MSc Project Report
Reinforcement Learning Approach to
Algorithmic Trading

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Abstract

Algorithmic trading has been continuously dominating the financial market and making the percentage of manual traders becoming lesser by each year. Financial institutions and hedge funds have to carry out continuous extensive research to find the alpha trading strategy because they have to adapt to continuously changing market conditions while beating competitor strategies.
In recent years many reinforcement learning algorithms have been developed to solve challenging tasks that have complicated problem space and imperfect information and a dynamically changing environment. Reinforcement learning appears to be promising in these exact problem sets that the algorithmic trading domain has. But there is much research to be conducted in order to deploy a strategy that has been trained in a simulated environment to be deployed in a real-world environment. This paper is focused on reducing the gap between the real-world environment and simulated one by incorporating factors such as slippage, bid-ask spread, and exchange commission. This paper attempts to cater to the issue by introducing an action scheme that has a limit orders to reduce the effect of mentioned issues and has a realistic transaction cost so that the actions that the agents learn will behave better in the real work environment.

Keywords: Algorithmic trading, Reinforcement learning