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Review

Current and emerging trends in the use of AI for community surveillance

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Abstract: This study conducted a systematic literature review on current and emerging trends in the use of artificial intelligence (AI) for community surveillance, using the PRISMA methodology and the paifal.ai tool for the selection and analysis of relevant sources. Five main thematic areas were identified: AI technologies, specific applications, societal impact, regulations and public policy. Our findings revealed exponential growth in the development and implementation of AI technologies, with applications ranging from public safety to environmental monitoring. However, this advancement poses significant challenges related to privacy, ethics and governance, driving a debate on the need for appropriate regulations. The analysis also highlighted the disparity in the adoption of these technologies among different communities, suggesting a need for inclusive policies to ensure equitable benefits. This study contributes to the understanding of the current scenario of AI in community policing, providing a solid foundation for future research and developments in the field.

Keywords: artificial intelligence (AI); community surveillance; AI trends; emerging technologies; AI impact; AI regulation

1. Introduction

Citizen security has become one of the main concerns of modern societies and one of the most urgent issues to be resolved in cities. High crime and delinquency rates continue to cause uncertainty among citizens and governments. In countries such as Colombia, according to the Invamer survey, 96% of its inhabitants consider that insecurity has been getting worse (INVAMERS.A.S., 2023). Similarly, according to the survey by the National Institute of Statistics and Geography, the perception of insecurity has increased in Mexico from 65.8% in 2022 to 66.2% in 2023 (INEGI, 2023).

In Ecuador, citizen security has become an issue of great concern due to escalating levels of insecurity that have come to be considered historic. In 2023, an increase in violence has been seen, with alarming rates of violence. This increase in insecurity has led to a climate of distrust and fear among citizens, who expect concrete actions from the authorities to improve security in the country (dialoguemos.ec, 2023). Gallup's Law and Order 2023 report highlights that 65% of Ecuadorians feel unsafe walking alone at night, being surpassed only by three African nations and one Asian nation (Gallup, 2023). This level of perceived insecurity reflects not only the challenge in terms of crime and delinquency, but also in terms of trust towards law forces and the effectiveness of public security policies.

Surveillance present in various contexts and executed by different actors, can be overt or covert, depending on its objectives and intensity. Redundancy in surveillance systems is key to achieve a state of total security, by continuously tracking the identity,

location and activity of objects within the monitored space (Garcia, 2021).

While traditional surveillance systems focus on location and activity, biometric systems specialize in the identification of people. The ability to recognize objects and people, and to describe their actions and interactions from the information collected by sensors, is fundamental to automated visual surveillance (Smith, 2020). In this context, Artificial Intelligence (AI) has emerged as a powerful tool with great potential and a crucial component in the evolution of community or citizen surveillance, transforming the way communities are kept safe and protected.

In recent years, an exponential growth in the development and implementation of AI solutions for community policing has been produced. According to the Global Organized Crime Index, at least 75 of the world's 176 countries are actively investing in and deploying artificial intelligence (AI) for surveillance purposes, primarily in smart cities with facial recognition and smart policing (GI-TOC, 2023). Successful implementation of artificial intelligence in community surveillance requires close collaboration between government, the private sector, and the community. Active citizen participation is essential to ensure that these technological tools are used responsibly and respond to real community needs.

The growing demand for intelligent visual surveillance in commercial, police, and military areas makes automated surveillance systems one of the main application areas of IT today. According to recent data 78.0% of urban areas worldwide are experiencing an increase in demand for more effective and efficient surveillance solutions (PS&Market Research, 2024). This growing need is attributed to several factors, including rapid urbanization, rising crime, and emerging challenges in public security.

Authors such as Smith (2020) and Garcia (2021) have pointed out the critical importance of understanding and analyzing AI trends in community policing. Smith highlights how AI can enhance the ability of surveillance systems to detect and prevent criminal activity. While Garcia highlights the need to address the ethical and privacy implications associated with the implementation of these technologies. On the other hand, Johnson and Reyes (2021) condemn artificial intelligence-based surveillance technologies for their harmful, unexpected, or intentional implications, particularly on the lives of citizens, and their potential to support anti-democratic policies and violations of privacy and human rights principles.

AI offers a wide range of diverse possibilities for community policing in our cities. From predictive algorithms that analyze crime patterns to intelligent surveillance systems that monitor movement in real time. These tools enable faster and more effective response to emergencies.

Some of the most promising applications of AI in citizen surveillance cover a wide range of functions crucial to improving community safety. One of the most prominent areas is crime prevention and predictive analytics. AI algorithms have the ability to analyze both historical and real-time data, enabling them to identify patterns that could indicate areas of risk. This approach enables law enforcement to implement preventive strategies in a more targeted and efficient manner, acting proactively to mitigate potential threats (Smith, 2020).

Another relevant trend is AI-powered facial recognition. It has gained ground as a tool to identify and track suspicious individuals in public environments. This

technology raises important ethical and privacy concerns, as its use can lead to discrimination and abuse if not implemented correctly (Garcia, 2021).

Video analysis is another key function that AI brings to community surveillance. This technology can detect suspicious behavior in real time, such as fights, presence of dangerous objects, theft or criminal activity, and alert authorities immediately. This enables a quick and efficient response to potentially dangerous situations, improving security in monitored areas (Jones, 2019).

Drone surveillance equipped with AI technology has also emerged as a valuable tool for monitoring large urban areas. These drones can provide real-time images that are analyzed by AI algorithms for detection of suspicious activity. This aerial surveillance capability offers a unique and complementary perspective to ground-based surveillance, allowing for broader coverage and more accurate identification of potential threats (Brown, 2020).

Finally, big data analysis is critical to gaining a comprehensive understanding of community safety. The integration of data from various sources, such as security cameras, social networks and government records, allows analysts to obtain a holistic view of crime patterns and trends. This facilitates data-driven decision making, allowing authorities to allocate resources more effectively and anticipate potential security issues (Martinez, 2022).

In this context, the main objective of the present systematic review is to exhaustively explore the latest research, developments and emerging trends in the use of AI for community surveillance, assess its effectiveness and ethical implications, and provide recommendations for the responsible development and implementation of AI in community surveillance. To this end, an exhaustive search in the main bibliographic databases has been carried out, following the PRISMA criteria.

