INVESTIGATING CRIME: A ROLE OF ARTIFICIAL INTELLIGENCE IN CRIMINAL JUSTICE

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ABSTRACT
The use of artificial intelligence has grown in significance in modern society. According to some researchers, AI algorithms can be useful in providing a precise, objective analysis of the different risks posed by sentenced criminals. Recent research suggests that crime can be expected, simply we need to be able to anticipate analytics gaining legal control. The primary objective is to investigate offenders as Cybercriminals are increasingly using IoT to produce and spread malware and launch ransomware attacks. (Waldman, 2023). In the next five years, it is anticipated that more than 2.5 million devices will be fully online. This paper focuses on artificial intelligence (AI), crime prediction and crime prevention. A study investigates whether it is morally acceptable to designate an electronic device as potential criminal offense detection. The study shows that using artificial intelligence to assess the effects of criminal law is not only a mechanical process but rather an assessment of a person convicted of a crime will be considered.
Keywords: AI, Artificial intelligence, Criminal Justice, Machine Learning

Introduction

Artificial Intelligence is a technology displayed by machines, opposing the natural intelligence indicating animals and humans. In the past artificial intelligence has been used relating machines and other human cognitive skills associated with the human mind and its action namely problem-solving and learning. Some researchers state AI algorithms which are helpful in providing a clear objective and absolute analysis of the various risks posed by sentenced criminals. AI plays a vital role in criminology. There are few of the potential utilized roles of AI in the judiciary system. Moreover, AI in criminology is seen as a significant application of technology which is used to make society cautious and equitable to the world of criminal justice.

Importance of Artificial Intelligence

Artificial Intelligence has become an important aspect of life and society resulting in an exact, faster, less workforce, leading to various parts of new technology. Artificial Intelligence is being used to automate everyday jobs that are monotonous, time-consuming, and often prone to human mistake. AI can analyze massive amounts of data and bring insights that can help decision-making in a variety of businesses. Overall, the importance of AI lies in its ability to automate, personalize, improve decision-making, increase efficiency, and drive innovation, making it a critical technology for businesses and individuals alike.

Artificial Intelligence in Criminology

Organizations, legal offices, and defense providers around the globe are in efforts to make the best possible use of Artificial Intelligence such as investigating, detecting, and preventing crime evidence. According to the latest research, crime can be anticipated. We just need to be able to expect analytics to get legal control. Intelligent and interrelated international infrastructure offers authorities and officers practical information. With the assistance of AI, real-time statistics may help hit upon crime quickly as soon as it occurs. AI has determined its execution across law enforcement agencies and judiciary at international places. It has been useful in serving governmental agencies to provide accurate clarity and deciding upon the roll out of police officers at a specific location and has also been able to help the judges in developed countries condemning and permitting bail. According to the reports by the Federal bureau of investigation, the crime rates have dropped by 3.3 % and 6.3 % co-in the USA. There are advanced mechanizations that can help police officers in deduction of crime rates and AI is one of them.

Metropolitan cities and organizations around the globe are infusing monetary aid in the prevention of crime using AI. The main aim of investment is to predict crime and crime should be easily detected using AI programs. To intercept crime by the governments, they must be able to gather substantial amounts of data to find patterns that may be practical to law enforcement and AI algorithms.

The use of IoT by cybercriminals to create and disseminate malware and launch ransomware assaults, which are aided by AI technologies, is on the rise, according to data and current trends. More than 2.5 million devices including industrial ones and operators of key infrastructure are anticipated to be fully connected to the internet in the next five years, which would increase the vulnerability of businesses and consumers to cyberattacks.

Today large pre-existing databases are processed, interpreted, and reviewed as part of data mining to provide fresh information that can be crucial to the company. To forecast current information, existing databases and numerous techniques have been used for analysis and prediction in data mining. However, little progress has been made in the subject of criminology. Comparing the data that each of these methods produces has not been attempted by many. Large databases of data that can be used to forecast or assess criminal activity involvement in society are often available at police stations and other criminal justice organizations. Data about crime can also be used to anticipate criminals. The study outlines multiple data mining techniques and technologies that might be applied to assess and forecast criminal activity in the various sectors. According to various research findings, the proposed fraud detection approaches may make use of either data mining techniques or machine learning algorithms.

