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Research on the application of ALPR technology in the police system related to criminal law issues

Zhang Ying [1], Chuluunbat Sharkhuu [2]

Ikh Zasag International University, Mongolia

[1]Ph.D.candidate,[2]Corresponding Author

Abstract

The ALPR technology, as a key tool for smart policing, significantly enhances the efficiency of crime detection and traffic management through its powerful capabilities of instant capture, identification, and in-depth excavation of vehicle information. However, on the other hand, the characteristics of large-scale data collection and long-term tracking of travel trajectories may potentially exceed the legitimate scope of criminal investigations, thereby triggering potential risks at the criminal law level, such as invasion of citizens' privacy and abuse of power. Striking a sophisticated balance within the framework of criminal law between the empowerment brought by technological advancement and the protection of civil rights undoubtedly represents a significant issue that urgently needs to be addressed in the field of criminal justice in the context of the digital age.

Keywords

law,ALPR technology ,Policing system .

1. Introduction

Under the strong impetus of artificial intelligence technology, Automatic License Plate Recognition (ALPR) systems have been deeply embedded in law enforcement work, greatly enhancing the effectiveness of crime fighting through a series of high-tech means such as real-time monitoring and trajectory tracing. However, at the same time, issues related to indiscriminate collection of massive vehicle data and erroneous accountability due to algorithmic misjudgments have become increasingly prominent. Coupled with the continuous expansion of investigative powers under the guise of technological innovation, these challenges are severely impacting the legal boundaries concerning the crime of infringing on citizens' personal information (Article 253) and the crime of abuse of power (Article 397) in the Criminal Law. When technological logic collides with procedural justice, reconstructing the compliance system for the use of ALPR technology in the criminal field has become a key issue in balancing public safety and the rights of the populace. This article explores the pathways for the transformation of technological regulation into a rule of law, centered around the core ideas of checks and balances and clear responsibilities.

2. Application characteristics of ALPR technology in policing scenarios

2.1. The dual nature of the application of technology

The ALPR system works closely with image recognition algorithms and a huge database to quickly match important info like stolen vehicles and vehicles driven by fugitives. Our country's "Sky Net" project has successfully connected over 30 million surveillance cameras and processes around a billion vehicle data entries daily (according to data from the Ministry of

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Public Security in 2022). While this project strengthens public safety, it has also sparked discussions about protecting citizens' privacy.

2.2. Technical extension of criminal power

Traditional investigation methods are often constrained by time and space, whereas the application of Automatic License Plate Recognition (ALPR) technology endows the police with the powerful capability to trace vehicle movement trajectories without temporal limitations. For instance, in 2021, the Guangzhou police successfully tracked and dismantled an inter-provincial drug trafficking network by retrieving ALPR information of the suspect vehicle from the past six months. This ability for "data deep mining" essentially represents a crossing and expansion of the boundaries of traditional investigation methods.

3. The core criminal law conflict raised by ALPR technology

3.1. Breaking the boundaries of personal information protection

The vehicle movement tracks captured by automatic license plate recognition (ALPR) technology fall under the category of "movement track information" as defined in Article 28 of the Personal Information Protection Law and are considered highly sensitive personal data. However, according to Article 150 of the Criminal Procedure Law, public security organs have the right to collect such data without notification while performing technical investigation tasks. In 2023, the police in a city in Zhejiang Province retrieved three months' worth of vehicle movement tracks of citizens unrelated to a theft case they were investigating, which has been criticized as potentially violating the principle of proportionality in the law.

3.2. The imputation dilemma of algorithmic misjudgment

It's worth noting that ALPR systems carry a risk of misidentification in real-world applications, with an average error rate of about 2%. In 2022, there was an incident in Zhengzhou where the ALPR system wrongly matched a license plate number, leading the police to mistakenly pursue an innocent car owner, resulting in them suffering three days of wrongful detention. According to Article 243 of the Criminal Law of the People's Republic of China, if law enforcement officers know that the system has flaws but still use the data, their actions may be considered abuse of power; if they neglect to verify the information, they could be charged with dereliction of duty.

3.3. The legitimacy crisis of data sharing

When public security agencies share automatic license plate recognition (ALPR) data with commercial platforms like map navigation services, if they fail to adequately anonymize the data, they could face charges for "illegally providing personal information of citizens" under Article 253-1 of the Criminal Law. Looking back at 2020, there was an incident of a data exchange violation between the traffic police in a certain area and a car-sharing company, involving up to five million pieces of vehicle travel trajectory information, and the responsible personnel were legally held accountable for it.

4. The path of criminal law regulation for the application of ALPR technology

4.1. Establish a hierarchical authorization and review mechanism

Data utilization will be implemented with hierarchical management. In accordance with the provisions for technical investigation stipulated in the Criminal Procedure Law, we categorize the application of ALPR data into three levels: 1. Real-time monitoring level, which requires formal authorization from the People's Procuratorate; 2. Historical trajectory retrieval level,

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which necessitates approval from leaders of public security organs at or above the county level; 3. Data intercommunication level, which explicitly prohibits the direct provision of raw data to any commercial entities.

4.2. Improve the system of presumption of fault liability

Burden of proof reversal mechanism: If the automatic license plate recognition system (ALPR) results in a misjudgment, leading to the implementation of improper coercive measures, the investigation agency must provide evidence, in accordance with Article 59 of the Criminal Procedure Law, to prove that it has effectively fulfilled its duty of data review. Principle of joint liability for technology providers: Once it is determined that the algorithm defect is intentionally caused by the technology supplier, penalties will be imposed on their actions of damaging computer information systems in accordance with Article 286 of the Criminal Law.

4.3. Establish a full-cycle data supervision system

Regarding the restrictions on the scope of collection: The installation and deployment of ALPR devices in non-public areas, such as residential communities and other private domains, is strictly prohibited. This measure aims to rigorously adhere to the solemn protection of citizens' residential rights stipulated in Article 39 of the Constitution. As for the retention period regulations: The storage of non-case-related data must be strictly limited to within 30 days (in accordance with the standards set forth in Article 5 of the EU General Data Protection Regulation), while case-related data must be destroyed within six months after the conclusion of legal proceedings.

5. Conclusion

ALPR technology is like a double-edged sword; while it boosts the efficiency of police work, it can also challenge the fundamental principles of criminal law. The criminal justice system needs to rein in the excessive expansion of investigative powers through flexible authorization mechanisms, balance responsibility using the principle of presumption of fault, and implement full lifecycle data supervision to counter systemic risk. Only by establishing a dual regulatory framework that emphasizes both "technological rationality" and "legal rationality" can we achieve a harmonious coexistence of safety and freedom in the transformation process of smart policing.

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lkh Zasag International University.

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