FROM DETECTION TO PROTECTION: ARTIFICIAL INTELLIGENCE AND VICTIM MANAGEMENT IN URBAN VULNERABILITY CONTEXTS

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ABSTRACT

This study examines the contribution of Artificial Intelligence (AI) tools to the management of crime victims in large urban environments with a focus on phenomena such as domestic violence, human trafficking, sexual abuse, and refugee vulnerability**.** Drawing on the theoretical framework of the "culture of control" (Garland, 2001) and predictive policing technologies, the research explores how digital tools contribute to the identification and enhanced protection of victims, as well as their influence on public trust and insecurities. Focusing on the characteristics of the urban context, the study analyzes the use of such technologies either as a lever of social trust or as a potential mechanism of surveillance.

Key words: Artificial Intelligence, predictive policing, victim identification, fear of crime, trust, gender-based violence, refugees, human trafficking, surveillance ethics

1. Introduction

The rapid advancement of Artificial Intelligence (AI) brings to the forefront new capabilities, but also significant dilemmas, in the fight against crime and the management of victims in urban environments. The shift from the mere detection of potential victims —through technologies such as facial recognition, stress-related voice patterns, or thermal imaging— to their substantial protection and support highlights the dual role of AI: on one hand, as a tool for prevention and empowerment, and on the other, as a potential risk for rights violations when clear safeguards are absent.

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In situations of urban vulnerability, as experienced by refugees, victims of gender-based violence or human trafficking, who are the subject of this study, the use of such tools must be evaluated under the lens of the principles of equality, non-discrimination, and human dignity. This paper investigates how AI can be ethically and effectively used to enhance social protection without undermining fundamental rights.

It begins with key questions concerning AI and its potential role in relation to crime victims in major urban centers (in Greece, for example, cities like Athens, Thessaloniki, Patras, etc.):

- (a) What are the core needs that algorithmic intervention models should address?
- (b) What do police statistics and empirical criminological research reveal about crime in large urban centers and, consequently, the victims it creates?
- (c) Given the vulnerability observed among individuals or groups living in urban settings (with increased social, economic, or cultural exclusion), in what ways and through which applications could AI contribute to victim management?

Before addressing these questions, certain clarifications regarding the terms used in the title are necessary. The phrase “from detection to protection” signifies a shift from merely identifying victims -e.g., through technologies for detecting faces, behaviors, or locations- to a holistic model of protection that includes service provision, prevention of revictimization, and the restoration of rights (Alexiadis, 2011:283-286). This points to the need for technology not to function solely as a surveillance tool, but as a supportive mechanism for vulnerable populations (Panousis, 2022, April 3).

The role of Artificial Intelligence in victim management refers to all stages of the process:

- Detection and identification: via facial recognition, thermal imaging analysis, voice pattern analysis, etc.
- Risk assessment: through predictive analytics and machine learning models that identify potential cases of abuse or trafficking.

- Management and support: e.g., via AI-powered chatbots or digital platforms for psychological support.

Simultaneously, the study explores how AI emerges both as a tool and as a challenge: its use may enhance or undermine victims' rights depending on its design and implementation. The term "urban vulnerability"[2] refers to individuals or groups who, within the urban fabric, experience heightened social, economic, or cultural exclusion, such as refugees, the homeless, trafficking victims, or at-risk children. Urban areas often concentrate both a greater number of victims and more technological applications, making this issue especially critical. This concept opens the discussion on how technology can amplify or reduce social inequalities.

But what is the reality in modern European urban centers regarding these questions? Contemporary European urban centers are characterized by high population density, intense social inequality, multicultural composition, and urban anonymity —factors that directly influence the conditions of victimization of vulnerable populations (Weinar, Bonjour & Zhyznomirska, 2018: 5–10). The lack of social cohesion and insufficient support structures in deprived areas create environments where phenomena such as domestic violence often go unreported, especially when victims are women of migrant origin or belong to socially excluded groups (Artinopoulou, 2006 :85–87; FRA, 2014).

At the same time, human trafficking is facilitated by the concentration of mobile populations and the authorities' inability to detect exploitation in densely populated and unevenly monitored areas (Askola, 2007: 204–217). The presence of refugees and asylum seekers in urban hubs -often without sufficient legal and social protection-

[2] Urban vulnerability refers to the degree to which individuals and communities in urban environments are susceptible to harm due to a combination of environmental, social, economic, and institutional factors (Moser & Satterthwaite, 2008; Wacquant, 2008). When viewed through the lens of social vulnerability**,** urban vulnerability emphasizes the unequal capacity of different social groups-particularly marginalized populations such as the poor, migrants, women, the elderly, and racial or ethnic minorities-to anticipate, cope with, resist, and recover from the impacts of crises, such as poverty, crime, environmental degradation, or disasters (Cutter et al., 2003). These vulnerabilities are often rooted in systemic inequalities, spatial segregation, lack of access to services, and weakened social networks (UN-Habitat, 2018:6,9,62). In the context of victim management using artificial intelligence tools**,** social vulnerability becomes a critical analytical and operational element, as it enables the detection of high-risk groups, the prevention of revictimization, and the prioritization of protective interventions.

renders them vulnerable to psychological and physical violence, forced labor, or sexual exploitation (IOM, 2019; Khosravi, 2010).

These observations are further confirmed by official police statistics (manifest crime), which remain a key tool for understanding and analyzing crime (Alexiadis, 2011:118-130; Dimopoulos, 2022:327-339). In Greece, for instance, the number of reported domestic violence cases in 2022 increased by 31.4% compared to 2021, doubling compared to 2020 (103.5%), illustrating the scale of the problem both nationally and across Europe.

