

Sir Syed University of Engineering & Technology (SSUET)
Department of Software Engineering

Course Name: Software Construction and Development(SE-314L)

Semester: 5th

Batch: 2023F

Section: C

PROJECT REPORT

Project Title: Criminal Face Detection Model



Submitted To:

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Submitted by:

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TEAM PROFILE

The Criminal Face Detection project was developed through the collaborative efforts of the following team members. Each member contributed according to their technical expertise and assigned responsibilities to ensure the successful completion of the project.

1. MUHAMMAD KHALID HUSSAIN

2023F-BSE-191

Roles: Project Lead, Backend Development, Backend and Frontend Integration

Responsible for overall project overview.

- Project Lead & Coordinator – Ensure project flows smoothly
- Backend Development Lead – Node.js, Express, MySQL integration
- API Development – Signup, Login, Dashboard, Projects CRUD
- Database Design & Management – Ensure secure & optimized queries
- Overall Architecture & Integration – Connect frontend with backend
- Supervise coding standards, code reviews, and merging branches

2. SHEHARYAR ALI

2023F-BSE-168

Roles: Frontend

- Complete UI/UX Development – Landing page, signup, login, dashboards
- React Components & Routing – React Router, Tailwind styling
- API Calls Integration – Connect frontend forms with backend APIs
- Ensure smooth and responsive design

3. ZAID ASIF

2023F-BSE-195

Roles: Frontend, UI testing

- Assist in Frontend Development – Components, dashboards
- Prepare Project Documentation & Report – Setup instructions, diagrams, screenshots
- Manage minor UI testing & bug fixes

4. ZAIN AHMED

2023F-BSE-156

Roles: Implement Client features

- Implement Client Features – Project add, view, update, delete
- Testing & QA – Test all flows for multiple users

1. PROBLEM DOMAIN:

Crime monitoring and identification remain major challenges for security authorities due to manual record-keeping, delayed verification, and lack of automated identification mechanisms. Traditional criminal identification methods rely heavily on human observation, manual database searches, and offline verification, which are slow, error-prone, and inefficient.

Security teams struggle to detect criminals in real-time environments such as public places, campuses, and checkpoints. Additionally, managing criminal records, violation history, warnings, and public claims is difficult due to disconnected systems and poor data organization.

Current solutions lack real-time face recognition, centralized criminal databases, automated warning systems, and integrated claim verification features. This results in delayed responses, wrongful identification, inefficient investigations, and increased security risks. Therefore, there is a strong need for a unified intelligent platform that integrates face recognition, criminal record management, warning classification, and claim verification into a single automated system.

Objectives:

1. To develop a real-time criminal face detection system using artificial intelligence and computer vision.
2. To create a centralized platform for managing criminal records, violations, and risk levels.
3. To enable administrators to add, update, and monitor criminal profiles efficiently.
4. To provide real-time alerts when a criminal face is detected through live camera feed.
5. To implement a rule-based warning system for classification of criminal behavior.
6. To allow users to submit claims and evidence for review and verification.
7. To improve security monitoring accuracy, speed, and automation.
8. To provide analytical dashboards for decision-making and investigation support.

2. PROPOSED TREATMENT:

The proposed system, **AI-Agent Based Criminal Face Detection & Monitoring System**, is a web-based intelligent platform that uses **Artificial Intelligence agents** to automate face detection, recognition, decision-making, and system coordination.

The system provides **role-based access** with two main dashboards: **Admin Panel** and **User Panel**, along with a **Real-Time Face Detection Module**.

System Overview:

- Face recognition is implemented using **face-api.js**, enabling real-time face detection and matching.
- Criminal classification is handled through **rule-based logic combined with AI automation**.
- The platform ensures transparency by allowing users to submit claims and view warnings.

Key Components of the Proposed Solution:

1. **User Management** – Role-based authentication for admins and users with secure login.
2. **Criminal Record Management** – Add, update, delete, and search criminal profiles.
3. **Face Recognition System** – AI-based face encoding and matching using deep learning models.
4. **Warning & Violation Tracking** – Automated classification of criminal behavior levels.
5. **Claim Management System** – Users can submit claims with evidence for review.
6. **Real-Time Alert System** – **Instant alerts when a criminal face is detected.**
7. **Analytics Dashboard** – Graphs and statistics for crime monitoring.
8. **Secure Data Handling** – Encrypted authentication and protected access control.

3. PLAN OF WORK:

Research:

- Study existing surveillance and face recognition systems and their limitations.
- Analyze challenges in manual criminal identification and record management.
- Understand requirements for security authorities and users.
- Review best practices for AI face recognition accuracy and system security.
- Explore concurrency and multithreading techniques for real-time processing.

