Identifying Traffic Accident 'Black Spots' in London through Spatial Clustering

Introduction

Building on the foundational work of Karamanlis et al. on black spot analysis for enhancing transportation sustainability, this project leverages their insights to pinpoint traffic accident hotspots in London. It employs spatial clustering of 2022 collision data to achieve this goal.

Methodology

This study mainly uses **Clustering** to find black spots. (It might also use **Classification** to predict accident severity and **Dimensionality Reduction** to better understand and visualize the factors affecting accidents.)

- **Data Preprocessing:** Clean and prepare the "Road Safety Data - Collisions 2022" dataset.
- **Spatial Clustering:** Utilize clustering algorithms such as **DBSCAN** or **K-means** to identify clusters of accidents. These clusters will be analyzed to identify high-risk areas or 'black spots.'
- **Evaluation:** Assess the clustering results using **silhouette scores** to ensure the clusters are meaningful and well-separated.
- ***Feature Analysis:** Investigate the characteristics of identified black spots, including time of day, accident severity, and potential environmental factors contributing to higher accident rates.

Research Significance

This research aims to contribute to the body of knowledge on road safety by providing a detailed analysis of traffic accident black spots in London. By identifying these high-risk areas, the study supports the development of targeted interventions and policies to enhance road safety.

Reference

Karamanlis, I., Nikiforiadis, A., Botzoris, G., Kokkalis, A. and Basbas, S., 2023. Towards sustainable transportation: The role of black spot analysis in improving road safety. Sustainability, 15(19), p.14478.

Data Resource

"Road Safety Data - Collisions 2022" dataset, accessible from data.gov.uk