# AURA: Adaptive User Response Assistant for Workplace Well-being

**Ajay S.P[1], Ajai Rathinam N[2], Gayathiri P[3], Kesavan M[4], Anne pratheeba R[5]**
[1, 2, 3, 4] Dept of CSE
[1, 2, 3, 4] CARE College of Engineering, Trichy, Tamil Nadu, India

***Abstract-*** *In modern digital work environments, employee stress has become a major factor affecting productivity and organizational performance. This paper presents AURA (Adaptive User Response Assistant), an intelligent system designed to monitor employee stress levels in real time using Artificial Intelligence (AI), Machine Learning (ML), and Computer Vision (CV).*

*The system analyses facial expressions, eye movements, and head posture using webcam input to detect stress indicators. It classifies stress levels into low, medium, and high categories and generates real-time alerts to encourage employees to take breaks. The system also stores stress patterns in a database and provides insights through an HR dashboard.*

*The proposed system improves workplace well-being, reduces burnout, and enhances productivity through automated monitoring and data-driven decision-making.*

***Keywords:*** AI, ML, CV, EAR, Stress Detection, Workplace Monitoring, Flask, MySQL

## I. INTRODUCTION

Employee well-being plays a crucial role in maintaining productivity, especially in remote and hybrid work environments. Traditional monitoring systems fail to provide real-time insights into employee stress and fatigue.

AURA is developed as an automated and non-intrusive system to detect stress using advanced technologies such as AI, ML, and CV. It continuously monitors behavioural patterns including eye blinking, facial expressions, and head posture.

By analysing these parameters, the system identifies stress levels and provides timely alerts, helping organizations maintain a healthy and productive work environment.

## II. LITERATURE SURVEY

Several existing systems have been developed for monitoring stress and user behaviour:

- Screen time monitoring systems track usage but do not detect emotional stress
- Machine learning-based systems analyse facial features for stress detection
- Eye blink detection using Eye Aspect Ratio (EAR) helps identify fatigue
- Haar Cascade methods enable real-time face detection
- Deep learning models such as CNN improve emotion recognition accuracy

However, most systems lack real-time alerts, integration, and employee management features. AURA overcomes these limitations by combining all functionalities into a single system.

## III. PROBLEM STATEMENT

Organizations face challenges in:

- Monitoring employee stress in real time
- Preventing fatigue and burnout
- Maintaining productivity in remote environments
- Analysing behavioural patterns effectively

Existing systems are either intrusive, inaccurate, or lack scalability.

## IV. PROPOSED SYSTEM

The proposed system is an AI-based stress monitoring system that continuously analyzes employee behaviour using webcam input.

Key Features:

- Real-time facial and eye movement tracking
- Stress classification (Low, Medium, High)

- Instant alerts and notifications
- HR dashboard for monitoring
- Secure login and data management

The system ensures efficient and non-intrusive monitoring.

## V. METHODOLOGY

System Modules:

1. User Interface – Developed using HTML, CSS, and JavaScript
2. Authentication Module – Secure login system
3. Video Capture Module – Webcam input
4. Face Detection Module – Landmark detection
5. Eye Monitoring Module – EAR calculation
6. Stress Detection Module – ML-based classification
7. Alert Module – Real-time notifications
8. Database Module – MySQL storage
9. Reporting Module – Data analysis

Working Process:

- Capture video using webcam
- Detect facial landmarks
- Calculate EAR for blink detection
- Analysebehaviour using ML
- Classify stress level
- Generate alerts

## VI. SYSTEM REQUIREMENTS

- Frontend: HTML, CSS, JavaScript
- Backend: Python (Flask Framework)
- Database: MySQL

## VII. RESULTS AND DISCUSSION

The system was successfully implemented and tested in real-time conditions.

- Accurate detection of facial landmarks and eye movements
- Reliable stress classification using blink rate
- Real-time alert generation
- Efficient storage and retrieval of data

The system effectively identifies stress and improves user well-being.

## VIII. ADVANTAGES

- Real-time monitoring
- Non-intrusive system
- Improves productivity
- Automated alerts
- Scalable solution

## IX. LIMITATIONS

- Depends on lighting conditions
- Privacy concerns
- Requires webcam and system resources
- Possibility of false alerts

## X. FUTURE SCOPE

- Integration with IoT devices
- Advanced deep learning models
- Mobile application development
- Voice-based stress detection
- Personalized AI recommendations

## XI. CONCLUSION

AURA provides an intelligent and efficient solution for workplace stress monitoring. By integrating AI, ML, and CV, the system enables real-time detection and proactive intervention. It improves employee well-being, reduces burnout, and supports better organizational decision-making.

## REFERENCES

[1] S. Lee, M. Brown, “Screen Time Monitoring Systems,” 2019
[2] K. Sharma, P. Gupta, “Real-Time Stress Detection using ML and CV,” 2021
[3] T. Soukupová, J. Čech, “Eye Blink Detection,” 2016
[4] P. Viola, M. Jones, “Haar Cascade,” 2001
[5] L. Chen, Y. Wang, “Deep Learning Emotion Recognition,” 2020