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MODERNIZATION OF THE LAW ENFORCEMENT SYSTEM: THE USE OF CONTEMPORARY ARTIFICIAL INTELLIGENCE TOOLS IN CRIME PREVENTION AND SUPPRESSION

Abstract

Law enforcement agencies represent one of the most significant users of artificial intelligence–based systems in the context of contemporary manifestations of crime. Police agencies, as well as those operating within the criminal justice system, already make extensive use of various systems, software, and tools in the field of crime prevention and suppression. This article analyzes the application of existing artificial intelligence systems by law enforcement agencies through

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a critical review of relevant academic and professional literature, along with an illustration of examples of systems, software, and tools used in the operational context. In the first chapter, the possibilities of applying artificial intelligence systems in the field of crime prevention are presented through an overview of specific software for predicting crime and the criminal behavior of individuals, including risk assessments of recidivism and repeat victimization. In the second chapter, the possibilities of applying specific systems, software, and tools in the field of crime suppression are presented, starting from the receipt of criminal reports, the preparation and planning of criminal investigations, and up to their application in the area of international police cooperation. Finally, the article points out the controversies surrounding the use of artificial intelligence by law enforcement agencies, considering several aspects such as technological, legal, ethical, and social.

Keywords: law enforcement agencies, crime prevention, crime suppression, artificial intelligence, controversies

INTRODUCTION

In contemporary conditions, law enforcement agencies strive to enhance their capacities to operate efficiently and promptly in a dynamic and complex environment, in order to safeguard the community and protect the human rights of all individuals. The manifestations of crime are changing, both in terms of their forms of occurence and the dynamics of their manifestation and development. The traditional approach to crime, which involves responding to criminal activity after it has already occurred, is losing its effectiveness in combating contemporary forms of criminal activity. Proactive policing, i.e., preventing crime before it occurs, is gaining priority status, emphasizing the importance of systematic and organized data collection from various sources, their processing, and utilization in the decision-making process of the competent authorities.

In an effort to overcome human limitations in solving complex problems across various areas of life, artificial intelligence systems have been developed, representing a combination of human beings and machines. Essentially, these are machines programmed to think and act

with a certain degree of human intelligence (Nehra 2015, 500). Artificial intelligence (hereinafter: AI) can be defined as a system, program, software, or algorithm that simulates human thinking and behavior, i.e., operates autonomously in order to think and act rationally and humanely, make decisions, or produce outputs (Martinez 2018, 1038). These are systems that display intelligent behaviour by analysing their environment and taking actions to achieve specific goals (EC 2018a). AI systems are designed to operate with varying levels of autonomy, along with the possibility to adapt to their environment; based on the inputs or data, they determine how to generate outputs, such as predictions, content, recommendations, or decisions (Regulation (EU) 2024/1689, Art. 12).

As such, AI systems have found their application in various areas, such as industry, medicine, finance, transportation, science, and others. Their potential has also been recognized by law enforcement systems, and the advancements achieved through the progressive development of AI systems are now being applied in the area of crime prevention and suppression. In addition, these systems are increasingly being used as support in decision-making processes within the criminal justice system.

For the purpose of examining existing artificial intelligence systems and their application within the law enforcement system, this article employs several scientific methods, such as content analysis, case study, and the comparative method. The focus of analysis is on the content available within relevant academic and professional literature regarding AI systems and their application in the area of crime prevention and suppression. This article provides an overview of AI-based systems and software utilized by law enforcement agencies worldwide for the purposes of predicting crime, individual criminal behavior, recidivism, and repeat victimization. Additionally, it explores the application of such systems and software in supporting administrative and operational activities in the context of criminal investigations. Finally, this article highlights the advantages of AI systems, manifested in the increased operational efficiency within law enforcement agencies and their capability in handling large volumes of data, as well as the challenges and criticisms regarding their application.

APPLICATION OF AI SYSTEMS IN CRIME PREVENTION

In practice, numerous police agencies utilize AI systems for the collection and processing of large volumes of data that may be relevant to crime prevention. One of the fundamental principles of police work is the principle of operational efficiency, which requires knowledge of the patterns of criminal activity in a specific area, i.e., the identification of so-called "crime hotspots", and the use of various sources of information on matters important for crime prevention (Žarković and Ivanović 2020, 6). AI systems have significantly contributed to enhancing police operational efficiency and response time in crime prevention, as they have been assessed as highly effective in so-called "predictive policing".

