EMPLOYEE PRODUCTIVITY SYSTEM USING MACHINE LEARNING

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INTRODUCTION

- Studies show that increase in employee productivity can contribute to greater profits for the company as well as increased employee satisfaction.
- Efficient productivity techniques would help the employees to perform well without burning out or compromising the quality of the software product.
- Traditionally, workforce productivity relies on various managerial decisions taken by the company.

PROBLEM STATEMENT

- As the software industry is constantly evolving and as more and more companies are going remote, there is a need for a modern and reliable system that ensures the productivity of the employees.

OBJECTIVE

- To create a software system that would maximize the productivity of the employees by providing timely short breaks during working hours. The system would also detect if the person is active or drowsy using machine learning techniques.

SCOPE

- Provide timely breaks after 30 minutes of work (Pomodoro technique).
- Detects how lively is the person (active/drowsy) during working hours by detecting facial features in real time.
- Provide detailed report to the manager.
- Suggest changes to the employee to enhance his productivity.

EXISTING SYSTEMS

- DeskTime
  - A time tracking application that combines employee monitoring, project management and productivity analysis.
  - Daily productivity timeline
  - Detailed visual and downloadable reports
  - Pomodoro timer
  - Integrations with project management apps
  - Absence calendar

EXISTING SYSTEMS (contd.)

- Amit A, Gautam S, Pradeep P – *Framework for Preventing Procrastination and Increasing Productivity*, IEEE ICPSC, May 2021
- Proposed ProScore – A Productivity Mobile Application
  - Pomodoro Technique
  - Gamification of Tasks
  - Peer Influence
  - Task Duration Estimation

EXISTING SYSTEMS (contd.)

- Jalaja S, Youngshen M – *Feature Based Statistical Model of Employee Productivity with Real Time Checked Data*, IEEE IEEM, Dec 2021
- Discusses the aftermath of COVID–19 pandemic and its impact on decentralisation of workforce.
- Proposals on how human competency can be achieved and ensure sustainable autonomous working in office or at an office.
- Presents a business model that improves employee efficiency.

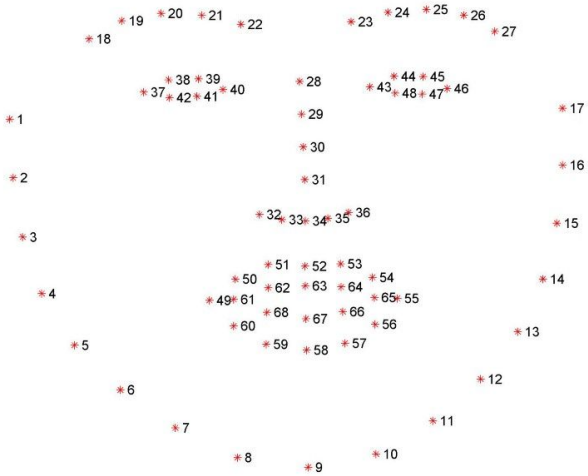
EXISTING SYSTEMS (contd.)

- Uma M, Rajanikanth A, Prasad P – *Driver Drowsiness Prediction Based on Multiple Aspects Using Image Processing Techniques*, IEEE Access, May 2022
- Prasath N, Sreemathy J, Vigneshwaran P – *Driver Drowsiness Detection Using Machine Learning*, IEEE ICACCS, July 2022
- Off-topic, but can be applied in this context.
- EAR and MAR can be used to calculate the intensity of drowsiness.
- Drowsiness negatively impacts employee productivity.

PROPOSED SYSTEM

- Our system tries to combine existing systems to develop a more intelligent productivity tracker.
- Uses Pomodoro technique to provide timely short breaks during working hours.
- Build an Employee Productivity Leaderboard based on the productivity of individual employees.
- Uses Machine Learning to detect activeness/drowsiness.

- Camera will be turned on to capture video images of the employee. Then the person's face area will be detected.
- To detect these each of the facial features like eyes, nose, mouth, etc. we use the pretrained landmark detector present inside the dlib library of OpenCV.
- It is used to estimate the location of 68 points which map to facial structures.



- Now calculate the Eye Aspect Ratio. This determines how closed is the eye. Similarly calculate the Mouth Aspect Ratio.
- Then we will continuously monitor the EAR to see if the value of the ratio is less than 0.3 for continuously 25 frames, thus implying that the eyes of the person has been closed. Now we will assume that the user is drowsy.
- On other hand, if the ratio is greater than the threshold, we can say that the employee is highly active or engaged in work.
- Based on the productivity score, suggestions are made and a detailed report is sent to the manager.

CONCLUSION

- The proposed system is more efficient when compared to existing systems as it uses traditional strategies like Pomodoro technique for time management and advanced machine learning strategies for drowsiness detection.

REFERENCES

- Amit A, Gautam S, Pradeep P – *Framework for Preventing Procrastination and Increasing Productivity*, IEEE ICPSC, May 2021
- Uma M, Rajanikanth A, Prasad P – *Driver Drowsiness Prediction Based on Multiple Aspects Using Image Processing Techniques*, IEEE Access, May 2022
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THANK YOU