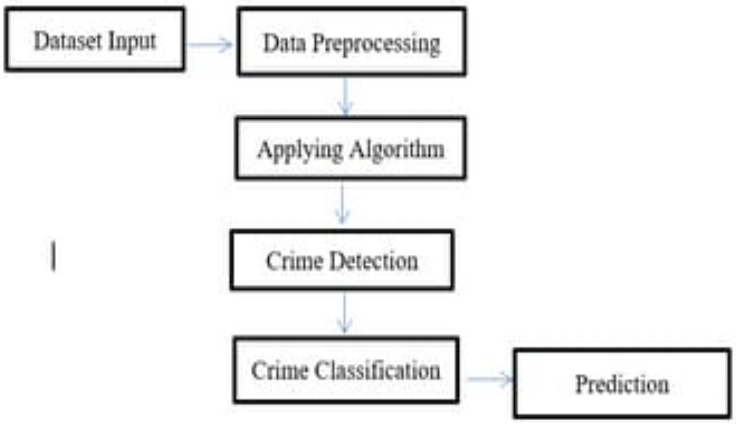

Figure 1. Data flow through an information system
Source: https://extrudesign.com/crime-prediction-using-naive-bayes-algorithm/

The above figure specifies that the program imports data sets related to crimes, then these dataset's data sets are cleaned up and pre-processed before being used in the stage of data preprocessing. Required algorithms used like random forest and Naive Bayes algorithms etc., in Crime detection stage cases of crime are discovered. Crime classification phases the several forms of crimes that are categorized. Finally, a crime type prediction is made in the prediction phase.

Literature Review

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think and act like humans. It involves the use of algorithms and computer programs to perform tasks that typically require human intelligence, such as visual perception, speech recognition, decision-making, and language translation, among others (Agarwal, 2013).

AI plays a vital role in criminology. With the increasing amount of digital data available today, AI can be used to analyze large datasets quickly and accurately, which can help law enforcement agencies to identify criminal activity, detect patterns, and solve crimes more efficiently (Hayward, 2020).

Machine learning can be used for crime prediction and analysis by analyzing large amounts of data to identify patterns and trends that may be indicative of criminal activity (Bharati, 2018).

Data mining techniques can be used to analyze and predict current information from existing databases. They can help organizations to make better decisions by providing insights that might not be apparent through simple analysis of the raw data (Dakalbab, 2022).

Data mining techniques and technologies can be powerful tools in predicting and preventing criminal activity. It is important to use these tools ethically and responsibly to avoid biases and protect individual rights (Anwar, 2021).

Coplink is a powerful tool for law enforcement agencies to analyze criminal-justice data and identify patterns and trends that may be indicative of criminal activity (Hauck, 2023). However, it is important to ensure that the data is used ethically and responsibly to avoid biases and protect individual rights.

AI has numerous applications in crime prevention and law enforcement, and is poised to play an increasingly important role in these areas in the future (Faggella, 2019).

AI has the potential to significantly improve forensic investigations and crime detection by providing law enforcement agencies with powerful tools for analyzing and interpreting large amounts of data (Chowdhury, 2021). However, it is important to ensure that these tools are used ethically and responsibly, and that individual rights are protected.

Use of AI in criminal justice systems has been a present phenomenon (King, 2020). Multiple potential applications of AI in criminal justice will appear sensible, with the touted risk to produce fairer outcomes and inflated safety for society. As prognostic policing, which can facilitate in resource allocation and targeting areas for increased risk posed by condemned criminals, thus providing a much better basis for sentencing to stop uses of AI within the justice system, but they're seen as significantly promising applications of technology that have the potential to create society safer and fairer and are getting down to flood the world of criminal justice.(Aleszavrsnik , 2020)

One of the researchers conducted searches on AI and crime were made on five databases (Google Scholar, Phil Papers, Scopus, SSRN, and Internet of Science) (Aleszavrsnik, 2020). These searches produced a large number of results on the use of AI to prevent or enforce crime, but very few results were seen about AI's instrumental or causal role in committing crime. Thus, a search was undertaken for every crime area that was included in Archbold. Archbold is the text for criminal lawyers used by leading practitioners.

Objectives of the Study

- To study the use of artificial intelligence (AI) in crime prediction.
- To study the use of AI in crime prevention activities, particularly in relation to cybercrime and the use of IoT devices.
- To study the potential risks posed by sentenced criminals and how AI algorithms can be used to provide a precise and objective analysis of these risks.

