

# CRIMINAL DATA ANALYSIS FOR IMPROVING CIS (CRIME INVESTIGATION SYSTEM) USING DATA MINING

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**Abstract**—Crime is one of the major issues affecting our society. To handle it, we have a police system and the judiciary in place. Our paper proposes an information system that can be used to help the police effectively extract knowledge from the daily collected information. Data mining is used to automatically discover patterns and relationships in large databases. Our system aims to work on main goal is to perform crime analysis and to detect the patterns in previous crimes and apply them to the current situations to find similarities. Our paper explores methods to perform these two tasks, independently.

**Index Terms**—Crime prevention, CIS, hotspot detection, Data mining, Weka

## I. INTRODUCTION

Crime analyzes is an emerging field in law enforcement without standard definitions. This makes it difficult to determine the crime analyzes focus for agencies that are new to the field. In some police departments, what is called “crime analysis” consist of mapping crimes for command staff and producing crime statistics. In other agencies, crime analysis might mean focusing on analyzing various police reports and suspect information to help investigators in major crime units. Crime analysis is proceeding of analyzing crime. Data Mining is the phenomenon of revealing useful clustering, sequential analysis etc. Among the data and hidden knowledge from dense crime database mining techniques, association rule mining carries most important role in crime analysis. Data mining has gained importance in recent time implication.

## II. OBJECTIVES

- 1) Reduce manual efforts increase efficiency
- 2) Eliminating delicacy
- 3) Increase transparency in work
- 4) Find out different patterns using data mining

## III. NEED FOR ANALYSIS OF CRIME

Crime usually have a propensity to justify their existence as crime analysis in what is known as police department, It is important to clear some of the reasons it makes sense to analysis of crime. There may be more other reasons depending on the community culture, geographic effects, and criminal tendency. Analysis of crime to inform law enforcers about general and specific crime trends, patterns. Analysis of crime to take advantage abundance of information existing in law enforcement agencies the criminal justice system, and the public.

## TYPES OF CRIME ANALYSIS

### 1) Tactical crime analysis:

The tactical crime analysis involves analyzing data to develop information on where, when, and how crimes happens in order to assist officers and investigators in identifying and understanding specific and immediate crime problems.

### 2) Operations analysis:

Operations analysis examines how a law enforcement agency is using its resources. It focuses on such topics as deployment, use of grant funds, redistricting assignments, and budget issues. In many agencies crime analysts are asked to assist on special projects for the department that fall into the category of operations analysis.

## IV RESEARCH METHODOLOGY

The below flow of work where we have used 99 records of criminals from different police stations and after doing data mining we have obtained optimized results which help to reduce usual tedious process of crime investigation.