Predictive policing represents a modern concept that involves the application of analytical techniques to data for the purposes of generating statistical predictions about events (McDaniel and Pease 2021, 7). Based on statistical data regarding crimes already committed within a specific time and location, extracted from various police records, it is possible to forecast when and where future crimes are likely to occur. The use of predictive analytics software yields more successful results in identifying locations with a high risk of criminal activity, thereby creating opportunities for timely intervention (Mohler *et al*. 2015).

AI software for crime risk assesment

Examples of AI-based software used by law enforcement agencies in the United States of America (hereinafter: U.S.) are *PredPol* and *HunchLab*; their use has proven particularly successful in the prevention of property crimes (Ratcliffe *et al*. 2021).

The software *PredPol* was developed through collaboration between university researchers and police analysts, and it was among the first to achieve commercial success and wider application across various police agencies. This software utilizes machine learning and an algorithm that was originally designed to predict aftershocks following an earthquake. It operates on the assumption that the occurrence of an earthquake increases the likelihood of another earthquake nearby in place and time (Mohler *et al*. 2011, 100). Similarly, according to the near-repeat theory, some future crimes (e.g., burglary, theft, or gang-

related violence) will occur very near to current crimes in time and place (Perry *et al*. 2013, 41).

The *PredPol* software analyzes patterns in incident records from the previous five years, focusing on a limited set of variables such as the type of crime, time, and place. Based on this analysis, it generates daily forecasts of "hotspots", which are visualized on maps (Ferguson 2019, 494). Police officers can easily access the maps via computer, after which patrol activity is redirected toward specific areas with an elevated risk of a particular type of crime. Active patrolling in "hotspot" areas produces a deterrent effect, which consequently leads to a reduction in crime rates (Hutt 2020, 36). Such an outcome was recorded in the police departments in Santa Cruz and Los Angeles, which used this software and reported a 12–25% decrease in the number of burglaries, car thefts, and thefts from automobiles, compared to the same period when the software was not in use. The software also proved successful in predicting the locations of 50% of gun homicides within a broader timeframe in Chicago, based on the analysis of data from previous crimes involving handguns (The predictive police company 2014, cited in: Ferguson 2017, 1134).

The geospatial software *HunchLab* employs a combination of several techniques from the AI area and machine learning, producing highly accurate crime predictions within the jurisdictions of specific police departments. Similar to *PredPool*, it uses algorithms based on the near-repeat theory but also incorporates other approaches that enhance its performance. For example, the *RTM* (*Risk Terrain Modeling*) approach is employed to generate a composite risk terrain map, which accounts for the spatial influences of all features at each place within the observed area (Caplan *et al*. 2015, 8). This means that *RTM* incorporates contextual information relevant to the social and physical environment in order to identify micro-locations within the area that have the highest level of risk of future incidents (Marchment and Gill 2021, 2).

Therefore, the algorithms of *HunchLab* learn not only from data contained in police crime reports but also from non-crime-related data, such as information about infrastructure (e.g., locations of bars, clubs, banks, metro stations, and other relevant places), temporal patterns, population density, socio-economic characteristics, and more (Degeling and Berendt 2017, 349). As Shapiro (2019) explains, this data is mapped onto a grid of cells, each covering an area of 500 square feet within the jurisdiction of the police department, and then categorized based on the crime outcomes in each cell. If a crime occurred in a cell, then

it is possible to determine which variables influenced the occasion of that crime and to what extent; variables are then weighted accordingly (462). The system automatically learns what is important for each type of crime, taking into account exogenous factors such as the location of crime-relevant objects – e.g., banks in the case of robberies, or relevant spots along a specific route where drivers may stop in the case of street prostitution (Caplan and Kennedy 2011). In addition, the software provides recommendations on where to focus available resources and suggests possible tactical responses for police officers – e.g., to collect information from citizens in a specific area, to conduct traffic stops and checks of vehicles and individuals, and so on.

