Solving Starcraft II Minigames using Deep Reinforcement Learning

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Outline

Presentation of Thesis

Starcraft II as a Game and Learning Environment

Deep Reinforcement Learning

Design Choices

Results and Discussion

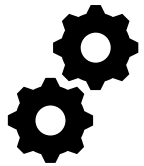
What we have done

01

Explored Starcraft II as a learning environment

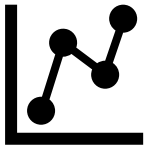
02

Implemented deep reinforcement learning agents



03

Solved Starcraft II Mini-games

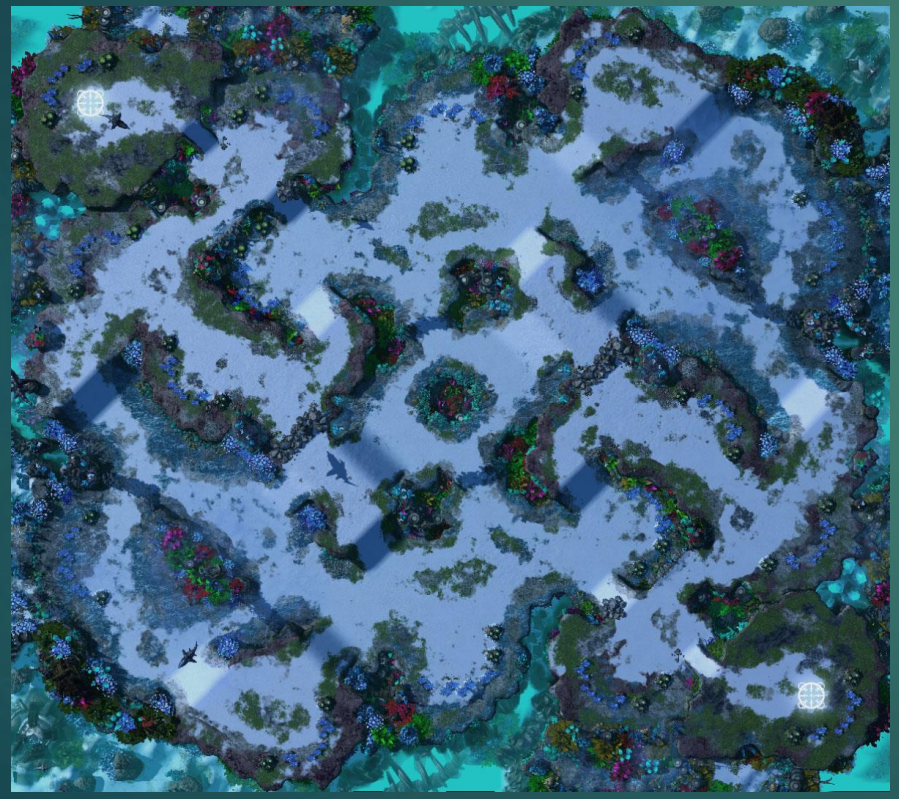


What is Starcraft II

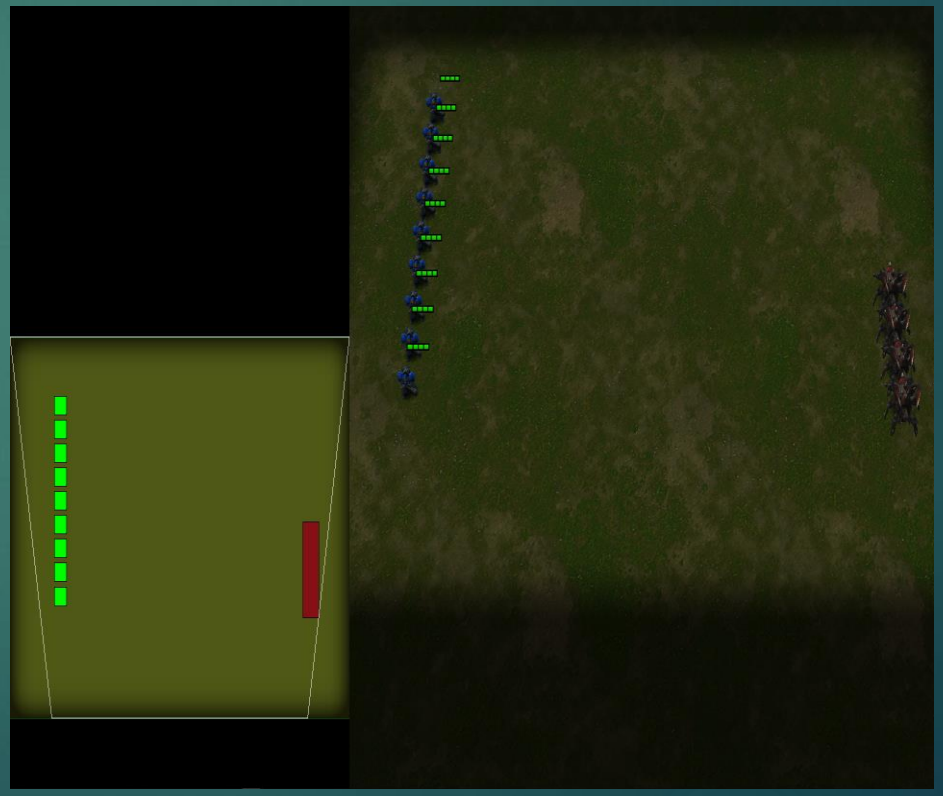
and why is it interesting?

