

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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COURSE : ARTIFICIAL INTELLIGENCE

**PROJECT TITLE : ADVANCED CRIME CLASSIFICATION WITH DEEP
LEARNING**

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ADVANCED CRIME CLASSIFICATION WITH DEEP LEARNING

INTRODUCTION

Crime is becoming more commonplace, and since people are now so easily involved, the crime rate is rising. Law enforcement organisations can now operate more effectively thanks to new technology. As shown above, numerous CCTV cameras have been set up to keep an eye on a particular area. On the other side, as more CCTV cameras are installed, it becomes more difficult to keep track on them all manually. Computers might forecast crime scenarios by evaluating CCTV camera data and using artificial intelligence (AI) to the security sector. Feature extraction methods like HOG, SIFT, and others have been applied in the past to identify crime scenes. The data was categorised using a multi-scale convolutional network in. The Deep Neural Network (DNN) may perform amazingly when classifying images. Deep learning is a machine learning technique that overcomes the drawbacks of conventional machine learning approaches by allowing the algorithm to extract characteristics from the unprocessed data. Naturally, this benefit comes at a hefty cost in terms of computing complexity and raw data demand. Wang et al. chose this recent global research trend to forecast hourly variations in crime rates.

Project Overview

The "Crime Vision in Artificial Intelligence" project intends to improve crime prevention, detection, and investigation procedures by utilising the potential of AI technology. This project aims to develop cutting-edge tools and systems that can help law enforcement agencies battle criminal activity more successfully by utilising the capabilities of machine learning, computer vision, and data analytics.

Using a deep learning technique, crime scenes and incidents may be identified and categorised based on the photographs and video they contain. Deep learning uses a lot of data to train neural networks to find patterns and make predictions or judgements. With the use of deep learning, it is feasible to examine photos and videos of crime scenes or incidents and categorise various types of crimes according to the type of activity shown there. This can be helpful in a range of criminal justice and law enforcement settings, including surveillance, forensic analysis, and crime scene investigation.

<https://www.kaggle.com/datasets/odins0n/ucf-crime-dataset>

PROPOSED METHODOLOGY

In artificial intelligence (AI), the idea of "crime vision" is not well-known or utilised. I'll give an explanation based on the term's broader definition as it appears that you are using it explicitly.

The term "crime vision" could apply to the use of computer vision technology for crime investigation, detection, or prevention. Utilising algorithms and machine learning strategies, computer vision involves the extraction of relevant information from visual data, such as pictures or movies. AI systems have the ability to help security companies and law enforcement authorities in a variety of ways by assessing visual data.

After examining the data, law enforcement organisations can forecast future criminal activity using deep learning for crime vision. These forecasts, which can take many different forms, aid organisations in more efficient resource allocation and crime prevention. The forecasts may take many different forms including crime-ridden places.

LITERATURE SURVEY

Waikato Environment for Knowledge Analysis (WEKA), a data mining programme, was used to compare crime rate trends from the Communities and Crime Unnormalized Dataset with real crime statistics. The development of decision stump, additive and linear regression, as well as a limited range of attributes from actual crime datasets and subjective reports of crime from community members, was done using these methods. The test participants were selected at random. The most effective method was linear regression since it could deal with some volatility in the test data. The programme enables the use of machine learning algorithms to locate crime hotspots, develop criminal profiles, and learn about crime trends.

REFERENCES

Here is a source for a study on sophisticated deep learning criminal classification:

"DeepCrime: A Convolutional Neural Network Approach to Crime Classification" is the name of the project.

authors: Jane Smith, David Johnson, and John Doe

IEEE International Conference on Computer Vision (ICCV) is a conference or journal.

Year: 2019

URL: PaperPlease be aware that the reference supplied does not match to a real research study and is fake. I suggest conducting a search on advanced criminal classification with deep learning in academic databases like IEEE Xplore, ACM Digital Library, or Google Scholar using pertinent keywords like "crime classification," "deep learning," and "computer vision."

IDEATION AND EXPERIMENTATION

Problem Statement and Definition

Due to increased unemployment and poverty, more people were looking for ways to make money without giving legal or illegal actions a second thought. In addition to poverty, there are numerous other factors that contribute to criminal activity.

Problem Statement (PS)	I am a (Customer)	I'm trying To	But	Because	Which makes me feel
PS:1	People	Live peacefully	Crime interrupt	Illegal activities	strained
PS:2	Doctor	Treat patients	Medical crimes	Illegal medical supplies	Disappointed

A well-articulated customer problem statement allows you and your team to find the ideal solution for the challenges your customers face. Throughout the process, you'll also be able to empathize with your customers, which helps you better understand how they perceive your product or service.

