The Use of Artificial Intelligence in Investigating, Combating and Predicting Various Crimes through Understanding the Psychology of Perpetrators

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Abstract

The safety of communities and residents is seriously threatened by the emergence of new sorts of crimes in recent years. Traditional criminal investigative methods are ineffective at preventing and tackling crimes because they are too passive. Currently, artificial intelligence is being applied in a number of ways, such as video image identification, crime data mining, crime prediction, and more, to enhance policing and criminal investigations. Naturally, there are hazards associated with the deployment of artificial intelligence, such as potential privacy violations. In the aim that artificial intelligence may be better used to criminal investigation activities and predicting its occurance, this article primarily introduces the key uses of AI in criminal investigation at this time and makes logical recommendations for issues and hazards.

Keywords: hazards, identification, investigation, recommendations, intelligence

Introduction

One of the trendiest current study topics is artificial intelligence, or AI. The phrase "artificial intelligence" was first used by John McCarthy at the Dartmouth Conference in 1956, which marked the formal beginning of AI, starting with the "Turing test" in 1950 [1, 2]. In its growth, artificial intelligence has touched practically every aspect of society, including politics, the economics, health care, and biology. Similar to how the emergence of the big data era has made it easier for criminals to commit crimes, it has given rise to new ways to commit crimes and new types of crimes, breaking the boundaries of traditional crime time and space, making it impossible for traditional investigation models and investigative measures to quickly and effectively solve cases. This creates the required circumstances.

Given the significant role that AI plays in criminal investigations, several academics have started to research the specific ways in which AI is used in this field. For instance, Arshath Raja et al. used machine learning (ML) to identify and cluster crime patterns, which increased the accuracy of crime pattern recognition [3]; McKendrick used AI to predict terrorist attacks based on the analysis of relevant data amounts to facilitate the scientific and effective deployment of counter-terrorism resources [4]; Helm and Hagendorff elaborate on Challenges for AI in the structure against hidden organised crime, AI can only detect a small portion of hidden organised crStu

Study problem

 -The problem of the study is limited to defining the role of artificial intelligence in criminal investigation work that includes combating all kinds of crime and predicting their occurrence in order to contribute to the achievement of criminal justice.

The importance of study

-Forensics,Artificial Intelligence and Machine Learning play a very crucial role. Investigators can automate their procedures with these two technologies, allowing them to swiftly identify information and insights, saving time in the process. Read on to learn how AI is improving the field of forensic investigation and crime detection.

Study objectives the objectives othis study is limited to come main points:-

1-the study aims to determining the promient methods of using the appropriatily tools in the stage of the criminal investigation

2-The study shows the importance of employing the requirements of artificial intelligence in combating all typs of crimes and predicting its occurrence

3-The study reviews the most important applications of artificial intelligence in the criminal systems of some Western and Arab models in security work

4-The study reviews the most prominent applications of artificial intelligence used to contribute to the achievement of criminal justice in all stages of criminal advocacy in both security and judicial work.

2--1-UThe study shows the importance of employing the requirements of artificial intelligence in combating crime and predictingiThe study shows the importance of employing the requirements of artificial intelligencetccurrencethe studyrrrrrtttttttsing Artificial Intelligence to Address Criminal Justice Needs

Search plan
-The first requirement:- Using Artifitial Intillegence in the criminal investigation
-The secound requirement :-The role of artificial intelligence in combating crimes-The third requirement:- The role of artificial intelligence in predicting crimes
-Forth Reqierment:-Using AI in determining the future possibilities in the criminal justice system
The first requirement:- Using Artifitial Intillegence in the criminal investigation

1-1-The defintion of Artificial intelligence

-AI demonstrates human-like behaviour, and thinking, that is reasonable for some of scholars and scientists who considered AI is a technological field that focuses on the study and advancement of theories, processes, tools, and application systems related to human intelligence Simply described, artificial intelligence (AI) is the use of machines to replicate complex human behaviours like thinking, comprehension, and decision-making.

-They demonstrate their point of view by that if one aspect of human intelligence is the ability to learn from experience, then machine learning is a simulation of that ability. This human ability in software algorithms and computers (1)

Through this idea, a significant portion of those in charge of the research came to the conclusion that artificial intelligence has the potential to always be a part of the criminal justice system, aiding in the area of investigation and enabling various police departments to better maintain security and public tranquilly.

-It is noteworthy in predicting law enforcement activities, artificial intelligence may be considered a key hallmark to differ from physical cyberspace in four key ways:

Forecasting and analysis, recognition and exploration, availability of information, and openness in the administration of justice

1-2-Types of artificial intelligence

-It has additionally been referred to as automated control or artificial intelligence. This learning seeks to comprehend fundamental concepts as a computational process and integrates methods from statistics and computer science, making it appropriate for seeing and anticipating new patterns as well as giving it the capacity to improve performance through feedback. To do this Purpose: In an effort to mimic human logic and the manner in which correlations or inferences may be produced, "machine learning" has been used from fuzzy logic to the creation of artificial neural networks; these networks rely on modelling neurons and giving the network with a collection of data (1).