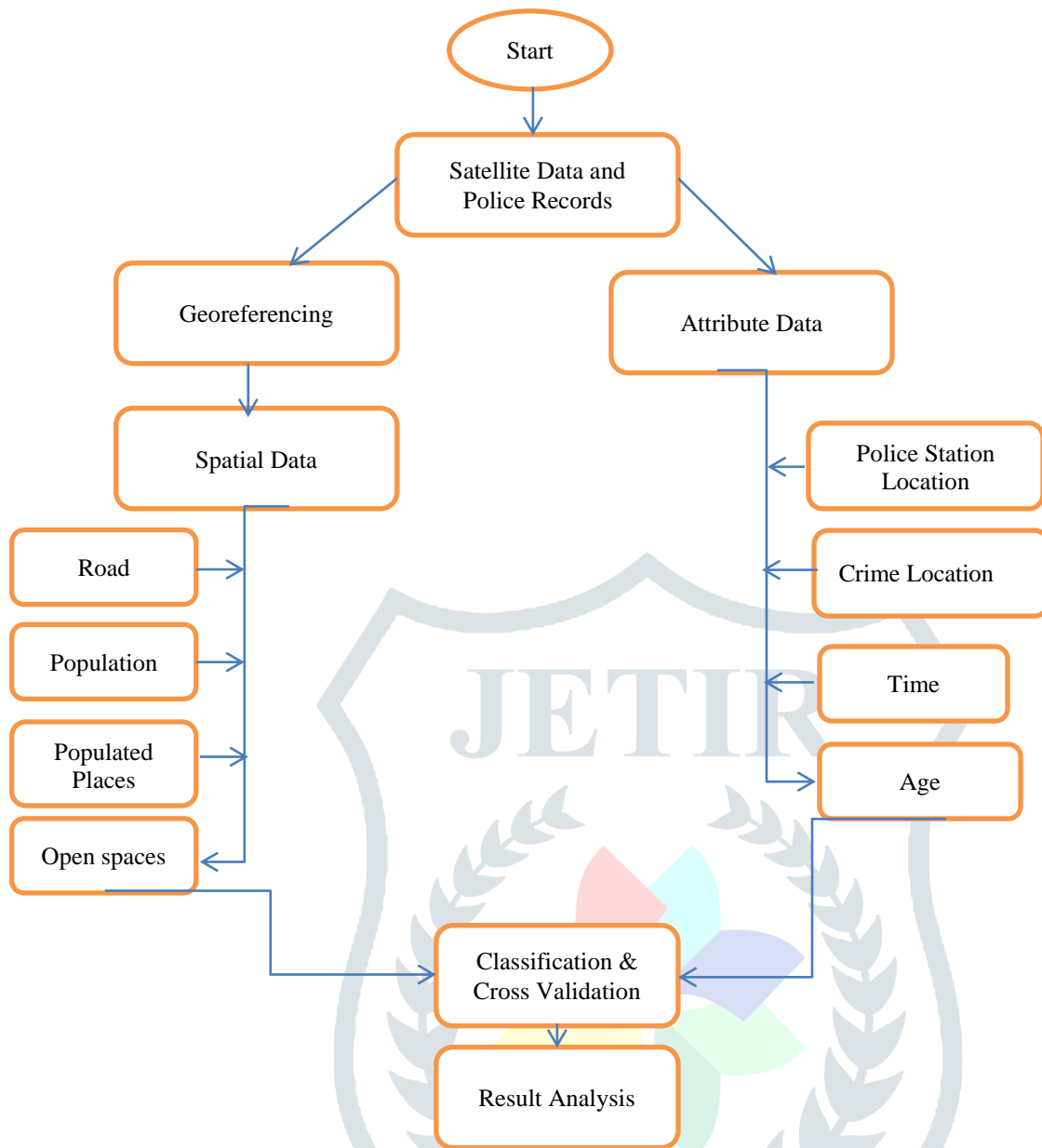


Figure1: Research Methodology

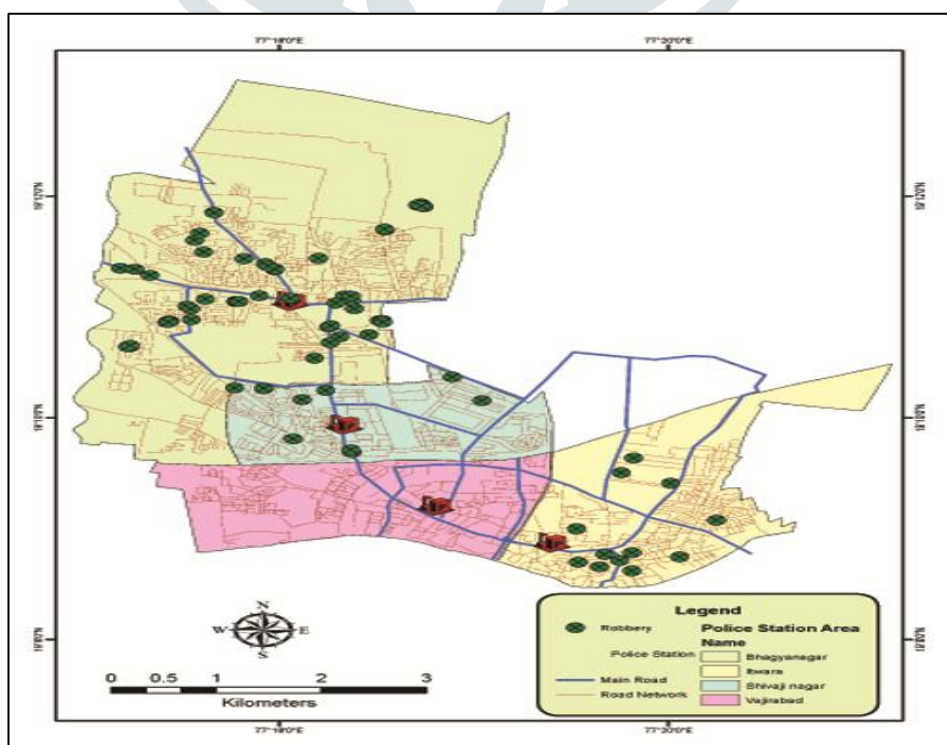


Figure2: Hotspot Detection

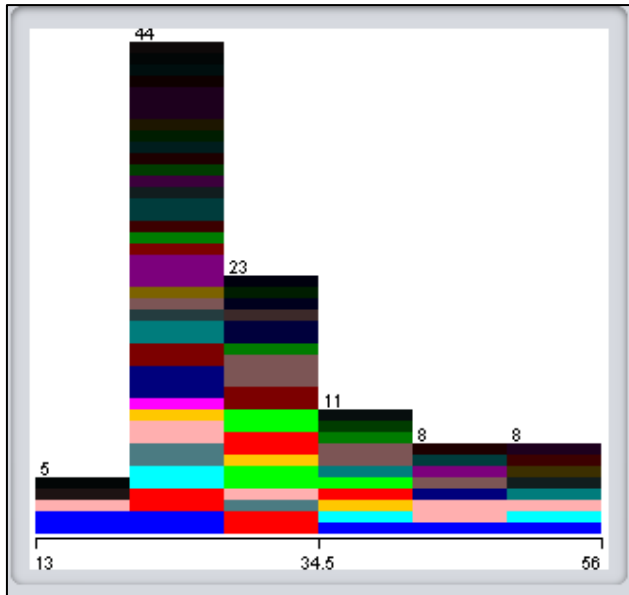


Figure3: Attributes Age Wise

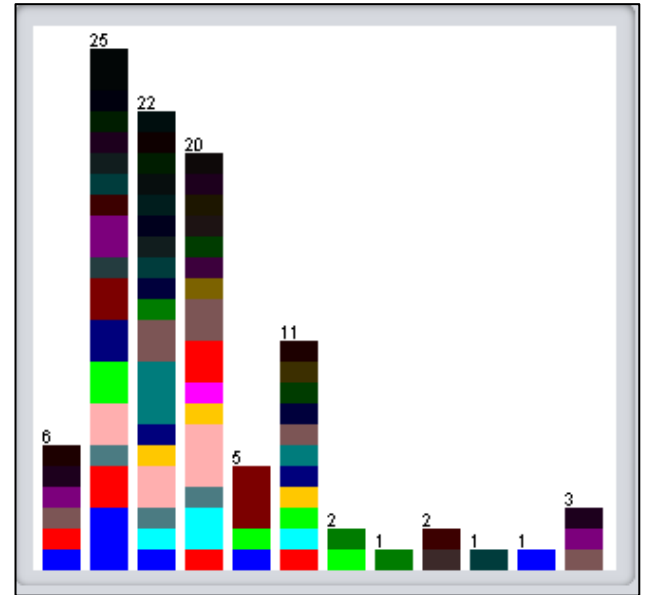


Figure4: Attributes Crime Wise

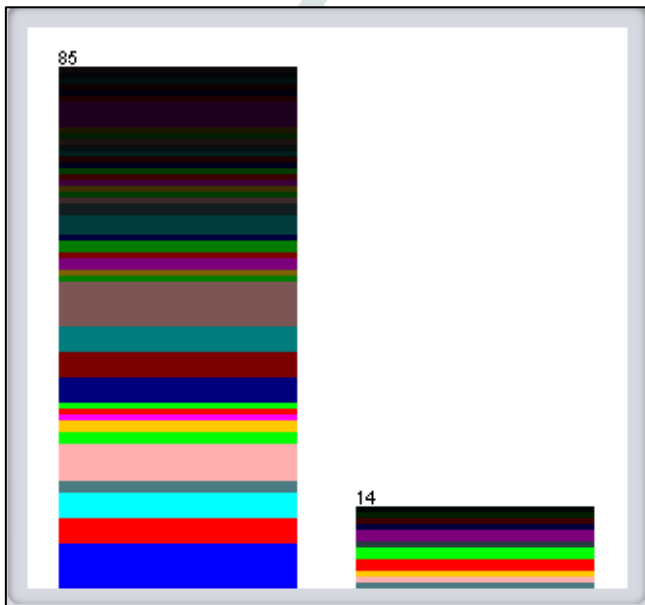


Figure 5: Attributes Gender Wise

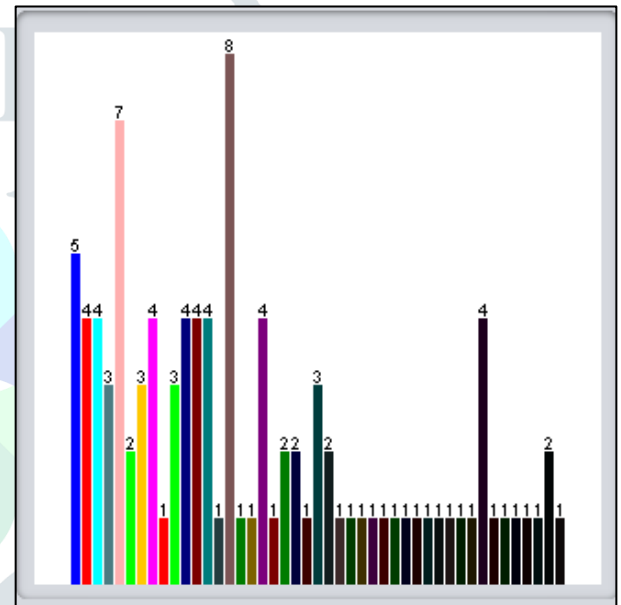


Figure 6: Attributes Time Wise

TABLE1. CONFUSION MATRIX FOR CRIMES

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=== Confusion Matrix ===

 a b c d e f g h i j k l  <-- classified as
