# Investigating the Characteristics of Correlated Parking-Charging Behaviors for Electric Vehicles: A Data-Driven Approach

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**Abstract :** In advancing the management of integrated electric vehicle (EV) parking-charging behaviors, this study uses Changshu City in Suzhou as a case study to establish a data association mechanism for parking-charging platforms and to develop a database for EV parking-charging behaviors. Key indicators, such as charging start time, initial state of charge, final state of charge, and parking-charging time difference, are considered. Utilizing the K-S test method, the paper examines the heterogeneity of parking-charging behavior preferences among pure EV and non-pure EV users. The K-means clustering method is employed to analyze the characteristics of parking-charging behaviors for both user groups, thereby enhancing the overall understanding of these behaviors. The findings of this study reveal that using a classification model, the parking-charging behaviors of pure EVs can be classified into five distinct groups, while those of non-pure EVs can be separated into four groups. Among them, both types of EV users exhibit groups with low range anxiety for complete charging with special journeys, complete charging at destination, and partial charging. Additionally, both types have a group with high range anxiety, characterized by pure EV users displaying a preference for complete charging with specific journeys, while non-pure EV users exhibit a preference for complete charging. Notably, pure EV users also display a significant group engaging in nocturnal complete charging. The findings of this study can provide technical support for the scientific and rational layout and management of integrated parking and charging facilities for EVs.

**Keywords :** traffic engineering, potential preferences, cluster analysis, EV, parking-charging behavior
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