Regarding human trafficking, data published by Eurostat on April 3, 2025, covering the year 2023, show that 10,793 victims of trafficking were recorded in the European Union in 2023 —a 6.9% increase compared to 2022 and the highest number recorded in the 2008–2023 period (Migration and Home Affairs, 2025).

These dynamics underline the need for a multidimensional approach to crime policy, which considers the urban environment as a risk condition rather than a neutral setting (Theologi, 2022:255-256, 2011:146–159). Special emphasis is required on improving access to support services, utilizing the community as a protective network, and limiting institutional indifference or distrust toward vulnerable groups.

2. Urban vulnerability and victimization in Athens: Empirical and theoretical perspectives

Urbanization[3], as a multidimensional phenomenon involving population concentration in major urban centers and the intensification of economic and social activity, deeply affects the structure of the social fabric and the distribution of opportunities and risks (Panousis, 2007:98-110; Zarafonitou, 2004:168). In high-density and socially diverse environments, urban life is often accompanied by inequalities in access to social goods, healthcare services, education, and social protection networks. In high-density and socially diverse environments, urban life is often accompanied by significant inequalities in access to social goods, healthcare services, education, and social

[3] According to the definition by Knox and McCarthy (2012:4) urbanization *is the process by which an increasing proportion of a population comes to live in urban areas, typically accompanied by the physical growth of cities and the intensification of economic, social, and environmental dynamics associated with urban life.*

protection networks. (Cutter, Boruff, & Shirley, 2003:242-261) These disparities are not random but are rooted in spatial exclusion, economic inequality, and insufficient urban planning, which often result in the marginalization of vulnerable groups such as migrants, persons with disabilities, the elderly, and single-parent families. Residents in underprivileged urban areas frequently face overcrowded and under-resourced schools, limited healthcare access, and few employment opportunities, further deepening social divisions and weakening the fabric of community life (Mitlin & Satterthwaite, 2013:17). According to the World Health Organization, urban inequalities are closely linked to lower life expectancy and increased vulnerability during times of crisis. Addressing these challenges requires inclusive urban development policies and stronger community participation in the design and implementation of social interventions (Harpham, 2009:107-116). This uneven distribution of resources and opportunities creates conditions for social exclusion, intensifies competition, and, combined with the weakening of local community institutions, increases the likelihood of criminal behavior (Kosmatos, 2025, April 23).

In the field of urban criminology, the theory of social disorganization (Sutherland, 1940)[4] highlights that neighborhoods characterized by high population mobility, socioeconomic instability, and a lack of social cohesion tend to exhibit elevated crime rates, due to the weakening of informal mechanisms of social control. Additionally, the 'broken windows' theory (Wilson & Kelling, 1982) argues that neglecting minor forms of social disorder in public spaces can foster a sense of lawlessness, potentially escalating into more serious crimes. This underscores the importance of timely and

[4]As has been noted by Park, Burgess, Mckenzie (1984:55), who used the theory as an interpretive scheme: "*Disorganization as preliminary to reorganization of attitudes and conduct is almost invariably the lot of the newcomer to the city, and the discarding of the habitual, and often of what has been to him the moral, is not infrequently accompanied by sharp mental conflict and sense of personal loss. Oftener, perhaps, the change gives sooner or later a feeling of emancipation and an urge toward new goals. In the expansion of the city a process of distribution takes place which sifts and sorts and relocates individuals and groups by residence and occupation".* Shaw and McKay were among the first in the United States to investigate the spatial distribution of crime and delinquency across urban areas. Their research built on work done by other Chicago School researchers, in particular Robert E. Park and Ernest W. Burgess, whose concentric zone theory examined how critical changes of the time (e.g., industrialization, urbanization, and immigration) affected the nature of social life in Chicago communities. Park and Burgess's theory characterized zones within the city, some marked by disorganizing characteristics and attributes. It was not until years later, however, with the work of Shaw and McKay, that crime became part of the equation. In their work, Juvenile Delinquency and Urban Areas, Shaw and McKay applied the concentric zone model developed by Park and Burgess to the study of juvenile delinquency (Kubrin, 2010:3; Zarafonitou, 2024:187,193).

routine interventions to preserve social order. However, when these approaches are applied without social sensitivity, they may overlook spatial inequalities and restrict the rights of socially vulnerable groups. In this context, the concept of the "right to the city" (Lefebvre, 1996:147-160) underscores the importance of democratic participation of all citizens in shaping the urban environment, advocating for social justice and equal access to the resources and opportunities that cities offer. The synthesis of these three theories proposes a more holistic framework for understanding urban life, where crime prevention extends beyond surveillance to include the safeguarding of social rights and collective responsibility.

Inequalities found in the urban environment are closely linked to the experience of crime and fear of crime[5], which vary, among other factors, according to social position and gender. This fear, as confirmed by empirical data, is not evenly distributed in the urban context. Fear of crime is higher in deprived neighbourhoods (Zarafonitou, 2002:44; Zarafonitou & Chrysochoou, 2015) and mainly affects vulnerable groups and reinforces phenomena of social withdrawal, isolation, and marginalization. Fear of crime is predominantly an urban phenomenon (Zarafonitou, 2002:40) and is also associated with perceptions of vulnerability, as highlighted by the research of Vieno, Roccato, and Russo (2013:519–535).