 0 6 0 0 0 0 0 0 0 0 0 0 0 | a = fraud
 0 25 0 0 0 0 0 0 0 0 0 0 0 | b = theft
 0 22 0 0 0 0 0 0 0 0 0 0 0 | c = physical assault
 0 20 0 0 0 0 0 0 0 0 0 0 0 | d = Rash Driving
 0 5 0 0 0 0 0 0 0 0 0 0 0 | e = Sexual harassment
 0 11 0 0 0 0 0 0 0 0 0 0 0 | f = Attempt to murder
 0 2 0 0 0 0 0 0 0 0 0 0 0 | g = riot
 0 1 0 0 0 0 0 0 0 0 0 0 0 | h = interfere in government work
 0 2 0 0 0 0 0 0 0 0 0 0 0 | i = physical harassment
 0 1 0 0 0 0 0 0 0 0 0 0 0 | j = decoity
 0 1 0 0 0 0 0 0 0 0 0 0 0 | k = suside
 0 3 0 0 0 0 0 0 0 0 0 0 0 | l = money extortion
    
```

TABLE2. CONFUSION MATRIX FOR GENDER

```

=== Confusion Matrix ===
  a  b  <-- classified as
85  0  | a = male
14  0  | b = female

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## V. CONCLUSION

Here we come to know that after analysis it easy to predict which type of crime is more happening and at what age, timing the person is male or female. Here we have reduced complex method of crime investigation and simplified it using data mining tool weka.

<b>Male</b>	85
<b>Female</b>	14
<b>More crime</b>	Theft
<b>Time</b>	8:30 PM
<b>Age</b>	44
<b>HotSpot</b>	Bhagyanagar

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