Development and Testing:

1. Frontend Development:

- Design responsive user interfaces for Admin and User dashboards.
- Implement authentication, profile management, and alerts.
- Integrate real-time camera and detection interface using face-api.js.

2. Backend Development:

- Implement RESTful APIs using Node.js and Express.
- Design role-based access control and authentication.
- Integrate AI agent logic for automation.
- Implement worker threads for concurrent processing.

3. Testing:

- Functional testing of all modules.
- Face recognition accuracy testing.
- Security testing for authentication and data access.
- Performance testing under concurrent detection scenarios.

Major Project Activities:

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1. Admin Activities:

- Login and dashboard access.
- Add and manage criminal records.
- Verify or reject user claims.
- Monitor detection alerts and statistics.

2. User Activities:

- Register and login.
- View personal status and warnings.
- Track violation history.
- Submit claims with supporting evidence.

3. Integrated Activities:

- Real-time face detection and alerts.
- Automated logging of detection events.
- AI-based rule evaluation and classification.
- Secure data synchronization.

4. RULE-BASED AND AI LOGIC IMPLEMENTATION

Criminal Classification Logic:

- Violation count ≥ 5 and warnings ignored \rightarrow Criminal status assigned.

Warning System:

- 1–2 violations \rightarrow Low warning
- 3–4 violations \rightarrow Medium warning
- 5+ violations \rightarrow High warning + Criminal status

Claim Handling:

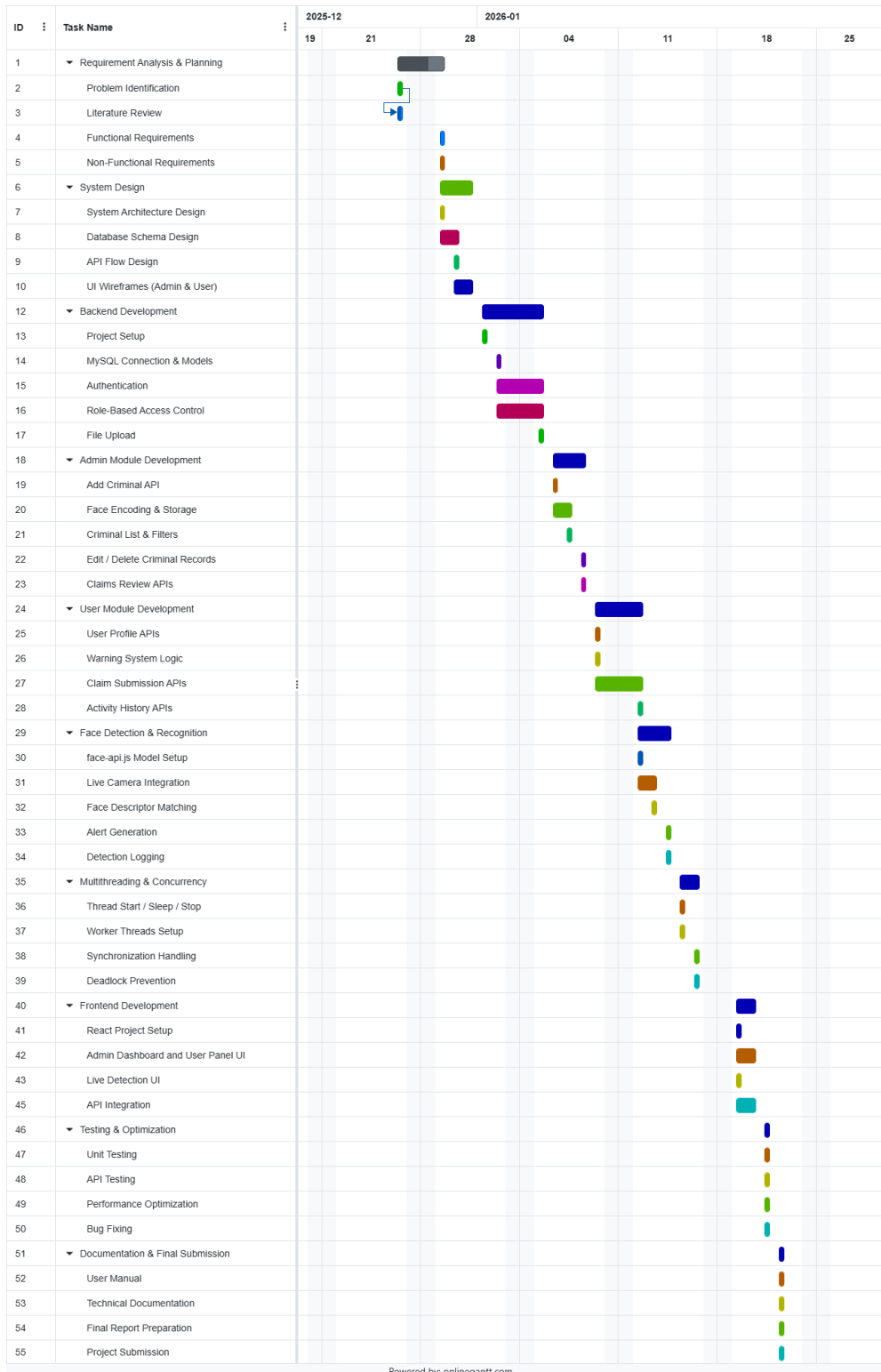
- Approved claim \rightarrow Status reset to Normal
- Violation count reset after verification