-Weak AI, strong AI, and super AI are three types of AI that may be categorised [8]. The term "weak AI" refers to AI systems that perform particular tasks in a professional setting, such as voice recognition, intelligent search, etc. [9]. At current time, weak AI is the most often utilised type of AI. In certain specialised sectors, like expert systems, weak AI has caught up to or even exceeded humans. Strong AI is a subset of AI that is capable of thinking almost as well as humans do and has self-awareness. It still has a long way to go before it reaches the level of powerful AI at the current stage. The term "super AI" refers to an intellect that may even outperform

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1 Bernard Marr, "What Is the Difference Between Deep Learning, Machine Learning and AI?" Forbes (December 8, 2016).

1-3-Main applications of using AL in criminal investigation

 A-"video investigation"

 -The term refers to the use of computer image processing technology to analyse and evaluate the video image data gathered by video surveillance in order to swiftly identify criminal suspects. It is one of the methods of criminal investigation that is frequently employed in the big data era.

-It mostly employed "human sea tactics" in the past, which involved individually searching for and comparing questionable targets using the video and picture data gathered. But with so many different types of monitoring installed throughout the streets, the volume of video surveillance data being captured and stored has skyrocketed, increasing the burden significantly.

information. Additionally, there were inconsistencies in the quality of the movies that were collected, and some of them were only temporarily kept, which further decreased efficiency. These issues may now be effectively resolved by using AI computer recognition technologies (such as movement recognition, vehicle trajectory recognition, and portrait recognition). Artificial intelligence (AI) technology can automatically process large amounts of video data, extract and retrieve target features, correlate other types of information, and identify and detect suspect targets (people and vehicles) automatically. It can also describe the behaviour of criminal suspects. It entirely relieves the investigators of the time-consuming search and comparison tasks,

B-Data mining for crimes

-Extraction of hidden, previously undiscovered, and potentially important information and knowledge from a huge volume of data in a database is known as data mining [11]. Data mining encompasses technology in related disciplines including statistics, artificial intelligence, databases, and visualisation methods. In order to find the investigation clues and evidence materials and further point out the investigation direction, data mining technology can be used to screen out crime-related data from massive data (such as communication data, network data, video data, and physical evidence data). On this basis, risk assessment and crime prediction can also be carried out to support the construction industry. Currently, widespread data mining

-Techniques include association, regression, and cluster analysis, among others. The main step is to determine the basic information about the criminal suspect, the information involved in the case, electronic information, trajectory information, and case information through correlation analysis of the characteristics of criminals, activity trajectory, case situation, traces, and physical evidence, etc. Next, establish a comprehensive model of criminal behaviour analysis, infer the suspect's foothold and the areas where they may continue to operate.

-Additionally, the use of data mining techniques in computer and network criminal forensics may be very beneficial.

C-Predicting crimes

-By merging enormous amounts of data, AI has altered the way that investigations are traditionally conducted, enabling more precise and scientific predictive analysis of crimes. Crime prediction may be broken down into several categories, including crime type, crime time and space, offender, victim, crime trend analysis, and recidivism.

-The gathered and extracted data are mined, integrated, analysed, and collated to summarise the pertinent aspects, features, and laws of crimes in accordance with the demands of investigation and handling. Create a crime prediction model after that, which can foretell future crime kinds, quantities, victim categories, locales, and other details The intelligence-led investigative paradigm enables law enforcement to develop focused strategies and scientifically optimise police resources to enhance

To analyse the crime's spatiotemporal sequence, we may utilise machine learning (ML) algorithms as the LSTM algorithm, genetic algorithm, neural network, etc. by using data that has been used to train the aforementioned algorithms, such as population density, time, place, economic status, distribution of the police force, weather, temperature, etc. To suit the crime trend, an ARIMA model, an exponential smoothing model, or a neural network model is built. Based on these models, RMSE and F1Score are used to assess the model's ability to forecast crime.

-There are other additional techniques for predicting crimes, including A Review on the Application of Artificial Intelligence. Grey system theory approach, Knox algorithm, SVM algorithm, 1545 K-means algorithm, etc.

The secound requirement :-The role of artificial intelligence in combating crimes

 -As the essence of the law depends on information or data, artificial intelligence is one of the contemporary methods that may be used to prevent and combat crime. These data have the computing ability to address issues that people alone are unable to solve.

- By using the effectiveness and accuracy of information gathered everyday in a number of criminal cases after each is assessed, AI provides immense potential for law enforcement, with which AI will soon become a significant focus of law enforcement..

-Bill Gates one of the Amircan scientits in this eield believes that the analysis of some tangible applications in the field of criminal investigation works is useful in:

1- identifying a known criminal in a particular area, send an email to the private phone

2- Determining the geographical areas and the times in which the incidents were committed

3- Determining a criminal file based on big data.