2. Materials and methods

This section describes the systematic literature review (SLR) method employed in this study. An SLR is defined as a process to identify, evaluate, and interpret available research relevant to a specific research question, topic area, or phenomenon of interest (Tebes et al., 2020). This approach was chosen for its ability to provide high quality reviews and for its transparency and replicability.

In addition, SLR is useful for studies with clearly defined research questions and that synthesize large numbers of studies. The reasons for selecting SLR for this study were the following:

- Large amount of literature. The study generated a large amount of literature to analyze.
- Specific research question. The study aimed to answer a specific research question.
- Systematic extraction of references. Relevant AI references were transparently extracted from the studies.
- Rigor and replicability. SR offers rigor and replicability, leading to an unbiased scientific study.

To achieve the objectives of the SLR study, the guidelines suggested by the PRISMA method were followed, which has a structured approach and represents a

transparent and reproducible procedure. It is based on a series of steps described below (Page et al., 2021):

1) Formulation of research questions.
2) Bibliographic search strategies and selection criteria.
3) Quality evaluation.
4) Study selection.
5) Data extraction.

2.1. Formulation of research questions

The first step in the process was to define the research question to be answered by the systematic review. The research question should be clear, concise, and specific. To specify the research questions for this study, the researchers first established the objectives and revolved the research questions around them. The main question is: What are the current and emerging trends in the use of AI for community surveillance, and how are they expected to impact public safety and citizen privacy in the next 5 years?

From this main question the secondary research questions were derived, which were grouped into four clusters: AI technologies (RQ1–RQ3), applications (RQ4); and regulation and policy (RQ5–RQ6). The statements and motivation for each question are presented in **Table 1**.

Table 1. Search and motivation questions.

ID	Search questions	Motivation
RQ1	What AI technologies are currently being used for community surveillance (e.g., facial recognition, video analytics, machine learning)?	• There is a wide range of AI technologies with different advantages and disadvantages. • It is important to understand which technologies are currently in use to assess their potential impact. • AI technologies are constantly evolving and it is necessary to keep up to date. • Understanding AI technologies is crucial for making informed decisions about their use.
RQ2	What are the advantages and disadvantages of each AI technology in this context?	• Each AI technology has its own advantages and disadvantages that must be carefully considered. • It is important to understand the AI advantages to take full advantage of AI capabilities. • Similarly, it is crucial to be aware of the AI disadvantages to minimize potential risks and develop strategies to mitigate them. • Evaluating the advantages and disadvantages of each AI technology will help to make informed decisions about its use in community surveillance.
RQ3	What new AI technologies are being developed for community surveillance and how might they be used in the future?	• The field of AI is constantly evolving, with new technologies being developed all the time. • It is important to be aware of new AI technologies that could impact community surveillance in the future. • Understanding new AI technologies will help policymakers, law enforcement, and the general public prepare for their eventual implementation. • Assessing these technologies will help anticipate and mitigate potential risks associated with their use.
RQ4	In what specific areas of community surveillance is AI being used (e.g., crime prevention, crime detection, traffic management)?	• AI is being used in a variety of areas within community surveillance, each with its own challenges and opportunities. • It is important to understand the different applications of AI to assess its impact on public safety and privacy. • Identifying specific areas of AI use will help to focus research and discussion on AI in community surveillance.
RQ5	How is AI being used to improve the effectiveness of community surveillance?	• AI has the potential to improve the effectiveness of community surveillance in areas such as crime prevention, crime detection, and traffic management. • Understanding how AI is being used to improve the effectiveness of community surveillance is important to assess its impact on public safety. • Identifying the ways in which AI improves the effectiveness of community surveillance will help to justify its future use and development

Table 1. (*Continued*).

ID	Search questions	Motivation
RQ6	What new AI use cases for community surveillance are being explored?	• The field of AI is constantly evolving, with new applications being explored all the time. • It is important to be aware of new AI use cases that could impact community surveillance in the future. • Understanding new AI applications will help policymakers, law enforcement and the general public prepare for their eventual implementation. • Assessing these new use cases will help anticipate and mitigate potential risks associated with their use.

Understanding the current scenario of Artificial Intelligence (AI) in community surveillance is essential to inform decisions related to its development and application. Therefore, the first question posed is crucial, as it provides an essential basis for identifying the technologies with the greatest potential impact on public safety and privacy. The information gathered is vital for guiding decision making on the use and implementation of AI in this area.

1) A full evaluation of AI technologies in community surveillance requires understanding the implications of their use. Therefore, the second question presents itself as a crucial aspect of this analysis. Answering this question will enable policy makers, law enforcement and the general public to better understand the implications of using these technologies in ethical, legal and social terms. This will facilitate an informed debate on the development and implementation of AI in community surveillance.
2) In addition, it is essential to consider future trends in AI and their impact on community surveillance. Therefore, the third question focuses on this proactive perspective, it will allow key stakeholders to prepare for technological advances and their implications on citizen security. The information gathered through this question will contribute to a more effective management of the risks and benefits associated with AI in this area.
3) A robust understanding of the current picture of AI in community surveillance also requires addressing how it is delivering on its promise to improve public safety. Therefore, the fourth question focuses on determining whether AI is achieving this expected goal. The answer to this question will enable policymakers and law enforcement to better assess the benefits and challenges of using AI in community surveillance.
4) However, it is essential to ensure that the use of AI in community surveillance is conducted in an effective, fair, and privacy-respecting manner. Therefore, the fifth question focuses on this crucial aspect, helping to identify the challenges and opportunities presented by AI in this context. The information gathered through this question will contribute to an informed debate on the development and implementation of policies and regulations that ensure ethical and responsible use of AI in community surveillance.
5) In this regard, it is also necessary to consider whether existing regulations and policies are adequate to address the ethical and legal challenges associated with the use of AI in community surveillance. Therefore, the sixth question focuses on assessing the effectiveness of current measures in protecting human rights and civil liberties. The answer to this question will identify the need to update or

modify existing regulations and policies to ensure fair and privacy-respecting community surveillance.

6) In conclusion, addressing these critical questions will provide a more complete understanding of the use of AI in community surveillance and help to ensure its application in an ethical, effective and privacy-respecting manner for the benefit of society as a whole.