AI Agent Role:

- Automates backend logic generation
- Optimizes API flow and concurrency

4. PROJECT SCHEDULING

Gantt chart:



Powered by: onlinegantt.com

5. SOFTWARE AND HARDWARE SPECIFICATIONS:

Following are the hardware and software requirements for the project

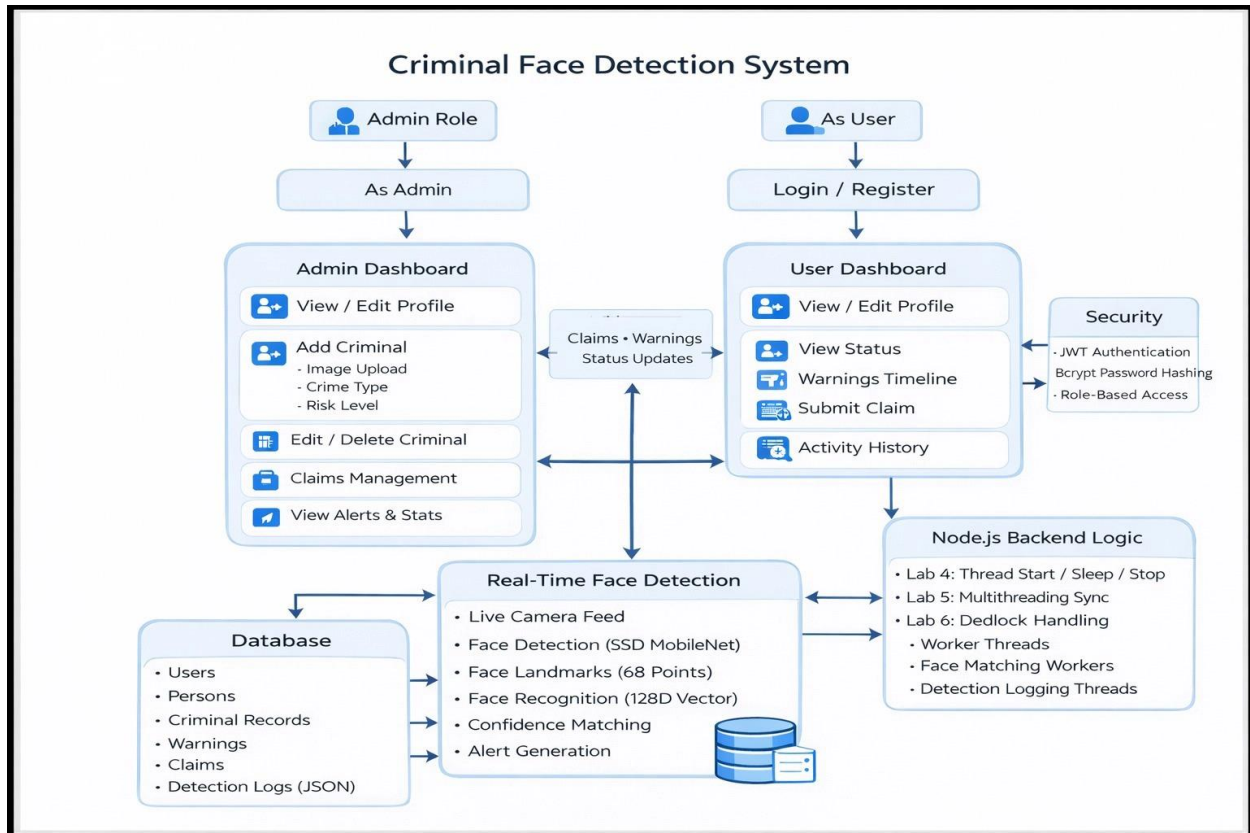
Hardware Requirements:

- Processor: Intel Core i3 or higher
- RAM: 4 GB or more
- Storage: 250 GB SSD
- Camera: HD Webcam
- Network: LAN/Wi-Fi