4- Indicating the level of multiple crimes in a specific area

5- Replacing a hypothetical agent in specific tasks for the police officer(1)

- It may be interesting to imagine on the mobile phone the risk of theft or aggression in a particular area, or to obtain an estimate of the number of pickpockets in another area, which may provide the citizen with a sense of control over his security Nevertheless, these applications have posed a threat to privacy and decision-making ability, in addition, it will be difficult without data control to assess the reliability of information, which is the best way to protect people from violations, avoid policing driven by return on investment, and allow reliance on the development of artificial intelligence applications from During the application of the law (2

2-1-Crime Scene Investigation

-Neural networks have recently been trained by scientists at the University of Leon -in northwest Spain to recognise clues left at the crime scene. Thousands of photographs from crime scenes are sent into the computer in this way so that the machine learning algorithms can learn what to look for. This discusses potential strategies that offenders may employ in various circumstances that could link all of the crimes to a single individual. For instance, if a burglary occurred, there are a variety of items that the thief may leave behind that might be used to link them to previous crimes in the neighbourhood

-It also demonstrates the importance of artificial intelligence techniques in finding ---evidence at crime scenes, particularly in complex murder cases. This is especially true if men of evidence can find important evidence from crime scenes through photographs taken by crime scenes that can help open a new link to the crime by Trusted AI systems. For instance, looking for a toy or a weapon found at a crime scene may eventually point to the offenders (1)..

-All of the computer-inputted photographs must be annotated in order to do this. For instance, if the researchers wanted the computer to recognise every footprint that had been left at the crime scene, they would then need to classify every image of the footprints because they come in a variety of sizes and forms. Additionally, the computer may be taught to recognise footprints not just by looking for them but by matching them to particular shoe kinds that can then be used to link them to footprints from other crime scenes. This would need humans to annotate each footprint at an even deeper level, labelling each one with the brand of shoe it belongs to, such as Nike, Puma, Adidas, etc.

-AI may be utilised by police agencies to reduce expenses in addition to helping them solve crimes. Police agencies all across the world are searching for ways to save costs, and many of them are turning to reducing the number of officers and investigators they have on staff. This is because police budgets are being cut worldwide. Cities may benefit from artificial intelligence by using it to do jobs that would otherwise need to be completed by humans. In the past, catching suspects required spending endless hours reviewing evidence files, security camera footage, the crime scene, and other materials. Thanks to recent advancements in AI, all of this can be completed more quickly, cheaply, and effectively.

2-2-Identifying Suspects

-"Bill Gates" declared that recent years have seen a rapid advancement in artificial intelligence. Innovation in artificial intelligence cannot fully manage personal data and information on its own; rather, it is essential to look at all sides of learning while acquiring enormous amounts of data. The use of learning algorithms to understand

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1 Patrick Perrot : what about AI in criminal intelligence ? From predictive policing to AI perspectives European police science and Research Bulletin . lssue 16 . summer 2017 .P73

2 Patrick Perrot : what about AI in criminal intelligence ? op , cit PP 73 , 74

and generalise relationships of interest is directly or indirectly demonstrated in the field of crime analysis.specially in the field of facial recognition

-It might be very difficult to recognise one person among a large group of people. Furthermore, although it could be extremely simple for the individual to make a mistake, it might be challenging to show in court. However, face recognition technology has made all of this simpler. Law enforcement organisations all around the world are using this new technology to identify persons both offline and online. For instance, if we have images of the suspect, we can input them into machine learning software so that it can learn to recognise the suspects on millions of web pages. Consider the difficulty of manually searching all of these websites for the person we are looking for. This is very useful for investigating the so-called "Dark Web" where lots of criminals lurk and illegal activity goes on.

2-3-Determine the loaction of the accident

-On the shooting side, the police can arrive at the scene of a shooting accident without anybody notifying them or an officer seeing the shooting occurrence. Each sensor records the timing and sound of the firing; this data from several sensors can assist identify the scene of the event and the shooter's location; the information is then sent to the police headquarters along with the shooting's location. An warning appears on the screen of a computer or smartphone with pinpoint accuracy

2-4-Harnessing the Power of Police Databases

-As There are databases containing a variety of details about previous suspects at both the police and other law enforcement organisations. These databases aren't, however, utilised to their full potential. For cops to manually search through the data and attempt to draw links would just take too much time. These links and hints may really be so deeply buried in the data that it is not feasible to find them with the naked eye. All of these adjustments are made via machine learning. In actuality, even if the system is unable to provide you a precise response,

-It has a few unexpected negative aspects. For example where the AI programme analysed a variety of data points and determined that a particular person was responsible for the crime. The accused's attorney will have the opportunity to argue this in court and ask as to precisely how the computer determined that his client was the offender. This implies that the software proprietor will be required to provide the defence counsel with full disclosure of any information on the internal workings of their programme. You can see how this would become a problem given that such software is frequently proprietary and nobody would want to divulge their private information

-On the other hand the ways that databases can be analysed using artificial intelligence. Many investigators might not think to look at the minute particles that suspects have left behind at the crime scene, yet doing so might provide important details like how long the suspect was there. But how would you evaluate something like this? A forensic specialist would need weeks or perhaps months to sit down and count all the particles. Verifying that the particles come from the suspect and not from the police or other witnesses at the crime site is one of the additional problems.

