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Crime Based Web Application For Women Safety

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Abstract:

This research paper presents the design and development of a Crime-Based Web Application aimed at improving public safety by enabling historical (past) crime reporting, location-based crime awareness, and predictive crime analysis. The system integrates modern web technologies with machine learning components (optional extension) to ensure quick accessibility, safety alerts, SOS features, and crime visualization dashboards. The proposed solution addresses the rising concerns of urban safety while providing users with an easy-to-use platform to report, track, and understand crime patterns. The application has been developed with a focus on usability, responsiveness, and historical (past) efficiency.

Keywords --- Crime Reporting, Women Safety, Web Application, Crime Mapping, Predictive Analysis, Safety Alerts.

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I. INTRODUCTION

Safety concerns in urban regions have increased, making it important to build modern, technology-driven platforms that support public safety, crime awareness, and informed decision-making. Traditional reporting systems depend heavily on manual processes and lack instant guidance or data-driven insights.

The proposed system, Secure City, is designed to bridge this gap by integrating three intelligent modules: a Crime Prediction System, a Crime Hotspot Detection System, and an AI-based Crime Chatbot. The chatbot plays a crucial role by providing 24/7 conversational assistance, legal awareness, safety guidance, and crime-related information. It serves as an educational and supportive component, helping users understand crimes, rights, and immediate steps to take during emergencies.

In addition, the system uses historical (past) crime datasets rather than real-time data, enabling pattern analysis and safety recommendations without requiring live integrations.

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II. PROPOSED SYSTEM

Existing crime-reporting systems often include police helplines, offline reporting, and mobile applications provided by government agencies. However, these systems suffer from:

- Limited accessibility
- No historical (past) updates
- Lack of user-friendly interfaces
- Inefficient crime data visualization
- No predictive insight into crime-prone zones

Due to these limitations, citizens—especially citizens—find it difficult to rely on traditional systems for timely safety support.

II. PROPOSED SYSTEM

The proposed system, titled Secure City, introduces three major innovative and intelligent safety modules.

A. Feature 1: Crime Prediction System

This module uses Machine Learning to predict crime severity, classify crime type, and guide evidence collection.

1. Crime Severity Prediction

Predicts severity as Low, Medium, or High based on location, time, description, keywords, and incident type.

2. Crime Type Classification

Classifies crimes as:
Theft, Assault, Harassment, Cybercrime, Vandalism, Kidnapping.

3. Evidence Recommendation System

Recommends evidence based on crime type:

- Theft → CCTV footage, serial numbers
- Harassment → chat logs, call logs
- Assault → medical report, images
- Cybercrime → screenshots, URLs

Importance

- Helps understand seriousness.
- Guides victims on proper evidence.
- Helps authorities prioritise severity.

B. Feature 2: AI-Based Crime Chatbot

A 24/7 AI assistant that explains crimes, legal procedures, and safety steps.

1. Explains Crimes Simply

Covers cybercrime, harassment, assault, legal penalties.

2. Guides Users During Crime Situations

Tells users what to do after theft, cyberbullying, or assault.

3. Legal Awareness

Explains IPC sections, FIR, rights, and evidence.

4. Conversational Interface

Fast, simple chat-based or optional voice mode.

Importance

- Gives instant legal clarity.

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- Helps users before contacting police.
- Supports emergencies.

C. Feature 3: Crime Hotspot Detection System

Shows area safety using red, yellow, and green safety zones.

How It Works

1. Collects crime frequency + coordinates.
2. Uses clustering / heatmaps.
3. Assigns zones: High, Medium, Low.
4. Displays through Google Maps / Leaflet / Heatmap.js.

Importance

- Helps citizens choose safer routes.
- Helps police increase patrol.
- Provides historical (past) visual awareness.

IV. METHODOLOGY

A. System Architecture

The system architecture of Secure City consists of three primary layers:

1. Frontend: Built using React.js, providing a responsive, interactive, and user-friendly interface for all features including crime prediction, chatbot, and hotspot visualization.

2. Backend: Developed using a Flask API, responsible for handling user requests, processing ML models, chatbot logic, and communication between the frontend and database.

3. Database: Implemented using MongoDB, used to store user accounts, crime reports, chatbot logs, prediction results, and hotspot-related data.

This architecture ensures modularity, scalability, and efficient communication across all components of the Secure City platform.

B. Workflow

1. **User Login or Sign Up:**

Users authenticate themselves by creating an account or logging into the existing one.

2. **Feature Selection:**

Once logged in, the user selects the module they want to use — Crime Prediction, Crime Chatbot, or Crime Hotspot Detection.