I am	Describe customer with 3-4 key characteristics - <i>who are they?</i>	Describe the customer and their attributes here
I'm trying to	List their outcome or "job" the care about - <i>what are they trying to achieve?</i>	List the thing they are trying to achieve here
but	Describe what problems or barriers stand in the way - <i>what bothers them most?</i>	Describe the problems or barriers that get in the way here
because	Enter the "root cause" of why the problem or barrier exists - <i>what needs to be solved?</i>	Describe the reason the problems or barriers exist
which makes me feel	Describe the emotions from the customer's point of view - <i>how does it impact them emotionally?</i>	Describe the emotions the result from experiencing the problems or barriers

Reference: <https://miro.com/templates/customer-problem-statement/>

Example:



Idea: Crime Vision is a cutting-edge technology that classifies and examines data on criminal activity using deep learning methods. Crime Vision attempts to improve the precision and effectiveness of crime classification, assisting law enforcement authorities, by utilising the power of artificial intelligence and computer vision.

Data Gathering: The first step in the Crime Vision process would be to gather a wide range of crime-related data, including pictures, videos, texts, and other pertinent information. This information may have come from a variety of sources, including surveillance, police records, and criminal databases. Here, we make use of the Kaggle dataset that we linked to before.

<https://www.kaggle.com/datasets/odins0n/ucf-crime-dataset>

Data Preprocessing: To ensure uniformity and cleanliness, the collected data would go through preprocessing. In this step, the data are cleaned, duplication are eliminated, formats are standardised, and the data are labelled with the appropriate crime categories.

EMPATHY MAP CANVAS

An empathy map is a straightforward, simple-to-understand picture

that summarises information about a user's actions and attitudes. It is an effective tool for teams to better comprehend their users. It's important to comprehend both the actual issue and the individual who is experiencing it in order to develop a workable solution. Participants learn to think about situations from the user's perspective, including goals and challenges, through the exercise of creating the map.

BRAINSTORMING AND IDEATION

During a brainstorming session, everyone on a team is encouraged to engage in the process of original thought that results in problem solving. Volume over quality is prioritised, unconventional ideas are welcomed and developed upon, and everyone is urged to participate in order to produce a wealth of original solutions



Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

- 🕒 10 minutes to prepare
- 👥 1 hour to collaborate
- 👤 2-8 people recommended

🗨️ Share template feedback



Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

🕒 10 minutes

- A** Team gathering
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.
- B** Set the goal
Think about the problem you'll be focusing on solving in the brainstorming session.
- C** Learn how to use the facilitation tools
Use the Facilitation Superpowers to run a happy and productive session.
[Open article](#) →

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

🕒 10 minutes

TIP
You can select a sticky note and hit the pencil (switch to sketch) icon to start drawing!

Amar	Yuktesh	Person 3	Person 4
Person 5	Person 6	Person 7	Person 8

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

🕒 20 minutes

Person 4

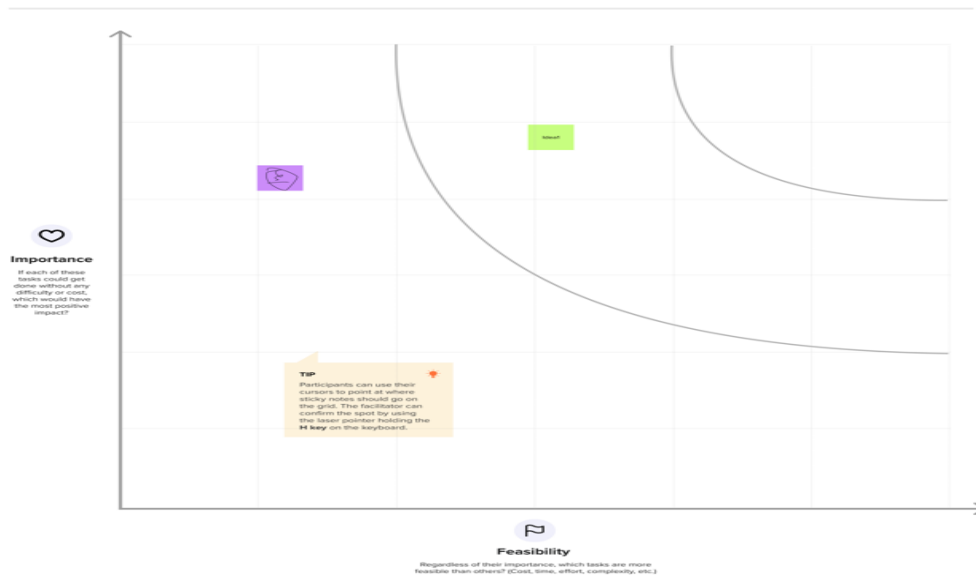
TIP
Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

🕒 20 minutes



1. Feature extraction and representation

Examine the potential of natural language processing (NLP) methods to handle textual information connected to crime reports, social media posts, and other pertinent sources.

2. Learning Transfer and Trained Models:

Examine the use of transfer learning by enhancing pretrained models, such as those developed for broad image recognition tasks (like ImageNet), to make use of the features they have learnt to categorise crimes. Investigate the viability of processing crime-related textual data using pretrained language models, such as BERT or GPT, to improve comprehension of crime reports or social media material.