AI software for recidivism risk assessment

In addition to software used for crime prediction, law enforcement agencies also utilize software focused on forecasting individual criminal behavior, specifically aimed at identifying individuals who are at high risk of reoffending. One such software is *COMPAS* (*Correctional Offender Management Profiling for Alternative Sanctions*), which employs advanced data analysis methods and machine learning techniques. This software is used by multiple institutions within the criminal justice and correctional systems to assess the risk posed by offenders and to develop appropriate treatment plans aimed at preventing reoffending. For example, the software generates risk scores that are taken into account in decision-making regarding release, probation, parole, and the planning of an individual's reintegration into society, as well as their supervision after release (Brennan and Dieterich 2018). The *COMPAS* is also used by judges in several U.S. states, such as New York, Pennsylvania, Florida, and others, in decision-making regarding pretrial detention, based on algorithms that assess the likelihood of reoffending (Engel *et al*. 2023, 383).

The software uses various data related to the defendant, collected from multiple sources. In addition to official records, it relies on data obtained from self-assessment questionnaires completed by defendants or inmates, as well as information gathered through standardized interviews with them (Blomberg *et al*. 2010). In risk assessment, approximately 15 different static and dynamic factors are used, such as the criminal involvement, history of violence, history of non-compliance, criminal associates, substance abuse, family status, financial

problems, employment and educational resources, social relationships and engagement, and others (Northpointe 2015). Each of these factors is measured using scales composed of multiple items, with a distinction made between risk scales and needs scales.[1]

On one hand, risk scales are designed to assess the risk of general recidivism, meaning the likelihood of reoffending, as well as the risk of violent recidivism, which refers to the commission of violent crimes such as homicide, aggravated assault, robbery, rape, and others (Lagioia *et al*. 2022, 464). On the other hand, needs scales are designed to measure the defendant's needs (e.g., in the domains of education, housing, employment, etc.) that should be addressed in order to reduce the risk of recidivism. In this way, they support decision-making in case planning tailored to the specific defendant, including the selection of effective interventions (Northpointe 2015). As a result, risk scores are presented as numerical values ranging from 1 to 10, indicating the individual's level of risk or the needs that require intervention. A low risk is assigned to individuals scoring between 1 and 4, medium risk to those between 5 and 7, and high risk to those scoring between 8 and 10 (Brennan and Dieterich 2018, 59).

A similar type of software is used by the police department in Durham, United Kingdom. The HART (*Harm Assessment Risk Tool*) software applies advanced statistical machine learning methods that are effectively used to analyze large volumes of data contained in police records. This software provides an assessment of a suspect's risk of reoffending after they have been arrested by the police and brought before the custody officer, primarily by using predictors related to their history of criminal behavior (Oswald *et al*. 2018, 228). Suspects are separated based on the likelihood that they will commit a new serious crime over the next 24 months, taking into account the potential harm that such a crime may cause. If it is assessed that the individual is unlikely to commit any crime in the mentioned timeframe, they are identified as low risk (Urwin 2016, 15). Individuals are classified as moderate risk if it is estimated that they are likely to commit a crime of lower social harm (a "non-serious" crime), while high risk is assigned when the prediction

[1] For example, within the scale related to the defendant's criminal involvement, items include the total number of prior arrests and convictions, frequency of incarceration, and so on, while the scale for history of non-compliance considers items such as failure to appear in court, positive drug tests, revocation of probation, and similar factors (Brennan, Dieterich and Ehret 2009, 34).

indicates indicates a likelihood of the commission of a "serious" crime, such as homicide, attempted murder, grievous bodily harm, robbery, sexual offenses, or crimes involving firearms (Oswald *et al*. 2018, 227). If a moderate risk is identified, a suspect may be considered for the application of an out-of-court disposal provided for within the special programme named *Checkpoint programme*. This programme offers the individual an opportunity to resolve their criminal behavior outside of court through interventions addressing its underlying causes, which may include counseling, education, rehabilitation programs, and support services (Weir *et al*. 2022).

In addition to the benefits achieved through the use of the aforementioned software, numerous controversies arise regarding the extent of their influence on decision-making by competent authorities, which will be discussed in more detail in a dedicated chapter.