-As part of this technique, machine learning algorithms are trained to find every type of particle the researchers are interested in. As a result, the computer will need to be able to discriminate between particles left at the crime scene by police officers, photographers, and dogs. Medical experts must annotate the data in this, which might be expensive and costly.finally, if such technology is developed to the point where it can recognise all the different types of particles left at the crime scene, it will help in solving crimes.

2-5- Countless possibilities.

- It depends on The machine learner theory in the security system is based on a number of different criteria, most notably: Feature extraction, training, testing, and evaluation. In the feature extraction phase, the characteristics of an object are stored as reference features to create numerical templates for future comparisons, reference template numbers are necessary for e. based on the traits or methods the system employs during the recognition step to identify the item.

 -The choice to recognise the computed distance between the reference template and another reference template is made when features comparable to those utilised in the reference template are also taken from the input item whose identification is necessary.

-We have just briefly touched on a few applications of artificial intelligence in criminal investigation. We will eventually reach a position where machines can conclusively solve a crime as technology advances. Communities will become safer as a consequence, and the possibility of false accusations against innocent individuals will vanish. We are now solely testing the potential effects of AI on law enforcement. We will have a better

understanding of its consequences and capabilities after this step is over. Future investigations might be significantly impacted by the generating technologies that speed up analysis that are currently waiting to be examined.

The third requirement:- The role of artificial intelligence in predicting crimes

3-1-the content of theory

- This theory included the potential to prevent crimes from happening in the first place by analysing vast amounts of data and information from criminal institutions and identifying persons who are most likely to commit crimes. The capacity of artificial intelligence can examine voluminous criminal justice data, forecast future criminal re-offending, and consequently In a similar vein,despite the fact that the use of AI in crime prevention and detection has allowed authorities to precisely analyse crimes while the crime rate has been dropping for decades, there may be some inherent hazards when using AI to track and identify crime. For instance, a person could be classified as a criminal or suspect in criminal systems based on racial bias that may be present in the AI system; as a result, these risks must always be assessed to determine if using AI is suitable or not and to explain such risks publicly.

 Some researchers established an automatic triage department in cooperation with Durham Police Department to fulfil orders from the state warehouse of North Calfrolina. The study team tracked the amount of persons at danger of resuming criminal activity by using algorithms to analyse the data collection, which has more than 340,000 entries.Since artificial intelligence has lately emerged as the most widely used method of predictive analysis by offering fresh views in the battle against crime, the world community has consequently resorted to the employment of such approaches in doing so. Criminal activity and crime

-In order to address the ongoing growth of crimes, it is crucial that the issue be addressed further. Future challenges will be enormous and thrilling in light of this vision. By using computers to analyse how violators deal with inquiries related to the capacity to analyse the sort of persons, it entails developing new chances to support investigators. The digital expert system is capable of learning. In a global context, illegal acts and behaviours will be concealed independently. In theory, AI may be applied in three different circumstances:

• Business modelling that is illegal.
• Demonstrating criminal behaviour and thought patterns
• Modelling behaviour and thinking verification technique

3-2-The methods of applying the theory and its benefits

-One of the main benefits of artificial intelligence systems is their capacity to continuously learn any kind of information, which improves decision-making effectiveness. Such a system also suggests a more thorough analysis by taking into account various points of view, but at its core, it is an empirical science based on research in hypotheses and testing. Databases and the method employed are directly related to systems (1)

-The most accurate method, , involves the potential use of artificial intelligence to model particular criminal files by evaluating the likelihoods based on the relationship between a suspicion and a prior fact and training the model using realistic case reports and crime theory. Using this system, a group model can be created for both victims and particular criminals.

  -Numerous characteristics, including a criminal's journey, their residence, their means of relationships, their tools, the sort of crime they do, how they communicate with others, their social networks, and the areas where they commit their crimes, may be used to analyse the patterns they create

Through the advanced presentation, crime analysts using artificial intelligence imagined that a robber would encounter the police during his second robbery thanks to these technologies. Additionally, crime locations and criminal weapons can be found as well as predicted in the future, for instance, an increase in thefts in a particular area may help predict future crime. Similar crimes occur nearby, which leads the police officer to consider stepping up patrols and directing traffic.(1) For instance, but not exclusively, in the context of looking for explosives and bombs, AI-powered robots can recognise materials used to make bombs, such as nitro glycerin, aluminium powder, tetranitrate, passive infrared sensors, and others, without endangering the lives of security personnel.

3-3-international conferences in this regard

-A computer engineering institution in Sri Lanka hosted the international conference "Artificial Intelligence in Criminal Justice Systems" in 2021, and the findings showed that crime studies indicated the potential for crime prediction using artificial intelligence by filtering a vast quantity of data.

