# Civi-Snap: A Deep Learning Powered Geotagged Civic Issue Detection and Monitoring Framework

**Bipin S Menon**
Student, Department of Computer Science and Engineering,
Sri Ramakrishna Engineering College, Coimbatore, Tamil Nadu, India bipinsmenon@gmail.com
**Dhanya Rajeswari S**
Student, Department of Computer Science and Engineering,
Sri Ramakrishna Engineering College, Coimbatore, Tamil Nadu, India dhanyasuresh402@gmail.com
**Mr.Gaurab Mudbhari**
Assistant Professor, Department of Computer Science and Engineering, Sri Ramakrishna Engineering College, Coimbatore, Tamil Nadu, India gaurabmudbhari@srec.ac.in

**How to Cite this Article**:

Menon, B. S. & S, D. R. (2026). Civi-Snap: A Deep Learning Powered Geotagged Civic Issue Detection and Monitoring Framework. International Journal of Creative and Open Research in Engineering and Management, 02(04). https://doi.org/10.55041/ijcope.v2i4.439



https://doi.org/10.55041/ijcope.v2i4.439

**Abstract—** An AI-based smart civic complaint management system is presented in this paper with the goal of increasing the effectiveness and dependability of public issue reporting. In order to ensure authenticity and minimize false reports, the system enables citizens to submit complaints along with visual or video evidence. The precise location and time of the complaint submission are recorded using automatic geotagging and timestamping. The system verifies photos and identifies public issues like potholes, trash buildup, and damaged infrastructure using artificial intelligence techniques. To prevent repeated reports from the same location, duplicate complaint detection is used. An AI-based smart civic complaint management system is presented in this paper with the goal of increasing the effectiveness and dependability of public issue reporting. In order to ensure authenticity and minimize false reports, the system enables citizens to submit complaints along with visual or video evidence. The precise location and time of the complaint submission are recorded using automatic geotagging and timestamping. The system verifies photos and identifies public issues like potholes, trash buildup, and damaged infrastructure using artificial intelligence techniques. To prevent repeated reports from the same location, duplicate complaint detection is used.

## I. INTRODUCTION

Urban areas frequently have civic issues like potholes, trash buildup, and damaged infrastructure. Authorities find it challenging to react effectively due to the slowness and lack of appropriate verification of traditional complaint systems. A lot of complaints are filed without supporting documentation, which results in inaccurate or redundant reports.

An AI-based civic complaint management system that enables users to file complaints with photo or video evidence is proposed in this paper. Using artificial intelligence methods, the system automatically records location information and classifies complaints. Additionally, users can monitor the status of complaints in real time, which enhances openness and communication between the public and government.

## II. SYSTEM ARCHITECTURE

The client-server architecture of the suggested system is founded on the full-stack development paradigm. Frontend, backend, database, AI modules, and cloud storage services make up this system.
React.js is used in the frontend development to create an intuitive interface for tracking and submitting complaints. The application uses JSON-formatted REST APIs to communicate with the backend. Python frameworks like Flask and Django are used in the development of the backend to handle complaint data and process requests.
Details of complaints and user information are stored in a NoSQL database. User-uploaded photos and videos are safely kept in cloud storage. The location of complaints is automatically recorded through the integration of GPS and map services.
Image verification, the identification of duplicate complaints, and the automatic classification of complaints all make use of artificial intelligence techniques. Token-based authentication and secure communication protocols are used to guarantee security.

## III. PROPOSED SYSTEM

Using a mobile or web application, citizens can report public issues through the proposed system, which is an AI-based civic complaint management platform. Users can file complaints by providing supporting documentation, such as pictures or videos. To guarantee accurate reporting, the system automatically logs the submission location and time.
Artificial intelligence methods are employed to classify complaints into various departments and validate uploaded images. Additionally, the system uses image and location similarity to identify duplicate complaints. Authorities can handle and update complaints via a separate dashboard interface, while users can monitor the status of complaints in real time.

## IV. SYSTEM FEATURES

A number of features in the suggested system increase the effectiveness and dependability of reporting civic complaints. When filing complaints, users must include photo or video proof. This guarantees the authenticity of the complaints and makes it easier for authorities to confirm problems.
Using GPS integration, the system automatically records the location and time of the complaint submission. In order to analyze uploaded images and detect civic issues, artificial intelligence techniques are employed. Additionally, the system reduces repeated reports by identifying duplicate complaints by comparing location and issue details.
Complaints are automatically sorted into different departments like roads, sanitation, and streetlights. Users can track the status of their complaints in real time. Authorities can update progress through a separate dashboard. Cloud storage keeps multimedia files secure, and token-based authentication provides safe access to the system..