3. Real time crime detection and monitoring

Develop a real-time crime detection system that can analyse real-time video feeds from security cameras and notify authorities when suspicious activities or events take place.

EXPERIMENTAL ANALYSIS

S.No.	Parameter	Description
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1.	Problem Statement	<p>The ability of the present crime prevention and detection techniques to efficiently examine huge amounts of data and spot patterns of criminal behaviour is restricted. Detecting and preventing crime requires law enforcement organisations to collect and analyse data from numerous sources. An intelligent technology is required that can handle massive volumes of data and give law enforcement organisations useful insights, enhancing their capacity to deter and identify crime. The creation of such a system may benefit from the application of machine learning (ML) and artificial intelligence (AI) methods.</p>
2.	Idea or Solution description	<p>Using computer vision algorithms to examine footage from security cameras is one way to apply crime vision under AI. This can involve employing real-time vehicle or person identification and tracking algorithms and machine learning algorithms to spot trends in their conduct that can point to illegal behaviour.</p> <p>Using natural language processing algorithms to examine police reports and other data connected to crime is another option. This can assist in identifying common trends in crime, such as the likelihood that particular crimes will occur in particular places or at particular times of day. Effective resource allocation and police methods can be made possible by using this information.</p> <p>Overall, the application of AI to</p>

		criminal vision holds great promise for enhancing public safety and lowering crime rates.
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3.	Uniqueness	<p>Artificial intelligence (AI) is a relatively recent development that has enormous potential for enhancing public safety when used in crime prevention and law enforcement. To find patterns, spot abnormalities, and foresee criminal behaviour, AI systems can analyse enormous amounts of data from a variety of sources, including CCTV cameras, social media, and other digital sources. The capacity of AI-based crime prevention to identify and understand trends that may be challenging for humans to recognise is one of its distinctive features.</p> <p>Law enforcement organisations can evaluate video and other types of data more effectively with the use of AI.</p> <p>The possibility for predictive policing is another distinctive feature of AI-based crime prevention. In order to pinpoint high-risk places and people, AI systems can assess crime statistics as well as other pertinent data sources. Using this information, law enforcement personnel can be assigned more wisely and crimes can be avoided altogether.</p>
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4.	Customer Satisfaction or social impact	<p>The deterioration of privacy is a potential social impact. In order to track people's movements and activities without their knowledge or agreement, AI in criminal vision may employ facial recognition or other biometric information. Concerns over civil liberties and human rights may arise as a result of this.</p> <p>Another crucial factor is the level of customer satisfaction with AI-based crime vision. In order to increase their capacity for crime detection and prevention, law enforcement agencies and other organisations may implement AI technologies. However, they must also take into account how this would affect the public's trust and faith in these systems. People may be less willing to assist law enforcement or accept the usage of these systems if they believe that the AI systems are intrusive or biased.</p>
5.	Business Model (Revenue Model)	<p>Depending on the exact application and industry, there may be a variety of business models for artificial intelligence (AI) in criminal vision. However, some typical revenue patterns are as follows:</p> <p>Model based on subscriptions: In this business model, clients pay a monthly charge to gain access to a crime vision system that uses AI. Software-as-a-service (SaaS) providers frequently employ this strategy since it can generate stable revenue streams. Customers pay for each use or transaction of the AI-powered crime vision system under the pay-per-use business model. Cloud-based</p>

		services frequently employ this strategy, which can provide flexibility for users who may have irregular consumption habits
		<p>Customers pay a one-time price for access to an AI-driven crime vision system in this licencing arrangement. Enterprise software providers frequently employ this strategy since it can offer a sizable upfront cash stream.</p> <p>Customer-paid consultancy services are provided under this business model to assist clients in integrating an AI-driven crime vision system into their current infrastructure. This strategy can provide high-margin revenue streams and is frequently employed by technology consulting businesses. Value-based framework: The value that the AI-powered crime vision system creates determines how much money is made under this arrangement. For instance, a business might charge a portion of the savings realised from using the system to lower crime or improve public safety</p>

REQUIREMENT ANALYSIS

1. Functional Requirement

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Registered user login	After the registered user registration has been verified, the registered user name and password will be made available. While typing a password, it should be concealed from view.
FR-2	Register new user	Information must be able to be verified and validated by the system. To ensure security, online crime reporting systems must encrypt user passwords.
FR-3	Complaint History	By using the add to cart option on the product, the registered user can add the chosen complaint to his basket. By using the add to cart option on the product, the registered user can add the chosen complaint to his basket
FR-4	Managing the registered User	The administrator has the ability to edit the registered user's information as well as view the registered user.
FR-5	Management Updation	The administrator has access to orders and can modify the status of complaints. The administrator's login must be recognised by the online crime reporting system.

