

MES COLLEGE OF ENGINEERING-KUTTIPPURAM
DEPARTMENT OF COMPUTER APPLICATIONS
RLMCA352 - MAIN PROJECT

PRO FORMA FOR THE APPROVAL OF THE FINAL SEMESTER PROJECT

(Note: All entries of the pro forma of approval should be filled up with appropriate and complete information. Incomplete Pro forma of approval in any respect will be rejected.)

Project Proposal Number : (Filled by the Department)
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Roll Number	: 21mca1109
Register Number	: MES21MCA-2009

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1. Title of the Project : SMART POLICING TECHNIQUE WITH CRIME TYPE AND RISK SCORE PREDICTION
BASED ON MACHINE LEARNING FOR EARLY AWARENESS OF RISK SITUATION

2. Name of the Guide : _____

Date :

Signature of the Student:

Comments of The Project Guide

Initial Submission :

Approval Status : Approved / Not Approved Dated Signature of Guide HOD

First Review :

Second Review :

Comments of The Project Coordinator

Initial Submission:



First Review :
Second Review :

Dated Signature of Project Coordinator:

SMART POLICING TECHNIQUE WITH CRIME TYPE AND RISK SCORE
PREDICTION BASED ON MACHINE LEARNING FOR EARLY
AWARENESS OF RISK SITUATION
FAHMITHA T.P (MES21MCA2009)

INTRODUCTION

In order to quickly and effectively respond to a newly received criminal case, information regarding the type and severity of the case is crucial for authorities. This paper designs and develops a crime type and risk level prediction technique based on machine learning technology and verifies its performance. The designed technology can predict crime type and crime risk level using a text-based criminal case summary, which is criminal case receipt data. For the text-based criminal case summary data, the KICS data format is considered, which is actual policing data that contains information about criminal cases. For the crime type, 21 representative types of crimes are considered; therefore, the system can predict one of 21 types of crime for each criminal case. Furthermore, to predict the crime risk level, we developed a crime risk calculation formula. The developed formula calculates the crime risk level and outputs the risk score in numerical terms considering the severity and damage level of the criminal case. To predict the crime type and crime risk score, both DNN and CNN-based prediction models were designed and developed. The performance evaluation section shows that, in the case of crime type prediction, the proposed prediction models can achieve better performance than traditional classification algorithms such as naïve Bayes and SVM. The performance of the CNN-based crime type prediction model is about 7% and 8% better than those of the SVM algorithm and the naïve Bayes algorithm, respectively. The performance of the designed technology was comprehensively analyzed and verified through various performance measurement parameters. It is also developed in the form of a software platform with a GUI, allowing field personnel (e.g. police officers) to intuitively identify the type of criminal case and the level of risk from a text-based criminal case summary upon receipt of a new criminal case.

OBJECTIVES

The objective of using smart policing techniques with crime type and risk score prediction based on machine learning is to improve the overall effectiveness and efficiency of law enforcement efforts. This is achieved through several key goals:

- **Early Awareness of Risk Situations:** By using machine learning algorithms to predict the likelihood of specific crimes occurring in a given location, law enforcement agencies can gain early warning signals, allowing them to take proactive measures to prevent or mitigate the impact of the predicted crime.
- **Improved Resource Allocation:** The resulting risk scores can help law enforcement prioritize their resources, deploying them more effectively to areas of highest risk, rather than relying on a one-size-fits-all approach.

- **Improved Understanding of Crime Trends:** The use of machine learning algorithms can provide valuable insights into crime patterns, allowing law enforcement to identify and respond to emerging trends more effectively.
- **Improved Decision-Making:** By analyzing large amounts of data, machine learning algorithms can identify correlations and patterns that may be difficult to see through manual analysis, helping to improve decision-making and overall crime-fighting strategies.

In summary, the objective of using smart policing techniques with crime type and risk score prediction based on machine learning is to improve the ability of law enforcement agencies to prevent and respond to crime, while making the most efficient use of their resources.