## VI. DATABASE DESIGN

The system uses a NoSQL database to store user information and complaint data. Each complaint record has details like user ID, complaint category, location coordinates, date and time, and complaint status. The database structure allows efficient storage and retrieval of complaint information. Cloud storage holds images and videos uploaded by users. This setup improves scalability and lets the system manage large amounts of multimedia data. The database connects to the backend server through REST APIs for effective data communication. Good data management ensures that complaint information is stored securely and can be easily accessed by authorized users. This increases system reliability and performance.

## V. AI MODEL IMPLEMENTATION

The proposed system uses artificial intelligence techniques to improve the accuracy and reliability of complaint verification. A convolutional neural network (CNN) based image classification model analyzes uploaded images and identifies civic issues like potholes, garbage accumulation, and damaged infrastructure. The model is trained with labeled datasets of various civic problems. The system also employs text classification to analyze the descriptions of complaints provided by users. Natural language processing methods identify keywords and classify complaints into predefined categories. This approach reduces manual effort and speeds up processing. The system detects duplicate complaints by comparing complaint locations and image features. When similar complaints are found nearby, it avoids creating duplicate entries. This helps authorities focus on unique issues and improves the system's efficiency.

FIGURE 1. LIST OF RECEIVED PROBLEM DATABASE

## VII. ADVANTAGES OF THE PROPOSED SYSTEM

The proposed system has several benefits over traditional complaint management systems. Using image and video evidence enhances the credibility of complaints and cuts down on false reports. Automatic location capture helps identify problems accurately. Techniques involving artificial intelligence make it easier to verify complaints and lessen the manual work needed by authorities. Detecting duplicate complaints prevents repeated reports from the same location. Real-time status tracking increases transparency and boosts user satisfaction. Cloud storage allows the system to scale up effectively and manage large amounts of data efficiently. The system offers a clear communication platform between citizens and authorities, which improves the overall process of resolving complaints.

Duplicate complaint detection stops repeated reports from the same place. This lightens the workload for authorities and improves system efficiency.

Cloud storage lets the system keep large amounts of multimedia data safe. The system design is flexible and can handle many users.

Artificial intelligence techniques improve complaint verification and reduce manual work. Automatic categorization

helps send complaints to the right department.

## VIII. WORKING METHODOLOGY

The process of the proposed system starts when a user logs into the application with secure authentication. Once logged in, the user can file a complaint by describing the issue and uploading an image or video as proof. The system automatically records the GPS location and timestamp of the complaint to ensure proper reporting.

Once the complaint is submitted, the backend server processes the data and stores it in the database. The uploaded image is checked by the artificial intelligence model to confirm if the complaint outlines a real civic issue. If the image is valid, the complaint is accepted and sorted into the right department, such as roads, sanitation, or streetlights.

The system checks for duplicate complaints by comparing location details and complaint categories. If a similar complaint already exists in the same area, the system links the new complaint to the existing record instead of creating a new entry.

After verification, the complaint is sent to the authority dashboard. Officials can review and update the status of the complaint. Users can track the progress of their complaints through the monitoring system until the issue is resolved.

