Abstract

Problem Statement: AI-Based Analytics Tool for 112 Police Helpline Data

The 112 Police Helpline is the first line of response for emergencies in India, receiving lakhs of calls annually. However, raw call logs are underutilized due to lack of structured analytics. Supervisory officers struggle to identify peak hours, high-risk zones, seasonal surges (e.g., monsoon accidents, festival crowd incidents), and slow-response cases. Without an analytics tool, resource allocation is reactive rather than proactive, impacting citizen safety. The challenge is to build an AI-powered decision-support system that converts raw helpline data into actionable insights through temporal, spatial, and categorical analysis.

Proposed Solution

We propose an **AI-enabled analytics tool** that converts raw 112 Helpline data into actionable insights through temporal, spatial, and categorical analysis.

- **Data Ingestion & Processing**: Helpline records will be ingested through a scalable pipeline and structured using Python (pandas, numpy). Enrichment includes time attributes (hour, day, month, season, festival) and geospatial mapping of calls to police station jurisdictions using geopandas.

- **Temporal Analysis**: Using pandas-based aggregation, the system will highlight peak call hours, daily and weekly cycles, monthly loads, and seasonal or event-based variations.

- **Spatial Analysis**: Caller locations will be visualized through Folium and Plotly maps, with hotspots and vulnerable zones highlighted. For advanced deployments in the future, integration with ArcGIS enables deeper geospatial insights.

- **Categorical Insights**: Calls will be analyzed by category (crime, accident, women's safety, etc.), with heatmaps generated for each type to identify recurring clusters.

- **Dashboard Interface**: A lightweight dashboard built in Streamlit will integrate charts, heatmaps, and filters, enabling supervisory officers to drill down by time, call type, jurisdiction, and response outcome.

- **Config-driven design**: Scalable in the future to new data, festivals, categories, analysis models like Apache Kafka or predictive ML (forecasting, anomaly detection).

Features of the Final Solution

- **Temporal Analytics**: Charts of call distribution across hours, days, weeks, months, and seasons.

- **Hotspot Visualization**: Digital maps displaying high-density areas of calls with category-specific overlays.

- **Category Heatmaps**: Separate heatmaps for crime, accident, women's safety, and other emergencies.

- **Filtering & Drill-Down**: Options to filter by time range, call type, jurisdiction, or outcome, with detailed drill-down views.

- **Interactive Dashboard**: Unified platform in Streamlit combining visualizations, maps, and reports.

- **Scalability**: Architecture expandable with Kafka pipelines and ArcGIS integration for enterprise-level deployment.

Reason for Opting for this Problem Statement

- Goa sees unique seasonal surges: monsoon accidents, festival crowds (Ganesh Chaturthi, Carnival), tourism-linked women's safety cases.
- There is no existing solution for effective analysis and usage of 112 helpline data.
- Our vision aligns with Goa Police, who can benefit immensely from data-driven deployment to improve response times and citizen safety.
- Our team chose this problem statement, because it is both impactful and feasible, and allows us to contribute towards a smarter police ecosystem.

Past Expertise in the Area

- Btech. in CSE with Cyber Security and currently pursuing Mtech. In Artificial Intelligence and Data Science at NFSU.
- Experience in data analytics & dashboards (network monitoring, security tools, log analysis).
- Built a Metasploit-based RL penetration testing tool, showing strong applied AI/automation skills.
- Skilled in Python, pandas, plotly, docker based web platforms
- Our background ensures we can deliver not just a prototype, but a scalable framework police can later deploy in production.