At a conference held by the Laboratory of Urban Criminology at Panteion University on November 23, 2022, titled “Mapping Crime and Insecurity in the Region of the Capital,” under the scientific responsibility of Professor Christina Zarafonitou, it was emphasized that fear of crime is shaped through a combination of actual threats and social perceptions, with strong spatial variation. In Athens, this results in a “paradox”: levels of fear are disproportionate to actual victimization rates (Zarafonitou, 2002, 2008, 2009, 2011). This discrepancy is attributed to various factors, such as dissatisfaction with state services related to crime control, low quality of life due to urban conditions, victim attitudes, lack of self-protection measures, and the role of the media (Zarafonitou, 2009, 2011). Major contributing factors to the feelings of insecurity in the Greek capital include drug use, inadequate policing, and the presence of migrants (Zarafonitou, & coll. 2016, Zarafonitou, Kontopoulou, 2020:3-33).

[5] Regarding the concept of fear of crime, see Zarafonitou, 2002, 2008, 2009, 2011, 2023.

One of the proposals presented at the conference for studying crime and fear of crime and developing effective crime prevention strategies was crime mapping, identifying the locations of victims and offenders to prevent future criminal acts (Bathas, 2022:105; Zarafonitou, 2022; Theologi, 2022:177). For successful implementation, technology must be integrated through the development of specific tools for prevention and early intervention (predictive policing). As a holistic approach to crime and insecurity in the Athens metropolitan area, it was suggested among others to move beyond crime "management" toward the search, identification, and resolution of criminogenic problems (Kontopoulou, Karagiannidis, 2022:169).

In this context, the integration of new surveillance technologies and artificial intelligence tools becomes particularly important, as it shapes the dynamics of urban control, the relationship of trust with law enforcement authorities, and the boundaries of individual rights protection.

3. From the "culture of control" to predictive victim management

Modern digital tools (e.g., risk assessment algorithms, victim detection models) are being utilized in several countries such as the U.S., the United Kingdom, the Netherlands, and Canada for the identification of trafficking and gender-based violence victims, as well as for understanding patterns of abuse (Lum & Isaac, 2016). In Greece, the challenges are multiplied due to high rates of reported domestic violence, the geographic concentration of refugees, and low levels of trust in law enforcement agencies.

3.1. Theoretical framework: surveillance and prevention

The choice to manage and control crime victims in urban environments through their identification and protection using AI technologies represents both a current reality in addressing the phenomenon and a practical application of preventive policing methods, which are increasingly favored and promoted today.

The origins of this shift can be traced back to the 1970s, when, as Garland notes in his work *"The Culture of Control: Crime and Social Order in Contemporary Society"* (2001), Western societies began a postmodern transition toward a regime of

heightened surveillance, security, and penal severity. Garland emphatically stresses that not only has crime changed, but society itself has transformed, and this transformation has reshaped criminological thinking, public policy, and the cultural meaning of crime and criminals (Garland, 2001:5–8). As a result, a "culture of control" has emerged, with criminal policy focused not on rehabilitation or social reintegration, but rather on risk management, emphasizing prediction, surveillance, and the identification of vulnerable populations.

Key features of this control-oriented criminal policy include: a logic of prevention; emphasis on individual responsibility (of either the offender or the victim), according to rational choice theory[6]; reliance on technological tools for surveillance and punitive enforcement; and the treatment of citizens[7] (Dimopoulos, 2020:52) as potential "suspects." Consequently, the preventive logic that operates prior to the commission of a crime mobilizes and incorporates algorithms that predict, monitor, and identify potential offenders as well as victims, who in turn become instruments of predictive control (Sunde & Sunde, 2021:1–21).

[6]This theoretical framework assumes that:

- The offender acts rationally, meaning they weigh potential gains from the criminal act against the risks (e.g., arrest, punishment).
- The environment and the availability of targets or victims influence the offender's decision-making.
- The likelihood of punishment and the readiness to enforce sanctions are key variables that can deter criminal behavior.

This perspective shifts responsibility primarily onto the offender, downplaying social, psychological, or structural factors (such as poverty, childhood trauma, inequalities). Furthermore, within the framework of Routine Activity Theory—which is closely related to rational choice theory (Cohen & Felson, 1979:588–608)—the opportunity for crime depends on the convergence of:

1. a motivated offender,
2. a suitable target (victim),
3. the absence of a capable guardian (Felson & Cohen, 1980).

This leads to a form of "victim responsibility," insofar as the victim's individual behavior (e.g., moving around at night, use of social media, social network) is interpreted as a risk factor. This view has been strongly criticized, as it tends to blame victims and overlook the broader social conditions that lead to victimization, especially in the case of women, children, or refugees (Walklate, 2007:26–56)

[7]Among the defining features of the concept of the citizen are those described by Aristotle in *Politics* III, 1275a22–25: "*A citizen, in general, is defined by nothing more than participation in judgment and in holding office. Among the offices, some are limited by time, so that it is not allowed to hold certain ones more than once*" *(*Dimopoulos, 2020: 526).

3.2. Predictive policing models

Artificial Intelligence appears to align with and be integrated into this logic, as algorithms predicting, monitoring, and identifying both potential offenders and victims are transformed into tools of "anticipatory control." Brantingham et al. (1995:5–26) are among the leading theorists of algorithmic crime prediction through tools of predictive policing such as PredPol, which forecasts locations likely to experience crime based on historical data, and Risk Terrain Modeling (RTM), which identifies "risky places" using environmental variables. According to these authors, the core of predictive policing theories is based on two main premises: first, that crime is not random but tends to cluster in space and time (hot spots); and second, that human behavior is to some extent predictable through historical analysis (via machine learning and pattern recognition) (Brantingham et al., 2018:1–6).