Full game vs Mini-game

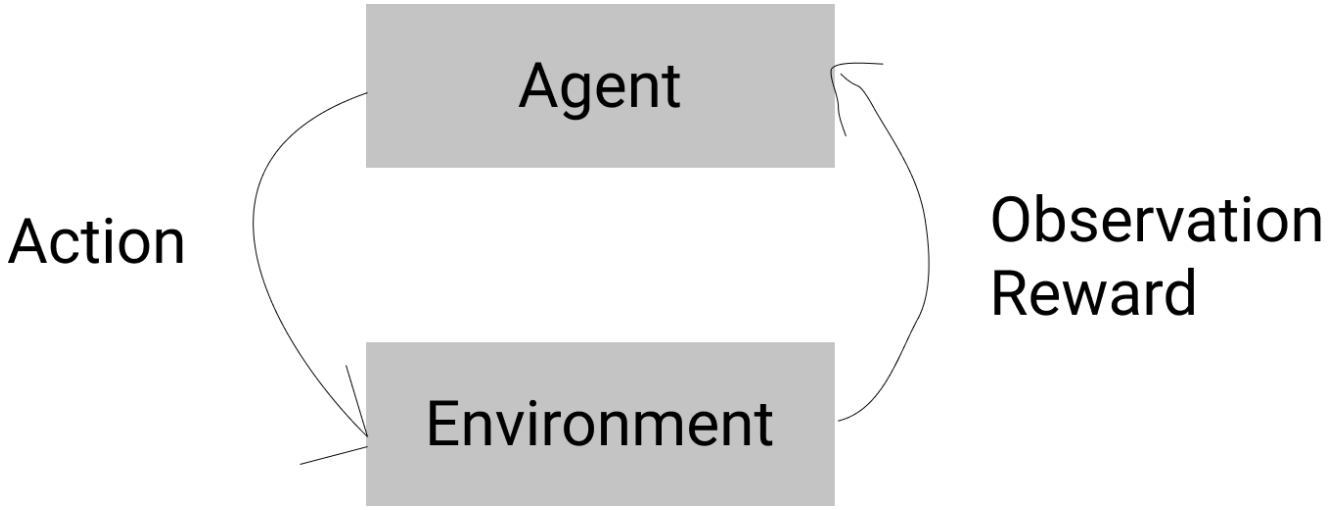
Abyssal Reef LE



DefeatRoaches



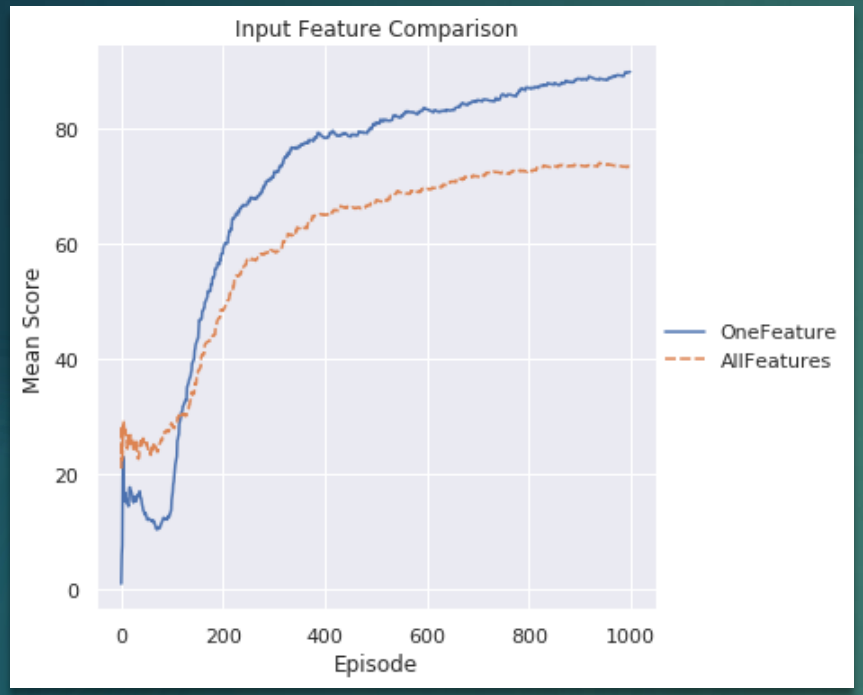
(Deep) Reinforcement Learning

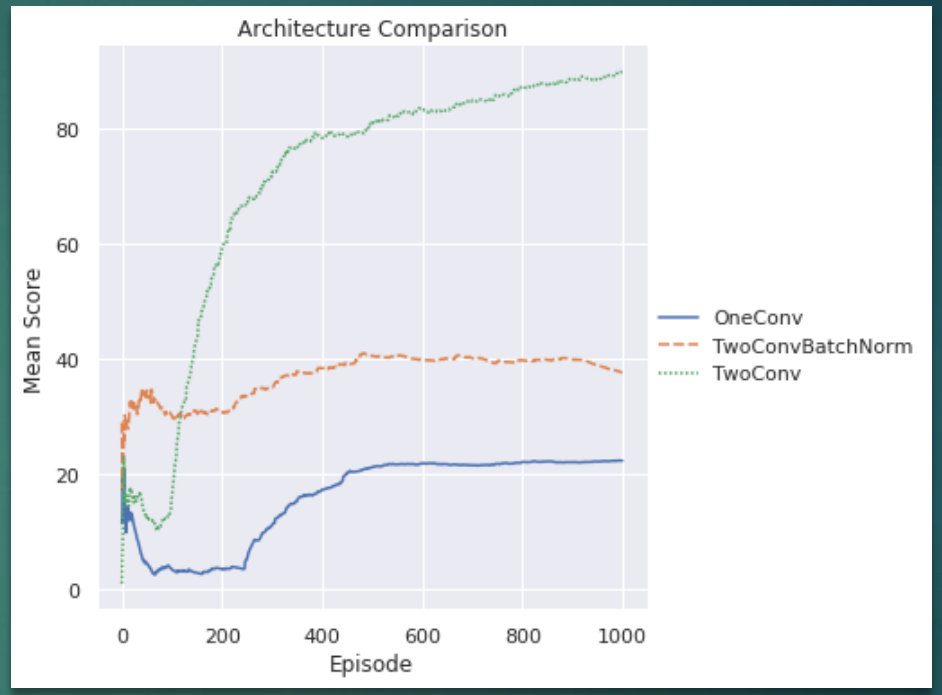


Design Choices

- Based on Deepminds FullyConv architecture
- Idea: reduce complexity since our scope is much narrower
- Action space: select point, attack move
- Architecture: No dense layers, few hidden layers.
- Input space: only screen features

Results





- Deepminds mean score on this mini-game; 100 after 600M steps
- Author easily reached a score of 250

Demonstration

Conclusion

- We reached good results very quickly
- Did not reach human level performance
- Need increased micro-management.
- Potential future work; Curriculum learning, more actions and training