FIGURE 2. SYSTEM ARCHITECTURE

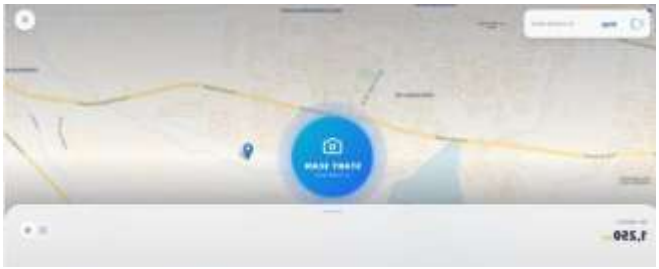


FIGURE 3. CITIZEN LOGIN PAGE

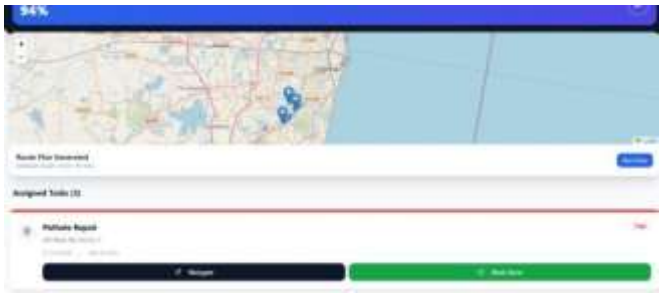


FIGURE 4. TASK ASSIGNMENT PAGE

## IX. SYSTEM IMPLEMENTATION

The team developed the proposed system with a full-stack development approach. They designed the frontend using React.js to create a simple, user-friendly interface. Users can submit complaints by entering a description and uploading an image or video as evidence. The interface also lets users track the status of their complaints in real time.
The system's backend was built with Python frameworks like Flask and Django. It manages user authentication, complaint submission, and data processing. REST APIs facilitate communication between the frontend and backend using JSON format. This setup keeps the system flexible and simple to maintain.
A NoSQL database like MongoDB or Firestore stores complaint information and user details. It keeps data such as the complaint category, location, description, and status. Images and videos uploaded by users are safely stored in cloud storage services.
Location services are built into the system to automatically record user locations when they submit a complaint. The GPS coordinates collected allow authorities to pinpoint the exact spot of the issue.
Artificial intelligence models are included in the system to check images and sort complaints automatically. These models help boost the efficiency and accuracy of the system.

## X. TECHNOLOGIES USED

The proposed system uses modern web technologies and artificial intelligence tools to ensure efficient performance. The application's frontend is developed with React.js, which provides a dynamic and responsive user interface. React allows for faster rendering of components and improves the user experience.
The system's backend is built with Python frameworks like Flask or Django. These frameworks handle user requests and communicate with the database effectively. The backend server processes complaint data and interacts with artificial intelligence modules. REST APIs enable communication between the frontend and backend components. Data is sent in JSON format, which is lightweight and easy to work with. This method boosts the system's flexibility and scalability.

Cloud storage services store images and videos uploaded by users. This reduces server load and improves system performance. Using cloud technology lets the system support large numbers of users.
The system also includes location services that use GPS technology. This enables automatic capture of the user's location when submitting a complaint.

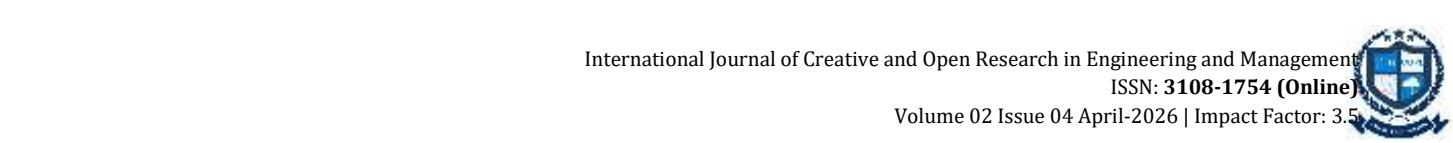
## XI. SECURITY MECHANISM

Security is a key part of the proposed system. The system uses secure authentication methods to protect user data and stop unauthorized access.Users must create an account and log in before submitting complaints. Token-based authentication verifies user identity. This makes sure that only authorized users can access the system.
The system uses secure communication protocols to protect data transmission between the client and server. All data exchanged between the frontend and backend is encrypted to stop unauthorized access.
User information and complaint data are stored securely in the database. Only authorized administrators can access the database.
Cloud storage services provide secure storage for uploaded images and videos. This keeps data safe and reliable.
These security measures keep the system safe and dependable for public use.

## XII. USER INTERFACE DESIGN

The user interface of the system is simple and easy to use. It has a clean layout that lets users move easily between different sections of the application.

The complaint submission page lets users enter details about their complaints and upload images or videos. The



interface offers clear instructions to help users submit their complaints.

The complaint tracking page lets users check the status of their complaints. They can see details like the complaint category, submission date, and current status. The authority dashboard offers tools for handling complaints. Authorities can access complaint details, verify images, and change the complaint status.

The interface design makes it easier to use the system. It helps users navigate without facing technical problems.

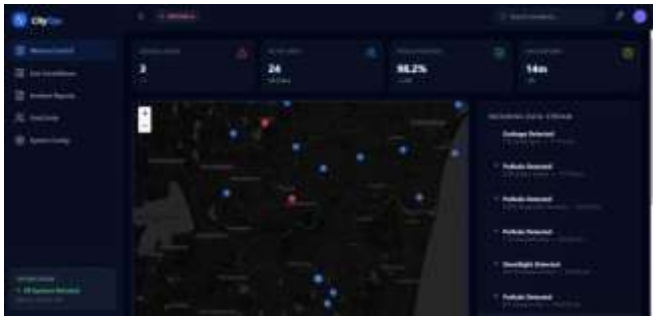


FIGURE 5. GEOSPACIAL VISUALIZATION OF PROBLEM AREAS

FIGURE 6. MAP VISUALIZATION

## XIII. PERFORMANCE ANALYSIS

The performance of the proposed system was evaluated by testing various complaint submissions. The system processed complaints efficiently without significant delays. We tested the response time during complaint submissions and status tracking. The system quickly responded to user requests thanks to effective backend processing and cloud storage integration.