4. Global applications and ethical tensions

4.1. Latin America as a case study

In Latin America, cities such as Rio de Janeiro, Buenos Aires, Medellín, and Mexico City have adopted surveillance technologies and artificial intelligence systems to address urban crime. Examples include the deployment of "smart cameras" with facial recognition capabilities, geolocation systems, and algorithmic risk analysis—often implemented in collaboration with private companies. However, human rights organizations such as *Red enDefensa de los Derechos Digitales* in Mexico[8] and *Instituto de Defensa Legal* in Peru[9] have expressed serious concerns. The use of these technologies tends to intensify surveillance in impoverished and

[8]The Red en Defensa de los Derechos Digitales (R3D) is a Mexican organisation dedicated to the defence of human rights in the digital environment. It uses various legal and communication tools for policy research, strategic litigation, and advocacy and campaigns, with particular attention to freedom of expression, privacy, and access to knowledge. Available at:https://privacyinternational.org/partners/red-en-defensa-de-los-derechos-digitales

[9]The Legal Defense Institute (IDL) is a civil society institution whose purpose is the promotion and defence of human rights, democracy and peace in Peru and Latin America.
The IDL monitors certain public policies that IDL considers fundamental to the success and sustainability of democracy in Peru, from the perspective of human rights, gender, social inclusion, interculturality, transparency in public management, governability and good government. Available at:https://www.forestpeoples.org/es/partners-regions/partners/partner/instituto-de-defensa-legal-idl/

marginalized neighborhoods, frequently without being accompanied by institutional safeguards or victim protection policies (Huey, Walby & Doyle, 2006:149–166).

Studies indicate that such technological interventions often operate within a broader framework of "technological neoliberalism" (Monahan, 2006:1–27; Galdon Clavell, 2016:78–100), wherein innovation is not employed to enhance social cohesion but rather to intensify control (Webster, Leleux, & Krieger-Lamina, 2013:17) and securitize socially and economically vulnerable populations. The unequal application of digital technologies thus exposes the structural inequalities embedded in digital policing, revealing how "security" is constructed as a privilege afforded to specific social groups (Müller & Segura, 2016:1–5).

4.2. Uruguay's AI for domestic violence prevention

AI technologies are also being applied in Latin America for predictive policing, with the goal of forecasting and preventing crime through data-driven risk assessments. In Uruguay, for instance, the Inter-American Development Bank (IDB) supported the development of a machine learning algorithm that predicts the likelihood of repeat domestic violence incidents. This tool is designed to identify high-risk cases based on historical data and behavioral indicators, enabling social services and law enforcement to intervene proactively (IDB, 2021). These predictive approaches align with broader trends in algorithmic crime control, where prevention replaces response, and data replaces discretion (Brantingham et al., 2018). However, such practices have raised concerns regarding algorithmic bias, stigmatization of marginalized populations, and the lack of institutional accountability frameworks (Galdon Clavell, 2016; Monahan, 2006). In many cases, the deployment of predictive tools without transparency or human rights safeguards reflects a techno-security paradigm that favors control over care, reinforcing structural inequalities rather than mitigating them (Webster, Leleux, & Krieger-Lamina, 2013).

4.3. Technological neoliberalism and structural inequality in South Africa

Drawing on the work of Andy Clarno and Martin Murray (2013:210-227), the case of Johannesburg illustrates how predictive policing in African urban contexts is deeply intertwined with processes of privatization and socio-spatial exclusion. The transformation of policing from a public, reactive model to a predominantly private, preventive framework reflects broader patterns of urban governance reshaped by neoliberal logics (Bénit-Gbaffou, 2008:93-109). In Johannesburg, private security companies deploy predictive policing technologies that emphasize surveillance and risk management, particularly targeting marginalized Black communities as potential threats (Dinter, 2012:215-228). This practice not only reproduces historical inequalities rooted in apartheid spatial segregation but also reinforces social exclusion through algorithmic decision-making (Clarno & Murray, 2013:215). Thus, predictive policing in African cities like Johannesburg operates less as a neutral tool of crime prevention and more as an instrument embedded within existing power structures, shaping urban security in ways that often marginalize vulnerable populations while privileging wealthier, predominantly white neighborhoods (Singh, 2008).

5. Tools for identifying and protecting victims

This thematic section aims to highlight and review the opportunities that Artificial Intelligence (AI) technologies can offer for the protection and safety of victims through specific tools. We consider such a review essential, both to systematize emerging technologies and their regulatory foundations, and to showcase practical solutions that shape further development in this field (Novitski et al., 2023:1-2).

Before briefly referring to the technological tools that have been developed and applied in the four types of violence covered by this study (domestic violence, violence against vulnerable groups such as refugees, sexual abuse, and human trafficking), it would be appropriate to identify the key areas where technology can play a positive and empowering role in these cases. According to Al-Alosi (2020:1-10), who mainly focuses on victims of domestic violence, these areas include topics such as those analyzed below.

5.1. Provision of basic services for victims

AI is increasingly being utilized to support vulnerable populations by offering immediate and accessible information. In Germany, the German Red Cross implemented innovative AI-based applications such as chatbots, providing legal and social support to asylum seekers and refugees (Ediae et al., 2024: 985–1007). These applications facilitated navigation through the complex asylum process by offering information in multiple languages and tailored guidance based on each user's legal status.

AI also contributed to access to basic services such as healthcare, housing, and education, enhancing refugees' autonomy and their potential for social integration. Similar applications can be adapted to support victims of gender-based or domestic violence, providing discreet, safe, and immediate frontline solutions, especially in environments where physical access to services is limited.

5.2. Reducing isolation and enhancing connection

Technology has emerged as an effective support tool for victims of domestic violence, offering a safe space for social connection during periods of forced isolation. As relevant studies highlight (Dimond et al., 2011:413-421), through online platforms, victims are able to stay in contact with family and friends, even when their social interactions have been restricted by the perpetrator.