AI software for victimization risk assessment

Police agencies worldwide have been using structured risk assessment tools for decades to evaluate the likelihood that an individual will become a victim of a crime, such as domestic violence, crimes involving firearms, stalking, child abuse, and others. For example, the police in Ontario, Canada, use the *ODARA* (*Ontario Domestic Assault Risk Assessment*) tool to evaluate the risk of repeated domestic violence against women, based on multiple factors such as prior domestic violence, confinement of the victim, number of children, assault on the victim during pregnancy, substance abuse, threats of violence, and others (Hilton *et al*. 2008, 151).

The development of AI has enabled the creation of new victimization risk assessment software that utilizes machine learning methods. Although some of these software tools were primarily developed for crime prediction and prevention, they can also be used to assess the risk of victimization. For example, the *NDAS* (*National Data Analytics Solution*) system combines advanced analytics and statistical techniques. Although the system is owned by the West Midlands Police, it is also utilized by several other police forces and agencies across the United Kingdom (Zilka *et al*. 2022, 883). It is an individual-focused system primarily developed for crime prediction and prevention; however, it can also be used for the purpose of assessing the risk of victimization (Fair Trials 2021, 15). In order to generate numerical scores indicating

the risk of future victimization for individuals listed in the database, this system uses data stored across multiple police records (West Yorkshire Police n.d; West Midlands Police 2023). For example, it uses records of crimes committed, police intelligence reports about events, locations, and offenders, custody and prisoner information, information on people, crimes, vehicles, and property, records of organised criminal groups, and others (Big Brother Watch 2020, 12). The use of this system has sparked numerous debates and criticisms, with controversies further intensified by expressed intentions to integrate data from other public services into the system, including healthcare, education, social welfare, local government, and others (Fair Trials 2021, 15).

The Chicago Police Department uses the *CVRM* (*The Crime and Victimization Risk Model*) tool for assessment of the risk that an individual would be a party to gun violence, either as a victim or perpetrator. This tool uses crime-related data and includes key risk factors such as the number of past shooting victimizations, age at last arrest, victimization due to aggravated burglary and assault, arrests related to unauthorized use of a weapon, and violent crimes (Hollywood *et al*. 2019, 12–13). The degree of risk is quantified using numerical values – the higher the number, the greater the risk that an individual will become a victim or be arrested for gun-related violence within the following 18 months (Chicago Police Department n.d.).

One of the more recent tools developed in Germany and commercially available is *Lizzy*. It is designed to assess the risk of domestic violence and is intended for use by police officers and other professionals who have initial contact with victims. The tool uses machine learning algorithms to predict repeated physical violence based on six factors, which involve the use of various forms of violence of differing intensity (Trafford *et al*. 2024). Currently, this tool is used by humanitarian workers from *Frontline* in several German provinces who conduct interviews with victims in the field and complete a brief questionnaire containing key questions, i.e., risk factors (Frontline n.d.). Based on the entered responses, the algorithm calculates the risk of repeated physical violence within the following three months. Results from its application indicate that it is an exceptionally useful tool, particularly because it can be easily used by professionals conducting fieldwork.

APPLICATION OF AI SYSTEMS IN CRIME SUPPRESSION

Generative AI can have wide application in the automation of administrative activities within criminal police departments, as it generates high-quality and realistic content that is almost indistinguishable from content created by a human being (Banh and Strobel 2023, 1). In this way, many activities can be simplified and accelerated without the need for additional personal or material resources. When establishing or verifying facts related to a crime, police officers are required to create various written documents, such as criminal complaints, official notes, records, reports, and others. Generative AI models, such as *GPT* (*Generative Pre-trained Transformer*), can play a significant role in this regard – by simply entering input data that describes the actions undertaken and the established facts, one can obtain contextually appropriate textual content tailored to a specific type of official document (Dubravova *et al*. 2024, 240).

The advancement of translation technologies, driven by the innovative development of new AI-based techniques, also plays a significant role in supporting the operations of the criminal police department. This has led to the development of new tools in the area of translation and language services. Police officers can easily access conversational chatbots, such as *ChatGPT*, which offer unprecedented efficiency in translating large volumes of text and enabling real-time communication (Siu 2024, 29). The use of translation technologies contributes to the effectiveness of the police in conducting criminal investigations in several ways – e.g., it facilitates the understanding of communications between different offenders who do not belong to the national language area, as well as communication and data exchange with other police agencies and institutions in the context of international operational police cooperation.