   Results from the International Conference on Artificial Intelligence, held on January 17, 2022 in Colmbo, the same nation, revealed that national and local governments spent $119 billion on police departments using artificial intelligence techniques because they will be an ineluctable component of the justice environment to accomplish the desired results on the one hand and detect crimes on the other. Alternatively, predicting(1)

-The conferences disscused that, AI can also predict the identification of potential victims of organised crime and violence-based organisations by identifying and accurately reading the set of patterns and monitoring their content that significantly aids in prediction., which effectively predicts crimes by monitoring the digital steps of people and detecting anything unusual, turning the goal of achieving law and justice from (hunting criminal) to prevention

-The participants also discussed the use of artificial intelligence applications in what is known as digital forensics or computer forensics through the function of extracting and analysing digital content devices and methods of displaying programmes with digital evidence via an investigation platform that enables forensic investigators to verify pertinent information in order to reach a better analysis that reveals. The unknowable facts

-It became necessary to adopt new technology in the field of common crime as well as a serious and organised crime. This calls for an evolution in law enforcement that fits its work with anticipation through criminal intelligence that integrates. 77

3-4-the forms of using A.l in predicting crimes and the potential victims in Euorpean countries

  -The most advanced form of police in the world is predictive policing. The growth of pre-crime influence has prompted the creation of several law enforcement organisations in an effort to identify fresh ways to combat crime.

-The French criminal intelligence is concerned with analysing the persons or groups engaged in the crime through data collection, analysis, and appraisal for a suggestion that amounts to either conserving or minimising the number of crimes through statistical projections for two years that can help artificial intelligence identify future targets, stop crime from happening, or solve past crimes.

 - The way of the French troops have used so-called criminal intelligence to give pertinent information is an excellent illustration of this. To define, comprehend, and foresee criminality at the several levels that it targets Upgrading the decision-making process as the crime is not a random process nor is it deterministic and it is difficult to identify all the features associated with the development of crime or criminal behavior (1)

   -through the French experience, some crime analysts in France in 2014 and result in that it is difficult to embrace all the characteristics of crime in one field, although the criminal intelligence in the state of France is the means to collect any kind of information necessary to combat crime. Efficiency and ability to contain criminal development as the possibilities available for simulation in terms of mobility or information technology resources allow it to commit multiple crimes with a high impact and minimal risk (2)

   -In the same context, the French police adopted a predictive risk approach in the period from 2012 to 2014 directed at common crime as a serious and organized crime by displaying a large set of data to reveal hidden patterns, unknown (relationships, freedom trends, criminal preferences and other information) through which it can Mathematics predict reasonable focal points when a type of crime occurs through accurate and probabilistic analysis(3)

 -On the part of the United States of America, some researchers in the United States of America went into the mechanism of using artificial intelligence in the field of criminal research that predictive analysis is a complex process that uses a large amount of data to predict and formulate possible outcomes , through surveillance practitioners and others It is one of the professionals who must gain experience over many years by programming algorithms for all naughty people in criminal institutions and introduce them to certain skills. It also plays a very influential role in determining their future criminal activities and explaining their behavior within those institutions.

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1 Bosio, P., Knowledge from experience of a police officer: a grounded study, CEPOL European Police Science and Research Bulletin, (2011) (4), 12.

2 International Association of Crime Analysts Definition and Types of Crime Analysis, Standards, Methods &Technology (SMT), (2014),Committee White Paper.

3 Perrot, P. L'analyse du risque criminel: l'émergence d'une nouvelle approche (2014), op, cit

These researchers believe that AI is able to analyze large amounts of records related to criminal activities and predict the return of the owners of those activities to crime through Trinity jointly research and with the University of Florida, the Durham Police Department, and the Orlando Police Department with the support of the (NIJ) Foundation -by using algorithms to analyze a group of data that can determine the time period until the next occurrence of any crime and predict the risk of return.

 - The development of predictive analysis is the first steps before the development of artificial intelligence, such as modeling crime characteristics in order to predict many accidents - and the "Washington Post" newspaper, in its issue issued in late 2018, spoke about predictive analysis in one of the articles entitled Never a crystal ball when you need one. Scientific methods is a real way to advance in forensic intelligence in which spatio-temporal methods appear as a very good opportunity to depict criminal acts. Logical reasoning about time and space is fundamental to understanding crime activities and predicting some new events (1)

3-5the forms of using AL in Arab country (United Arab Emarat)

-The United Arab Emirates, on the other hand, topped the list of Arab nations and assumed the leading global positions in establishing the use of artificial intelligence techniques in the security system after developing a national AI strategy in 2017. Nine sectors were identified (transport, health, space, and renewable energy, for example). Water, technology, education, the environment, and traffic.

By enhancing government performance, speeding up accomplishments, campaigns, and field trips to government agencies, developing the capabilities and skills of all employees working in the field of technology, and setting up training sessions for officials, this strategy aimed to achieve centenary goals until 2071.