Research Methodology

The current study concentrated on earlier studies that had been done. The literature was reviewed to consolidate all previous reviews which included the study design resulting in the documentation of the work done throughout the procedure. Moreover, a search technique provides an idea for relevant extracted information used for further evaluation. Extraction of data, selection and screening of relevant data was inclusive of reviews of many primary searched articles.

Observations

Choosing the research topics for the current study was the first step in this study. The searches for relevant information extraction took place. Step 2 of this study is to select required articles. To evaluate the search phrases in the selected field, a preliminary Google Scholar search was done.

The databases were selected for the primary search on the grounds that the Criminology Collection was thought to be important from a criminological perspective. Google Scholar was chosen because it produced interdisciplinary evaluations and provided a comprehensive perspective on the targeted area. The number of reviews found during each database's literature search, the number of abstracts read, the number of full-text reviews read, and finally the number of reviews that were chosen from each database were all recorded.

Secondary Data Analysis

Artificial intelligence (AI) is becoming more significant and common across most major industries, from computer-assisted medical diagnostics to financial trading to market personalization. More creative uses are found as the technology advances and is improved, frequently using advanced machine learning algorithms, to boost productivity, cut costs, and augment or replace human capabilities. Every day, AI is utilized to engage and respond to consumers in millions of online and phone encounters. These computers may also learn to predict issues and find solutions, answer questions directly, and react to complicated instructions and a variety of scenario combinations. The crime rates have been reviewed from high to low distribution showing the results.

Forensic Investigation

AI technology increases the possibility of discovering and looking into crimes. This makes it possible for forensic specialists to locate the issue's root cause quickly and successfully. AI helps investigators rapidly solve a crime and helps them save money in the process (Chowdhury, 2021). They will be able to focus more on the locations where cybercrime is most likely to happen as a result. AI can find suspicious and criminal conduct by searching through the disorganized data that the investigators have gathered. (Faggella, 2019). AI provides cognitive-data analytics, allowing people to review and consume data fast. It may also make it simpler for investigators to look through criminal convictions and identify potential offenders. AI can help in detecting certain elements in the images and movies under investigation. AI also helps with identification of analogy communication, place, and time.

Working of Forensic Investigation

The process is as follows:

-They start by assessing how a company performs in terms of fraud detection and conducting forensics by comparing it to a maturity model that considers people, processes and technology used to do so.

The creation of risk models which are essential for advanced analytics follows the combination of structured and unstructured data from multiple sources.

-Then, rather than ranking risks at the data layer, advanced analytic models built on data, such as text analytics and computational modeling are used.

-In addition, sophisticated analytics techniques like MI and cognitive data analytics are employed.

Crime Investigation - An important application of Artificial Intelligence

Every region's infrastructure is getting more sophisticated as governments aim to assist their country's fast expansion. Smarter and more connected infrastructure in countries is sending real-time data to government agencies (Bharati, 2018). Real-time data mixed with AI can help spot crimes as they happen.

