

Spatiotemporal data mining and visualization for smart cities

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Importance

- **Data mining** is essential for extracting meaningful patterns and insights from complex datasets.
- **Visualization** provides an intuitive way to comprehend and interpret data effectively.
- The combination of data mining and visualization is valuable for city planning and management.
- It helps optimize urban development and facilitates the sustainable growth of cities.



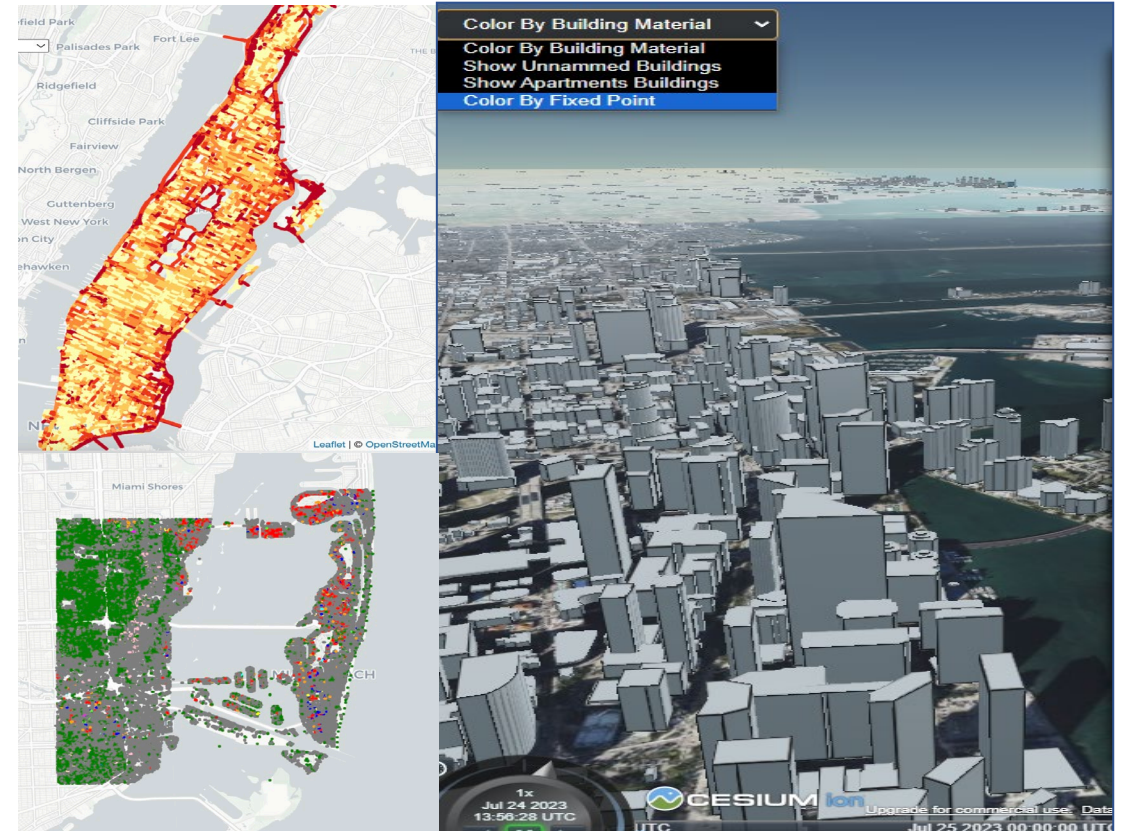
Objectives

1. Applications of interactive front-end 2D/3D data visualizations:

- Traffic management: insights into traffic flow, and congestion patterns.
- Urban planning: Identify potential design issues, evaluate building heights and locations.

2. Infrastructure integrity pattern mining with clustering:

- Analyze large datasets to reveal hidden insights and patterns.



