Deep Reinforcement Learning for Automated Stock Trading

Project Description

A crucial and difficult challenge for investors is learning how to make wise selections while trading stocks. The primary goal of this specific application of reinforcement learning is to assess whether a DRL agent can automatically make trading judgements and generate long-term consistent profits given that DRL has surpassed humans in many areas, such as playing Atari games. In this project, we will be explore the ensemble trading strategy using three actor-critic based algorithms: Proximal Policy Optimization (PPO), Advantage Actor Critic (A2C), and Deep Deterministic Policy Gradient (DDPG). We will attempt to simulate the results of the primary paper and will try to suggest improvements to obtain better results.

List of selected papers

1. Yang, H. (2020, September 11). *Deep Reinforcement Learning for Automated Stock Trading: An Ensemble Strategy*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3690996

2. L. Chen and Q. Gao, *"Application of Deep Reinforcement Learning on Automated Stock Trading,"* 2019 IEEE 10th International Conference on Software Engineering and Service Science (ICSESS), Beijing, China, 2019, pp. 29-33, doi: 10.1109/ICSESS47205.2019.9040728. https://ieeexplore.ieee.org/abstract/document/9040728?casa_token=xAs-JBgbJhQAAAAA:cUQFlgLHauvepFTGhJZW4y8DDWQJwRebP4I9TabsHwrJqpqVCcw2DBYiOE0nqbPi4xjh-OtCxVuf_Go

3. AbdelKawy, R. (2021, January 5). *A synchronous deep reinforcement learning model for automated multi-stock trading*. SpringerLink. https://link.springer.com/article/10.1007/s13748-020-00225-z?error=cookies_not_supported&code=a004a2ce-bee9-464c-a332-65d488ce6e6a

4. W. Si, J. Li, P. Ding and R. Rao, *"A Multi-objective Deep Reinforcement Learning Approach for Stock Index Future's Intraday Trading,"* 2017 10th International Symposium on Computational Intelligence and Design (ISCID), Hangzhou, 2017, pp. 431-436, doi: 10.1109/ISCID.2017.210.

https://ieeexplore.ieee.org/abstract/document/8283307?casa_token=mvJWTD9yr_wAAAAA:hqNVbBRLBG8fV5XNe9C7ZATQkCOYBelsZPi0KTd1B-dkIodE6jm8ncnIp4jiDGprRvjBWjspFf-GT8g

5. Liu, X. (2021, November 4). *FinRL: Deep Reinforcement Learning Framework to Automate Trading in Quantitative Finance*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3955949

6. Kabbani, T., & Duman, E. (2022). *Deep Reinforcement Learning Approach for Trading Automation in the Stock Market. IEEE Access, 10*, 93564-93574. https://arxiv.org/pdf/2208.07165.pdf

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4.	Harsh Vardhan Gupta	2019B3A70630H
5.	Aryan Kapadia	2019B3A70412H
6.	Pranay Kumar Dasoju	2019A7PS0006H