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# Stress Detection for Employee's using Image Processing and Text Mining

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**Abstract:** *The major goal of this study is to use vivid Machine Learning and Image Processing methods to identify stress in the human body. Our system is an upgraded version of previous stress detection systems that did not include live detection or personal counselling, but this system includes live detection and periodic analysis of employees, as well as detecting physical and mental stress levels in them and providing proper stress management remedies via a survey form. Our method is primarily focused on stress management and creating a healthy and spontaneous work environment for workers in order to get the most out of them during working hours*

**Keywords:** Facial Expressions, K Nearest Neighbour Classifier, Stress, Stress prediction

## I. INTRODUCTION

Stress is a normal phenomenon in today's world, and it causes people to respond to a variety of factors, resulting in physiological and behavioural changes. If we keep stress in our minds for too long, it will have an effect on our bodies. Many health conditions associated with stress can be avoided if stress is detected sooner. When a person is stressed, a pattern can be detected. Stress is something that concerns our lives. There are many variables in our day-to-day life that are tension. Human environments, like worksite, home, or society, may somehow inflict stress on a person. According to Palmer "Stress is defined as a complex psychological and behavioural condition when the person's demands are imbalanced and the way demands are met."

## II. LITERATURE SURVEY

**Detecting stress and anxiety in films using facial clues AUTHORS: G. Giannakakis, D. Manousos, F. Chiarugi**

Through video-recorded face clues, this research creates a framework for detecting and analyzing stress/anxiety emotional states. Through a range of external and internal stresses, a complete experimental methodology was designed to produce systematic diversity in emotional states (neutral, calm, and stressed/anxious). In order to measure emotion expression more objectively, the study focused mostly on non-voluntary and semi-voluntary facial signals. Eye-related events, mouth activity, head motion characteristics, and heart rate assessed via camera-based photo-plethysmography were also investigated. In each experimental phase, a feature selection technique was used to pick the most robust characteristics, followed by classification algorithms that discriminated between stress/anxiety and neutral states with reference to a relaxed condition. In addition, a ranking transformation based on self-reports was presented to study the relationship between face attributes and a participant's reported stress/anxiety level. Specific facial signals generated from eye, mouth, head, and camera-based cardiac activity acquire excellent accuracy and are acceptable as discriminative markers of stress and anxiety, according to the findings.

**Detection of Stress Using Image Processing and Machine Learning Techniques AUTHORS: Nisha Raichur, Nidhi Lonakadi, Priyanka Mural**

Stress is an uncomfortable state of emotional arousal that individuals feel in settings such as sitting in front of a computer for lengthy periods of time. Computers have become a way of life; we spend so much of our time on them that we are more impacted by the ups and downs they create. One cannot totally avoid using computers for work, but one should at least limit his or her use if he or she is concerned about being stressed at a certain moment. Monitoring a

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person's mental state while working in front of a computer for an extended period of time is critical for their safety. This research uses real-time nonintrusive movies to assess a person's emotional state by analyzing their facial expression. Each video frame contains a distinct feeling, and the stress level is determined in the hours after the video recording. We use a method that enables us to train a model and compare differences in feature prediction. Theano is a Python framework aimed at speeding up the execution and development of the linear regression model, which is employed as a deep learning technique in this case. The results of the experiments reveal that the devised method works effectively with a generic model of all ages.

**Techniques for Predicting Stress in Working Employees Using Machine Learning AUTHORS: U. S. Reddy, A. V. Thota and A. Dharun**

Stress problems are a widespread problem among today's working IT professionals. Employees are more likely to experience stress when their lifestyles and work environments change. Despite the fact that many sectors and corporations provide mental health-related programs and attempt to improve the office environment, the problem remains out of Control. In this research, we will use machine learning approaches to examine stress patterns in working people and to identify the elements that have a significant impact on stress levels. Data from the OSMI mental health survey 2017 answers of working professionals in the IT sector were used to help with this. After proper data cleaning and pre-processing, we used a variety of Machine Learning approaches to train our model. The accuracy of the models mentioned above was determined and compared. Among the models used, boosting had the best accuracy. Gender, family history, and the availability of health benefits in the job were found as key characteristics that impact stress using Decision Trees. With these findings, businesses may focus their efforts on reducing stress and providing a more pleasant working environment for their workers.