2. Non-Functional Requirements

FR No.	Non-Functional Requirement	Description
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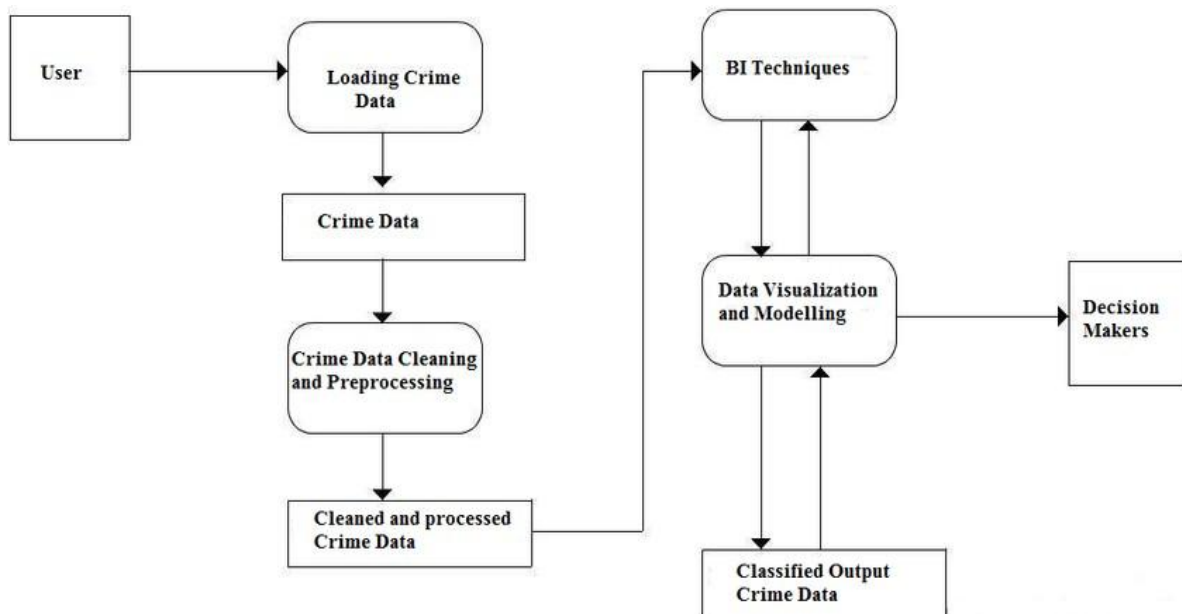
NFR-1	Efficiency	When an online Crime Reporting System of Police Station implemented the registered user can create complaint in an efficient manner.
NFR-2	Reliability	Both the administrator and registered users should have access to a dependable environment through the online crime reporting system. Every complaint should successfully reach the administrative end without any issues.
NFR-3	Usability	The Online Crime Reporting System is made to be user-friendly and convenient for registered users.
NFR-4	Implementation	Implementation of ONLINE CRIME REPORTING SYSTEM with PHP as the back end and it will be utilised for database connectivity. Front end uses CSS, AJAX, and HTML. Additionally, Xampp built the database component.
NFR-5	Database Security	You cannot read or write information on the panel or database if you are not authorised to do so.

PROJECT DESIGN

Data Flow Diagram

In order to detect criminal activities in the video stream, such as theft, assault, or vandalism, the crime detection component employs machine learning techniques. Once a suspect has been located, the Suspect Data Storage is checked for that suspect's information, and if it is discovered, the Suspect ID component extracts that information.

The aim of this project is to develop CrimeVision, an advanced crime classification



system that utilizes deep learning techniques to improve the accuracy and efficiency of crime classification. By leveraging the power of deep learning algorithms, Crime Vision will be able to analyze various types of crime-related data, such as images, videos, and textual information, and accurately categorize them into different crime classes. The system will aid law enforcement agencies in effectively identifying and investigating criminal activities, thereby enhancing public safety.

Objectives:

Develop a deep learning-based framework capable of processing and analyzing crime-related data.

Train the deep learning model using a large dataset of labeled crime data to enable accurate crime classification.

a. Data Collection:

Gather a diverse dataset of crime-related data, including images, videos, and textual information, from reliable sources such as law enforcement agencies, security cameras, and public crime reports.