These platforms are also used to search for jobs, obtain information related to the needs of themselves and their children, and communicate with other victims. Platforms like Facebook serve as tools for empowerment, encouraging mutual support and experience sharing, while reinforcing a sense of safety through continued online presence.

Safety Guides for victims of abuse, created in cooperation with relevant organizations, also play a vital role. However, the data collected and shared on popular platforms like Facebook -which are also accessible to perpetrators-highlight the need for ongoing updates and privacy protection, reinforcing the dual nature of technology as both a tool of support and a potential risk.

5.3. Risk Detection and early intervention

Security devices and AI systems have become vital tools for prevention and intervention on behalf of abuse victims. Modern Natural Language Processing (NLP) algorithms analyze communication patterns on online platforms and messaging apps to detect warning signs related to domestic violence, trafficking, or other forms of abuse (Piraianu et al., 2023).

These technologies are used by authorities for the timely identification of potential victims. For example, in the UK, the police developed an innovative AI system that collects and analyzes data from emergency calls, social media, and healthcare services to detect possible abuse cases and enable preventive interventions (wa Teresia, 2024:226). These systems not only facilitate rescue and support efforts but also enhance the ability of welfare and policing agencies to respond more quickly and precisely, using cutting-edge technology.

5.4. Evidence gathering and abuse documentation

AI significantly strengthens the identification and documentation of abuse cases through the analysis of large volumes of data from diverse sources such as social media, surveillance records, public databases, official documents, and big data from border controls and digital traces (Dakalbab et al., 2022).

In border control contexts, machine learning algorithms are used to process biometric data, travel patterns, electronic passports, and entry-exit records to detect suspicious movements or false identities (Europol, 2023). For example, Frontex uses AI systems to monitor cross-border movements and cross-check information with known criminal networks (Frontex Risk Analysis Unit, 2022).

At the same time, AI is used to analyze digital traces from geolocation, cryptocurrency transfers, social media platforms, and the dark web. NLP technologies allow for communication and language pattern analysis, facilitating the identification of trafficking (Sykiotou, 2003:90) or child abuse victims (Interpol & Europol Joint Report, 2023). Furthermore, blockchain analysis links suspicious transactions with

online advertisements, offering crucial information about perpetrators, networks, and locations (Drake, 2025).

A notable example is the *Spotlight* application used by the National Center for Missing and Exploited Children (NCMEC) in the USA. Based on AI, it allows for the rapid detection of missing children in online ads -often within hours- and provides law enforcement with real-time potential intervention locations (Davis, 3.20.2025).

Moreover, this technology can support the drafting of legal documents such as search warrants, subpoenas, and indictments, automating processes that traditionally required time and human involvement. In this way, the need for victims to repeatedly recount their experiences in front of perpetrators is reduced, limiting the risk of secondary victimization.

Overall, the combination of physical and digital data through AI capabilities allows authorities to act more proactively, faster, and more accurately than ever before, ensuring victim protection and effective prosecution of criminals.

5.5. Facial recognition for victim and perpetrator identification

Facial recognition and other forms of biometric analysis, based on AI, have begun to be applied by police authorities to identify victims and suspects in cases of disappearances, human trafficking, and domestic violence. By analyzing data from security cameras, public records, and social media photos, these systems enable quicker and more accurate interventions (Fontes et al., 2022).

In the UK, the Metropolitan Police has applied facial recognition technology in public spaces to locate missing persons as well as known offenders. Simultaneously, facial recognition has helped protect victims by identifying people in danger (e.g., declared missing), allowing for the immediate mobilization of public support services (Ediae et al., 2024).

However, the use of such tools also raises ethical concerns and privacy issues, which must be taken seriously, especially when dealing with vulnerable populations such as children or victims of gender-based violence. Despite the benefits of facial recognition in victim protection and crime prevention, its use raises serious questions

about privacy, consent, and the risk of misidentification. This is especially true for vulnerable groups such as children, refugees, or victims of domestic and gender-based violence, where systematic surveillance can lead to secondary victimization or stigmatization. There is also a significant risk of discrimination, particularly when these systems show reduced accuracy for individuals with different racial or cultural features (Garvie et al., 2016). Therefore, the implementation of such technologies requires transparency, legal oversight, and explicit guarantees for the protection of fundamental rights.

5.6. Empowerment and behavioral change

This is achieved through innovative applications aimed at improving victims' quality of life by reducing self-blame and re-victimization.

In this direction falls the digital application *myPlan*, developed by Johns Hopkins University, which provides education on healthy relationships including awareness of abuse, decision-making, readiness building, and healing. Its theoretical approach draws on social-cognitive theory, empowerment, and trauma-informed care, emphasizing safety and empowerment through action, decision-making, and recovery (Decker et al., 2020:1-2). By asking victims about critical abuse-related issues in their current relationships (e.g., level of risk, inflicted or intended severe physical harm), it generates a personalized safety plan aligned with their needs and priorities[10].

Additional requested information includes prioritization elements such as children's well-being or privacy, aiming to create a customized plan for long-term safety and well-being. To ensure confidentiality, a personal identification number (PIN) is

[10]In March 2023, Greece introduced its first digital application specifically designed to address domestic violence incidents—the "Panic Button." This mobile application is provided free of charge to women identified as victims of domestic violence, enabling them to send an immediate and discreet alert to the Hellenic Police in cases involving threats to their life or physical integrity. Once installed on a smartphone, the application can be activated by pressing and holding a designated icon, which automatically sends a text message (SMS) to the Emergency Response Operations Center, containing key information for locating the victim. The distribution of the application is coordinated through local Police Departments, the Domestic Violence Response Offices in Athens and Thessaloniki, and the Counseling Centers of the Network of Structures under the General Secretariat for Demographic and Family Policy and Gender Equality of the Ministry of Labor and Social Affairs. The initiative represents a significant step toward integrating technology into victim protection frameworks and enhancing rapid police intervention in high-risk situations. (Ministry of Labor and Social Affairs. 2023, March 23).

provided, which redirects the user to a downloadable application to maximize available options[11].