Interactive front-end 2D data visualization

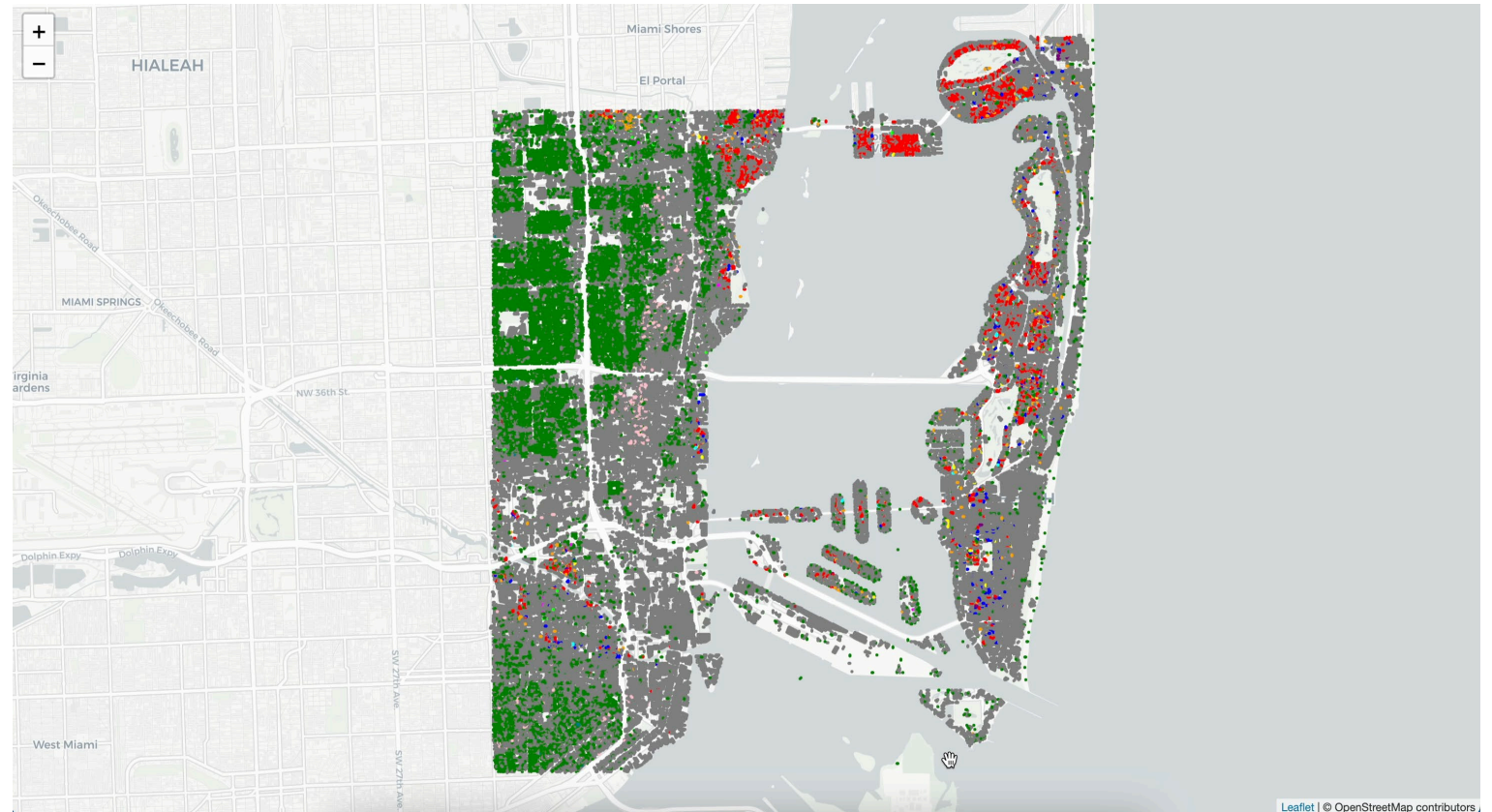
- Leaflet is utilized to create a 2D web map of Manhattan.
- The map's focus is to showcase the city's densest regions, determined by a specific attribute.

Interactive front-end 3D data visualization

- Cesium is utilized to create a 3D web map of Miami.
- The buildings are depicted with their respective features, and the visualization is enhanced through functions available in the dropdown menu.