Intake of criminal reports and the evaluation of the completeness and truthfulness of their content

The development of AI has also led to the increasingly intensive use of technology-mediated reporting of crimes, which replaces or supplements traditional methods of reporting via telephone or by appearing in person at a police station. Instead of human dispatchers,

numerous police agencies have started using various types of chatbots on their websites, through which citizens can report minor crimes at any time (Bradford *et al*. 2025, 3). For example, the police in Bedfordshire, United Kingdom, use chatbots to handle reports related to the loss, damage, or theft of low-value property, as well as those indicating animal abuse or neglect (Muir and O'Connell 2025, 12). In the Netherlands, there is a specialized system that uses an intelligent form for reporting online fraud, such as cases involving fake online stores and malicious sellers on e-commerce platforms (Odekerken *et al*. 2022). The system can automatically identify deficiencies in the content of a report and ask citizens questions to gather additional relevant information, thereby reducing the need for the police to request supplements and speeding up case processing time (Odekerken 2024).

AI-based tools can also be useful for detecting false reports. For example, the *VeriPol* tool has been implemented in nearly all stations of the National Police in Spain and demonstrates a high level of accuracy in identifying false reports, especially concerning property crimes[2] (Ramos *et al*. 2020). This tool uses algorithms that consider around 300 variables and is based on natural language processing; it identifies patterns that are repeatedly used in report submission and calculates the probability of their truthfulness (Álvarez 2019). In this way, the police officer is alerted to the possibility of a false report, which assists in determining further action in the specific case.

The planning and conduct of criminal investigations

Within criminal investigations, the police undertake a range of measures and actions, both operational and evidentiary. Their successful execution is conditioned by the systematic collection of relevant and complete data from various sources. An example of this is the planning of stakeout operations by the police. Their successful execution depends on the systematic collection of relevant and complete data from various sources. For example, to prepare a plan for a stakeout operation, it is necessary to gather all available data regarding suspect whose arrival is expected at a specific location, including information about their close contacts, criminal associates, and their movements; in addition, data is collected concerning

[2] For example, theft or loss of mobile phones without elements of violence, loss of a larger amount of money, thefts from a house where valuable items have gone missing, etc.

the specific stakeout location (e.g. terrain configuration, layout of nearby structures, etc.), weather and atmospheric conditions, vehicles used, and more (Aleksić and Škulić 2016, 87). For this purpose, police records can be used, such as the suspect's criminal file, *modus operandi* records, past police reports, the unified information system of the police, and so on.[3] Data can also be collected through the implementation of other measures and actions – e.g., by gathering information from persons of interest, based on the analysis of obtained telephone communication records, the base stations used, and the location of the place from where a communication was performed, etc. Generative AI can significantly facilitate the planning and preparation of a stakeout operation by processing and analyzing input data. In addition to generating relevant recommendations regarding the timing and location of a stakeout, as well as predicting multiple possible scenarios, the end result would be the creation of an operational plan for a stakeout[4] (see: Dubravova *et al*. 2024).

Searching records for the purpose of collecting operational data often results in significant time consumption and carries the risk of overlooking certain information. Therefore, specialized tools have been developed to enable the linking of various data from police records and to facilitate easy search capabilities, such as the *Coplink* system and its enhanced versions, *CoplinkX* and *CrimeTracer*. In its original version, the system used algorithmic techniques to identify links between objects of interest within the database, which made it useful in a policing environment. For example, crime analysts and investigators at the Tucson Police Department, Arizona, used this system to support investigative activities. Based on the developed and structured database tailored to their needs, police officers had the ability to enter search terms through various forms, after which the system would display related terms to them (Hauck *et al*. 2002).[5]

[3] For example, whether the person possesses any weapons, where, when, and with whom they were stopped by the police and their identity checked, which vehicles they use, whether they have been recorded as involved in any incidents reported to the police, etc.

[4] Such a plan should include all key elements, such as: the objective of a stakeout; the location or multiple locations where a stakeout will be set-up; the timing and duration of a stakeout; its formation and method of deployment; the number of police officers to be engaged; and the required equipment and technical resources (Žarković and Ivanović 2020, 182).