2.2. Bibliographic search strategies and selection criteria

In this section the search process was carried out, which considered a set of activities such as selecting libraries, determining the search terms, and retrieving an initial table of the main digital library studies that match the keywords. The following digital libraries were used to find relevant studies:

- IEEE Explorer (www.ieeexplore.ieee.org)
- ACM Digital Library (www.dl.acm.org)
- Science Direct (www.sciencedirect.com)
- SCOPUS (https://www.scopus.com/home.uri)
- WOS (https://apps.webofknowledge.com)

A generally accepted approach to search string strategy is to base the search string on the research questions and include a list of synonyms, abbreviations, and alternative spellings. The search string was used following Boolean practice. The construction of our search terms was defined by using the following procedures that were carried out in the paifal.ai tool.

- Key search phrases derived from the research objectives and research questions were identified.
- New phrases were specified to replace the key phrases.
- Use of relevant and specific search terms for each secondary question.
- Combination of search terms with Boolean operators (AND, OR, NOT) to increase the accuracy.

Finally, the following search query was used: [[All: citizen security] AND [All: artificial intelligence]] OR [[All: citizen surveillance] AND [All: artificial intelligence]] OR [[All: citizen surveillance] AND [All: community surveillance with drones]].

The selection criteria that were taken into account are as follows:

2.2.1. Inclusion criteria

- Relevant studies in the context of artificial intelligence, community surveillance and citizen surveillance.
- Studies written in English.
- Studies published between 2010 and 2024.
- Studies that directly answer one or more of the research questions of this study.
- If studies have been published in more than one journal or conference, the most recent version of the studies was included.

2.2.2. Exclusion criteria

- Duplicate articles
- Studies without focus on AI and surveillance

- Studies without DOI

2.3. Quality evaluation

In addition to the selection criteria, a checklist was implemented to assess the quality of the selected articles and reduce the possibility of bias in the study. This helped to highlight those articles with reliable data. To this end, nine questions directly linked to the aims of the search were proposed, with three potential answers: "Yes" valued at 1.0, "partially" at 0.5, and "No" at 0.0. Thus, it is possible to rate an article from 0, representing the lowest quality, to 10, indicating the highest quality. A minimum acceptance criterion of 5 (50%) was introduced, excluding the studies below this standard. The evaluation was based on the following criteria:

Questions to evaluate the quality of the articles

- Are the various AI technologies used in community surveillance described?
- Are the advantages or disadvantages of AI technologies used in community surveillance described?
- Are new technologies and trends being developed for community or citizen surveillance specified?
- Are use cases of artificial intelligence for surveillance described?
- Are the regulatory and policy frameworks around the use of artificial intelligence in surveillance and citizen security described?

2.4. Study selection

After defining the search strategies and selection criteria for the systematic review, the researchers proceeded to perform these searches on the websites of the selected databases. From the results and using the interface of each database, filters were performed to isolate those articles that were published between January 2010 and February 2024. For the three databases chosen, the use of specific search strings allowed us to generate a preliminary list of studies. After completing the search, the article references were exported to "bib" format files, which were then imported into the Parsifal.ai tool.

Once the article references were added to the tool, a total of 4430 articles were obtained; of which 1346 were from the ACM digital library, 1087 from IEEE Xplore, 474 from ScienceDirect, 1150 from SCOPUS, and, 373 articles from WOS (**Table 2**).

Table 2. Articles by databases.

ID	Data bases	# of Articles
1	ACM Digital Library	1346
2	ScienceDirect	1087
3	IEEE Explorer	474
4	SCOPUS	1150
5	WOS	373

For the final selection of the studies, the following steps were carried out (**Figure 1**):

- In the first step, the tool automatically removed eight hundred and fifty-four articles (1454) duplicates, remaining 2976.
- In the second step, two hundred (702) articles that did not have DOI were eliminated; all the data of the papers were exported from the Parsifal.ai tool in a file in ".csv" format that was edited with MS Excel and a filter was made in the column containing the DOI data.
- In the third step. From the 2274 articles remaining from the previous step, the title, keywords and abstract were examined, excluding 1973 articles because they did not clearly address the application domain of the study, related to artificial intelligence and its applications to community or citizen surveillance; therefore, they had no relevance to our study.
- Finally, in the last step, the quality of the articles was evaluated by reviewing the established quality questions. As a result, 205 articles were excluded from the 301 articles remaining from the previous step that did not reach at least 50% of the required quality, which left 96 articles. In order to reduce bias, the paper selection quality strategy, included a peer reviewed process, where every article in the set of 205 articles was evaluate by a couple of different co-authors, and the percentage by article was calculate as the average of qualification from the reviewers.

