Development Document

# Project: Using existing CCTV networks for crowd management,crime detection and prevention and work monitoring for Railway Stations.

#### Team: Meta Minds

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## **I. Technical Stack**

**Programming Languages:**

* Python (primary language for backend development and model training)
* JavaScript (for frontend development and user interface interactions)
* Frameworks and Libraries:

Libraries:

* Matplotlib, seaborn, numpy pandas for graphical analysis
* Imageio for reading and writing the images
* Keras for building and training deep learning models

Machine learning frameworks:

* Tensorflow, scikit-learn
* Yolo: Used for anomaly detection

**Backend:**

* Node.js
* Express.js

**Frontend:**

* React (JavaScript framework for building user interfaces)

**Cloud Platform**:

* AWS ( for website development)

**II. AI Model Architecture**

**Chosen Model:**

* Recurrent Neural Network (RNN) with Long Short-Term Memory (LSTM) architecture. Captures sequential patterns and context in tweets. Handles long-term dependencies in text data
* Convolutional Neural Network (CNN)- We build the video classifier using CNN. It captures features of each frame of the video.

**III. Key Functionalities**

**Crowd Detection and Management:**

* Utilizes advanced algorithms to analyze crowd size and dynamics in real-time.
* Assigns individuals or groups to waiting rooms based on crowd density and distribution.
* Adapts resource allocation (staff, security, facilities) dynamically according to crowd fluctuations.
* Provides real-time alerts and recommendations for immediate action in critical scenarios.

**Crime prevention:**

* Employs machine learning algorithms to detect unusual or abnormal patterns in behavior, helping identify potential criminal activities.
* Classifies different activities such as accidental pushing, suicidal tendencies, and assault, using computer vision
* Sends instant notifications to employees and relevant personnel when suspicious activities are detected, enabling quick response.

**Work monitoring:**

* Monitors and assesses the flexibility of available services allocation in railway stations.
* Focuses on optimizing services for employee needs and efficient resource allocation.
* Incorporates predictive analytics to forecast service demand and employee requirement

**User Interface:**

Provide a user-friendly interface for:

* For viewing and getting real time insights of anomaly detection, work monitoring, crowd management
* Provides graphical representation of the data for better understanding.

**Sample Links:**

* **GIthub Repository Link:** <https://github.com/Himanshu-Sangshetti/Nestria-Hackathon--Team-Meta-Minds>
* **Github Project Link:** <https://github.com/Himanshu-Sangshetti/Nestria-Hackathon--Team-Meta-Minds>