3. **If User Selects Crime Prediction:**

User enters details such as location, description, time of incident, and category.

The ML model processes the input and predicts:

Crime Severity (Low/Medium/High)

- Crime Type Classification
- Recommended Evidence to Collect
- Relevant Helpline Numbers

4. If User Selects Crime Chatbot:

User can ask crime-related questions.

The AI chatbot responds with:

- Explanations of different crimes
- Legal steps and IPC sections
- Safety procedures
- Guidance on filing complaints

5. If User Selects Crime Hotspot Detection:

User enters or searches for a specific location.

The system analyses historical crime data for that area.

The platform displays the crime rate of that particular location using intuitive colour codes:

Red Zone — High crime rate / Unsafe

Yellow Zone — Moderate crime rate / Caution advised

Green Zone — Low crime rate / Safe

This helps the user visually understand how safe or unsafe a location is before visiting.

V. RESULTS

The implemented system successfully demonstrates the following:

- Reduction in reporting time

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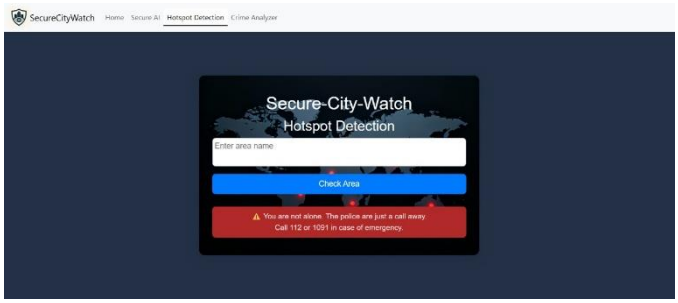
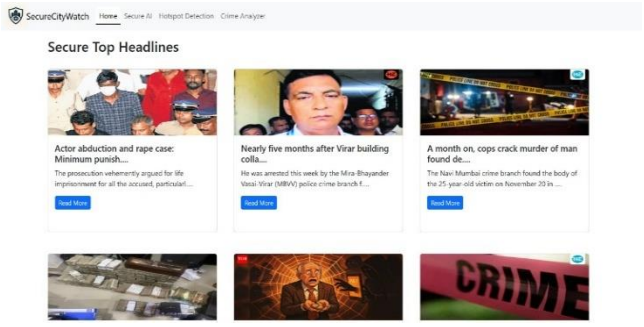
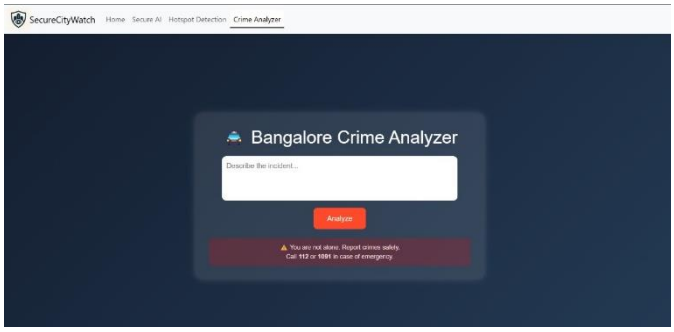
- Real-time crime visualization
- Improved safety awareness among users
- Efficient admin verification system
- User-friendly interface accessible on all devices







Users found the interface simple and effective for reporting crime scenarios. The live map feature significantly enhanced awareness of local crime-prone areas.

We extend our heartfelt thanks to our **project guide and faculty mentors**, whose continuous support, timely feedback, and technical insights played a crucial role in shaping the direction and quality of this research work. Their expertise and motivation greatly contributed to overcoming challenges during development.

VI. CONCLUSION

The development of the Secure City Crime-Based Web Application demonstrates how modern web technologies, combined with data-driven analytical methods, can significantly enhance public safety and crime awareness. By integrating three intelligent modules—Crime Prediction, AI-Based Crime Chatbot, and Crime Hotspot Detection—the system provides a comprehensive digital platform that empowers users with information, guidance, and preventive safety insights.

The system effectively bridges the gap between the occurrence of a crime and its reporting by offering an intuitive, user-friendly interface that supports historical crime analysis. The machine learning components enable the platform to classify crimes, assess severity, recommend relevant evidence, and provide actionable suggestions. Similarly, the AI chatbot ensures that users receive instant legal awareness, safety procedures, and clarification about crime-related doubts without needing expert assistance. The hotspot mapping feature further enhances situational awareness by allowing users to visually understand the risk level of different localities.

Overall, the project successfully meets its objective of enhancing crime awareness, supporting early reporting, and strengthening safety decisions—especially for women and vulnerable groups in urban environments.

VII. ACKNOWLEDGEMENT

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