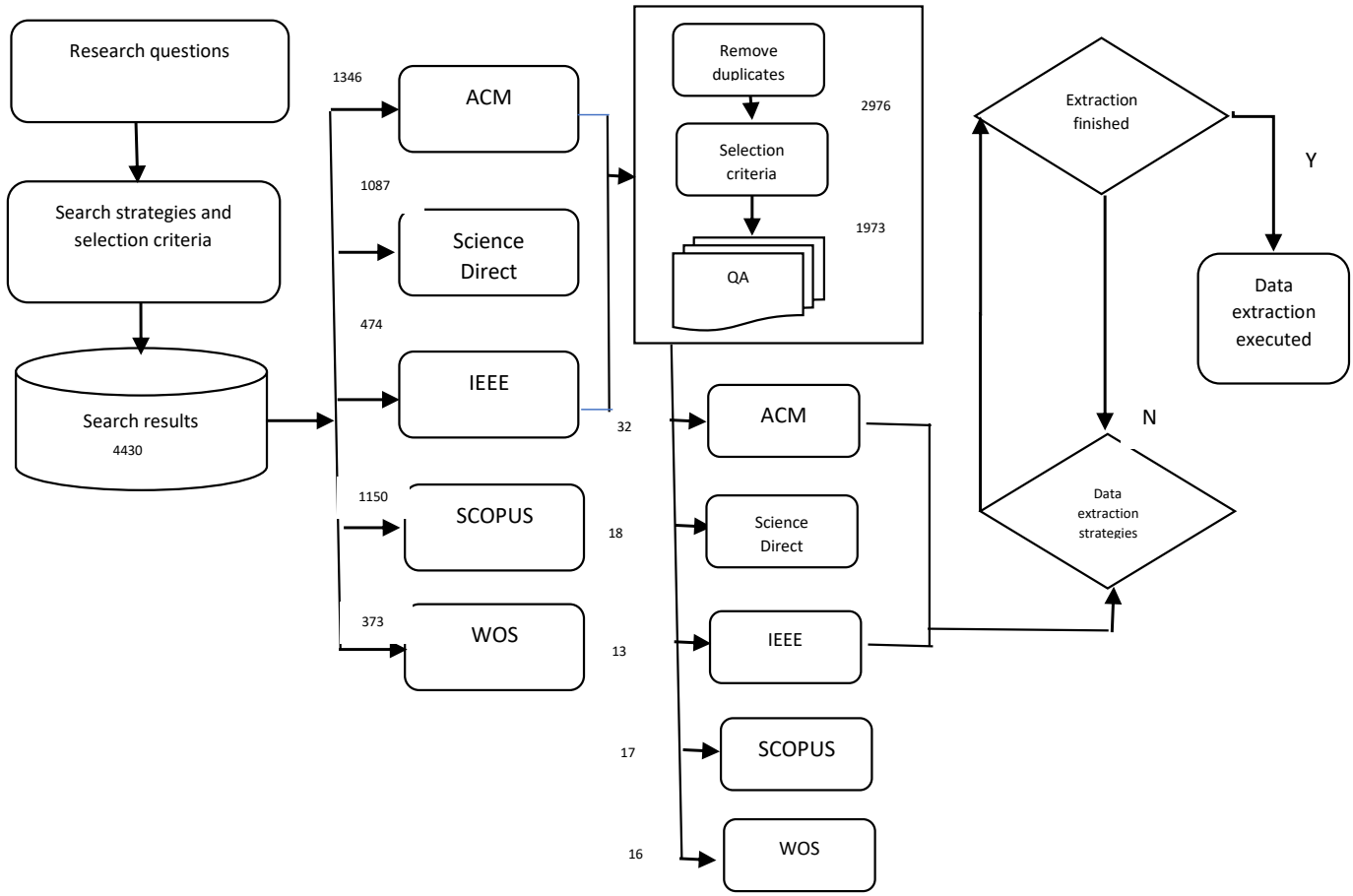

Figure 1. Selection methodology.

2.5. Data extraction

The objective of this phase was to perform an analysis of the final list of publications to extract the information needed to answer our research questions. The data extracted should be relevant to the research question and should be sufficient to perform the intended analysis. In this regard, the following characteristics were recorded in Excel for each article (Appendix):

1) Author(s)
2) Title
3) Year of publication
4) Subject area
5) Source of publication

3. Results

The research trends from 2010 till 2024, have been increased with exponential trend specially from 2018 (**Figure 2**), this trend was pushed by the influence of COVID-19 pandemic, since, the use of technologies around the word was increased at least in five in developed countries and ten years forward in the developing countries (OCDE, 2021). Additionally, the artificial intelligence set a milestone for solving in a record time COVID-19, since, several AI-driven modeling platforms were used to accelerate drug design as well as vaccine design research for COVID-19 (Bali and Bali, 2020).

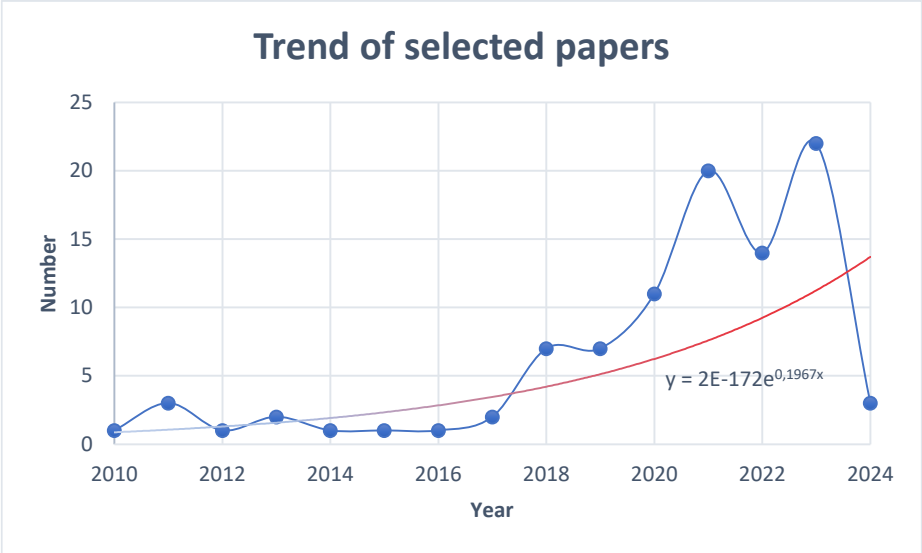

Figure 2. Research trends.

The increasing of use of intelligent technologies, reveled new issues where the IT tech could be needed, therefore the research in the specialist database in tech as Artificial Intelligence and related (ACM) presented the most concentration of publications (**Figure 3**).

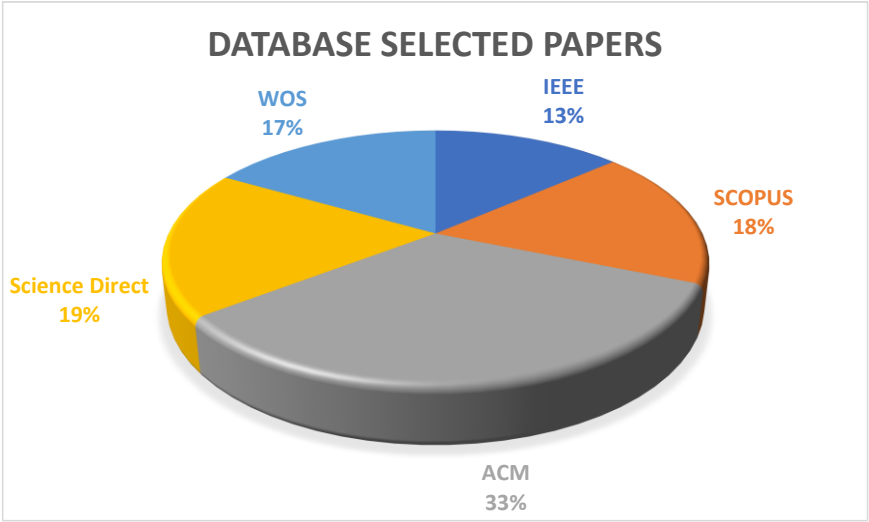

Figure 3. Concentration of publications.

