



Joint RL meeting

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June 26, 2023

Brown University

Outline

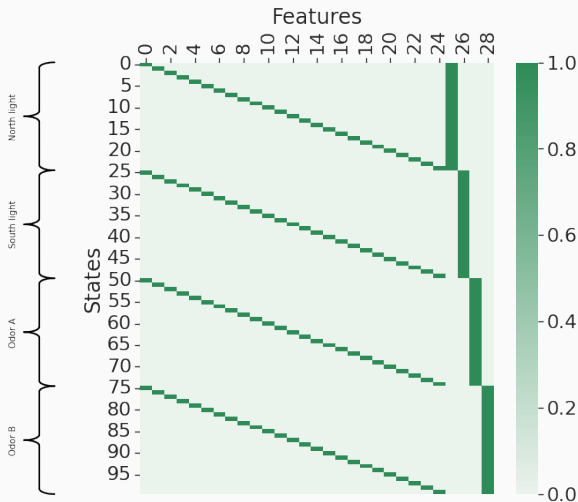
1. Reducing the number of features in function approximation
2. Deep RL – first draft & issues

Outline

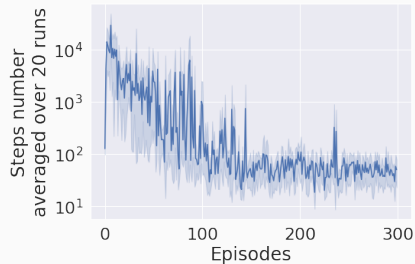
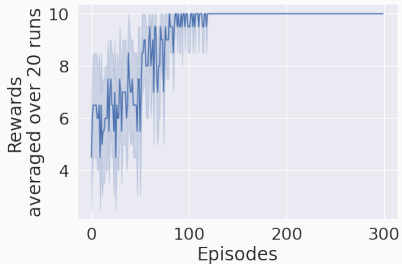
1. Reducing the number of features in function approximation
2. Deep RL – first draft & issues

Features matrix – allocentric agent

→ Reduced from 100 to 25 locations + 4 cues

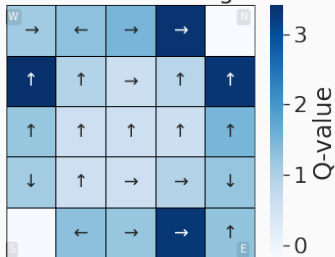


Rewards and steps – allocentric agent

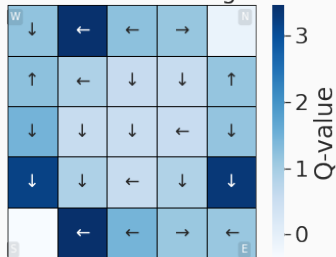


Q-values learned – allocentric agent

Pre odor - North light



Pre odor - South light



Post odor - Odor A

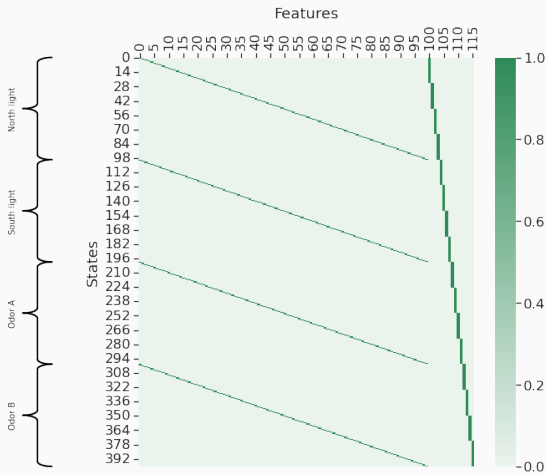


Post odor - Odor B

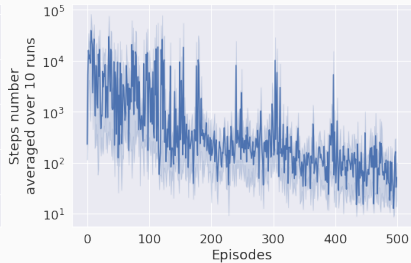
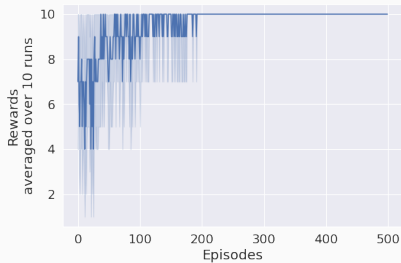


