

## Optimizing Electric Vehicle Charging with Charging Data Analytics

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**Abstract :** Electric vehicles are considered as viable replacements to gasoline cars since they help in reducing harmful emissions and stimulate power generation through renewable energy sources, hence contributing to sustainability. However, one of the significant obstacles in the mass deployment of electric vehicles is the charging time anxiety among users and, thus, the subsequent large waiting times for available chargers at charging stations. Data analytics, on the other hand, has revolutionized the decision-making tasks of management and operating systems since its arrival. In this paper, we attempt to optimize the choice of EV charging stations for users in their vicinity by minimizing the time taken to reach the charging stations and the waiting times for available chargers. Time taken to travel to the charging station is calculated by the Google Maps API and the waiting times are predicted by polynomial regression of the historical data stored. The proposed framework utilizes real-time data and historical data from all operating charging stations in the city and assists the user in finding the best suitable charging station for their current situation and can be implemented in a mobile phone application. The algorithm successfully predicts the most optimal choice of a charging station and the minimum required time for various sample data sets.

**Keywords :** charging data, electric vehicles, machine learning, waiting times

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