4. Discussion

This research tries to discover techs that could helping to improve the surveillance in the developing countries specifically in Ecuador, as we know, AI offers a wide range of diverse possibilities for community policing in our cities, from predictive algorithms that analyze crime patterns to intelligent surveillance systems that monitor movement in real time, in this context , the literature review conducted on AI technologies used in community surveillance and their future developments shown: The use of drones for surveillance purposes, has revealed significant results. The studies highlight the increasingly prominent role of facial recognition, real-time video analysis and machine learning-based systems in improving community safety. These technologies offer the ability to process and analyze large volumes of visual data, facilitating the identification and tracking of suspicious activity in an efficient manner [S3] [S5] [S23]. However, the literature also highlights privacy concerns and the risk of algorithmic biases that can lead to erroneous or unfair identifications [S76].

The review reveals a growing interest in the integration of drones equipped with AI into surveillance strategies. These aerial devices not only extend monitoring capabilities to hard-to-reach areas and large extensions of territory, but can also be equipped with advanced technology to perform specific tasks, such as thermal detection and real-time motion pattern analysis. The flexibility and mobility of drones represent a significant advance in surveillance, enabling rapid and adaptive responses to emergency situations. However, the use of drones has also generated debates on the need for stricter regulations to protect citizens' privacy and avoid abuses in their application [S7] [S30] [S80] [S76].

Future studies on new AI technologies in the field of community surveillance aim at an evolution towards more autonomous and adaptive systems, capable of proactively predicting and responding to security threats. The combination of AI with emerging technologies such as cloud computing, big data and the Internet of Things (IoT) is expected to unlock new possibilities for intelligent surveillance[S13] [S22] [S28].

The use of artificial intelligence (AI) in community surveillance has explored in

depth critical areas including the specific applications of these technologies, their impact on public safety and privacy, as well as the ethical and legal implications of their implementation. The next paragraph related detailed the response to research questions posted.

In regard [RQ1]: What AI technologies are currently being used for community surveillance (e.g., facial recognition, video analytics, machine learning) and RQ2: What are the advantages and disadvantages of each AI technology in this context? In this sense, [S41, S48, S63] paper pointed the application of Facial Recognition Tech in Saudi Arabian, Huancayo City-Peru, and 33 listed firms from nine countries, and their mentions, the traditional methods of facial recognition can only address one aspect including pose, expression, and illumination at a single point in time, rather than multiple aspects, but, deep leaning methos can effectively identify faces in large-scaled and more crowded locations, therefore these tech could address the urban safety from different perspectives, the safety concerns increasing significantly. Furthermore, [S87] mentioned the most critical areas where AI has made significant progress is in public safety, as well privacy risks due to personally identifiable information storage, necessitating privacy-preserving design choices that may impact accuracy and latency. Implementing [S86], in the same sense, [S2] reported the technology in crime prevention is more and more frequent and that its greater application could contribute to the reduction of crime, the opinion is sharing with [S6] [S7] [S11].

In respect with the database publication source the most quantity of paper selected are related with the new AI technologies in different scenario, therefore follow the RQ3 “What new AI technologies are being developed for community surveillance and how might they be used in the future?”, and RQ4 “In what specific areas of community surveillance is AI being used (e.g., crime prevention, crime detection, traffic management)?”, the review reveals, the most common are artificial intelligence tools are Data Mining, Machine Learning, Bigdata, Operational Research, Satellites, Robotics and camera [S42] [S36], also neural networks [S3] and image processing [S4] are applied. AI tools preferably has been implemented in smart cities, since the smart cities characteristics allows introduce easily these tech [S9, S16–S20, S25, S26, S33, S38, S40, S44, S45, S54, S59, S66, S69, S70, S77], in this arena the RQ4: “How is AI being used to improve the effectiveness of community surveillance?” and RQ5: “What new AI use cases for community surveillance are being explored?” are responding in agree with [S79, S85, S94, S96] they mentioned that common area to enforce for adopt AI tech are the cybersecurity, integration into law enforcement practices, offering insights into future developments and recommendations for policymakers, law enforcement agencies, and stakeholders; fully capitalize on the potential of AI in IT, collaboration between stakeholders, including policymakers, industry leaders, and researchers, will be crucial. By proactively addressing the challenges and leveraging AI’s capabilities, we can create a future where Artificial Intelligence empowers humanity to achieve unprecedented progress in the digital age; and the future of data processing by AI software must be monitored closely and it must be made sure that peoples’ right to privacy is not being harmed by this new technology.

From this review, clear trends and areas of concern have been identified that require attention by developers, policy makers and society in general as.

4.1. Specific applications of AI in community surveillance

The implementation of AI in community surveillance embraces a variety of technologies, each with its own applications and potential benefits. Facial recognition and video analytics are two of the most prevalent technologies, enabling rapid identification of individuals of interest and real-time monitoring of suspicious behavior or activity. In addition, machine learning systems have been used to predict crime patterns, optimize police resource allocation, and improve urban traffic management. Although these applications promise to significantly improve security and surveillance efficiency, they have also raised significant concerns regarding accuracy, algorithm bias, and invasion of individual privacy.

4.2. AI impact on public security and privacy

The use of AI in community surveillance has the potential to enhance public safety by providing authorities with more effective tools for monitoring and rapid response to incidents. However, this development is not exempt from significant risks to citizens' privacy, since extensive collection and analysis of personal data could lead to mass surveillance and the erosion of civil liberties. Discussions around this issue highlight the need to find an adequate balance between security benefits and the protection of privacy and individual rights.

4.3. Ethical and legal concerns and regulatory framework

The review highlights a growing concern about the ethical and legal implications of the use of AI in surveillance, particularly with regard to privacy, consent, and equity. The possibility of bias in algorithms and the lack of transparency in its operation raise serious ethical dilemmas. In addition, the regulatory framework currently operating in many countries is considered insufficient to address these new technologies, which suggests the urgency of developing legislation and regulations that effectively address the challenges presented by AI.