-All artificial intelligence services should be provided by the government, and security and medical services should be fully integrated. introducing a leadership strategy and passing legislation on the responsible use of AI The United Arab Emirates is notable for being the first nation to establish a Minister of State for Industrial Intelligence (1).

-In the same text the United Arab Emirates' innovative role in designating a Minister of Industrial Intelligence to oversee the use of artificial intelligence in all branches of government.

-Through the adoption of innovative and pro-active security service ideas that play a significant role in developing the tool and quality of security and community services, and ensure the protection of community members and provide the best services to them in all aspects and fields, the UAE has advanced up the ladder of international competitiveness indicators to enhance its leadership position in the use of artificial intelligence techniques in security work.

-A strategic plan for law enforcement from 2017 to 2021 has been adopted by the Dubai government in general and the Dubai Police General Command in particular on the security front. This plan is in line with the creation of a new public administration for artificial intelligence within the Dubai Police. Additionally, it has been stated that the UAE has spent more than 33 billion AED on AI-related projects since 2017 (1).

-In keeping with the same context, the Dubai Police General Command represented one of the top police forces in the Arab world and globally in terms of creating best practises and creating cutting-edge Fourth Industrial Revolution tools and techniques that keep up with the rapid digital transformation and improve readiness for upcoming demands and challenges.

3-6- In the field of protecting victims

-It has also become clear through these researches that artificial intelligence can be used to identify potential elderly victims of abuse or physical and financial abuse in partnership with one of the science centers.

 -The University of Texas Health Department follows the use of artificial intelligence algorithms by analyzing the forensic and environmental factors that explain elder abuse and can be used to predict potential victims of behavior-based violent crime as used by the Chicago Police to collect information and form primary groups focused on building social networks and conducting analyzes of individuals at risk This research has become part of Chicago's violence reduction and law enforcement strategy (2)

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1 Why does Trump need a crystal ball when he has a crystal gut ? : Washington post
https://www,washingtonpost.com

2 "Chicago Police Predictive Policing Demonstration and Evaluation Project," grant number 2011-IJ-CX-K014

-Although these axes are not related to specific operations, they differ according to the degree of complexity types and databases, and some have argued in this regard that the more chaotic the environment in which artificial intelligence operates, the more chaotic the system is, the more difficult the system will be to apply and enforce the law(1)

3-7 Using AI in predicting tourist crimes

3-7-1-The beginning of the theories

In 2013 a team of researchers used artificial intelligence techniques through rules called (temporal probability) in which they relied on studying behavioural models and came up with several policy recommendations for reducing terrorist attacks in the aftermath of the attacks that occurred in Pakistan and India alongside the terrorist (Askar group) in 2008.

 In 2015, a technology company "predictfy me" claimed its ability to predict terrorist attacks by relying on more than 170 data points and an early event recognition system "embers" that integrates results from various predictive models such as disease outbreaks and disturbance events in the city.

3-7-2- Applying theories to tourist crimes

-In addition to the above, some researchers in the field of artificial intelligence have expected to use it for criminal and terrorist purposes, especially after it has become more integrated into society and less expensive, taking many diverse criminal forms, most notably:

A-Digital attacks such as automated export of spears and exploiting security vulnerabilities.

B-Political attacks such as spreading news in fake media to provoke conflict, face-sharing tools and deception to manipulate video

C-Physical attacks like drone or drone smuggling

 -They confirm their point by what happened in Tokyo(2) when a radioactive substance fell on the roof of the Japanese Prime Minister's office and circulated around the unauthorized airspace of the facilities.and The remote manual control of the drones caused the US Air Force's nuclear crisis, and in the future, more autonomy may result from the development of artificial intelligence.

And what many terrorist groups relied on to create chaos in the international community - by taking advantage of the technological requirement by launching many cyber attacks - and also enhanced their ability in many areas, most notably (training, recruitment and spreading propaganda). That had been outlined in "Defence One" magazine that terrorist entities will exploit artificial intelligence in aggression against the international community, and pointed out the error of previous analysts in their assessment of the capabilities of these entities, and demonstrated his point of view through what happened in 2017.

-On the other hand, we discover that the Houthis in Yemen have used drones to influence any upcoming peace negotiations after ISIS sent small armed planes during which it was able to skirmish the Iraqi forces(1). This is despite the fact that the organisation also includes European and American elements that have extensive experience in the world of digital spaces.

   -The proponents of this trend demonstrate their point of view through the following factors (3)

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1 stanisias chaillou

Artificial intelligence and architecture from research to practice , IST Edition , Birkhauser , 2022 , pp72-74

2 the Japanese Prime Minister's office in Tokyo; entering unauthorized airspace in United States Air Force and Navy nuclear facilities

Japan radioactive drone: Tokyo police arrest man", April 25, 2015, https://www.bbc.com/news/world- asia-32465624

3 M. Muro, R. Maxim, J. Whiton, "Automation and Artificial Intelligence: How Machines are Affecting People and Places" the Brookings Institute, January, 2019, https://www.brookings.edu/wp-content/uploads/2019/01/2019.01_BrookingsMetro_Automation-AI_Report_Muro-Maxim-Whiton-FINAL-version.pdf

A– Many countries lack any essential activities for artificial intelligence, despite their participation in national initiatives, but they have not made any investments from their governments to be able to use them.