Features matrix – egocentric agent

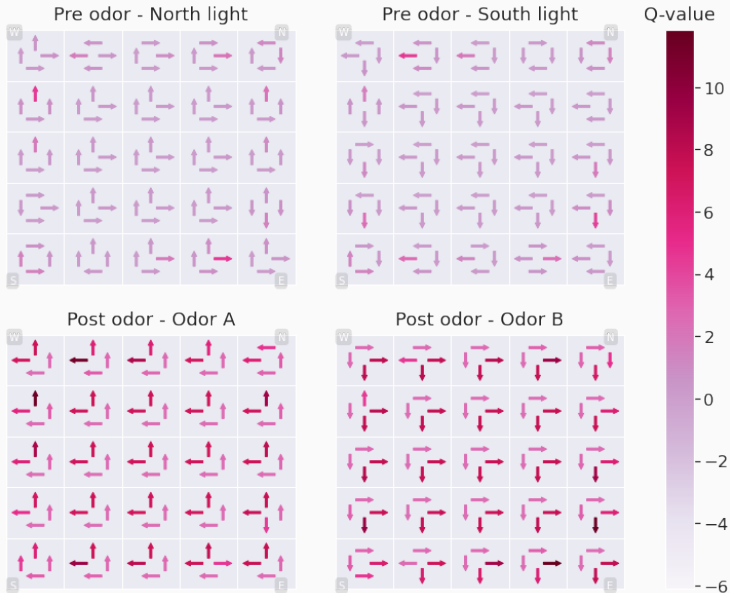
→ Reduced from 400 to 100 locations (25 locations x 4 head directions) + 16 cues (4 cues x 4 head directions)



Rewards and steps – egocentric agent



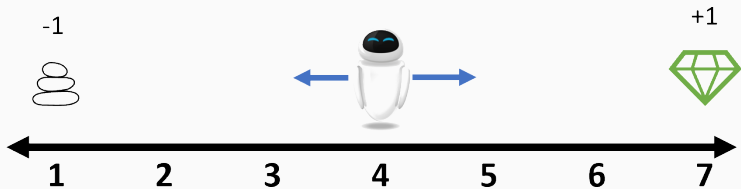
Q-values learned – egocentric agent



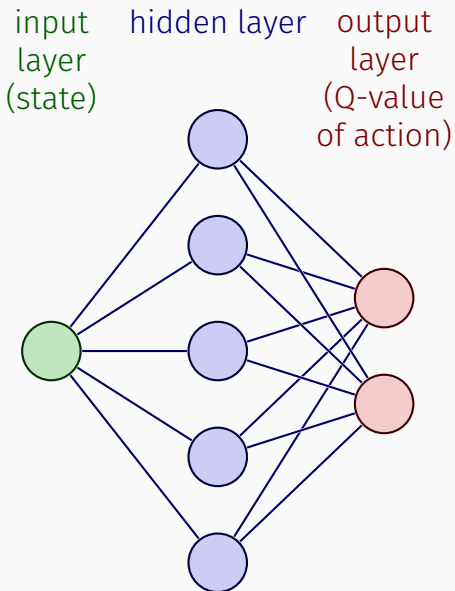
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1. Reducing the number of features in function approximation
2. Deep RL – first draft & issues

