

Playing Starcraft with Deep Q-learning

In this project we want to use a Deep Reinforcement Learning approach for playing Starcraft.



Starcraft is a difficult game for an artificial agent because the state space is large and exploration of the state space, e.g. with ϵ -greedy, to find a good policy turns out to be very difficult.

The ϵ -greedy strategy explores the state space completely randomly, similar to a random-walk. Humans, on the other hand, tend to explore unknown areas more systematically by keeping track of where they have been before, and by essentially generating a map of the space in their head. This “simple” idea has turned out to be highly effective according to a recently published NATURE paper *First return, then explore*¹. In this thesis we want to explore this approach for star craft.

We will start with an existing RL-based approach for playing Starcraft, developed by our students last semester. We will be able to build on the existing code, use the existing performance as a base-line for comparison the more strategic approach.

To do this work, you should ideally have good python skills and you ideally have completed the applied machine learning course with a good grade.

Contact:

Volker Krüger	Professor i Datavetenskap	volker.krueger@cs.lth.se
---------------	------------------------------	--

¹ A. Ecoffet *et al.* First return, then explore. NATURE Vol. 590, Feb 2021.