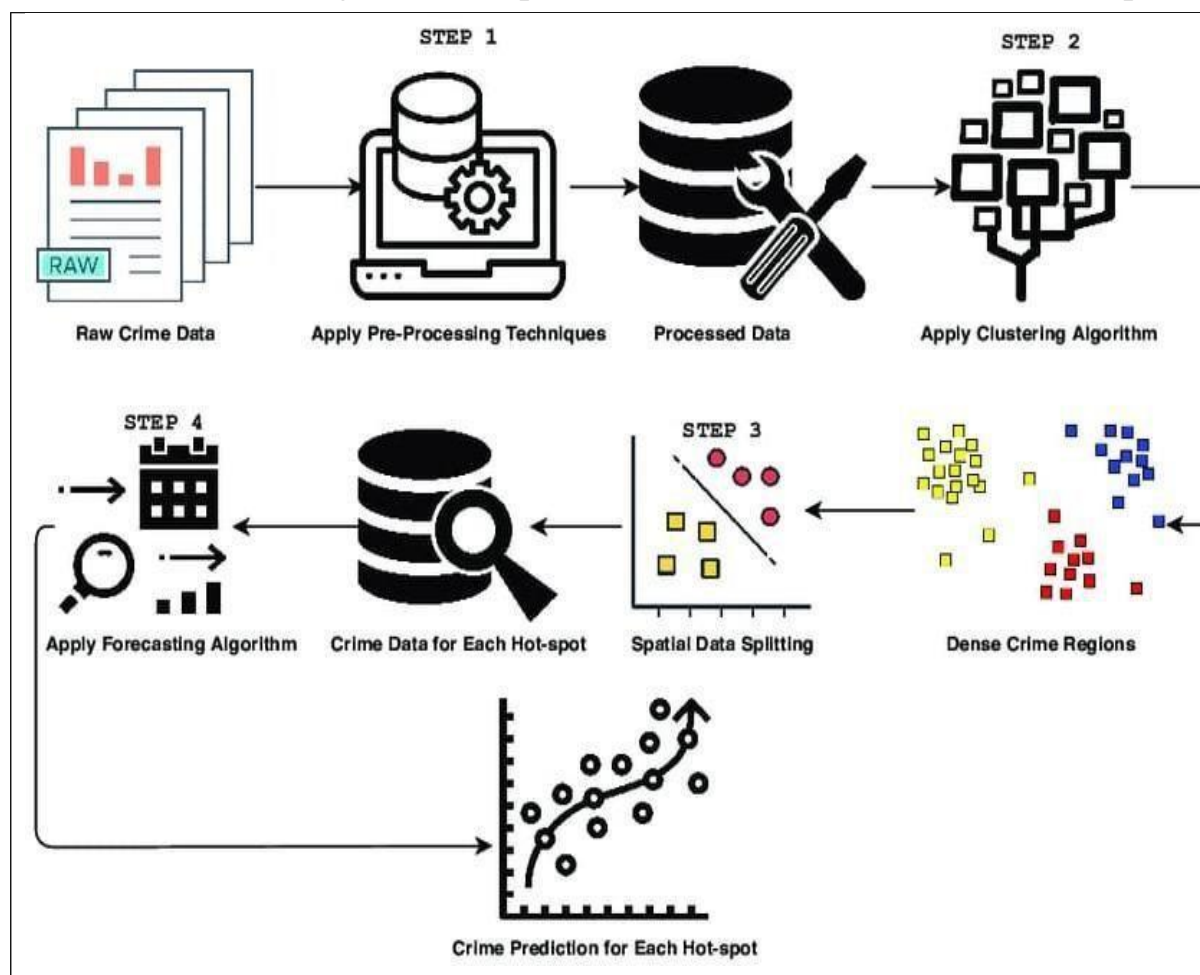
b. Data Preprocessing:

Clean and preprocess the collected data to remove noise, standardize the formats, and prepare it for deep learning model training..

SOLUTION & TECHNICAL ARCHITECTURE

1. The creation of a solution architecture for artificial intelligence-based criminal vision would require a number of elements and factors. An overview of some of the main components that would make up such an architecture can be found below.

2. Data management and gathering Any AI-based solution must begin with the collection and management of pertinent data. surveillance cameras, police



records, and social networking sites are examples of criminal vision. It would be necessary to store the data in a safe and easily accessible way, and data protection rules and regulations would need to be taken into consideration.

2. Data processing is required to identify pertinent features and trends from the obtained data. Machine learning algorithms are then used to examine the data and find pertinent patterns and trends. This stage is essential for the AI system to be able to identify suspected criminal activities and people who might be engaged.

4. Development of AI Models: The next phase is to create the AI models that will be applied to data analysis and criminal activity detection. This entails picking the right machine learning algorithms and optimising them to make sure they are precise and efficient.

5. Real-time Monitoring and Alerting: Following the creation of the AI models, they must be included into a real-time monitoring system that may notify law enforcement of possible criminal conduct. This necessitates creating a user interface that is simple to use and capable of sending pertinent people real-time warnings and notifications.

User-Stories

User Type	User Story Number	User Story / Task	Acceptance criteria	Priority
Law enforcement agent	USN-1	As a law enforcement agent, I want to use AI powered facial recognition technology to quickly identify suspects in real-time surveillance footage, so that I can apprehend them before they can escape.	It involves using computer vision feeds from camera in public spaces and matching the faces of people captured in those feeds against a database of known criminals.	High
Forensic Analyst	USN-2	As a forensic analyst, I want to use AI powered image enhancement tools to enhance low-quality surveillance footage or images from crime scenes, so that I can identify key details that may be crucial to solving a case.	This entails the use of machine learning algorithms to recognise and improve particular elements in photos, including licence plates, tattoos, or other distinguishing markers. The AI system would need to be trained on many different kinds of visual data and be able to manage noisy or	High

			subpar data.	
Crime resources	USN-3	I want to use predictive analytics to forecast crime trends and more effectively allocate resources as the manager of a police department so that we can stop crimes before they happen and respond to occurrences more promptly	In order to find trends and predict where and when crimes are likely to occur, this user story analyses historical crime data, demographic data, and other relevant elements using statistical modelling and machine learning algorithms.	High