## III. MODULE IDENTIFICATION

- User can register with personal information
- User should provide login information
- User should select profession
- User should give answer to the question
- Auto Face will be detected and depression on facial expression and text will be calculated

## IV. ALGORITHM

1. **Raw data set:** It contains 40,000 sentence and 4 columns(stress Y/N)

**2. Data Pre-processing:**

- Removal of regular expressions, symbols using the 're' library
- Removal of lemmas (Lexicon Normalization) using WordNetLemmatizer from NLTK
- Removal of multi-letter ambiguities, e.g 'noooo' gets converted to 'no'
- Removal of stop-words - caused decrease in f1-score as well as overall accuracy

**3. Word Dictionary:** Words are stored in a dictionary.

**4. Word2Vec:** Vectorization is done. Words are vectorized each vector represents the category of emotion.

**5. Training Model:** SVM is used to train the system and than it predict the emotion.

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## V. SYSTEM ARCHITECTURE

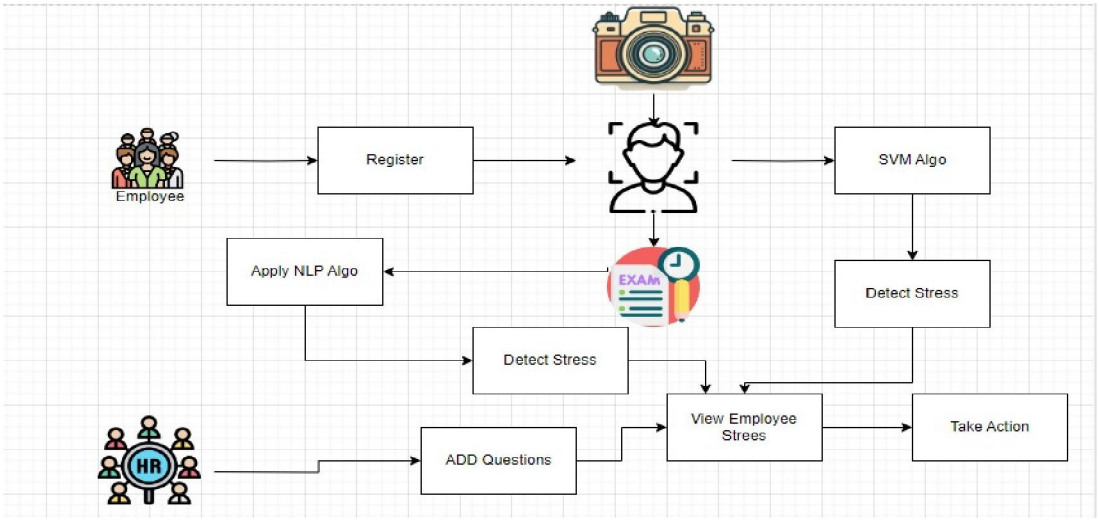
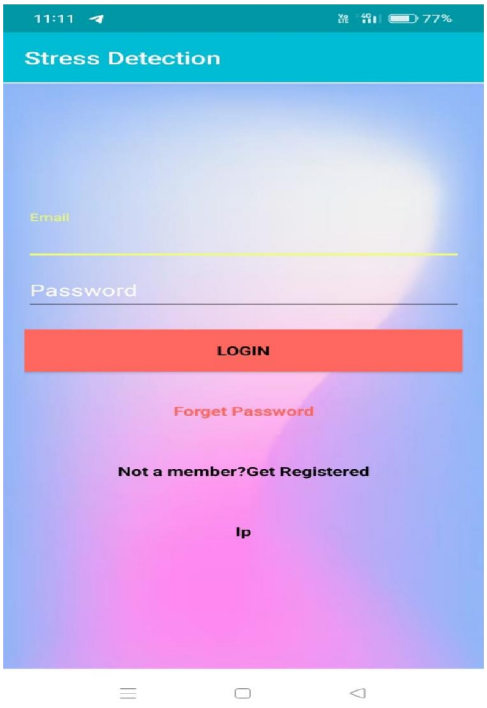
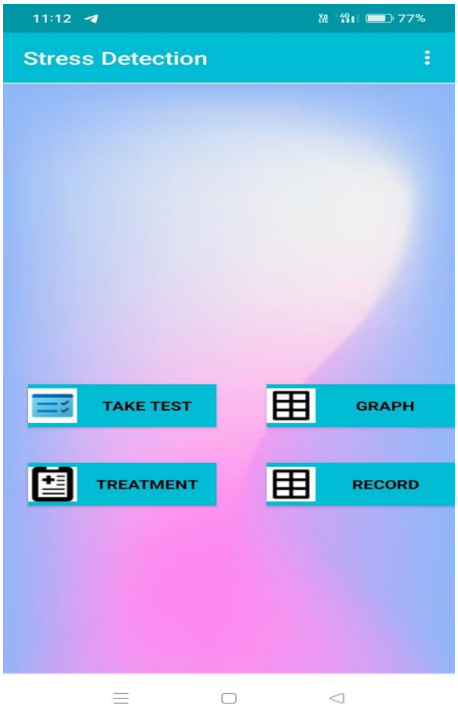