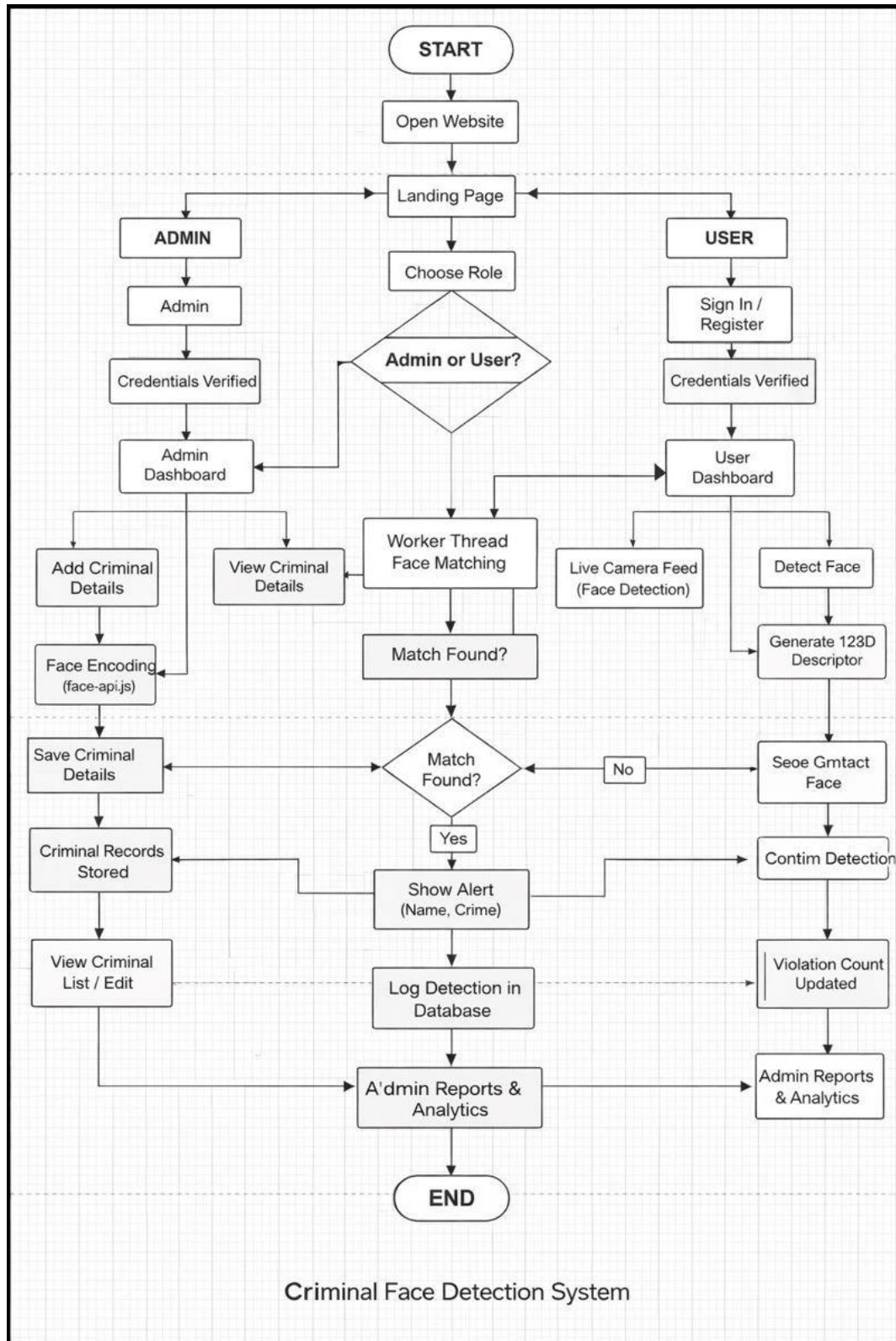
Software Requirements:

- Frontend: React.js, Tailwind CSS, HTML, CSS, JavaScript
- Backend: Node.js, Express.js
- Database: MySQL
- AI & Face Recognition: face-api.js
- AI Agent Tools: Cursor .
- Development Tools: VS Code, Postman.
- Optional: Git for version control