[5] In this way, they were able to link a specific suspect to a vehicle or to other individuals; to enter vehicle data into a search in the system and determine whether

An enhanced version of this system represents a powerful platform designed for law enforcement agencies in the U.S., as it features a centralized interface[6] through which it is now possible to search a large volume of data, both structured and unstructured (SoundThinking n.d.). Users of the *CrimeTracer* system can perform intelligent searches using an AI-based chatbot by simply entering terms and concepts in natural language. The system enables advanced link analysis to quickly detect relationships between people, locations, and events; linking ballistic evidence from the national database with reports, suspects, and other entities; identification of crime trends, and more (SoundThinking n.d.).

Determining similarities between crimes based on the analysis of police reports and linking them into a series can also be enhanced by using AI-based systems. For example, the *VALCRI* (*Visual Analytics for Sense-making in Criminal Intelligence Analysis*) system uses machine learning algorithms to search through large volumes of data by analyzing semantic features in the textual descriptions of crimes contained in police reports, which are then grouped based on identified similarities (Sacha *et al*. 2017, 5). In this way, an analyst can obtain various types of reports, such as comparative case analyses. The system can identify new connections between criminal entities based on which similar cases can be linked – i.e., when similar criminal behaviour or *modus operandi* appeared in several cases, or when there is a geographic or temporal relationship between the cases, etc (EC 2018b). This system has been tested and used by multiple police agencies across Europe, as well as by *EUROPOL* (*European Union Agency for Law Enforcement Cooperation*).

For the effective preparation and conduct of criminal investigations, systems based on artificial intelligence that are used for public space surveillance are also of importance. For example, in China, a special program called *Skynet* was launched, aiming to integrate a large number of surveillance cameras (both private and public) into a unique platform. In this way, the capabilities for identifying people in China's largest cities are at the highest possible level and enable real-time determination of the number of people at a given location, their gender, clothing

it appears in any case and which persons are associated with it; to cross-reference the suspect's nickname with the victim's name in order to establish a possible connection, and so on (Hauck *et al.* 2002).

[6] This platform provides access to data contained in over a billion law enforcement records from various agencies across the U.S. (SoundThinking n.d.).

characteristics, as well as vehicles used (Fornasier and Borges 2023, 448). For instance, within the *Skynet* system, several subsystems operate, such as: a system that capture faces in video footage in real time and compares the created "digital fingerprint" of the face with a database of known faces to determine matches; a face retrieval system, which allows targeted searches for individuals across a large number of recordings; as well as a system post-retrival system that enables searching and analysis of already recorded footage for the purpose of clarifying certain events relevant to the police (Qiang 2021, 36–37).

International operational police cooperation

The use of AI has significantly contributed to and facilitated the collection and processing of large volumes of data held by international organizations engaged in police cooperation in combating crime, such as *INTERPOL* (*International Criminal Police Organization*) and *EUROPOL* (Ramos *et al.* 2020). For example, *INTERPOL* has implemented an analytical platform within the *INSIGHT project* that utilizes advanced technology and AI-based analytical techniques for data processing and the production of criminal intelligence analyses (INTERPOL 2020). The platform enables the search of data contained in various records and in different data formats, like notices and diffusions, free text information, police reports, emails, spreadsheets, images, and videos, thereby facilitating faster detection of hidden connections, patterns, and crime trends (INTERPOL n.d.). In this way, *INTERPOL* has enhanced its capabilities in distributing intelligence information to member states during the conduct of criminal investigations, strengthening cooperation and data exchange in combating transnational crime.

Similarly, *EUROPOL* uses the system *SIENA* (*Secure Information Exchange Network Application*)**.** Within this system, it is possible to exchange operational and intelligence information about crime in the form of messages, documents, and multimedia content (EUROPOL 2025). The interface is multilingual, enabling communication and data exchange in multiple languages, and operators using this system have the ability to conduct searches and generate statistical reports based on the exchanged data (Council of the European Union 2019, 70). The usefulness of this platform is demonstrated by the fact that in 2023, 1.79 million messages were exchanged, with over 151,000 cases

initiated, mostly in crime areas such as drug trafficking, fraud, and illegal immigration (EUROPOL 2024).