Importantly, digital technology also plays a role in assisting perpetrators by offering them opportunities to reassess and reform their abusive behavior. Emphasis here is placed on encouraging participation in regular support meetings (Bellini et al., 2020:1-13). In Northern England, through the initiative of the charity *Safe Start*, an algorithm was developed for domestic violence offenders, highlighting specific mechanisms related to personal accountability and behavioral change. These include self-awareness, recognition of the extent of harm, support from professionals, and respect for norms.

In light of the above, it can be concluded that the use of such technologies aligns with the logic of algorithmic prevention. However, it raises critical questions regarding privacy, transparency, and ethics. Their integration into victim management requires careful evaluation to ensure they serve their primary purpose -empowering victims- and do not become tools for control or the stigmatization of vulnerable groups.

5.7. *Global case studies in Latin America*

In Latin America, AI-based technologies are increasingly being used to support crime victims, particularly in the domains of identification and early detection. One prominent example is the use of Clearview AI by law enforcement agencies in countries such as Brazil, Ecuador, and Colombia to identify victims -especially in cases of child sexual exploitation -through facial recognition technologies (BBC, 2020, 23 January). In Ecuador, the “Guardianes Digitales por la Niñez” initiative led to the identification of over 100 victims and dozens of perpetrators within a few days of implementation. Additionally, in Mexico City, the “Saving Life 911” program employs natural language processing (NLP) and AI-powered models based on transformer architectures to analyze emergency call audio, helping to detect domestic or gender-based violence cases that would otherwise be misclassified (UNODC & INEGI, 2024). Another innovative tool is the OlimpIA chatbot developed in Mexico by AuraChat.AI, which offers personalized legal and psychological support to victims

[11]The *myPlan* program has been implemented in populations with diverse demographic characteristics, such as in the United States, Canada, New Zealand, and Australia.

of digital violence via WhatsApp. Designed specifically to address non-consensual sharing of intimate material, the AI assistant also provides multilingual support - including indigenous and sign languages-and adapts its role to the user's needs, whether as a lawyer, counselor, or rights defender (Explora CDMX, September 5, 2024).

5.8. Case studies in South Africa

In South Africa, where rates of violent crime rank among the highest globally, AI-based emergency-reporting apps like Namola aim to enhance authorities' response speed and victim support (Fanzio, September 23, 2019). Namola allows users to trigger distress signals via their mobile phones, transmitting real-time location data and incident specifics to first responders. Studies report that Namola has reduced emergency response times by approximately 20–30%. However, adoption remains hindered by limited internet access in rural areas and technological illiteracy among elderly and low-income populations. For AI integration to be effective, it must be accompanied by inclusion policies-such as free data access, digital literacy training, and local community support-to ensure equitable access to protection (Parks, November 27, 2017)[12].

5.9. Conclusion: toward ethical and equitable AI in victim management

AI holds potential to support victims and improve safety in urban areas, but only if implemented with safeguards for privacy, transparency, and justice. Technology must serve-not surveil-those at risk. To that end, interdisciplinary approaches integrating law, sociology, technology, and human rights are essential for equitable urban governance.

[12]Namola acts as an intermediary to victims of crime in South Africa and 10111 centers. The free 24/7 crime response app answers and pre-screens calls to alleviate some work from emergency response teams. For genuine calls, Namola shares pertinent information and the GPS location of the caller with the nearest police department or citizen responder. This partnership improves the efficiency of South Africa's crime response services. Available at:https://borgenproject.org/namola-an-innovative-way-to-report-a-crime-in-south-africa/

6. Regulatory framework for the use of Artificial Intelligence technologies in policing and victim identification.

The development and implementation of Artificial Intelligence (AI) tools in the domains of policing and victim identification take place within a complex legal and ethical framework at national, European, and international levels.

6.1. Protection of Personal Data

AI technologies that process personal and sensitive data (e.g. facial recognition[13], behavioral profiling[14]) must comply with the General Data Protection Regulation (Regulation (EU) 2016/679 - GDPR) and with Greek Law 4624/2019, which incorporates relevant provisions into national law[15]. Additionally, the Council of Europe's Convention 108+ establishes fundamental principles for data processing in the context of law enforcement, with respect for fundamental rights (Mantelero, 2018:636–642; FRA, 2018; Bygrave, 2014:5–9).

Facial recognition and behavioral pattern analysis constitute processing of biometric data, which, under Article 9 of the GDPR, are considered “sensitive” and may only be processed under strict conditions, such as necessity for public interest or the explicit consent of the data subject. The deployment of such technologies in urban environments, especially without prior information and consent of individuals, poses risks of mass surveillance, spontaneous profiling, and amplification of social inequalities (EDPS, 2021). The European Data Protection Supervisor (EDPS) has already called for a ban on the real-time use of facial recognition by law enforcement authorities, stressing that such tools may undermine the core of fundamental freedoms

[13]Facial recognitionconstitutes a form of such as in the United States, Canada, New Zealand, and Australia.biometric processing and is classified by the GDPRas high-risk(Article 9), requiring explicit consent or a specific legal basis (e.g., public interest). (European Union, 2016; Bygrave, 2014:5–9).