6. BLOCK DIAGRAM



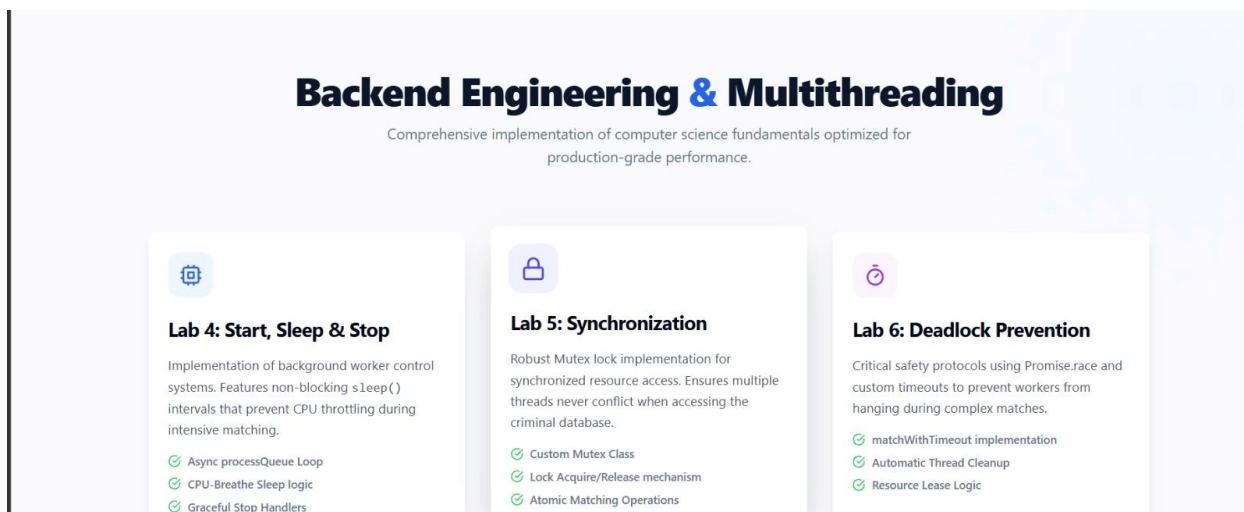
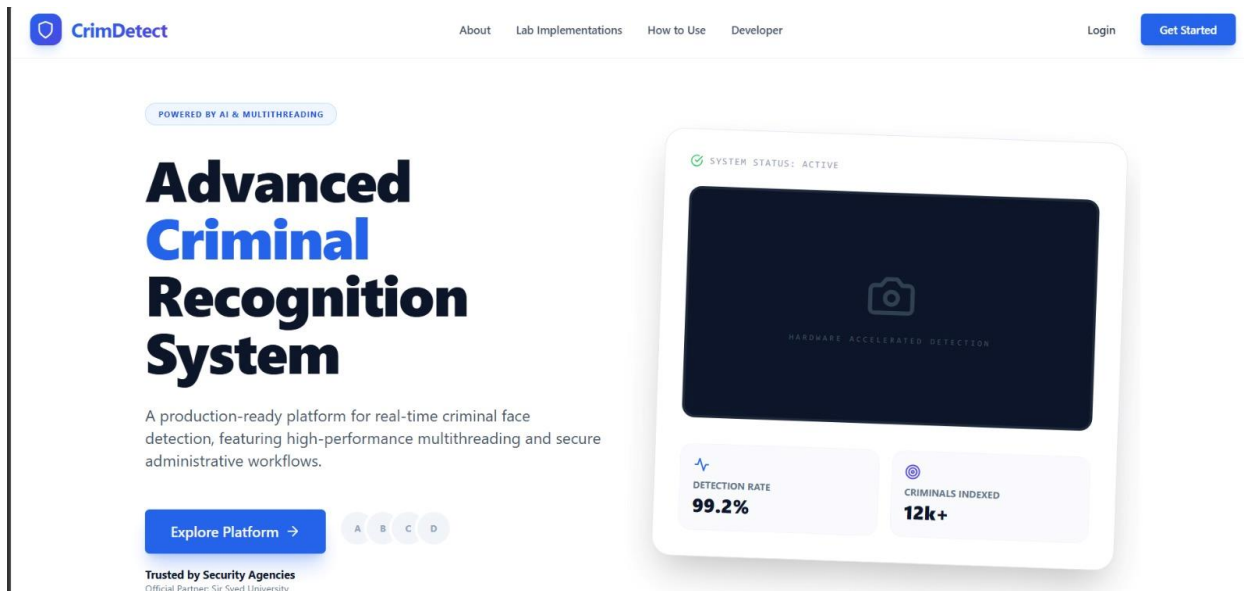
7. SYSTEM FLOW DIAGRAM



8. USER GUIDE

Explain through screenshots, how the end users will interact with your developed project. Describe the whole process step by step.

1. HomePage:



Software Construction and Development



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[Login](#)

[Get Started](#)



Khalid

FULL STACK AI ENGINEER

Muhammad Khalid Hussain, a proactive software developer at Sir Syed University, specializing in building scalable web applications using React, Node.js, and modern frameworks. Active member of GDSC SSUET, contributing to student tech initiatives, creating platforms like SSUETNotes and SSUETConnect, and mentoring peers in web development and AI projects. Passionate about turning complex ideas into practical solutions that benefit the university community.



ACADEMIC & PROFESSIONAL TRUST

SIR SYED UNIVERSITY



Redefining public safety through advanced facial recognition and distributed computing technologies.