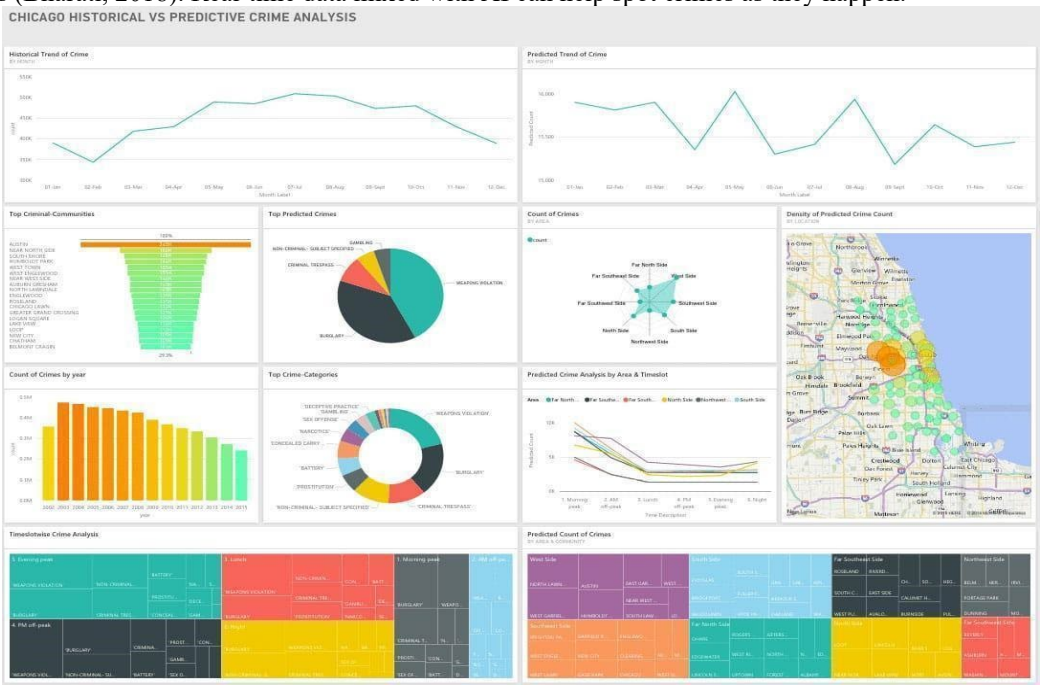

Figure 2. Example of Chicago historical Vs Predictive crime investigation

Source:https://cloudblogs.microsoft.com/industry-blog/government/2016/03/03/predictive-policing-the-future-of-law-

Above dashboard shows the information of Chicago historical Vs Predictive crime investigation

Applications of AI in crime detection:

Gunshot Detection

Police can be present at a shooting scene without being summoned or without any police watching the incident. What is the most effective strategy to do this? The answer is yes, with the help of AI technology such as sensors can be installed in public infrastructure which will be connected to a cloud-based computer capable of accurately identifying and pinpointing gunshots. Each sensor records the timing and sound of gunfire. This data from several sensors can help in the investigation of the incident. Sensors can also help pinpoint the shooter's location. The whole information, as well as the precise location of the gunshot, is subsequently transmitted to police headquarters. Also, the data is shown as a pop-up alert on a computer or mobile screen. According to studies, just 12% of shooting incidents are reported to police. In such cases, using AI technology to identify gunshots and notify police can help them to respond to a shooting event more swiftly (Hauck,2023).

Probing for clues at the criminal site

Investigations must be rigorous in complex murder cases. What if, however, a machine might aid in the discovery of significant cues at the murder scene? Police personnel snap pictures of the crime scene as soon as they arrive at the scene (Hayward ,2020). The images are used to search for cues and proof that might point to a new connection to the crime. Technologies with AI capabilities can help find clues in police photographs. For instance, if a toy or weapon is photographed at the site of a crime, the official database may be checked to discover if the same item was used in any other murders. It might not be convincingly shown that the same person committed the earlier crime. (Bhandari,2016)

Identifying Bombs

The deadliest weapons used by terrorists and criminals are bombs which might kill hundreds of people at once. Robots can detect other components of bombs such as Aluminum powder, passive infrared sensors, nitroglycerin and tetranitrate. AI introduced bots can identify bomb components that are able to swiftly detect bombs without jeopardizing the lives of security officers.

Views

The organizations and municipal officials can effectively reduce crime due to the use of artificial intelligence (AI) in crime prevention and detection. Keeping aside the fact that crime has been declining for years, much more money has been spent overall on law enforcement. When it comes to prevention and detection of crime, AI has benefits which come with certain inherent risks. For example, a person who is labeled as a criminal or vulnerable to engaging in criminal conduct, depending on unintentional racial prejudice integrated into the AI system. To determine whether utilizing AI to stop criminals is a strategic fit, such dangers should be assessed honestly and transparently (Caldwell, 2018).

Below mentioned figure 3 is the output of an AI application which explains the most concerning crimes are those in the upper right quadrant, being both very harmful and hard to defeat. Crimes in the lower right quadrant potentially offer the strongest potential for intervention, being both harmful and defeat-able. (Brahan 1993). The red points indicate the most harmful and defeat rate as negligible which can include audio\video impersonation, fake news, extorting and disrupted systems. The yellow points determine the moderate level of profit and harm such as cyberattacks, online addiction, data poisoning, market bombing. The green points indicate the safest alternatives which are least harmful such as forgery, fake reviews, burglar bots, AI-assisted fake stalking.

