

**Proposal for Internee**

###### Project Title

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| Automated People Face Detection and Recognition Using CCTV Cameras |

###### Supervisor(s) Name(s) and Department affiliation

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###### Abstract

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| **Introduction**  The proliferation of CCTV cameras across various sectors has transformed security and monitoring capabilities, shifting from basic video recording to advanced, real-time surveillance tools. As technology progresses, CCTV systems now incorporate sophisticated algorithms for facial detection and recognition, enhancing their utility in high-security environments. These advancements enable organizations to not only secure their premises but also to monitor and manage access with precision, using facial recognition as an efficient and automated solution for identity verification.  In controlled settings, such as laboratories where access is limited to authorized personnel, integrating CCTV infrastructure with face detection and recognition algorithms presents an opportunity for streamlined access management. By automating facial recognition, this project aims to enhance security, ensure compliance, and simplify the monitoring of authorized individuals in the lab.  **Objectives**:   1. Develop a robust system for real-time face detection and recognition (a single person) using existing CCTV cameras, focusing on accurate and secure access management within the lab. 2. Implement robust a) face detector, b) deep feature extractor (such as GhostNet), c) SVM face classifier). 3. Design an intuitive interface for face recognition to monitor live and active recognition.   **High-level Overview of the Project**:   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Camera |  | Input |  | AI Model |  | Results | | **E1 Pro** |  |  |  | **AI Model** |  |  |   **Different views of our multi-camera installed Laboratory:**   |  |  |  | | --- | --- | --- | | Camera 1 | Camera 2 | Camera 3 | |  |  |  | |
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###### Resources Required

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| **Hardware:**   * CCTV Cameras: Utilize existing cameras; additional units may be required depending on the lab's layout. * Servers/Workstations: Necessary for processing video data and running detection algorithms.   **Software:**   * Video Processing Framework: Tools like OpenCV for real-time video analysis. * Machine Learning Models: Pre-trained models for people detection (e.g., YOLO, SSD, or custom models). * GUI Interface: Developed using python graphic frameworks like **tkinter**.   **System Requirements**   1. CCTV Integration  * Utilize existing CCTV cameras at lab entry and exit points for real-time footage capture. * Ensure compatibility with the current camera models and video feeds.  1. People Detection and Tracking:  * Implement a robust people detection algorithm that works effectively under varying lighting conditions * Recognize and Track individuals across multiple camera angles to accurately recognize. |
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