PROJECT

[Live Detection](#)
[Admin Panel](#)
[API Docs](#)
[Thread Manager](#)

RESOURCES

[Lab 4: Controls](#)
[Lab 5: Sync](#)
[Lab 6: Timeouts](#)
[Case Studies](#)

DEVELOPER

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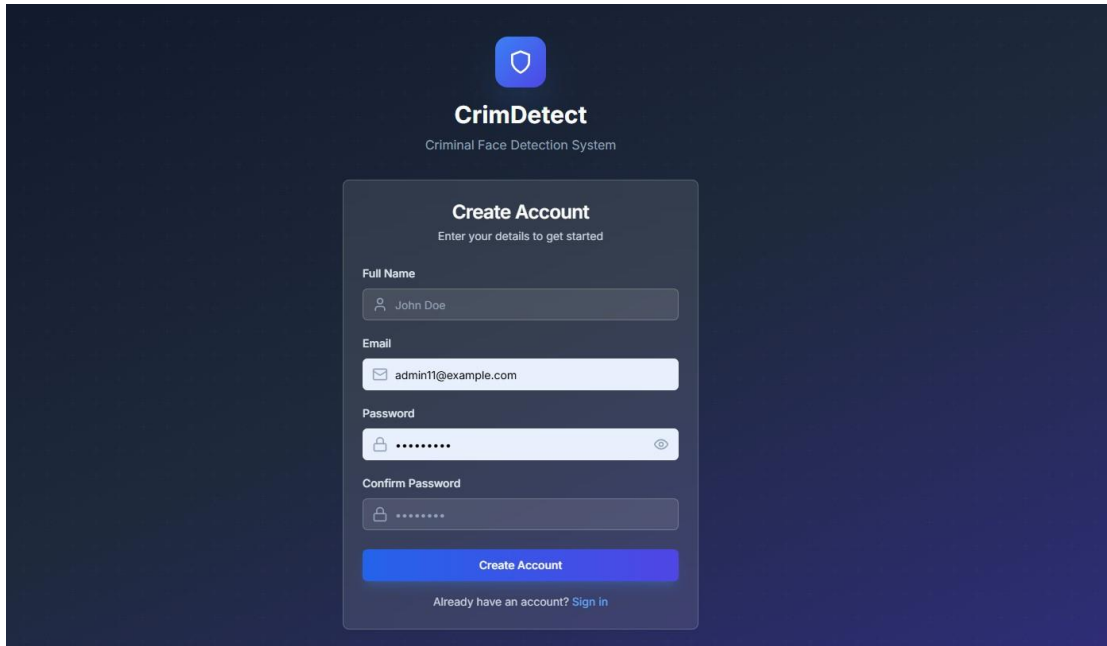
© 2026 CrimDetect. Designed by Khalid Bin Waleed. No rights reserved (SP License).

[TERMS](#) [PRIVACY](#) [COOKIES](#)

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2. Registration Pages:

Register as a normal User or Admin.



The image shows a registration form for 'CrimDetect', a Criminal Face Detection System. The form is titled 'Create Account' and includes a sub-header 'Enter your details to get started'. It features four input fields: 'Full Name' (with a user icon and the text 'John Doe'), 'Email' (with an envelope icon and the text 'admin11@example.com'), 'Password' (with a lock icon and masked characters), and 'Confirm Password' (with a lock icon and masked characters). A blue 'Create Account' button is at the bottom, followed by a link 'Already have an account? Sign in'.

CrimDetect
Criminal Face Detection System

Create Account
Enter your details to get started

Full Name
John Doe

Email
admin11@example.com

Password

Confirm Password

Create Account

Already have an account? Sign in



The image shows a registration form for 'CrimDetect Admin', an Administrative Access system. The form is titled 'Create Admin Account' and includes a sub-header 'Register a new system administrator'. It features four input fields: 'Full Name' (with a user icon and the text 'Admin Name'), 'Email' (with an envelope icon and the text 'admin11@example.com'), 'Password' (with a lock icon and masked characters), and 'Confirm Password' (with a lock icon and masked characters). A pink 'Create Admin Account' button is at the bottom, followed by a link 'Back to Login'.

CrimDetect Admin
Administrative Access

Create Admin Account
Register a new system administrator

Full Name
Admin Name

Email
admin11@example.com

Password

Confirm Password

Create Admin Account

Back to Login

Software Construction and Development

3. Login Page:

Login as Client or as a Admin.

