

Energy trading optimization: A Comparative Analysis of Reinforcement Learning Techniques

This paper embarks on a comparative study of three diverse reinforcement learning techniques applied to forecasting and optimizing energy trading in day-ahead markets for medium-sized prosumers. Given renewable energy sources' inherent volatility and unpredictability, this study leverages these diverse approaches, each known for its unique advantages in navigating complex optimisation landscapes. The primary objective is to develop robust energy trading strategies that guide the challenges posed by fluctuating energy demands, prices, and the limitations of battery storage capabilities. Through this comparative analysis, the authors aim not to prescribe definitive solutions but to illuminate the strengths and limitations of each methodology in the context of energy management. The insights garnered are intended to serve as a valuable resource for researchers, offering a foundational understanding that could spur further investigations into adaptive, cost-effective, and efficient energy trading mechanisms. While the direct applicability to the energy sector remains entirely determined, the methodological comparisons and discussions presented herein contribute significantly to the ongoing discourse on optimising renewable energy utilisation and trading strategies.

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