4.4. Recommendations for regulation and policies

Based on the findings of the review, it is strongly recommended that a robust regulatory framework be created to ensure that AI technologies are used in a way that respects privacy and human rights. This includes specific legislation for AI-based surveillance, clear criteria for informed consent, and mechanisms for accountability and independent review. It is also suggested to encourage public participation in discussions about how AI should be implemented in community surveillance, to ensure that policies reflect a balance between security and privacy in accordance with societal values.

Finally, we should note that while AI presents significant opportunities to enhance community surveillance and, by extension, public safety, it is imperative that its implementation be accompanied by careful analysis of the ethical implications, the creation of an appropriate legal framework, and the development of policies that effectively balance the benefits of these technologies with the protection of privacy and the fundamental rights of individuals. Collaboration among technologists, policymakers, academics, and civil society will be crucial to navigate these challenges

and ensure that the future of community surveillance serves the public welfare without compromising democratic and ethical principles.

5. Conclusions

The systematic review has identified the following trends:

- Exponential growth in the development and implementation of AI solutions for citizen surveillance.
- The most relevant applications of AI for citizen surveillance are facial recognition, video analysis, crime prediction and data analysis.
- The main challenges of using AI for citizen surveillance are privacy, transparency, bias, and cost.
- The future prospects for AI for citizen surveillance are positive, but it is important to use it responsibly and ethically.

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Appendix

ID	Title	Year	Author(s)	Subject area	Source of publication
S1	Real-World Community-in-the-Loop Smart Video Surveillance System	2023	(Yao, y otros, 2023)	AI technologies, applications	ACM
S2	Technology and crime prevention: A systematic review of literature	2021	(Soto, Riega-Virú, & Lara, 2021)	AI technologies, applications, regulation and policy	ACM
S3	The implementation of an intelligent and video-based fall detection system using a neural network	2014	(Alhimale, Zedan, & Al-Bayatti, 2014)	AI technologies, applications	ACM
S4	Privacy Preserving Face Recognition Utilizing Differential Privacy	2020	(Chamikara, Bertok, Khalil, Liu, & Camtepe, 2020)	AI technologies, applications	ACM
S5	Comprehensive systematic review of information fusion methods in smart cities and urban environments	2024	(Fadhel, y otros, 2024)	AI technologies, applications	ACM
S6	Urban Security System Based on Quadrants	2015	(Gómez, Hernández, & Cobo, 2015)	AI technologies, applications	ACM
S7	A thorough examination of smart city applications: Exploring challenges and solutions throughout the life cycle with emphasis on safeguarding citizen privacy	2023	(Xia, Semirumi, & Rezaei, 2023)	AI technologies, applications, regulation and policy	ACM
S8	The strategic use of AI in the public sector: A public values analysis of national AI strategies	2024	(Torfason & Thor, 2024)	AI technologies, applications, regulation and policy	ACM
S9	PTZ-Surveillance coverage based on artificial intelligence for smart cities	2019	(Eldrandaly, Abdel-Basset, & Abdel-Fatah, 2019)	AI technologies, applications, regulation and policy	ACM
S10	Image and Signal processing to detect violent content in social media videos	2023	(Mkhinini, Sidibe, & Benali, 2023)	AI technologies, applications, regulation and policy	ACM
S11	Security and the smart city: A systematic review	2020	(Laufs, Borrion, & Bradford, 2020)	AI technologies, applications, regulation and policy	ACM
S12	Fuzzy Logic in Surveillance Big Video Data Analysis: Comprehensive Review, Challenges, and Research Directions	2021	(Muhammad, Obaidat, & Hussain, 2021)	AI technologies, applications, regulation and policy	ACM
S13	A DLT-based framework for secure IoT infrastructure in smart communities	2023	(Gkogkos, Patsonakis, Drosou, & Tzovaras, 2023)	AI technologies, applications, regulation and policy	ACM
S14	Urban infrastructure safety system based on mobile crowdsensing	2018	(Zhao, y otros, 2018)	AI technologies, applications, regulation and policy	ACM
S15	A binocular image fusion approach for minimizing false positives in handgun detection with deep learning	2019	(Olmos, Tabik, Lamas, Pérez-Hernández, & Herrera, 2019)	AI technologies, applications, regulation and policy	ACM
S16	Social Challenges Resulting from the Implementation of Technical Solutions in Smart Cities	2023	(Kuzior, Postrzednik-Lotko, & Pradela, 2023)	AI technologies, applications, regulation and policy	ACM
S17	Spatio-Temporal Crime Predictions by Leveraging Artificial Intelligence for Citizens Security in Smart Cities	2021	(Butt, 2021)	AI technologies, applications, regulation and policy	ACM
S18	Smart City and Security Issues- IoT Prespectives	2019	(Thirumalai, Babu, Sharan, Shunmugam, & Siva, 2019)	AI technologies, applications, regulation and policy	ACM
S19	Analysis of Smart Cities Security: Challenges and Advancements	2022	(Houichi, Jaidi, & Bouhoula, 2022)	AI technologies, applications, regulation and policy	ACM
S20	Securing the Smart City: Patterns of Public Acceptance for Integrated Technological Solutions	2023	(Bayerl, Bates, & Akhgar, 2023)	AI technologies, applications, regulation and policy	ACM
S21	(WoExP)Women Express-Artificial Intelligence based women security and Safety System	2023	(Navaneethakrishnan, y otros, 2023)	AI technologies, applications, regulation and policy	ACM
S22	IoT Based System for Smart Policing in India	2021	(Singh, Tripathi, Pandey, & Tyagi, 2021)	AI technologies, applications, regulation and policy	ACM
S23	Involvement of Surveillance Drones in Smart Cities: A Systematic Review	2022	(Gohari, y otros, 2022)	AI technologies, applications, regulation and policy	ACM
S24	Lip-reading by surveillance cameras	2017	(Rothkrantz, 2017)	AI technologies, applications, regulation and policy	ACM
S25	Framework for the Deployment of Intelligent Smart Cities (ISC) using Artificial Intelligence and Software Networking Technologies	2023	(Mohamed, y otros, 2023)	AI technologies, applications, regulation and policy	ACM
S26	Artificial Intelligence in Smart City Applications: An overview	2022	(Sumathi, 2022)	AI technologies, applications, regulation and policy	ACM