Criminal Face Detection System

Welcome Back

Enter your credentials to access your account

Email

Password

[Sign in](#)

[Don't have an account? Sign up](#)

Demo Credentials
admin@system.com / admin123

4. Client Dashboard:

Dashboard

Profile

Face Detection

Khalid Hussain

User

Logout

User Dashboard

My Dashboard

Welcome back, Khalid Hussain

Profile Overview

K

Khalid Hussain

khalid1234@gmail.com

Status: CRIMINAL CNIC: 4220163477555

CRIMINAL

Violations: 185

Warnings: 1

Submit Claim

Total Warnings

1

Unacknowledged

1

Warning Level

HIGH

Recent Warnings

You have been marked as a criminal record: Traffic Violation. Please contact administration if this is an error. 4 minutes ago

HIGH

Acknowledge

My Claims

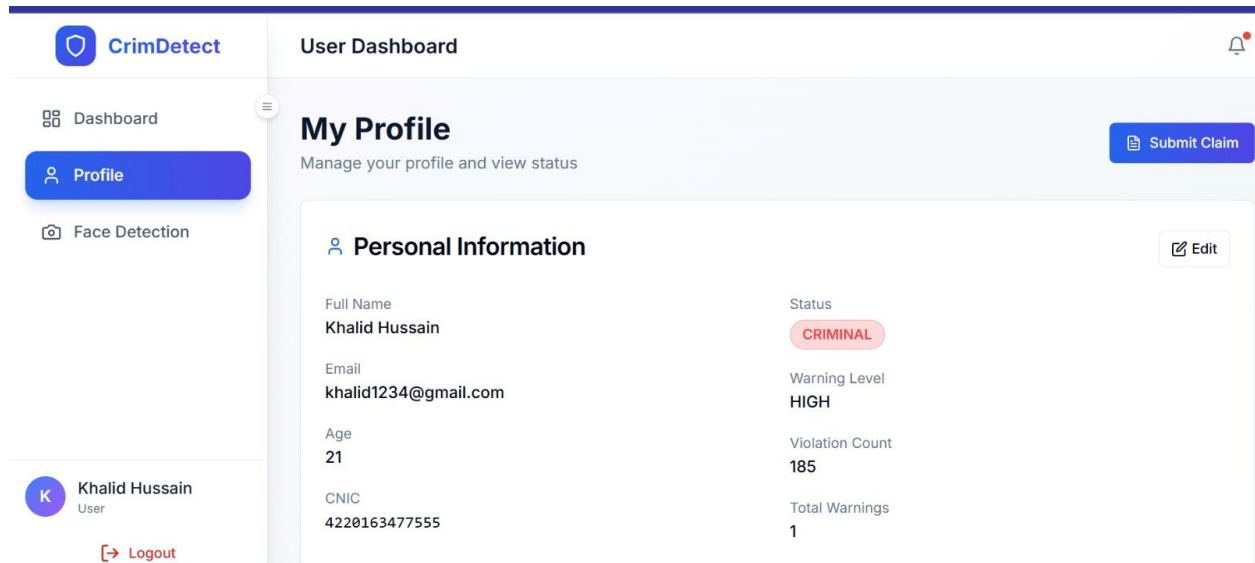
No claims submitted yet

View All

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12 Page

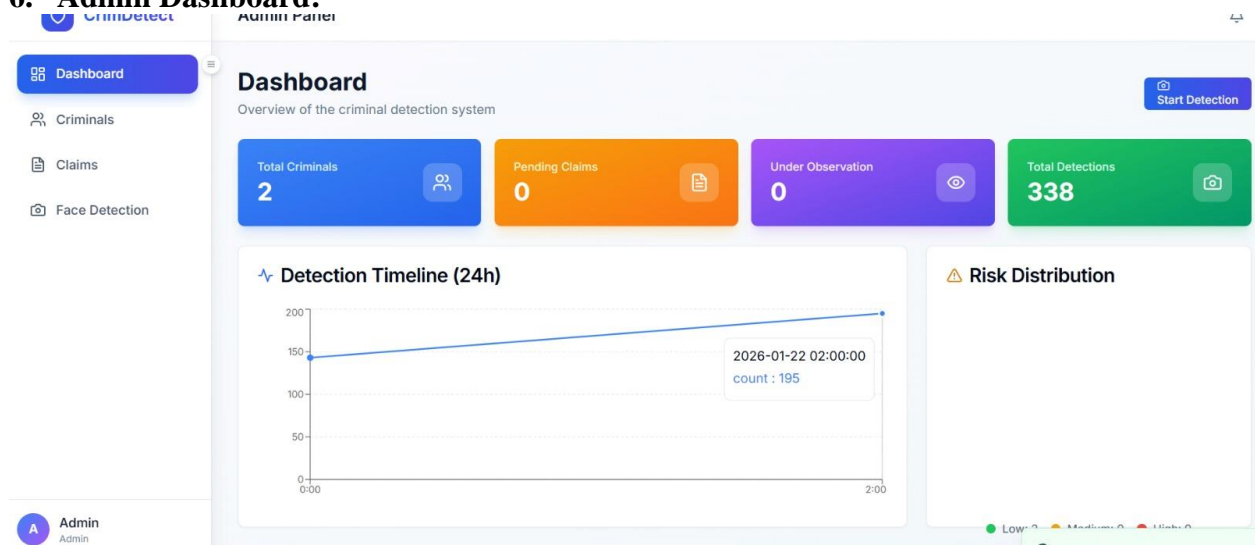
4. Client Profile:



The User Dashboard for Khalid Hussain features a sidebar with navigation options: Dashboard, Profile (selected), and Face Detection. The main content area is titled 'My Profile' with a subtitle 'Manage your profile and view status' and a 'Submit Claim' button. The profile information is organized into two columns. The left column contains personal details: Full Name (Khalid Hussain), Email (khalid1234@gmail.com), Age (21), and CNIC (4220163477555). The right column displays status and warning information: Status (CRIMINAL), Warning Level (HIGH), Violation Count (185), and Total Warnings (1). An 'Edit' button is located at the top right of the profile information section. A user card at the bottom left shows the user's name, initials 'K', and a 'Logout' button.

Personal Information	
Full Name	Khalid Hussain
Email	khalid1234@gmail.com
Age	21
CNIC	4220163477555
Status	CRIMINAL
Warning Level	HIGH
Violation Count	185
Total Warnings	1

6. Admin Dashboard:



The Admin Dashboard provides an overview of the criminal detection system. It features a sidebar with navigation options: Dashboard (selected), Criminals, Claims, and Face Detection. The main content area is titled 'Dashboard' with a subtitle 'Overview of the criminal detection system' and a 'Start Detection' button. The dashboard displays four key metrics in colored boxes: Total Criminals (2), Pending Claims (0), Under Observation (0), and Total Detections (338). Below these metrics is a 'Detection Timeline (24h)' line chart showing a steady increase in detections over time, with a specific data point for 2026-01-22 02:00:00 showing a count of 195. To the right of the chart is a 'Risk Distribution' section with a legend for Low, Medium, and High risk levels.

Metric	Value
Total Criminals	2
Pending Claims	0
Under Observation	0
Total Detections	338

Detection Timeline (24h)







2026-01-22 02:00:00
count : 195

Risk Distribution

Low Medium High

7. Criminal Management:

The screenshot shows the 'Criminal Management' section of the Admin Panel. The left sidebar contains links for Dashboard, Criminals (selected), Claims, and Face Detection. The main content area has a search bar, filters for 'All Crime Types' and 'All Risk Levels', and a table of criminal records. A '+ Add Criminal' button is in the top right. The bottom of the sidebar shows the user 'Admin' with a 'Logout' link.

Criminal	Crime Type	Risk Level	Violations	Added	Actions
 Eisha 123124124211	Traffic Violation	LOW	2	Jan 22, 2026	 
 Khalid 4220163477555	Traffic Violation	LOW	90	Jan 22, 2026	 

8. Claims:

The screenshot shows the 'Claims Management' section of the Admin Panel. A 'Claim Details' modal is open, displaying information for a claim by 'Khalid Hussain' (khalid1234@gmail.com). The modal shows the current status as 'CRIMINAL' and the claim status as 'PENDING'. It includes a 'Reason for Claim' (please review), a 'Proof/Evidence' section with a 'View uploaded proof' link, and a 'Your Response' section with a text input field. At the bottom of the modal are 'Reject' and 'Approve' buttons. The background shows the 'Claims Management' interface with a list of claims and a 'View' button.

Claim Details

Khalid Hussain
khalid1234@gmail.com

Current Status: **CRIMINAL** Claim Status: **PENDING**


Reason for Claim: please review

Proof/Evidence: View uploaded proof

Your Response: Enter your response (optional)...

Reject **Approve**

9. Face Detection:

 **CrimDetect**

Dashboard

Criminals

Claims

Face Detection

Admin

Admin

[Logout](#)

Admin Panel

Face Detection

Real-time criminal face recognition

176

Total Scans

149

Matches Found

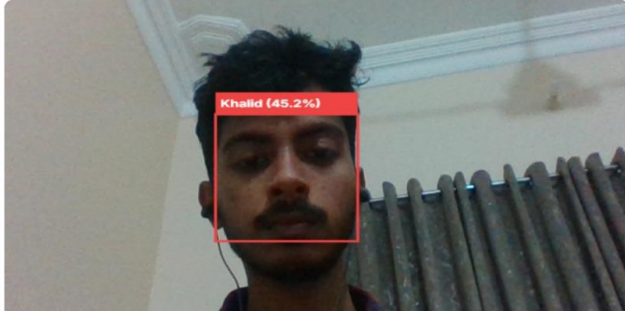
2

In Database


Active

Status

Live Camera Feed



CRIMINAL DETECTED!

 **Khalid**

Traffic Violation


45.2%

CNIC: 4220163477555

Email: khalid1234@gmail.com


Violations: 0

Recent Detections

 Khalid


45.2%

Just now

 Khalid

48.7%

Just now

 Khalid

Just now