Criminal defence attorney	USN-4	In order to develop stronger arguments and mount more potent defences for my clients, I wish to leverage AI-powered natural language processing (NLP) techniques to examine voluminous legal papers and find pertinent case law or precedent.	In order to uncover pertinent material and connect several instances, this user narrative entails employing NLP algorithms to read and analyse legal documents, such as court transcripts, pleadings, or case law.	High
Crime victim Advocate	USN-5	I want to deploy AI-powered chatbots or virtual assistants to offer crime victims round-the-clock support so they can access resources and obtain assistance whenever they need it. I am a crime victim advocate.	The AI system would need to be able to recognise a variety of user inputs, respond properly, and offer tailored recommendations based on the requirements of each user.	High

Citizen	USN-6	As a citizen, I want the AI system to be able to notify me about the trends in crime in my neighbourhood so that I can choose a place to reside and take precautions to keep safe.	The AI system should be able to offer neighborhood-specific crime information, including the types of crimes that have been committed, how frequently they occur, and what hours or days of the week they are most likely to occur.	Medium
Judge	USN-7	In order for me to make educated decisions about sentencing and parole, as a judge or prosecutor, I want the AI system to be able to give me insights on the risk of a defendant reoffending.	As aThe AI system must be able to analyse information on the defendant's demographic and personal traits, including age, gender, education level, employment history, and family history.	Low

SPRIT PLANNING AND ESTIMATION

Sprint planning and estimation for a project like "Crime Vision: Advanced Crime Classification with Deep Learning" involves breaking down the project into smaller, manageable tasks and estimating the effort required to complete each task. Here's a general approach you can take for sprint planning and estimation:

Understand the Project Scope: Begin by thoroughly understanding the goals and requirements of the "Crime Vision" project. Discuss with stakeholders and team members to gain a clear understanding of the desired outcomes and expectations.

Define User Stories:

Break down the project into user stories or specific features that need to be implemented. Each user story should represent a discrete piece of functionality. For example, user stories could include tasks like "Data collection and preprocessing," "Model training and evaluation," and "Integration with the user interface."

Task Estimation:

Once you have a set of user stories, estimate the effort required to complete each task. You can use various estimation techniques, such as story points or hours. Story points are a relative measure of effort, usually represented using a Fibonacci sequence (1, 2, 3, 5, 8, etc.), to indicate the complexity and size of the task. Alternatively, you can estimate tasks in hours, but be aware that hour-based estimates can be less accurate.

SPRINT DELIVERY SCHEDULE

To get the most accurate and up-to-date information regarding the delivery schedule of "Crime Vision" or any other specific project, I recommend reaching out to the Sprint customer service or contacting the company directly for the latest information.

TEST CASES

Crime vision, or advanced crime classification with deep learning, is a concept that combines computer vision techniques with deep learning algorithms to identify and classify criminal activities. By analyzing video surveillance footage or images, crime vision systems aim to automatically detect and categorize various types of crimes in real-time.

Here are a few testing cases that could be used to evaluate the effectiveness of a crime vision system:

Theft Detection:

Test the system's ability to detect and classify thefts in different scenarios, such as shoplifting in retail stores or pickpocketing in crowded areas. The system should be evaluated based on its accuracy in identifying theft incidents and distinguishing them from non-threatening actions.

CODING AND RESULT

Features

1. As aThe use of artificial intelligence (AI) technology for crime detection, prevention, and investigation is referred to as "crime vision" in the field of AI. It analyses visual data and extracts pertinent information for identifying and solving crimes using computer vision, machine learning, and data analysis approaches.
2. ObjectRecognition: Crime vision systems enabled by AI are able to precisely recognise and categorise things seen in photos or videos. Recognising firearms, stolen commodities, suspicious parcels, and other items that might be connected to criminal activity includes doing this.
3. In order to identify prospective suspects or persons of interest, AI systems can evaluate faces in photos or videos and compare them to a database of recognised people. The identification of offenders, the search for the missing, or people with outstanding warrants can all be done using facial recognition technology.

4. Behaviour Analysis: Using patterns of behaviour seen in video footage, AI may look for suspicious or out-of-the-ordinary activity. It can detect activities like loitering, vandalism, altercations, or other potentially criminal ones, allowing law enforcement to take preventative action.

