

(54) Title of the invention : CLUSTER ELECTRIC VEHICLE CHARGING BEHAVIOUR OPTIMIZATION METHOD BASED ON DEEP REINFORCEMENT LEARNING

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(57) Abstract :

The proposed invention introduces a Cluster Electric Vehicle Charging Behavior Optimization Method Based on Deep Reinforcement Learning, aiming to revolutionize the management of electric vehicle (EV) charging infrastructure. By leveraging advanced artificial intelligence techniques, particularly Deep Reinforcement Learning (DRL), the system dynamically optimizes the behavior of charging clusters. Each charging station acts as an autonomous agent, making intelligent decisions based on real-time data and feedback from the grid. Through continuous learning and adaptation, the system maximizes the utilization of available capacity, minimizes congestion, and balances cost efficiency with user satisfaction. This decentralized approach ensures scalability, resilience, and adaptability across diverse environments, promoting equitable access to charging services while reducing grid stress and promoting renewable energy integration. The proposed method holds promise for driving significant economic, environmental, and societal benefits, accelerating the transition towards a more sustainable and efficient transportation system.

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