TEXAS
The University of Texas at Austin

Quantum Reinforcement Learning

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Presenters: **JORDI RAMOS, BENJAMIN PACHEV**

The University of Texas at Austin

We wanted to replicate

Bold Claims

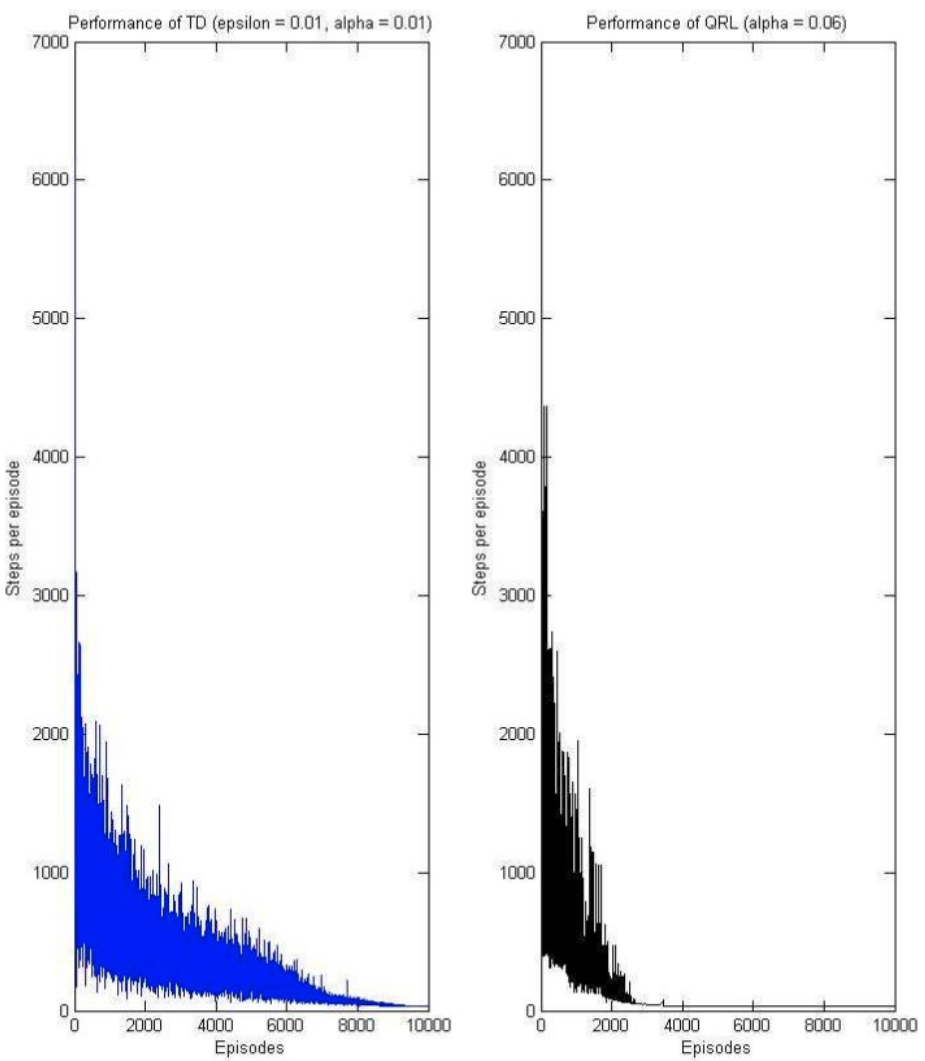
- “From the following analysis, it is obvious that QRL shows much better performance than other methods when the searching space becomes very large.” (pg 7)

- “QRL explores more than TD algorithm at the beginning of learning phase, but it learns much faster and guarantees a better balancing between exploration and exploitation” (pg 9)

QRL

Figures from (Dong. et al 2008)

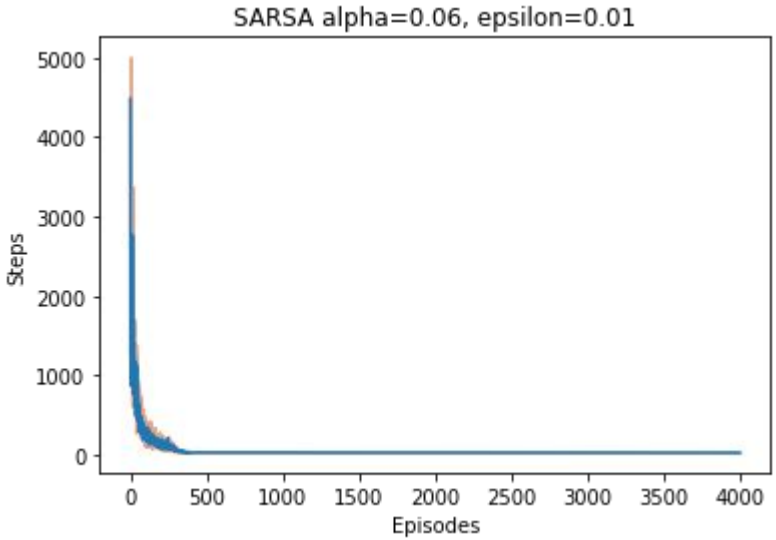
- QRL is based on TD(0) and uses Grover updates to modify the action probabilities.

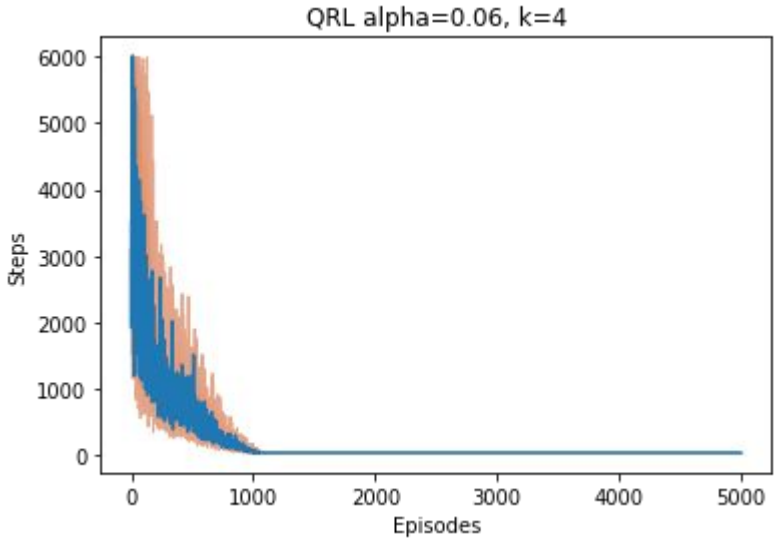


Our Journey

- Initially, we wanted to extend the results of the paper to new problems and were very excited.
- However, the more we dug into the paper, the more we realized that crucial implementation details were missing.
- We spent a lot of effort trying to fill in these details with our best guesses.
- The better we understood the algorithm, the more questions we had about its feasibility and practicality.

What we Found





Lessons Learned

- Not all results are replicable
- Citation counts can be misleading
- It is important to review papers carefully

Thank you!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