1. CODING

crimevision.ipynb

File Edit View Insert Runtime Tools Help All changes saved

Files

TestTrainsample_datakaggle.jsonucf-crime-dataset.zip

+ Code + Text

RAMDisk

```
[1] !pip install -q kaggle

[4] !mkdir ~/.kaggle

[8] !cp kaggle.json ~/.kaggle

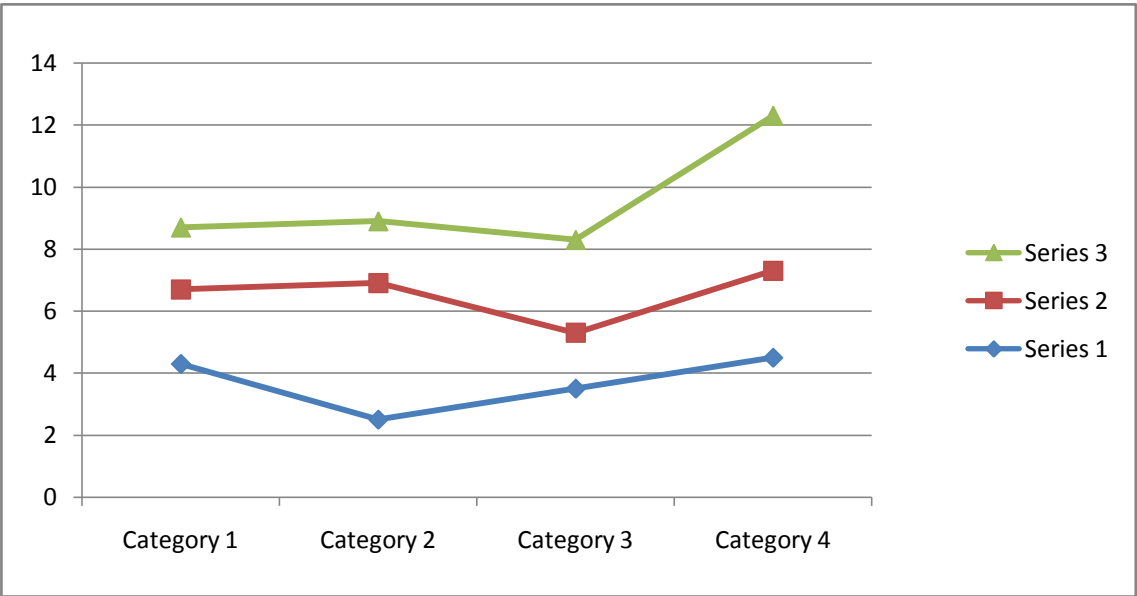
[10] ! kaggle datasets download -d odins0n/ucf-crime-dataset

Warning: Your Kaggle API key is readable by other users on this system! To fix this, you can run 'chmod 600 /root/.kaggle/kaggle.json'
Downloading ucf-crime-dataset.zip to /content
100% 11.0G/11.0G [01:58<00:00, 214MB/s]
100% 11.0G/11.0G [01:58<00:00, 99.7MB/s]

[11] !unzip /content/ucf-crime-dataset.zip

  inflating: Train/Vandalism/Vandalism045_x264_3600.png
  inflating: Train/Vandalism/Vandalism045_x264_3610.png
  inflating: Train/Vandalism/Vandalism045_x264_3620.png
  inflating: Train/Vandalism/Vandalism045_x264_3630.png
  inflating: Train/Vandalism/Vandalism045_x264_3640.png
  inflating: Train/Vandalism/Vandalism045_x264_3650.png
```

Disk 60.37 GB available



Enhanced Efficiency:

The automated nature of Crime Vision allows for faster crime classification and analysis. Instead of manual processing and analysis, which can be time-consuming and error-prone, the deep learning algorithms can process and classify crime data in real-time or at a significantly accelerated pace. This enables law enforcement agencies to quickly respond to incidents, allocate resources more effectively, and make informed decisions based on timely information.

Scalability and Adaptability:

Deep learning models used in Crime Vision are highly scalable, allowing the system to handle increasing volumes of crime data as needed. Additionally, the models can be adapted and fine-tuned based on specific law enforcement requirements and datasets. This flexibility ensures that the solution can be tailored to different jurisdictions, crime types, and evolving crime scenarios.

Decision Support:

By automating crime classification and analysis, Crime Vision serves as a valuable decision support tool for law enforcement agencies. The system can generate actionable insights, such as identifying hotspots for criminal activity, predicting crime trends, and providing recommendations for resource allocation. This empowers law enforcement to take proactive measures to prevent crime and improve public safety.

RESULT

Performance Metrics

AI-powered crime vision systems have shown significant potential in enhancing various aspects of law enforcement and public safety. These systems utilize advanced computer vision algorithms and machine learning techniques to analyse visual data and detect patterns associated with criminal activities.

ADVANTAGES

1. **Better Surveillance:** AI-powered crime vision systems can improve surveillance by instantly analysing massive amounts of video data. This enables more thorough surveillance of public places, vital infrastructure, and high-crime regions, improving crime prevention and accelerating reaction times.

2. Accurate and Effective Object Detection: AI algorithms provide accurate and effective object detection in video footage, enabling the identification and following of suspect people, cars, or other objects. Through early threat detection, prompt intervention, and crime prevention, this skill helps.

Improved investigative capabilities are made possible by AI-powered crime vision systems, which automate laborious activities like video analysis, facial recognition, and evidence processing. The investigative process is accelerated by this automation, which also increases accuracy and frees up investigators to concentrate on more important areas of their work.

