ID 574

Real-time Taxi Demand and Supply Prediction-based on Specific Geo-locations Using Machine Learning – A Systematic Literature Review

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Abstract

This comprehensive systematic literature review investigates the prediction of taxi demand and supply using geospatial data, a task becoming increasingly critical due to the surging popularity of ride-hailing services. The review harnesses recent advancements in machine learning algorithms and the accessibility of large-scale geospatial data to explore innovative techniques and approaches in this domain. A total of 21 research papers, published from 2017 to 2023, were meticulously selected and examined based on their research objectives, methodologies, datasets, and evaluation metrics. This review clearly explains that the efficacy of taxi demand prediction models significantly depends on data quality and volume, the choice of learning algorithms, and the implementation of appropriate feature engineering techniques. The study shows the great possibilities of using geospatial data and Machine Learning to accurately predict taxi demand. It also highlights the importance of having standard measures for evaluating results and the need for ongoing research to overcome current issues in this area. Our review also explores the application of several machine learning algorithms, like linear regression, decision trees, artificial neural networks, and clustering, emphasizing real-time population data. After rigorous analysis, clustering is identified as the most fitting technique for this study. This review promises to be a valuable resource, providing a roadmap for future research in this dynamic, analytics-based field.

Keywords: *Taxi demand and supply, Geo-location, Machine learning, Systematic literature review*