Project Title

Spatiotemporal Ambulance Demand Forecasting using Machine Learning and H3 Hexagonal Grids

Detailed Description

This project aims to develop an intelligent ambulance demand forecasting system for Bangalore city using historical emergency vehicle GPS data. The system will:

- Analyze spatial patterns of ambulance demand using Uber's H3 hexagonal grid system
- Predict future demand by location and time using machine learning (XGBoost)
- Monitor data drift to ensure model reliability over time
- Provide real-time predictions via a REST API for operational integration

This project uses Bangalore ambulance GPS data to build a machine learning system that predicts where and when ambulances will be needed. By forecasting demand across city hexagons, emergency services can pre-position vehicles for faster response times. The project benefits the public through improved emergency care, helps city planners with data-driven decisions, and provides the research community with an open-source MLOps reference implementation for geospatial demand forecasting.