MOTIVATION OR RELEVANCE

Smart policing techniques that use machine learning for crime type and risk score prediction can play a significant role in early awareness of risk situations and improving the overall effectiveness of law enforcement efforts. By using advanced algorithms and data analysis, these techniques can help law enforcement agencies predict the likelihood of specific types of crimes occurring in a particular location, based on historical crime data, demographic information, and other relevant factors. The resulting risk scores can provide early warning signals for law enforcement, allowing them to take proactive measures to prevent or mitigate the impact of the predicted crime. This approach can also help law enforcement prioritize their resources, deploying them more effectively to areas of highest risk, rather than relying on a one-size-fits-all approach. Additionally, these techniques can provide valuable insights into crime patterns, allowing law enforcement to identify and respond to emerging trends more effectively. By analyzing large amounts of data, machine learning algorithms can identify correlations and patterns that may be difficult to see through manual analysis, helping to improve decision-making and overall crime-fighting strategies. In conclusion, the use of smart policing techniques with crime type and risk score prediction based on machine learning can provide early awareness of risk situations and play a key role in improving the effectiveness and efficiency of law enforcement efforts.

PROBLEM DEFINITION

In the existing system crime identification and management are done manually. Manual management of crime data and information can lead to several problems, including:

Inaccuracies and inconsistencies: With manual processes, there is a risk of human error, which can result in inaccuracies and inconsistencies in crime data and information.

Limited accessibility: With manual methods, crime data and information is often stored in paper-based files or spreadsheets, making it difficult to access and retrieve.

Slow processing times: Retrieving, updating, and analyzing crime data manually can be time-consuming, leading to slow processing times and reduced efficiency.

Inadequate data security: Manual methods for storing crime data and information are susceptible to loss, theft, or damage, which can compromise data security and confidentiality.

Limited data analysis capabilities: Analyzing crime data and trends manually can be challenging and time-consuming, making it difficult to identify patterns and make informed decisions.

Reduced collaboration: Without a centralized system, sharing crime data and information between law enforcement agencies can be difficult, reducing collaboration and hindering efforts to combat crime.

Overall, manual management of crime data and information can lead to inefficiencies, security risks, and a limited ability to analyze and respond to crime trends. An electronic system for managing crime data and information can help overcome these challenges and improve the efficiency and effectiveness of crime management efforts.

BASIC FUNCTIONALITIES

Main users are,

- Admin
- Officer
- User
- Prediction

Functions of admin

- Login
- Add and manage officers
- View Complaints and status
- Assign work to officers
- View daily report
- View feedback
- View users

Functions of Officer

- Login
- View work and update status
- Manage daily report

- View complaint and update status
- Chat with users
- View feedback

Functions of User

- Register
- Login
- Report officers
- Send complaint and view status
- Send feedback
- Chat with officers

Functions of Prediction

Data set management

- Crime type and weight value
- Victims gender and weight value
- Age and weight value
- Physical damage
- Mental damage

Risk score calculation

Allocate case

TOOLS / PLATFORM, HARDWARE AND SOFTWARE REQUIREMENT

Hardware Requirements

The selection of hardware is very important in the existence and proper working of any of the software. When selecting hardware, the size and capacity requirements are also important. The hardware must suit all application developments.

- Processor : i3 or above.
- System Bus : 32 Bit or 64 Bit
- RAM : 4GB or Above
- HDD : 500 GB or Above
- Monitor : 14 LCD or Above
- KeyBoard : 108 Keys
- Mouse : Any Type of mouse
- Mobile : Android supported mobile phone

Software Requirements

One of the most difficult tasks is selecting software, once the system requirement is found out then we have to determine whether a particular software package fits for those system requirements. This section summarizes the application requirement.

- Operating System : Windows 8 or above
- Frontend : Html, Css, Bootstrap
- Backend : Python, Java
- Database : MySQL
- IDE : Android Studio / JetBrains PyCharm