

Deep Learning

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My personal notes on *An application of deep reinforcement learning to algorithmic trading*.

I. REINFORCEMENT LEARNING

Some definitions and symbols

1. S : Set of environment and agent state.
2. A : Set of actions which are available for agent to use.
3. s_t : RL environment internal state
4. o_t : Observation
5. a_t : Trading action
6. i_t : Information
7. $\pi(a_t|i_t)$: Trading policy (Rule)
8. r_t : Network's reward.
9. ν_t^c : Total amount of cash in portfolio.
10. ν_t^s : Corresponding value of the share.
11. n_t : Total number of shares, lots.

Reinforcement learning techniques are concerned with the design of π maximizing an optimality criterion, which directly depends on the immediate rewards r_t observed over a certain time horizon.

II. ADDITIONAL NOTES AND QUESTIONS

1. Representing the transition from one candle to the next one as a Markov process.
2. Considering the correlation between candles as a spin system (as in the case of Witten's "An introduction to quantum information theory")

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