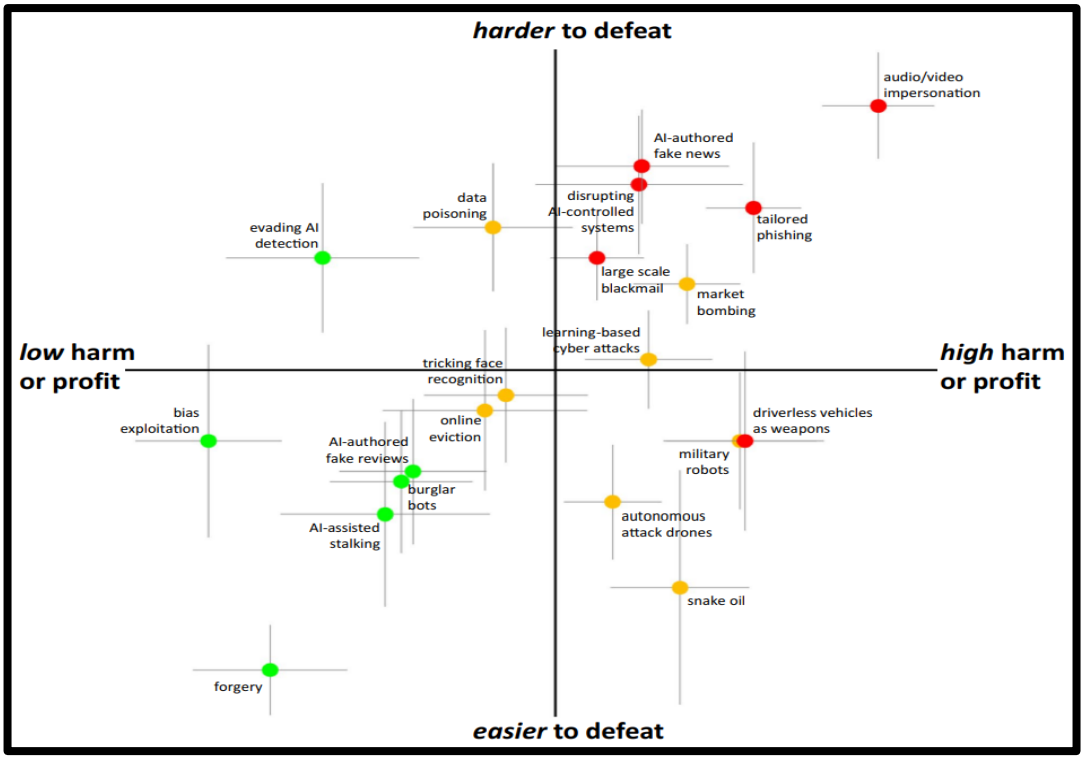

Figure 3. Challenges related to profitability of crime.
Source:https://www.google.com/amp/s/www.secureworld.io/industry-news/top-10-most-powerful-countries-in-cyberspace%3fhs_amp=true

Findings

AI-based predictive policing can help law enforcement agencies to identify potential crime hotspots and allocate resources accordingly. AI can be used to detect and prevent cybercrime by analyzing network traffic for suspicious activity and identifying potential threats before they can cause harm. AI-based risk assessment algorithms can provide a more objective analysis of the risks posed by sentenced criminals, such as the risk of reoffending or the risk of violence. Overall, the Use of AI in crime prediction, prevention, and risk analysis has the potential to significantly improve the effectiveness and efficiency of law enforcement activities. However, it is important to address the ethical and privacy concerns associated with these applications, and to ensure that they are used in a responsible and transparent manner.

Conclusion

The prevalent usage of electronic information processing methods defines modern social interactions. Above mentioned study proves that the rapid advancement of computer technology and capabilities of doing intricate tasks need complete solutions to both technical and original issues. Artificial intelligence related technologies are currently employed in a variety of human endeavors in an effective manner, such as from facial recognition on a smartphone screen to composing music and art from scratch. Considering these facts, legal science can make more decisions with the use of high-tech tools in criminal trials to determine criminal penalties and several ways of criminal law which influences those who have engaged in socially harmful behavior.

The goal of the study is to explore whether it is ethically acceptable to identify an electronic device as a means of information processing as a potential target for punishment in law.

To do this, we need to consider the issue of defining artificial intelligence as a system for making judgments without the involvement of humans. The study demonstrated that the use of artificial intelligence in determining the impact of criminal law is not a mechanical process of selecting one of the punishments.

It is impossible to ignore the fact that, in many cases, the judgment rendered in favor of the defendant regarding the level of criminal liability imposed directly affects the rights and legitimate interests of third parties, including family members, dependents, victims etc. Even the best computer program cannot evaluate these and many more factual situations that are not covered by the law and are not in the public interest related to crime or victims.

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