CONTROVERSIES IN THE APPLICATION OF AI WITHIN LAW ENFORCEMENT SYSTEMS

The introduction of AI systems also entails their responsible use within the law enforcement system. In this regard, a number of complex questions arise, ranging from the types of AI systems or software used by law enforcement agencies, and the conditions under which they are procured from private companies that develop them, to whether the public is informed about the deployment of such systems and how they function in practice (Joh 2017). The question of the justification for using AI systems also arises, given that there is still no absolute consensus regarding their actual effectiveness, particularly in predicting crime and recidivism (Van Brakel 2025). This has led some police and other agencies to discontinue their use.

In general, controversies associated with the use of AI within law enforcement systems can be considered from multiple perspectives, including technological, legal, ethical, and social. Technological controversies are related to the limitations of the systems themselves, as well as to the manner in which data is processed and results are generated. One of the important issues is the potential bias inherent in such systems. This is particularly important given that AI systems are only as effective as the quality of the data on which they are trained (Feldstein 2019a, 47). AI-based software used in policing environments analyzes data that primarily comes from archived police records. It is well known that such data may be incomplete, and an even more complex issue is that it can be biased, potentially leading to the discrimination of certain communities.

One of the main criticisms directed at the use of crime prediction software, such as *PredPol* and *HunchLab*, is that they rely on historical police data, which may be discriminatory toward certain communities residing in areas identified as high-risk for criminal activity. In order to improve the effectiveness of police patrols, officers are expected to act proactively, which in practice means patrolling more frequently in areas identified by the software as high-risk. Considering that patrol performance quotas are, among other factors, measured by the number of individuals stopped, identified, and searched during a duty shift, it is not difficult to conclude that certain communities will be disproportionately

affected by such increased police presence and surveillance, regardless of the actual crime rates in those areas (Benbouzid 2019). This can be illustrated by an article published by *The Markup*, a U.S. non-profit newsroom. This article points out that the predictions generated by the *PredPol* system, used by law enforcement agencies in the U.S., disproportionately focus on neighborhoods that are home to Black and Latino communities, compared to White communities[7] (Kirchner and Goldstein 2021). Identified biases in the system can lead to violations of the human rights of such communities, including the right to privacy, and result in their further marginalization.

Similar criticisms can be directed at software that generates recidivism predictions, as profiles of high-risk individuals are created based on patterns identified in the data analyzed by algorithms (Van Brakel 2025). It is known that such software is used in criminal justice systems in many countries as a support tool for decision-makers. However, in practice, it is not uncommon for a high-risk assessment generated by the software to have a decisive influence on decisions, which can sometimes lead to unfair outcomes (See Oswald *et al*. 2018). For example, the defendant may be held in custody until trial, may receive a prison sentence instead of a suspended sentence, may be denied parole, and so on (Engel *et al*. 2024). In a study examining cases in Florida, U.S., where the *COMPAS* system was used, a discussion was opened regarding its accuracy; it was found that individuals assessed as high-risk often did not reoffend, while others assessed as low-risk committed new crimes (Lagioia *et al*. 2022). Additionally, controversy has arisen over the presence of racial bias in generating risk assessments, as it has been found that this system produces more favorable recidivism predictions for White defendants compared to Black defendants, who are twice as likely to be assessed as high-risk (Dressel and Hany 2018).

Ethical and social controversies in the application of AI systems within law enforcement also arise because their algorithms analyze large volumes of data, which are not necessarily related solely to criminal activity. This means that data of individuals who have never committed any crime may also be analyzed, raising concerns about the right to privacy and freedom, as well as the protection of personal data. Even

[7] These communities were already living in socioeconomically disadvantaged conditions, compared to white communities, which generally belonged to the middle to upper-income groups.

greater controversy is fueled by the fact that AI systems are used for mass surveillance purposes, which is neither transparent nor properly controlled, potentially leading to various misuses (Feldstein 2019b).

Issues related to compliance with the principle of transparency are also highlighted, stemming from the fact that law enforcement agencies are actually the end-users of artificial intelligence systems and are most often not directly involved in their design. The owners of various software solutions used in police practice are private companies, which frequently refuse to publicly share information regarding how the software was developed and on which algorithms and principles it operates, citing commercial confidentiality (Zilka *et al*. 2022, 887). Therefore, it is necessary to introduce an effective mechanism requiring private companies to disclose information about the internal mechanisms and applications of algorithms, thereby enabling public oversight (Lu 2020). Furthermore, it is important not to overlook the fact that private companies producing such systems may become owners of sensitive data collected in the police and judicial contexts (Brauneis and Goodman 2018). The mentioned deficiencies inherent in the design and application of AI systems must be addressed appropriately to ensure respect for fundamental principles such as human oversight, technical robustness and safety, privacy and data governance, transparency, diversity, non-discrimination and fairness, accountability, and others (See Prlja *et al*. 2022).

