Classifier

**RESULTS AND DISCUSSION:**

Comparison of Existing Solutions: 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 it 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 images. The emotion are displayed on the rounder box. The stress level indicating by Angry, Disgusted, Fearful, Sad. 4.2. Data Collection and Performance metrics In stress detection the recorded images will be evaluated and it will give a best solution to the user. In KNN the algorithm must be find accurate result and it will be find the result after capturing the face and KNN will be evaluated that image through finding nearest values.

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 based project in future it will be converted an android application and every user can know their stress by using this project and they can reduce their stress by this project provide the suggestions for the user when there are feel stressed.

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Fig 4. Home Page



Fig 5. User Registration Page

**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.

**FUTURE ENHANCEMENT:**

The Project will be detect the most number of faces at a time. Which will take less time detect the stress of group of people at a time. This project now it will be a web-

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