[14]Behavioral patterns (such as gait analysis, micro-expressions, and emotion recognition) fall under the category of indirect biometric identification, which raises concerns regarding transparency, objectivity, and systemic exclusion (Wachter, Mittelstadt & Floridi, 2017:76–99; Mantelero, 2018:636–642; EDPS, 2021).

[15]Facial recognitionand the analysis of behavioral patternsfall within the scope ofArticle 9 of the GDPR concerningspecial categories of personal data, which requireenhanced protectiondue to thehigh risk of privacy infringement. The deployment of such tools inpublic spaces, without a clear legal basis, raises critical concernsregarding legality, necessity, andproportionality, as emphasized in theAnnual Report of the European Data Protection Board (EDPB, 2021).

(EDPS Opinion 6/2021). The Artificial Intelligence Act, adopted by the European Parliament in 2024, limits the use of real-time biometric identification systems to narrowly defined exceptions, such as preventing terrorist threats, and imposes strict requirements for accountability, transparency, and judicial oversight (European Parliament, 2024).

6.2. Victims' rights

AI-based victim identification technologies must align with Directive 2012/29/EU on victims' rights and Directive 2011/36/EU on trafficking in human beings. The national framework includes Law 4251/2014 and the Istanbul Convention (Law 4531/2018), which emphasize the duty of authorities to provide individualized assessment, information, and protection to victims (European Commission, 2020; Walklate & Mythen, 2011:179–195).

When identifying and assisting victims of trafficking, domestic violence, or sexual abuse, the use of AI technologies based on behavioral or biometric indicators (e.g. thermal imaging, facial expression analysis[16], or stress-related voice patterns[17]) must

[16]Thermal imaging and facial expression analysis, as non-invasive observation technologies, have been proposed as effective tools for the identification and support of victims of human trafficking, domestic violence, and traumatized refugees. These methods enable the detection of non-verbal indicators of fear, stress, or trauma, even in individuals who are unwilling or unable to verbally communicate their experiences. As noted by Lewinski, den Uyl, and Butler (2016), tracking microexpressions and facial temperature fluctuations can reveal emotional conditions associated with victimization. Similarly, Pavlidis and Levine (2002) highlight the value of thermal imaging in identifying psychophysiological stress, making it a promising tool for supporting vulnerable individuals in critical contexts. Nonetheless, the application of these technologies in sensitive environments requires strict ethical safeguards, including informed consent, data privacy protections, and measures to prevent secondary victimization. Such tools must not function in isolation; rather, they should be embedded within multidisciplinary frameworks that prioritize the rights, dignity, and psychological well-being of victims. Furthermore, as emphasized by the International Organization for Migration (IOM, 2019), the healthcare and protection of refugees and migrants should be guided by principles of non-discrimination, confidentiality, and cultural sensitivity, ensuring that any technological intervention respects the complex realities faced by these populations.

[17]Acoustic stress patterns refer to vocal features that may indicate psychological distress or anxiety, detectable through voice analysis technologies. These systems analyze parameters such as pitch, speech rate, pauses, and volume, which can serve as markers of emotional stress.

Voice stress analysis is increasingly applied in a variety of fields, including criminal investigations, interrogations, mental health monitoring, and emotional support services. Despite its potential benefits, this technology raises significant concerns regarding privacy, consent, and reliability, particularly when deployed without the informed consent of the individual involved (Hayashi & Takahashi, 2021; De Silva & Lu, 2020; Epps & Shi, 2020).

Globally, these technologies are employed for different purposes:

be particularly cautious regarding the risk of revictimization. According to Article 8 of Directive 2012/29/EU, victims are entitled to individualized assessment and protection from secondary victimization during interactions with law enforcement. Furthermore, Directive 2011/36/EU on trafficking in human beings mandates that identification should not depend on a victim's cooperation with law enforcement, thereby discouraging surveillance-based approaches that could cause additional trauma. Indiscriminate use of AI in refugee camps, first reception facilities, or shelters may breach the principle of non-discrimination (Article 14 ECHR) and the presumption of privacy, while lack of transparency in decision-making processes may restrict fair treatment and access to justice.

6.3. Privacy and civil liberties

The use of AI tools in urban areas for the purpose of surveillance or crime prevention[18] must respect the Charter of Fundamental Rights of the European Union,

- In the United States, systems such as Voice Stress Analysis (VSA) are predominantly used in the context of criminal investigations and lie detection.
- In the United Kingdom, voice stress tools are integrated with artificial intelligence to support cases of domestic violence, forced labor, and other forms of exploitation. These tools assist in evaluating victims' emotional states or analyzing suspect behavior during interviews.
- In Germany, voice analysis technologies are used for security screening and interrogation settings, particularly in criminal justice.
- Japan is investing significantly in the use of such technologies for forensic and medical research, focusing on emotional state monitoring.
- In China, these tools are often implemented as part of broader surveillance and public security systems, highlighting concerns about state control and data use (Epps & Shi, 2020; De Silva & Lu, 2020).

While these applications demonstrate the growing capabilities of audio-based stress detection, they also underscore the need for transparent legal frameworks, ethical oversight, and data protection measures, especially when dealing with vulnerable individuals.

[18]The use of Artificial Intelligence (AI) tools in urban environments for purposes of crime prevention or surveillance is grounded in the logic of predictive policing. This approach seeks to forecast unlawful acts through algorithmic analysis of spatiotemporal data and behavioral patterns (Joh, 2019).