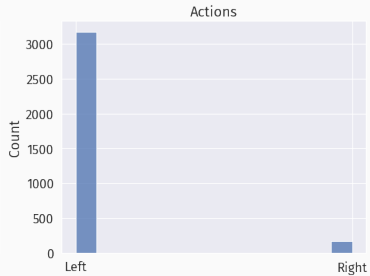
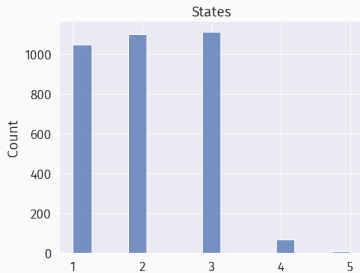
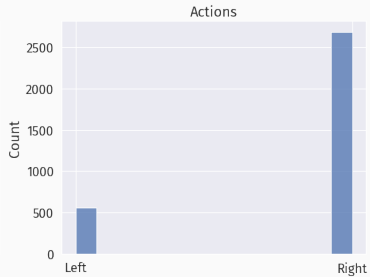
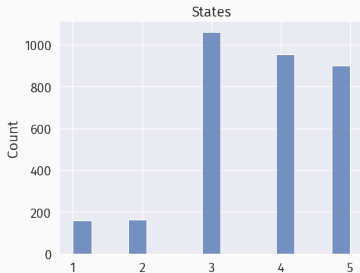
Toy task : Random Walk 1D



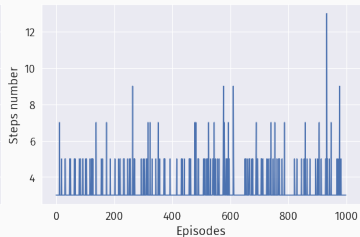
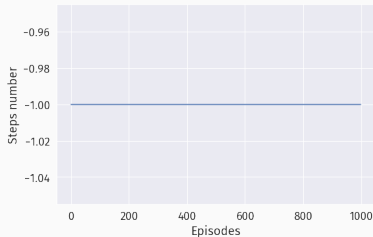
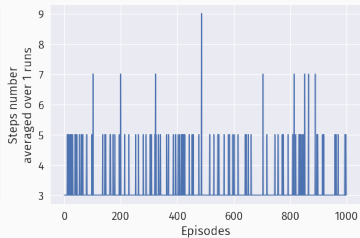
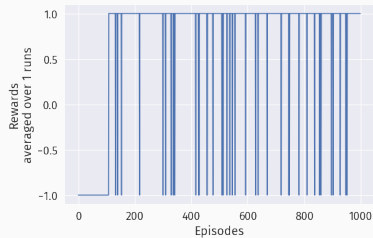
Network used



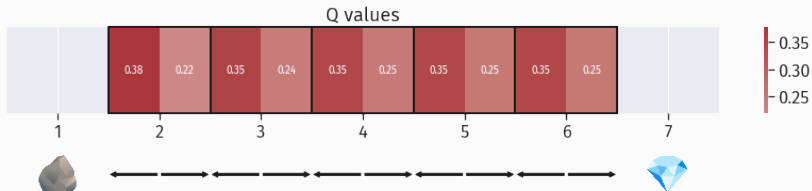
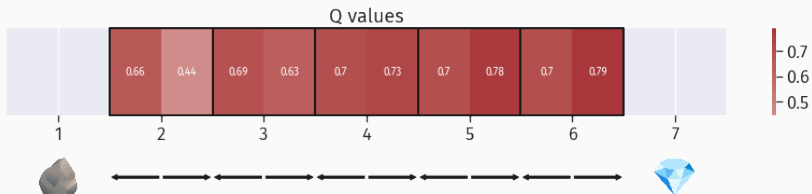
States and actions



