

SE 506: Software Project Lab II

Employee Performance Evaluation System

Submitted by -

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Introduction

Employee Performance Evaluation System (EPES) is an employee monitoring and management system that uses performance metrics to improve the employee workrate and efficiency of an industry. The performance metrics data will be generated using a noble activity recognition mechanism which will use real time data to identify idling workers.

For example, an apparel industry has different tasks assigned to different workers. They perform various tasks like sewing, knitting etc. An employee may sit idle reducing efficiency and workflow of the company. In a huge industry like garments, it is very difficult for any supervisor to monitor each worker individually.

So, we want to design a system to automatically monitor and evaluate employee performance using the techniques of activity recognition. Using this information, the cause of inefficiency can be identified and handled properly leading to increased profit.

Scope

Project Goal:

- **Employee Monitoring:** We aim to make a system to record performance of each worker using visual sensors and use activity recognition to monitor work time and idle time. Supervisors can monitor each worker under their supervision, see which activity is being done by which employee and current performance rating. Each employees will have a dashboard featuring:
 1. Employee name and id
 2. Current activity and workplace
 3. Employee KPI score
 4. Field of expertiseSupervisors can access this dashboard.
- **Report Generation:** We will use the recorded performance to generate KPI(Key performance Indicators) records for each employee. Each employee will have a credit score for each task they do proficiently. The supervisor will use this data to assign work to employees.
- **Gamification:** We plan to implement a gamified system where employees will be rewarded based on their performance ratings. There will be leaderboards for different tasks generated on a weekly and monthly basis. Employees can be rewarded and training programs can be arranged based on employee leaderboards.
- **Worker assignment:** Supervisors can assign workers properly to different workstations using the system. The supervisors can do the following tasks through the system:

- i. Evaluate strength and weakness of each worker on producing product types.
 - ii. Build more efficient teams
- **Automated Worker Balancing:** Based on KPI scores and performance ratings, employees will be automatically assigned activities by the system.
 - **Attendance system:** Employee attendance record will be saved in the system. This will be a factor in the performance metrics.
 - **Notification system:** The supervisors will be notified through the system about the generation of reports, leaderboards and suggestions on automated line balancing.
 - **Login system:** Supervisors and admin will use the login system for authentication and authorization.

Workflow: Our project workflow maintains a sequence of tasks as mentioned below:

- The initial step is to fit cameras in garment factories and record footage of workers at their stations.
- A model will be trained using the recorded footages to identify work and idle activities.
- The recorded footage is analyzed using an activity recognition system to identify efficiency of workers or its lack thereof.
- The data gathered from analysis of footage is conveyed to the supervisors and is also used to find the strong suits of individual workers.
- The information gathered can be used to optimize the workplace.

Tools:

For frontend we will use HTML, CSS, JavaScript and reactJS for interoperability across platforms.

For the backend we will use MySQL as relational database, nodeJS and python.

The activity recognition model is trained using Python.

Deliverables:

- SRS documentation
- Application for garments industry
- Final Report

Motivation

There are three primary motivations which inspire us to work on this project.

- The main motivation for this project is to solve a real life problem.
- We will gain experience in real life deployment of experimental technology.
- Successful use case implementation in industries like garments.
- Increase efficiency in industrial manufacturing.

- Help to fulfill SDG goal 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all) and 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation)[1]

Work Plan

Firstly, we will meet with the stakeholders, listen to their needs and on the basis of these needs we will complete the story.

Then we will divide our project into the following sections:

- SRS documentation
- Designing
- Development
- Deploying the software
- Final report writing
- Getting stakeholder feedback

Timeline:

Activity	Tentative timeline
Visiting industry and gathering requirements	1st-2nd week
Analyzing requirements	3rd-4th week
Prepare SRS documentation	5th-7th week
Developing the project	7th-15th week
Deployment	16th-19th week

Reference:

[1] SDG goals, <https://sdgs.un.org/goals>, Date Accessed: 19/12/2022

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20/12/2022

Supervisor's Signature:

A handwritten signature in black ink, appearing to read 'Shafiul', followed by a long horizontal line extending to the right.