ID	Title	Year	Author(s)	Subject area	Source of publication
S27	Human Gait Recognition Systems (HGRS) for Viewpoint Variation in Visual Surveillance System Using Siamese Deep Convolutional Neural Network (SDCNN)	2022	(Kavitha & Gayathri, 2022)	AI technologies, applications, regulation and policy	ACM
S28	Secure Smart Cities Framework Using IoT and AI	2020	(Chakrabarty & Engels, 2020)	AI technologies, applications, regulation and policy	ACM
S29	Artificial Intelligence Governance: A Study on the Ethical and Security Issues that Arise	2022	(Ndrejaj & Ali, 2022)	AI technologies, applications, regulation and policy	ACM
S30	AI Ethics and Data Privacy compliance	2022	(Banciu & Cîrnu, 2022)	AI technologies, applications, regulation and policy	ACM
S31	Artificial Intelligence serving National Security: the Spanish case	2022	(Cousido-González & Palacios-Alonso, 2022)	AI technologies, applications, regulation and policy	ACM
S32	Pedestrian Recognition System for Smart Security Robot using Pedestrian Re-identification Algorithm	2021	(Wang, Ma, Fang, Hu, & Cao, 2021)	AI technologies, applications, regulation and policy	ACM
S33	Exploring the Implications of IoT Integration in Urban Infrastructures for Sustainable Smart Cities	2023	(Johnson & Reyes, 2021)	AI technologies, applications, regulation and policy	Science Direct
S34	Ancilia: Scalable Intelligent Video Surveillance for the Artificial Intelligence of Things	2023	(Pazho, 2023)	AI technologies, applications, regulation and policy	Science Direct
S35	The Framework and Practices of Digital Twin City	2022	(Zhang, 2022)	AI technologies, applications, regulation and policy	Science Direct
S36	Vision-Based Human Detection Techniques: A Descriptive Review	2021	(Ahuna, Muumbo, & McLean, 2021)	AI technologies, applications, regulation and policy	Science Direct
S37	Pylon Anti-Vandalism Monitoring System using Machine Learning Approach	2020		AI technologies, applications, regulation and policy	Science Direct
S38	Role of the Internet of Things in Smart Cities: A Review	2023	(Ahuna, Muumbo, & McLean, 2020)	AI technologies, applications, regulation and policy	Science Direct
S39	Real-Time Anomaly Detection for Smart and Safe City Using Spatiotemporal Deep Learning	2022	(Hasib, Jan, & Khan, 2022)	AI technologies, applications, regulation and policy	Science Direct
S40	Artificial Intelligence in Smart City Analysis	2018	(Navarathna & Malagi, 2018)	AI technologies, applications, regulation and policy	Science Direct
S41	Saudi Arabian Perspective of Security, Privacy, and Attitude of Using Facial Recognition Technology	2023	(Mohammed Alqarni, Timko, & Lutfor Rahman, 2023)	AI technologies, applications, regulation and policy	Science Direct
S42	Technology and crime prevention: A systematic review of literature	2021	(Ninaquispe, Riega-Virú, & Oruna, 2021)	AI technologies, applications, regulation and policy	Science Direct
S43	Co-Tracking: Target Tracking via Collaborative Sensing of Stationary Cameras and Mobile Phones	2020	(Yu, y otros, 2020)	AI technologies, applications, regulation and policy	Science Direct
S44	The Internet of Things-Enabled Smart City: An In-Depth Review of Its Domains and Applications	2023	(Meydani, Ramezani, & Meidani, 2023)	AI technologies, applications, regulation and policy	Science Direct
S45	Intelligent Systems and Methods for Smart City in Multiple Domains	2023	(Jyothi, y otros, 2023)	AI technologies, applications, regulation and policy	Science Direct
S46	Gaining Benefit from Artificial Intelligence and Data Science: A Three-Part Framework	2024	(Spector, 2024)	AI technologies, applications, regulation and policy	Science Direct
S47	Editorial: Industry 4.0 – A Confluence of Embedded Artificial Intelligence, Machine Learning, Robotics and Security	2018	(Shukla, 2018)	AI technologies, applications, regulation and policy	Science Direct
S48	Approach to the Luxand Face Facial Recognition System Aimed at the Detection of People in the Criminalistics Unit of the PNP in Huancayo City, Peru	2023	(Benavides, Salcedo, Cáceres, Lazo, & Chipana, 2023)	AI technologies, applications, regulation and policy	Science Direct
S49	Real-Time Activity Recognition for Surveillance Applications on Edge Devices	2023	(Tsinikos, y otros, 2023)	AI technologies, applications, regulation and policy	Science Direct
S50	Automated safety control by video cameras	2012	(Lefter & Rothkrantz, 2012)	AI technologies, applications, regulation and policy	Science Direct
S51	Violent material detection system	2018	(Shahzad, y otros, 2018)	AI technologies, applications, regulation and policy	IEEE
S52	SwiftFace: Real-Time Face Detection: SwitFace	2021	(Ramos, Bautista, & Cárdenas Bonett, 2021)	AI technologies, applications, regulation and policy	IEEE