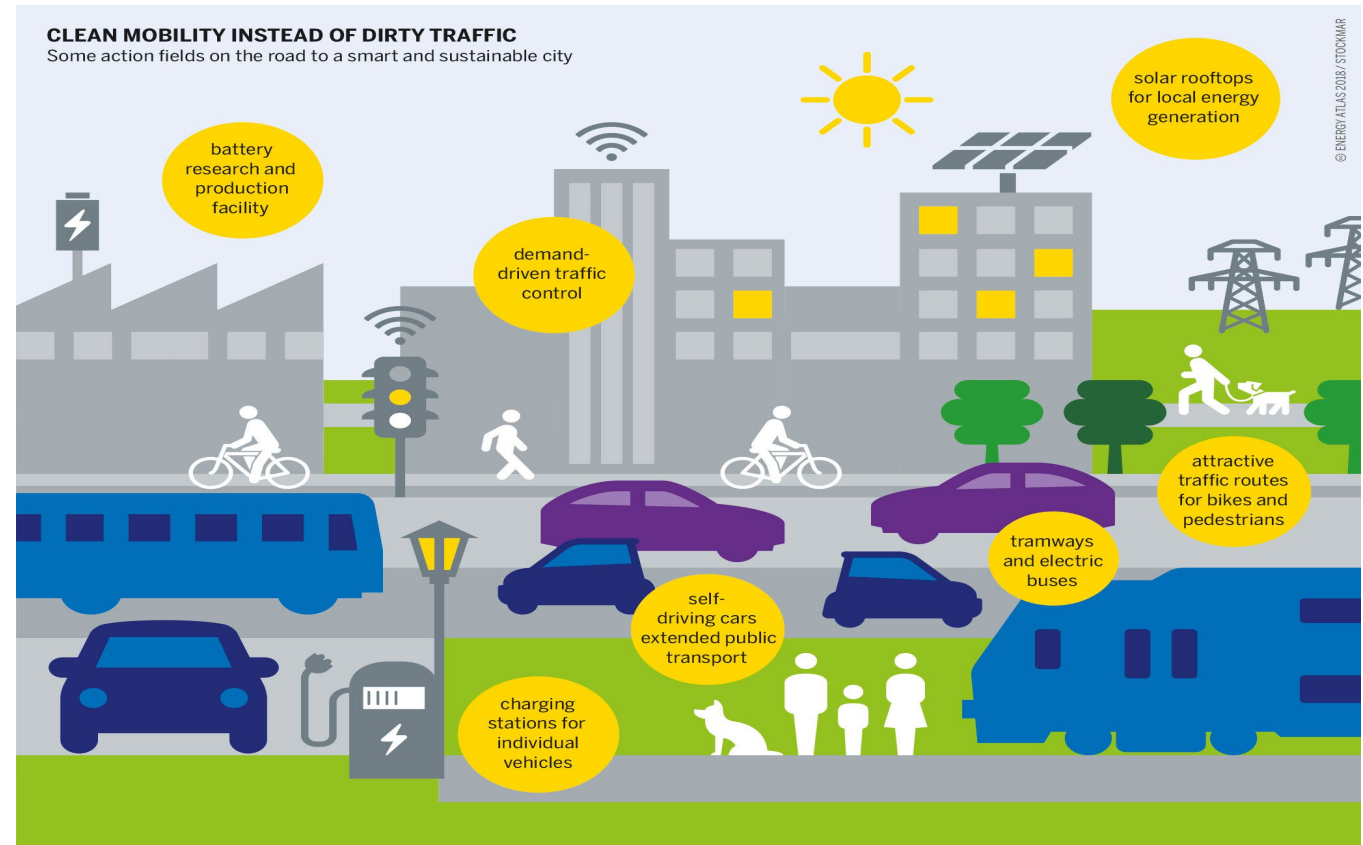
Infrastructure integrity pattern mining

- Clustering using the DBSCAN algorithm in python, focuses on five specific attributes for analysis
- Segmentation of polygons on the map into separate groups by colors
- Visual representation highlights densest regions in the area with leaflet.



Conclusion

- From these powerful processing tools and visualization techniques, this project contributes to the advancement of smart city.
- A key to understanding urban dynamics and uncovering essential patterns within the city's data for a smart city.



Questions & Feedback