Rewards and steps

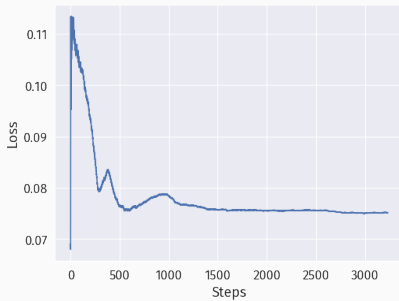


Q-values learned

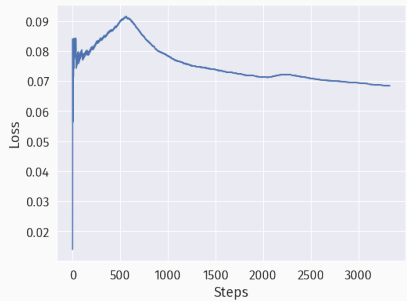


Network loss

Right leaning

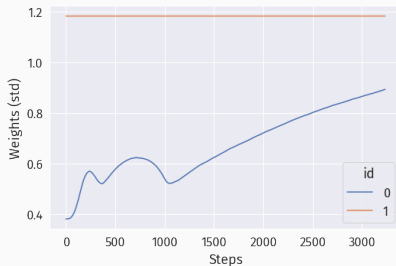
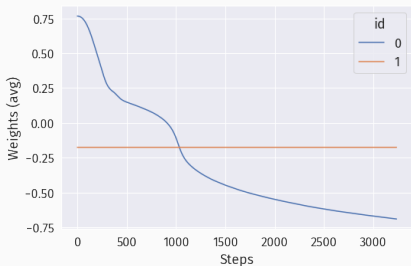


Left leaning

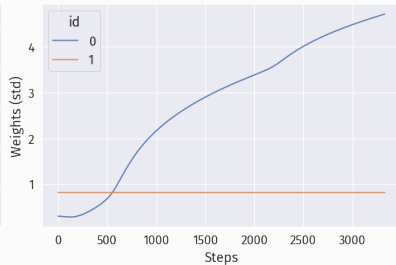
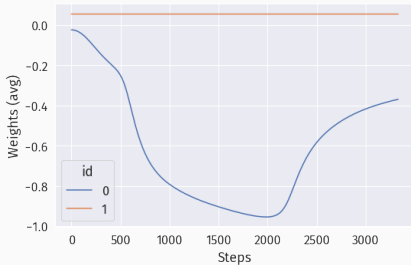


Network weights

Right leaning

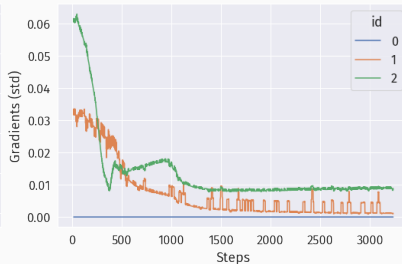
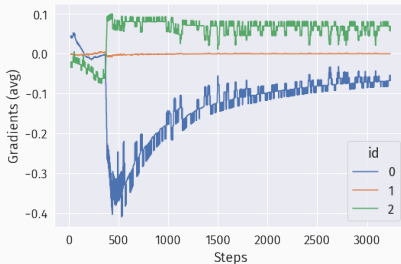


Left leaning

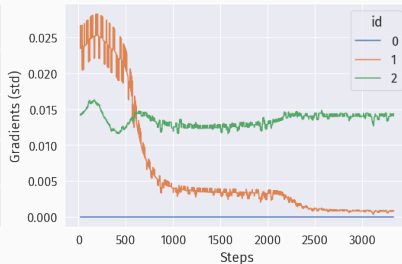
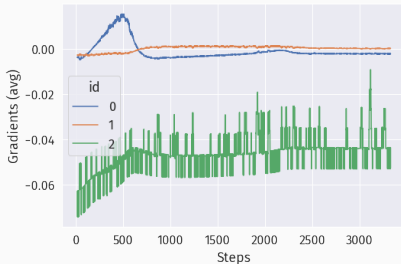


Network gradients

Right leaning



Left leaning



Troubleshooting next steps

- Loss function?
- One more hidden layer?

Questions ?