

**Problem Statement 5:** ModusMapping: Mapping crimes and criminals through their Modus Operandi and creating succinct summaries

Law enforcement agencies often struggle with efficiently analyzing and visualizing connections between crime-accused individuals, their methods of operation, and potential links such as familial ties or past collaborations in criminal activities. They also handle vast amounts of data on criminals including details of criminals, details of bail application, grant of bail, release from jail, progress of their cases under trial, modus operandi etc. making it challenging to extract and retrieve critical information efficiently.

Manual review of these records is time-consuming, prone to human error, and places a significant burden on police personnel, delaying decision-making and response times.

This project aims to develop a standalone analytical software that leverages existing police records to systematically map crime-accused individuals, analyze their modes of operation, and uncover hidden relationships between them. This autonomous AI tool must be capable of summarizing police records and data comprehensively. The tool will process textual records entered real time and link with database in easily retrievable manner.

Designed for seamless integration with on-premise servers at police stations, it will operate without internet dependency, ensuring data security and real-time accessibility.

**Abstract:**

AI based crime analysis software:

It is difficult for law enforcement to track criminal trends, analyse records, and find connections. An AI-powered stand-alone solution called ModusMapping maps connections, generates summaries automatically, and operates safely on-site for offline data access. We included role-based access functionality to the system, so that one user can edit data while another can just view it. An interactive interface featuring search, graphs, charts, reports, and alarms is offered by a dashboard built using React.js. In addition to extensive search capabilities for expedited data access and analysis, the dashboard features categorised sections for different types of crimes, like robbery and murder.

While Neo4j and NetworkX allow for the relationship mapping of criminals and crime patterns, PostgreSQL/MySQL keeps organised crime records. BERT (NLP) improves case summarisation and intelligent search, while machine learning (Scikit-Learn + K-Means Clustering) identifies recurrent criminal patterns. Docker is used to securely package the complete system for a smooth deployment. We plan to recommend the government to recognize police officers who actively contribute to crime information sharing. ModusMapping increases overall law enforcement efficiency by automating investigative procedures, which decreases manual effort, enhances decision-making, and speeds up the settlement of criminal cases.

