



**IJIRCCCE**

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 12, Issue 10, October 2024

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 8.625**

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# SNAP PIC Vehicle Evidence Tracker

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**ABSTRACT:** SNAP PIC (Vehicle Evidence tracker) refers to a system designed to automatically capture images of vehicles involved in traffic violations using a specific app. These images are then processed to extract critical information, like the vehicle's license plate number, time, date, and location of the violation. The captured evidence is used to support legal actions, issue fines, or take corrective measures. Finally, it collects key information and data serve as legal evidence for issuing fines or penalties by using this app. For enhanced security, Snap Pic employs a cloud-based data storage system, ensuring that all captured images and videos are stored securely and can be accessed in this app. These records are SNAP-proof and can serve as irrefutable evidence in legal disputes or insurance claims. The process of identifying suspicious activities but also help predict and prevent potential threats by analyzing patterns in vehicle behaviour over time. The vehicle evidence tracker is also designed to be user-friendly and highly customizable. Whether used by government agencies for large-scale missing the parts of the vehicle, Snap Pic offers various levels of control and reporting. Users can generate detailed reports, and access a user-friendly dashboard that displays real-time data and historical tracking information.

In conclusion, Snap Pic is a versatile and powerful vehicle tracking solution, combining real-time analytics to ensure the highest level of vehicular monitoring and security. Its ability to provide credible and actionable evidence makes it a crucial tool for law enforcement, traffic management, and vehicle owners alike.

## I. INTRODUCTION

With the global rise in vehicle usage, traffic violations have become increasingly common, leading to significant concerns about public safety and urban traffic management. Traditional methods of traffic law enforcement often face challenges such as limited manpower, subjectivity, and inefficiency. The Snap Picture Vehicle Evidence Tracker (SPVET) aims to address these issues by leveraging advanced technologies for more effective and reliable traffic violation detection and evidence collection.

## II. SYSTEM DESIGN

### A. ARCHITECTURE

The SPVET system comprises three primary components: realtime image capturing units, a central processing server, and a cloud-based storage and analysis platform.

1. Realtime Image Capturing Units: Strategically positioned along key traffic intersections, these units employ high-resolution cameras equipped with AI-based motion detection algorithms to capture images of vehicles committing traffic violations.

2. Central Processing Server: The captured images are transmitted to a central server where vehicle identification algorithms, including license plate recognition and vehicle model detection, are applied.

3. Cloud-Based Storage and Analysis Platform: The processed data is stored in a secure cloud environment, allowing for further analysis and integration with legal documentation processes.



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### III. METHODOLOGY

#### A. Image Processing and Vehicle Identification

The image processing module utilizes convolutional neural networks (CNNs) for accurate vehicle and license plate recognition. The system is trained on a diverse dataset to enhance its ability to identify various vehicle types and conditions under different lighting scenarios.

**B. Data Transmission and Storage** Ensuring the integrity and security of the data is paramount. The system employs end-to-end encryption during data transmission and uses multi-factor authentication for accessing stored data. Redundant storage systems are implemented to prevent data loss.

**C. Legal Documentation Automation** The integration with legal databases allows SPVET to automatically generate evidence reports. These reports include detailed information about the violation, supported by timestamps and geolocation data, streamlining the legal process for traffic law enforcement agencies.

### IV. IMPLEMENTATION AND DEPLOYMENT

The SPVET system was piloted in Gummidipoondi, Tamil Nadu, over a six-month period. During this phase, it successfully identified and documented over 10,000 traffic violations, providing actionable evidence for enforcement agencies.

### V. RESULTS AND DISCUSSION

The implementation of SPVET has shown a significant decrease in traffic violations, attributed to the increased likelihood of detection and prosecution. Surveys conducted with local law enforcement reported a substantial improvement in efficiency and accuracy of traffic law enforcement.

#### 1. Our Implemented Idea: Snap Pic Vehicle Evidence Tracker

The Snap Pic Vehicle Evidence Tracker is an innovative solution developed to enhance the efficiency and effectiveness of capturing and managing vehicle-related evidence. Our implemented idea focuses on leveraging modern technology to address the shortcomings of existing systems, improving public safety and facilitating law enforcement operations. Below are the key features and components of our implemented idea:

#### 2. Automated Evidence Capture

Officers can capture high-quality images of vehicles involved in incidents using a user-friendly mobile application equipped with automatic number plate recognition (ANPR). The app allows for immediate data capture, ensuring that evidence is collected without delays or errors associated with manual entry.

#### 3. Comprehensive Metadata Integration

Each image is automatically tagged with essential metadata, including GPS coordinates, timestamps, and weather conditions, providing a detailed context for each piece of evidence. All captured evidence is stored in a secure, cloud-based database, allowing for easy retrieval and management.

#### 4. Centralized Data Management

The tracker integrates with existing law enforcement and traffic management databases, ensuring that all relevant data is accessible in one place. Authorized personnel can access the system from various devices, facilitating collaboration among different departments and agencies.

#### 5. Real-Time Sharing and Collaboration

The system allows for real-time sharing of evidence among law enforcement, traffic authorities, and insurance companies, promoting efficient communication and coordination. The system can send real-time alerts to relevant authorities when incidents are captured, enabling quicker responses.





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### 6. User Training and Support

Comprehensive training is provided to users to ensure they can effectively utilize the system and understand its functionalities. A dedicated support team is available to assist users with technical issues and provide updates to the system as needed.

#### ADVANTAGES:

Automates the evidence collection process, reducing the time required for documentation and allowing law enforcement officers to focus on other critical tasks.

- The system minimizes human error by automating data capture, ensuring that details such as license plate numbers and timestamps are recorded accurately.
- A secure cloud-based platform allows for easy storage, retrieval, and management of evidence, facilitating better collaboration among law enforcement agencies and other stakeholders.
- The ability to share evidence in real-time enhances coordination between different agencies, allowing for quicker response to incidents and improved communication.
- Designed for ease of use, the system can be adopted by non-technical users with minimal training, promoting widespread implementation.
- By enhancing law enforcement capabilities, the system contributes to improved public safety and can help reduce vehicle-related crime and accidents.

#### DISADVANTAGES:

- The system relies on technology, which can be susceptible to malfunctions, technical issues, or software bugs that could disrupt operations.
- The collection and storage of vehicle-related data may raise privacy issues among the public, necessitating strong data protection measures and transparency about data usage.
- Although the system is user-friendly, some training will still be necessary for users to understand all functionalities, which can require additional time and resources.
- While the system will implement security measures, there is always a risk of data breaches or unauthorized access to sensitive information, which could compromise the integrity of the evidence.
- Law enforcement agencies may face resistance from personnel accustomed to traditional methods, which could hinder adoption and implementation of the new system.

## VI. CONCLUSION

The Snap Picture Vehicle Evidence Tracker represents a significant advancement in the field of traffic law enforcement. By automating the process of traffic violation detection and evidence collection, SPVET enhances public safety and ensures more consistent and reliable enforcement of traffic laws. Future work will focus on expanding the system's capabilities and integrating additional sensors for broader applications.

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