IULOGO

**Project Title:**

**Enhancing Airport Security Management Through Real-time Computer Vision: An AI-Powered Anomaly Detection System**

**Group Members:**

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**Description:**

This project focuses on implementing a real-time computer vision system for airport management. It involves local cameras integrated with deep learning models, particularly Convolutional Neural Networks (CNNs), to detect anomalies such as unattended material, wet floors, variation in light intensity, filled garbage bins, unauthorized personnel in no go area, broken tiles and traffic in boarding lanes. The system will alert management promptly upon detection, enabling them to take necessary action within the existing framework of Airport Management Systems.

**Functional Requirements:**

1. **Real-Time Monitoring:** The system should continuously monitor the airport premises using local cameras integrated with deep learning models.
2. **Anomaly Detection System:** The system is intended to detect various anomalies in real-time to ensure enhanced operational efficiency and safety within the designated premises. Key functionalities are anticipated to include:

* Detection of unauthorized personnel in restricted areas, with immediate alert to management.
* Identification of unattended luggage or objects, enabling prompt intervention and security measures.
* Monitoring of passenger queues and immigration counters to optimize queue management, thereby minimizing waiting times and enhancing customer experience.
* Continuous monitoring of light intensity levels, with automatic alerts to management.
* Identification of areas with broken tiles, facilitating timely repair and maintenance actions.
* Detection of filled garbage bins, with alerts generated to enable timely disposal activities.
* Detection of wet floors, enabling timely mitigation to prevent slip hazards.

1. **Alert Generation:** Generate timely alerts to notify airport management when anomalies are detected.
2. **Customization:** Allow customization of detection parameters and thresholds to adapt to different airport environments and requirements.

**Non-Functional Requirements:**

1. **Accuracy:** The system should achieve high accuracy in anomaly detection to minimize false alerts and ensure reliable notifications to airport management.
2. **Reliability:** The system should operate reliably under varying environmental conditions and camera setups, with minimal downtime or disruptions.
3. **Scalability:** The system should be scalable to accommodate the growing needs of the airport, supporting additional cameras and increasing data volumes without compromising performance.
4. **Usability:** Ensure the system is user-friendly and intuitive for airport personnel, with clear interfaces and streamlined workflows for monitoring and responding to anomalies.
5. **Compatibility:** Ensure compatibility with existing Airport Management Systems (AMS) and infrastructure to facilitate seamless integration and operation.
6. **Maintainability:** Design the system with modular components and well-documented code to facilitate maintenance, updates, and future enhancements.