B - The lack of these countries in expert programmers and infrastructure from future generations of semi-transportation, advanced materials, cloud and robotics, especially science and technology education And mathematics, the lack of which leads to the inability of countries to engage in artificial intelligence techniques in the future.

C - Imitation of human cognitive functions on which artificial intelligence is based may lead to mass unemployment, because the stage of maturity reached by artificial intelligence, especially after the possibility of assigning all human tasks to machines and robots, which work more efficiently and less expensively.

4 - The future rapid transition may lead to a mechanized labor revolution that will involve a great challenge to society to the extent that it will not stop with the high crime rate and uncontrollable economic migration(1)

Forth Reqierment:-Using AI in determining the future possibilities in the criminal justice system

4-1- The importance of using the criminal justice system

-The importance of artificial intelligence techniques in the traditional judicial system is clarified, where the accused is released or the judge must quickly determine whether the accused poses a threat to society or whether the accused will harme a witness. The AI judicial system can alter this system and assist in deciding whether to release a person by using the competency of the AI algorithms with a number of risk factors before the defendant is released, including prior charges and convictions of the accused, prior failure to appear before hearings Court, and previous prison sentences (1).

-Through this idea, a significant portion of those in charge of the research came to the conclusion that artificial intelligence has the potential to always be a part of the criminal justice system, aiding in the area of investigation and enabling various police departments to better maintain security and public tranquilly

-for example There are various potential advantages to using AI and predictive analytics in India's criminal justice system. These technologies can increase the effectiveness of criminal investigations, improve public safety through improving risk assessment, and lessen decision-making

4-2-the role of AI in assisting the criminal justice

-It is clear from the above that the applications of artificial intelligence pave the way for future possibilities to assist the criminal justice system and security work through:

A-Improved Efficiency in Investigating Crimes:through The capacity to increase the effectiveness of criminal investigations is one of the most important advantages of predictive analytics and artificial intelligence in criminal justice. For example The Mumbai Police, for instance, uses AI and predictive analytics to forecast the risk of crime in a certain region and allocate resources appropriately. The technology analyses past crime statistics to find trends and forecast upcoming crimes, giving law enforcement the ability to be proactive and stop crimes before they happen.

B- Improved Risk Assessment for Enhanced Public Safety: Predictive Analytics and increase public safety by enhancing risk assessment. The Crime and Criminal Tracking Network system was created for example- in India by the National Crime Records Bureau (NCRB), and it gathers and analyses crime data from all around the nation. This information is used by the system to identify high-risk people, including repeat offenders and known criminals, and to keep tabs on their whereabouts.

C-Reduction of Bias in Criminal Justice Decision-Making: By removing human subjectivity, predictive analytics and AI can help minimise bias in decision-making. The Crime and Criminal Tracking Network and Systems (CCTNS) through the " Criminal Analytics and Prediction System" (CAPS) are AI-based systems created by the Odisha police in India also that use machine learning algorithms to predict the likelihood of an accused person fleeing the state. This method has increased the process' objectivity by reducing its reliance on the judgements of police officers and judges.

By estimating the risk of a suspect reoffending, predictive analytics and artificial intelligence may also assist in reducing bias in decision-making. The "Integrated Criminal Justice System" (ICJS), an AI-based system that the Telangana police in India have adopted, combines data from numerous sources to generate a profile of a suspect

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1 The Official Portal of the UAE Government, https://www.government.ae/en/about-the-uae/uae-future

that includes their criminal past and social media activity. The algorithm can then forecast a suspect's chance of reoffending, allowing the police to decide whether to release them on bond or parole with greater knowledge.

D-The ability to analyze videos for integrated facial recognition, detect individuals in multiple locations via CCTV or through multiple cameras, detect objects and activities to prevent crimes through motion and pattern analysis, identify ongoing crimes, and help investigators identify suspects with technology Such as cameras, video and social media that generate huge amounts of data.

E-AI can detect crimes that would not otherwise be discovered and help ensure greater public safety by investigating potential criminal activity, thereby increasing community confidence in law enforcement and the criminal justice system.

F- AI also has the potential to assist the country's crime labs in areas Such as complex DNA mixture analysis.,Data pattern analysis, deterioration, and prosecution of various crimes and criminal enterprises can be used.

G-Algorithms can also help prevent victims and individuals from falling into criminal pursuits and help criminal justice professionals protect the public in ways that they haven't.

H-By AI Pre-imagined , the technology also has the ability to provide police services and their management with situational and context awareness, helping police officers make better-informed responses to potentially dangerous situations.