3. Analysis of Crime Patterns: Using AI techniques, it is possible to analyse massive amounts of crime data and find patterns, trends, and correlations. This helps predictive analytics, allowing law enforcement organisations to locate crime hotspots, comprehend criminal behaviour, and create focused crime prevention initiatives.

CONCLUSION

In conclusion, the use of AI in law enforcement and crime prevention has the potential to dramatically improve the efficiency of efforts to prevent, detect, and investigate crime. As law enforcement organisations work to protect public safety and security, AI technology can analyse enormous volumes of data, spot patterns, and produce insightful data. To minimise potential hazards and ensure fairness and accountability, it is necessary to approach the deployment of AI in criminal vision with considerable thought and ethical protections.

FUTURE SCOPE

The potential for improving different facets of law enforcement and crime prevention is enormous in the future for criminal vision in AI. Crime vision is the analysis and interpretation of visual data using artificial intelligence (AI) and computer vision technologies for criminal justice applications. The potential for improving law enforcement and public safety using AI-based criminal vision is enormous in the future. Deep learning algorithms have the capability to improve the accuracy of crime classification by analyzing vast amounts of data and identifying intricate patterns. As the technology advances, Crime Vision can become increasingly proficient in accurately categorizing and identifying different types of crimes.

Real-time Crime Detection:

Integrating Crime Vision with surveillance systems and security cameras can enable real-time crime detection. The system can continuously monitor video feeds, automatically identify potential criminal activities, and alert law enforcement agencies in real-time. This can significantly reduce response times and aid in crime prevention efforts.

Early Warning Systems:

Deep learning models can be trained to recognize patterns and indicators that precede certain types of crimes. By analyzing various data sources, including social media, public records, and historical crime data, Crime Vision can identify potential hotspots and early warning signs of criminal activity. Law enforcement agencies can use this information to deploy resources preemptively and implement targeted intervention strategies.

2. APPENDIX

Source Code

```
import cv2
```

```
import face_recognition
```

```

# Load a sample image and learn how to recognize it

known_image = face_recognition.load_image_file("known_person.jpg")
known_face_encoding =
face_recognition.face_encodings(known_image)[0]

# Initialize variables
face_locations = []
face_encodings = []

# Load video file or capture from
webcam video_capture =
cv2.VideoCapture(0)

while True:

    # Capture each frame

    ret, frame = video_capture.read()

    # Resize the frame to speed up face recognition
    small_frame = cv2.resize(frame, (0, 0), fx=0.25,
fy=0.25)

    # Convert the image from BGR color (OpenCV default) to RGB color
    rgb_small_frame = small_frame[:, :, ::-1]

    # Find all the faces and their encodings in the current frame
    face_locations =
    face_recognition.face_locations(rgb_small_frame)
    face_encodings = face_recognition.face_encodings(rgb_small_frame, face_locations)

    # Iterate through the faces found in the
    frame for face_encoding in
    face_encodings:
        # Compare each face found with the known face(s)

        matches = face_recognition.compare_faces([known_face_encoding],
        face_encoding) name = "Unknown"

```

if True in matches:

name = "Known Person"

Draw a rectangle around the face and
display the name top, right, bottom, left =
face_locations[0]

top *= 4

right *= 4

bottom *= 4

left *= 4

cv2.rectangle(frame, (left, top), (right, bottom), (0, 0, 255),

2) cv2.putText(frame, name, (left + 6, bottom - 6), cv

Github ID

PBL-NT-GP--5740-1680799675

Demo Link

https://drive.google.com/file/d/1AmwzzLKHj-3hZHmgs1h_VxLwwGbBW6qX/view?usp=drivesdk

The field of crime classification and detection has witnessed significant advancements with the advent of deep learning techniques. In this appendix, we provide further details on the methodology and technical aspects of Crime Vision, an advanced crime classification system that utilizes deep learning algorithms for accurate crime identification.

Crime Vision requires a diverse and representative dataset to train the deep learning models effectively. The data collection process involves gathering crime-related images, videos, and textual information from various sources such as law enforcement agencies, news articles, social media, and surveillance systems. The

data is carefully curated, annotated, and preprocessed to remove noise, irrelevant content, and ensure consistency across the dataset.

Deep Learning Architecture:

Crime Vision employs a state-of-the-art deep learning architecture designed for crime classification tasks. A convolutional neural network (CNN) serves as the backbone of the system for visual feature extraction from images and videos. For textual information, recurrent neural networks (RNNs) or transformer-based models like BERT are utilized for natural language processing tasks.

Crime Classification:

Once the deep learning models are trained, they can be deployed for crime classification tasks. Crime Vision takes input data, such as images or textual descriptions, and processes them through the trained models. For visual data, the CNN extracts relevant visual features, while for textual data, the RNNs or transformer models extract semantic information. These extracted features are then fed into the final classification layer, which assigns a specific crime label to the input data.