The artificial intelligence model processed uploaded images quickly. This allowed for fast verification of complaints. The system was also tested with several users submitting complaints at once. It managed multiple requests without failing. The results indicate that the system works well and can support real-world application.

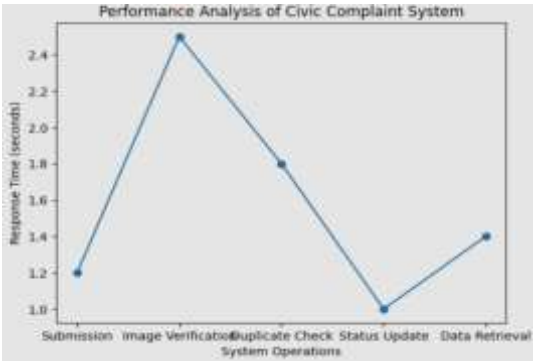



FIGURE 6

KEY METRICS

managing public issues easier. The system lets citizens submit complaints along with image or video evidence, making it easier to verify that the issues are legitimate. Automatic geo-tagging and timestamping help authorities pinpoint the exact location of problems so they can respond more quickly. AI techniques were used for image verification, detecting duplicate complaints, and automatically categorizing complaints. These features cut down on manual work and make the complaint management process more efficient overall. The system also offers real-time complaint tracking, which enhances transparency and builds trust between citizens and authorities.

The system was built with modern web technologies and cloud storage services, which makes it scalable and reliable. Performance analysis showed that the system can handle complaints efficiently with low response times. This system can be used in smart cities to improve public service management and communication between citizens and government authorities. Future improvements could include developing a mobile application and using advanced artificial intelligence models to further improve

*A.* Response Time:

Response time measures how quickly the system handles user requests, such as complaint submission, image verification, and status updates. The system showed a low response time for most operations, which indicates efficient performance.

*B.* Accuracy:

Accuracy refers to how correctly the artificial intelligence model identifies civic problems from uploaded images. The model detected common issues, such as potholes and garbage, with good accuracy.

*C.* Duplicate Detection Rate:

This metric measures how well the system finds duplicate complaints from nearby locations. The system successfully identified repeated complaints and avoided unnecessary entries.

*D.* System Reliability:

Reliability measures how consistently the system operates without errors. The system was tested with multiple complaint submissions and showed stable performance.

*E.* Data Processing Speed:

Data processing speed indicates how fast the backend server processes complaint data and stores it in the database. The system processed complaint data efficiently with minimal delay.

*F.* User Satisfaction:

User satisfaction was evaluated based on how easy it was to submit complaints and track their status. The system interface allowed users to submit.

## XIV. CONCLUSION

This paper presented a civic complaint management system that uses artificial intelligence to make reporting andsystem performance and usability..

REFERENCES

[1] Y. LeCun, Y. Bengio, and G. Hinton, "Deep learning," Nature, vol. 521, no. 7553, pp. 436–444, 2015.

[2] J. Redmon, S. Divvala, R. Girshick, and A. Farhadi, "You Only Look Once: Unified real-time object detection," in Proc. IEEE Conf. Computer Vision and Pattern Recognition, 2016, pp. 779–788.

[3] T. Chen and C. Guestrin, "XGBoost: A scalable tree boosting system," in Proc. ACM SIGKDD Int. Conf. Knowledge Discovery and Data Mining, 2016, pp. 785–794.

[4] Google Developers, "Google Maps Platform Documentation," 2023. [Online]. Available: https://developers.google.com/maps

[5] MongoDB Inc., "MongoDB Database Documentation," 2023. [Online]. Available: https://www.mongodb.com/docs

[6] Amazon Web Services, "Amazon S3 Cloud Storage Service," 2023. [Online]. Available: https://aws.amazon.com/s3

[7] M. Abadi et al., "TensorFlow: Large-scale machine learning on heterogeneous systems," 2016.

[8] A. Sharma and P. Gupta, "Smart civic issue reporting system using web applications," International Journal of Engineering Research and Technology, vol. 9, no. 4,
pp. 210–214, 2020.