

A Mobile Framework for Real-Time EV Charging Management and Optimization

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Abstract: *The rapid adoption of electric vehicles (EVs) has created significant challenges related to charging infrastructure accessibility, utilization efficiency, and user experience. This paper presents a comprehensive mobile application framework, "Smart EV Connect," designed to address these challenges through intelligent location services, energy consumption prediction, real-time availability tracking, and reservation capabilities. The application employs a combination of geospatial algorithms, machine learning-based energy prediction models, and distributed database architecture to deliver a seamless user experience. Validation tests conducted with 150 EV users across urban and suburban environments demonstrate a 37% reduction in charging anxiety and a 42% improvement in charging station utilization rates. The system architecture provides extensibility for integration with smart grid infrastructure and vehicle-to-grid (V2G) technologies, positioning it as a valuable component in the evolving EV ecosystem*

Keywords: Electric vehicles, mobile applications, charging infrastructure, energy prediction, smart grid integration