J- Robots and drones can also conduct safe safety oversight, integrate it into comprehensive public safety systems, and provide a safe alternative to putting police and the public out of the many diverse avenues of harm.

G-Robots and drones can also perform recovery, provide valuable intelligence, and augment criminal justice professionals in ways yet to be discovered.

k-Predictive policing: Predictive analytics are being utilised in India and other nations to locate "hot spots" of criminal activity and more efficiently allocate police resources. In order to do this, historical crime data is used to forecast future crime hotspots.

L- AI is being utilised to help courts decide what penalties to impose on offenders. This entails recommending a sentence based on information on an offender's criminal history, the crime's specifics, and other elements

M-Predictive analytics is being utilised to decide whether a criminal needs to be held pending trial. The chance of escape or reoffending is predicted using information on an offender's criminal history, socioeconomic status, and other characteristics.

-Finally it can be said that predictive analytics and AI have a lot of potential to transform society and the criminal justice system. By minimising prejudice, enhancing risk assessment, and ensuring that resources are used wisely, proponents contend that these technologies can increase the effectiveness and fairness of the criminal justice system. However, detractors contend that these technologies might result in arbitrary or biassed decisions, violate people's right to privacy, and perpetuate systemic prejudices.

-Moreover, ongoing moral and legal discussions concerning the proper application of these technologies are expected to influence the future of predictive analytics and AI in the criminal justice system in all nations. To guarantee that the use of these technologies is transparent, responsible, and subject to proper legal frameworks and oversight procedures,

Conclusion

- In this study, we investigated the idea of artificial intelligence and how, through the overviews of, scientists and philosophers who attempted to embrace its characteristics according to various visions in terms of its patterns, branches, and systems based on its applications. Through the following suggestions, we will try to throw some light on the key fundamental pillars that must be taken into consideration in order to achieve the desired goals when applying artificial intelligence to the fields of crime fighting and future prediction.

- The applications of AI in criminal investigation process have The ability to be a permanent part of our criminal justice ecosystem as they provide investigative assistance and allow criminal justice professionals to better maintain public safety.

-Law enforcement will be better able to deal with incidents, prevent threats, determination of measures, redirect resources, ,investigate and analyse criminal activity with the help of AI and predictive police analytics integrated with computer-assisted response and live video institutions for public safety.

-Through the previous proposition, which included the most prominent examples of cases of using artificial intelligence and its applications in the security system and criminal research work through different visions,

however, some have rightly argued that the monitoring capabilities resulting from the use of artificial intelligence will have a potential impact on the basic human right to privacy as Recognized in the Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights, as well as many international and regional legal rights, given that the use of artificial intelligence in the security system has become more widespread throughout the world, which has become with it that its use must comply with the aforementioned basic rights to be such as moral rights

-Overall, the use of AI and predictive analytics to criminal justice is a complicated and developing topic that need both regulation and careful thought. A balanced strategy that prioritises accountability, openness, and justice must be developed after weighing the advantages and obstacles.

Recommendations

 1-About the concern that the use of AI and predictive analytics in criminal cases may result in a lack of accountability and transparency in the decision-making process. It could be challenging for defendants and their solicitors to contest the validity or accuracy of the algorithms employed in these procedures, which might undermine public confidence in the criminal justice system.so the

Predictive analytics and AI must be used in criminal proceedings in India in a transparent, responsible, and constitutionally compliant manner in order to allay these worries. This entails creating suitable legislative frameworks and supervision procedures to control how these technologies are used in the criminal justice system. The admissibility of evidence gathered by AI and predictive analytics presents another difficulty. The requirement that the evidence used in a criminal trial be credible, pertinent, and admissible has long been acknowledged by the courts. Which assess the evidence produced by these technologies is not yet apparent, though. Such evidence can be contested on the grounds that it is unreliable or doesn't fulfil other requirements for admission.s we recomande providing appropriate awarness to judges about the effectivness of Artificial Intillegence application and adapting it to serve the criminal justice

2- It is nesessary to train employees with a degree of qualification suitable for the use of these applications correctly in all aspects and fields, especially in security systems. This can be done by holding international and regional conferences and discussing academic research and field experiment results.

3- It is nesessity to focus on addressing the knowledge gaps discovered by experts' study in the usage of artificial intelligence applications that restrict its use, such as the lack of information that has attracted the most researchers' attention recently.

3- Artificial intelligence experts and professionals are used to teach individuals in charge of using its applications, especially with regard to the distinction between it and big data following the field of computing to avoid the significant confusion between the two ideas.

5- Making sure that big data is activated by ensuring that it is input accurately and taking into consideration a language's moral and semantic understanding in order to get around the issue of how difficult it is to branch the language culturally.

6- Using studied future plans that keep up with the rapid advancement in technology, we can adapt artificial intelligence applications to serve the criminal justice system in order to prevent and detect crimes in all their forms. This will help security systems to pursue crimes in all their forms by carefully preventing their occurrence and swiftly apprehending their perpetrators in order to hopefully use them in future predictions.

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