Globally, the implementation of such technologies is already widespread:

- In New York City, the police employ systems like CompStat and ShotSpotter, the latter enabling real-time detection of gunfire through acoustic sensors.
- In Chicago, the Strategic Subject List aimed to identify individuals deemed at high risk of involvement in violent incidents. However, the initiative drew strong criticism for bias, lack of transparency, and reinforcement of social inequality (Ferguson, 2017).
- In London, facial recognition has been tested in public spaces to monitor for suspects.
- In China, particularly in Beijing and Shenzhen, the most extensive surveillance networks in the world have been deployed, combining biometric, thermal, and kinetic data streams to track movement and behavior on a massive scale (Zuboff, 2019). Despite their technological

particularly Articles 7 and 8 on respect for private life and protection of personal data. The balance between public security and individual freedoms is a critical factor for societal acceptance (Zuboff, 2019; Koops et al., 2009:1–22; Lyon, 2003).

6.4. Vulnerable groups and minorities

Policing policies and technological tools applied to vulnerable groups such as refugees, victims of gender-based violence or trafficking must comply with international anti-discrimination standards (Article 14 ECHR) and the principles of equality and dignity. Targeting individuals based on ethnic, racial, or social identity can undermine the legitimacy of such interventions (Eubanks, 2018:20–22). Surveillance practices in refugee camps or victim shelters must adhere to the principles of necessity and proportionality (ECRI, 2021), and any technological intervention should be embedded within a broader psychosocial support framework to avoid further victimization (Browne, 2015:113–114). The formation of ethical governance models, as well as the active involvement of vulnerable groups in the design of technological solutions, are key conditions for institutional legitimacy and the preservation of public trust (FRA, 2019; Koops et al., 2019:483–575; Wachter, Mittelstadt & Floridi, 2017:76–99; Mantelero, 2016:238–255).

7. Conclusion

Artificial intelligence tools for crime prevention, as well as for the identification and protection of victims of domestic violence, human trafficking, and other forms of abuse, represent innovative preventive practices with positive outcomes in areas such as early risk detection, targeted interventions, and enhanced victim support. However, the use of such tools raises critical ethical concerns, including the protection of personal data, the potential for algorithmic bias, and the broader shift toward

sophistication, such systems pose serious risks to democracy and human rights, especially when deployed without proper legal safeguards or community consent. Algorithmic surveillance can undermine principles of transparency, proportionality, and accountability, particularly when targeting socially vulnerable groups (Harcourt, 2015).The shift from a presumption of innocence to a logic of technological suspicion marks a troubling development, potentially leading to preventive surveillance regimes characterized by discrimination, exclusion, and social profiling.

preemptive social control, which may lead to stigmatization or over-policing. In this context, the adoption of a clear regulatory framework is essential—one that incorporates the principles of accountability, transparency, citizen participation, and thorough risk assessment, with the ultimate goal of ensuring the fair and responsible use of these technologies.

The introduction of AI systems aimed at reducing crime and the feelings of insecurity-crime reduction being a primary objective for major metropolitan areas, as emphasized in the proceedings of the conference "*Mapping Crime and Insecurity in the Metropolitan Region of Athens During the Economic Crisis"*[19]-can yield positive results only when accompanied by socially accepted surveillance practices, public accountability, and participatory security policy design. Transparency, proper training of personnel, and ongoing impact assessments are fundamental prerequisites for strengthening public trust in these technologies (Vieno, Roccato & Russo, 2013: 513–519; Jackson & Bradford, 2010: 241–248; Innes, 2004: 335–355).

Especially in large urban centers like Athens—where high population density, significant migratory flows, and a growing number of domestic violence reports are observed—prevention policies and victim protection tools can contribute to the timely identification of risk patterns. However, it is crucial to stress that such a preventive policy must be based on public trust in the competent authorities and on the adequate training of personnel in relevant services, in order to ensure its participatory and effective implementation.

8. Policy recommendation

To ensure the fair and effective integration of AI-based tools for victim detection and protection within national crime prevention strategies, states implementing or planning to implement such technologies must establish a robust legal, ethical, and institutional framework. This framework should uphold human rights, safeguard personal data, and actively mitigate algorithmic bias. Key pillars of this approach include:

[19] Under the scientific responsibility of Prof. Christina Zarafonitou.

- Transparent algorithm design, with the publication of technical documentation and open-access risk assessments.
- Regular evaluations by an independent AI ethics oversight body, composed of legal experts, data scientists, victim support professionals, and civil society actors. This board should conduct pre-implementation audits, ongoing performance reviews, and publish annual transparency reports.
- Mandatory training for frontline professionals (e.g., police, social workers, healthcare personnel) in both the technological and ethical dimensions of AI use.

Importantly, victims and representatives of vulnerable populations must be actively involved in shaping the design, implementation, and evaluation of these tools to ensure social legitimacy and fairness.

In large urban centers such as Athens—characterized by high population density, increasing migration flows, and elevated rates of domestic violence—policy tools must be localized and context-sensitive. Targeted pilot programs should be launched in identified high-risk districts, using a "sandbox" model to allow for controlled experimentation. These pilots could include AI-assisted early warning systems, trauma-informed digital case tracking platforms, and mobile applications for real-time victim alerts. Each initiative should be co-developed and monitored by a multidisciplinary steering group consisting of public agencies, NGOs, and data governance experts.

Sustainable financing of these initiatives should rely on blended funding models, combining national public investment (e.g., Ministries of Citizen Protection, Digital Governance, and Social Cohesion), EU funding instruments (e.g., Digital Europe Programme, ESF+), and strategic partnerships with civil society. Funding eligibility should be contingent upon demonstrable adherence to principles of ethical AI use and measurable impact on victim protection.

Finally, investment should be made in:

- Developing localized AI models that account for social and cultural variables (e.g., gender, ethnicity, socio-economic status),

- Expanding digital inclusion through internet access programs and digital literacy training for marginalized groups,
- Establishing real-time feedback mechanisms to ensure adaptive, accountable, and community-sensitive implementation.

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