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Leveraging Deep Q Networks in Portfolio Optimization

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Abstract : Deep Q networks (DQNs) represent a significant advancement in reinforcement learning, utilizing neural networks to approximate the optimal Q-value for guiding sequential decision processes. This paper presents a comprehensive introduction to reinforcement learning principles, delves into the mechanics of DQNs, and explores its application in portfolio optimization. By evaluating the performance of DQNs against traditional benchmark portfolios, we demonstrate its potential to enhance investment strategies. Our results underscore the advantages of DQNs in dynamically adjusting asset allocations, offering a robust portfolio management framework.

Keywords : deep reinforcement learning, deep Q networks, portfolio optimization, multi-period optimization
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