**Fig 1. System Architecture**

## VI. OUTCOME



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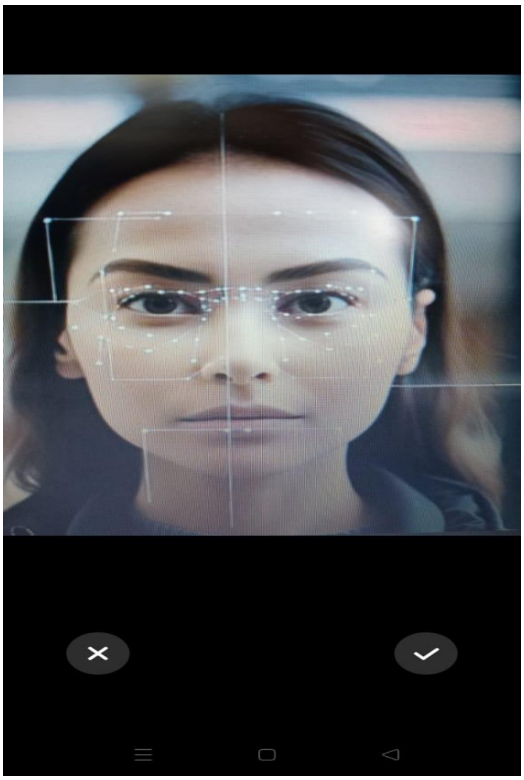

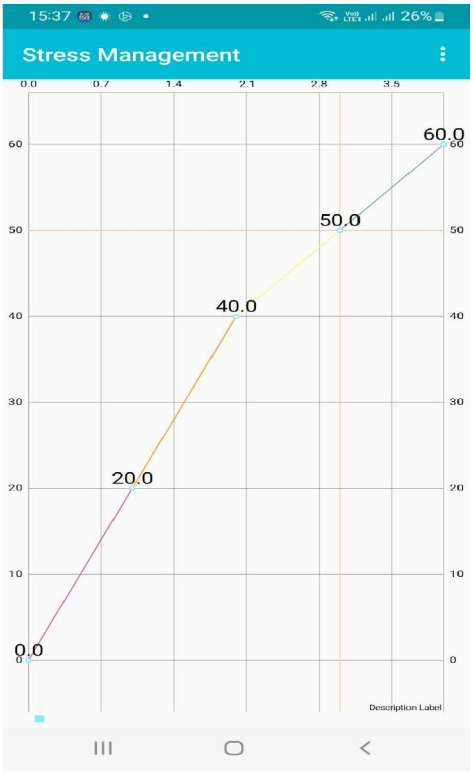


## VII. CONCLUSION

The Tension Detection System monitors collected photographs of authorized users to forecast stress in workers, making the system safe. When the authenticated user logs in, the picture capture is done automatically depending on a time period. Based on certain common conversion and image processing processes, the acquired pictures are utilized to determine the user's stress. The system will then use Machine Learning algorithms to analyze the stress levels, resulting in more efficient outcomes.

## REFERENCES

[1] Palmer S 1989 The Health and Safety Practitioner, 8 16-18
[2] Ahuja R and Banga A 2019 International Conference on Pervasive Computing Advances and Applications – PerCAA 2019 125 349-353
[3] Bobade P and Vani M 2020 Proceedings of the Second International Conference on Inventive Research in Computing Applications (ICIRCA-2020) 51-58
[4] Vaikole S Mulajkar S More A Jayaswal P and Dhas S 2020 International Journal of Creative Research Thoughts (IJCRT) 8 5 2239-44
[5] Schmidt P Reiss A Duerichen R Marberger C and Laerhoven K V 2018 Proceedings of the 20th ACM International Conference on Multimodal Interaction 400-408
[6] Padmaja B Rama Prasad V and Sunitha K V N 2018 International Journal of Machine Learning and Computing 8 1 33-38
[7] Pandey P S 2017 2017 17th International Conference on Computational Science and Its Applications (ICCSA)
[8] Ghaderi A Frounchi J and Farnam A 2015 22nd Iranian Conference on Biomedical Engineering (ICBME) 93-98
[9] Sandulescu V Andrews S Ellis D Bellotto N and Mozos O M 2015 International Work-Conference on the Interplay Between Natural and Artificial Computation 526-532
[10] Zhang X Xu C Xue W Hu J He Y and Gao M 2018 Sensors 2018 18 11 3886