CONCLUSION

The development of AI has significantly contributed to the modernization of law enforcement systems. Law enforcement agencies utilize various systems, software, and tools in their work that have the potential to advance crime prevention and suppression efforts. The use of different AI-based software has enabled greater efficiency and speed in processing large volumes of data, which previously exceeded human capabilities. Conclusions generated through its application provide intelligent work support and also facilitate the decision-making processes of the police, courts, and other law enforcement agencies. The ability to process various operational data in less time has significantly simplified the conduct of administrative police activities, and enabled more efficient planning and documenting of investigative actions. Furthermore, the establishment of analytical platforms utilizing AI-based analyses has led to significant progress in international operational police cooperation,

particularly regarding the ability to exchange data between countries in combating transnational crime.

However, the benefits of AI systems in this area cannot be considered independently of the challenges that accompany their design and practical implementation. Therefore, it is essential to ensure adherence to key principles in order to mitigate existing errors and deficiencies of AI systems. In their application, it is important that human beings retain final control over decision-making processes that impact the lives of individuals – e.g., judges should not automatically base their decisions solely on AI software assessments but must carefully evaluate each individual case and its specific circumstances; police officers should critically reassess generated risk assessments in the context of their legitimacy, utilizing their experience and knowledge of the local community in which they operate, and align their preventive and repressive actions in accordance with the broader social context.

The technical robustness and safety of AI systems must be ensured, and the data used within them must be collected, stored, and utilized in a lawful and ethical manner. It is important to ensure compliance with the principle of transparency – the public, and especially individuals who may be affected by decisions made based on AI systems, must be clearly informed about how these systems operate, which data they use, and how they generate conclusions. Ultimately, it is important to establish appropriate legal and regulatory frameworks that ensure responsible and ethical use of AI systems, protect human rights, and uphold the principles of equality and fairness, while also determining accountability for potential errors and human rights violations. In this regard, it is essential to have adequate response mechanisms that enable the detection, investigation, and remediation of consequences arising from errors and other deficiencies manifested in the operation of AI systems.

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МОДЕРНИЗАЦИЈА СИСТЕМА ЗА СПРОВОЂЕЊЕ ЗАКОНА: УПОТРЕБА САВРЕМЕНИХ АЛАТА ВЕШТАЧКЕ ИНТЕЛИГЕНЦИЈЕ У ПРЕВЕНЦИЈИ И СУЗБИЈАЊУ КРИМИНАЛИТЕТА

Резиме

Агенције за спровођење закона представљају један од најзначајнијих корисника система заснованих на вештачкој интелигенцији у контексту савремених манифестација криминалитета. Полицијске агенције, као и оне које делују у оквиру система кривичног правосуђа, већ увелико користе различите системе, софтвере и алате у области превенције и сузбијања криминалитета. Овај чланак анализира примену постојећих система вештачке интелигенције од стране агенција за спровођење закона, кроз критички преглед релевантне академске и стручне литературе, заједно са илустрацијом примера система, софтвера и алата који се користе у оперативном контексту. У првом поглављу, представљене се могућности примена система вештачке интелигенције у области превенције криминалитета, кроз приказ конкретних софтвера за предикцију криминалитета и

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криминалног понашања појединца, укључујући процене ризике рецидивизма и поновне виктимизације. У другом поглављу, представљене су могућности примене посебних система, софтвера и алата у области сузбијања криминалитета, почевши од запримања пријава о кривичним делима, припреме и планирања криминалистичких истрага, па до њихове примене у области међународне полицијске сарадње. На крају, у чланку се указује на контроверзе у примени вештачке интелигенције од стране агенција за спровођење закона, уз сагледавање више аспеката, као што су: технолошки, правни, етички и друштвени.

Кључне речи: агенције за спровођење закона, превенција криминалитета, сузбијање криминалитета, вештачка интелигенција, контроверзе

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