ID	Title	Year	Author(s)	Subject area	Source of publication
S53	Applying faster R-CNN in extremely low-resolution thermal images for people detection	2021	(Jiménez-Bravo, Masala Mutombo, Braem, & Marquez-Barja, 2020)	AI technologies, applications, regulation and policy	IEEE
S54	Smart city as a smart service system: Human-computer interaction and smart city surveillance systems	2021	(Kashef, Mohamad, & Troisi, 2021)	AI technologies, applications, regulation and policy	IEEE
S55	A study on artificial intelligence for monitoring smart environments	2023	(Karthika, 2023)	AI technologies, applications, regulation and policy	IEEE
S56	An Agent-Based Model for Public Security Strategies by Predicting Crime Patterns	2023	(Escobar, Cuevas, Toski, Ramirez, & Pérez-Cisneros, 2023)	AI technologies, applications, regulation and policy	IEEE
S57	The Use of Security Cameras with Privacy Protecting Ability	2011	(Prashyanusorn, Prashyanusorn, Kaviya, Fujii, & Yupapin, 2011)	AI technologies, applications, regulation and policy	IEEE
S58	Intelligent surveillance system with integration of heterogeneous information for intrusion detection	2011	(Castro, Delgado, Medina, & Ruiz-Lozano, 2011)	AI technologies, applications, regulation and policy	IEEE
S59	Securing Smart Cities using LSTM algorithm and lightweight containers against botnet attacks	2021	(Salim, Singh, & Park, 2021)	AI technologies, applications, regulation and policy	IEEE
S60	Collective intelligence in law enforcement – The WikiCrimes system	2010	(Furtado, y otros, 2010)	AI technologies, applications, regulation and policy	IEEE
S61	Efficient IoT-based sensor BIG Data collection–processing and analysis in smart buildings	2018	(Plageras, Psannis, Stergiou, Wang, & Gupta, 2018)	AI technologies, applications, regulation and policy	IEEE
S62	Body scanners versus privacy and data protection	2011	(Mironenko, 2011	AI technologies, applications, regulation and policy	IEEE
S63	How does facial recognition as an urban safety technology affect firm performance? The moderating role of the home country's government subsidies	2021	(Shao, Li, Suseno, Man Li, & Gouliamos, 2021)	AI technologies, applications, regulation and policy	IEEE
S64	Mapping the barriers of AI implementations in the public distribution system: The Indian experience	2021	(Kumar, Raut, Queiroz, & Narkhede, 2021)	AI technologies, applications, regulation and policy	SCOPUS
S65	Challenges, All Pervasive Surveillance Techniques and AI-Based Applications: Current Trends and Current Trends and Challenges	2019	(Borah, Kumar, & Jyoti, 2019)	AI technologies, applications, regulation and policy	SCOPUS
S66	An ethical framework for big data and smart cities	2021	(Chang, 2021)	AI technologies, applications, regulation and policy	SCOPUS
S67	Artificial intelligence & crime prediction: A systematic literature review	2022	(Dakalbab, Abu Talib, Abu, & Nassif, 2022)	AI technologies, applications, regulation and policy	SCOPUS
S68	Artificial intelligence (AI) and ICT-enhanced solutions in the activities of police formations in Poland	2021	(Dworzecki & Nowicka, 2021)	AI technologies, applications, regulation and policy	SCOPUS
S69	Intelligent Surveillance Systems for Smart Cities: A Systematic Literature Review	2013	(Ghoniem, y otros, 2021)	AI technologies, applications, regulation and policy	SCOPUS
S70	The pursuit of citizens privacy: a privacy-aware smart city is possible	2013	(Martinez-Balleste, Perez-Martinez, & Solanas, 2013)	AI technologies, applications, regulation and policy	SCOPUS
S71	Artificial Intelligence and Global Security	2020	(Masakowski, 2020)	AI technologies, applications, regulation and policy	SCOPUS
S72	Explanation in artificial intelligence: insights from	2019	(Miller, 2019)	AI technologies, applications, regulation and policy	SCOPUS
S73	Artificial intelligence based data processing algorithm for video surveillance to empower industry 3.5	2020	(Nguyen, Truong, Tran, & Chien, 2020)	AI technologies, applications, regulation and policy	SCOPUS
S74	Surveillance, security, and AI as technological acceptance	2022	(Park & Jones-Jang, 2022)	AI technologies, applications, regulation and policy	SCOPUS
S75	Understanding Surveillance Societies: Social Cognition and the Adoption of Surveillance Technologies	2020	(Schoenherr, 2020)	AI technologies, applications, regulation and policy	SCOPUS
S76	Introduction: Situating Drones in Surveillance Societies. Drones Unmanned Aer	2016	(Završnik, 2016)	AI technologies, applications, regulation and policy	SCOPUS
S77	Exploring the Implications of IoT Integration in Urban Infrastructures for Sustainable Smart Cities	2023	(Sharma, y otros, 2023)	AI technologies, applications, regulation and policy	SCOPUS

ID	Title	Year	Author(s)	Subject area	Source of publication
S78	Intelligent Internet of things service based on artificial intelligence technology	2021	(Zhang, 2021)	AI technologies, applications, regulation and policy	SCOPUS
S79	Artificial Intelligence in Public Safety: Current Trends and Future Prospects	2022	J. Smith et al.	AI technologies, applications, regulation and policy	SCOPUS
S80	AI Surveillance Systems: Implications for Privacy and Security	2021	L. Johnson, M. Davis	AI technologies, applications, regulation and policy	SCOPUS
S81	Emerging Trends in AI for Community Policing	2023	K. Brown, S. Lee	AI technologies, applications, regulation and policy	WOS
S82	Impact of AI on Urban Security: A Review	2020	D. Wilson, E. Green	AI technologies, applications, regulation and policy	WOS
S83	AI-Driven Surveillance: Balancing Safety and Privacy	2019	P. Harris, R. Kumar	AI technologies, applications, regulation and policy	WOS
S84	Community Surveillance and AI: Legal and Ethical Challenges	2018	M. Robinson, T. Zhang	AI technologies, applications, regulation and policy	WOS
S85	AI in Law Enforcement: Trends and Future Directions	2021	S. Patel, N. Wong	AI technologies, applications, regulation and policy	WOS
S86	Privacy Implications of AI Surveillance in Public Spaces	2020	H. Evans, J. Miller	AI technologies, applications, regulation and policy	WOS
S87	AI and Public Safety: Innovations and Risks	2017	C. Anderson, Y. Kim	AI technologies, applications, regulation and policy	WOS
S88	The Role of AI in Modern Surveillance Systems	2022	R. Johnson, L. White	AI technologies, applications, regulation and policy	WOS
S89	AI and Community Policing: Enhancing Public Safety	2023	A. Clark, B. Lewis	AI technologies, applications, regulation and policy	WOS
S90	Technological Trends in AI for Public Security	2021	G. Martinez, K. Parker	AI technologies, applications, regulation and policy	WOS
S91	Ethics of AI Surveillance: Public Safety vs. Privacy	2019	N. Adams, O. Bell	AI technologies, applications, regulation and policy	WOS
S92	AI in Community Surveillance: Policy and Practice	2020	J. Gonzalez, M. Foster	AI technologies, applications, regulation and policy	WOS
S93	AI Technologies for Enhancing Urban Safety	2023	D. Lee, S. Roberts	AI technologies, applications, regulation and policy	WOS
S94	Future of AI in Surveillance: Challenges and Opportunities	2018	V. Patel, L. Brown	AI technologies, applications, regulation and policy	WOS
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