Joint RL meeting

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Outline

1. Reducing the number of features in function approximation

2. Deep Reinforcement Learning – first draft

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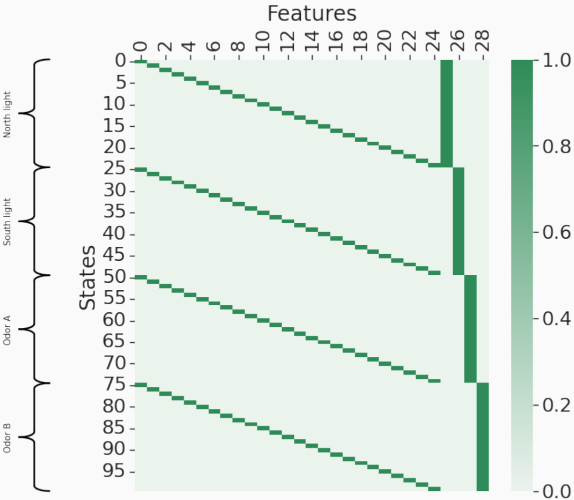
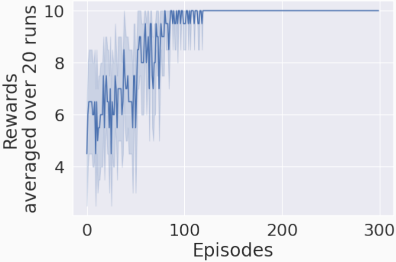
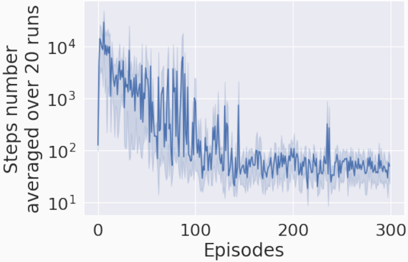
Features matrix – allocentric agent

→ Reduced from 100 to 25 locations + 4 cues

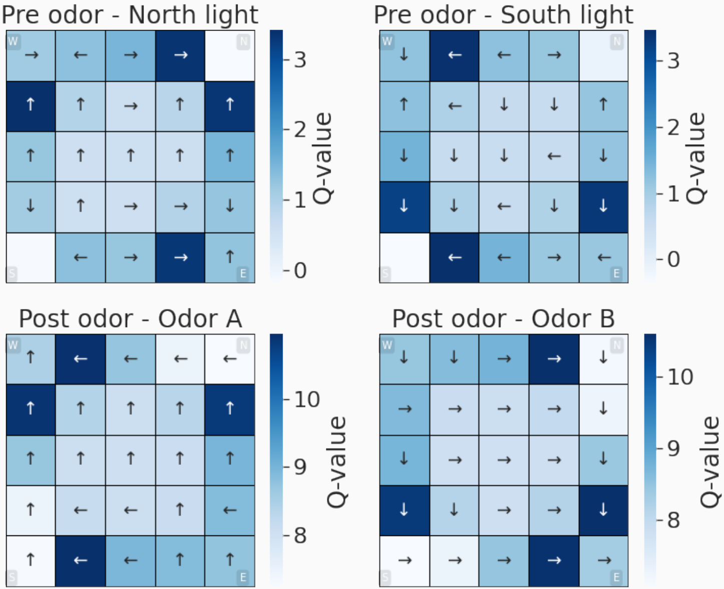


Rewards and steps – allocentric agent





Q-values learned – allocentric agent


Pre odor - North light

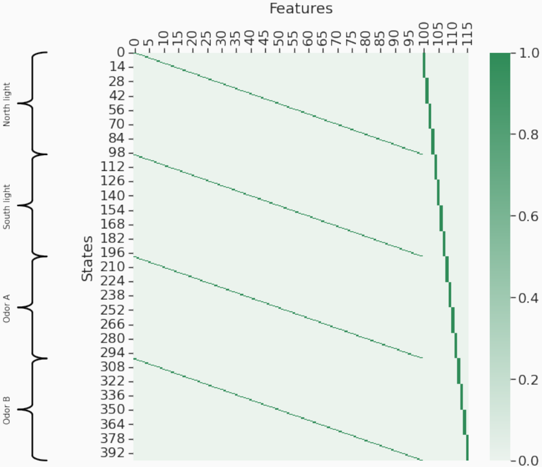
Pre odor - South light

Post odor - Odor A

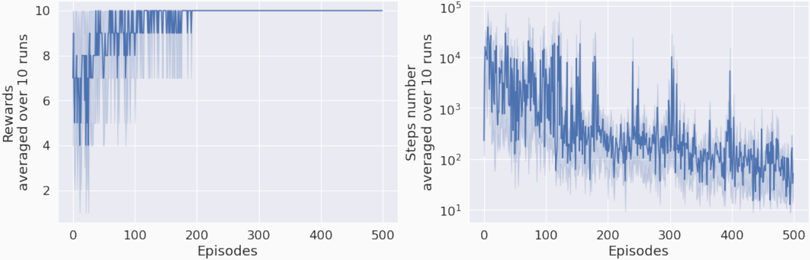
Post odor - Odor B

Features matrix – egocentric agent

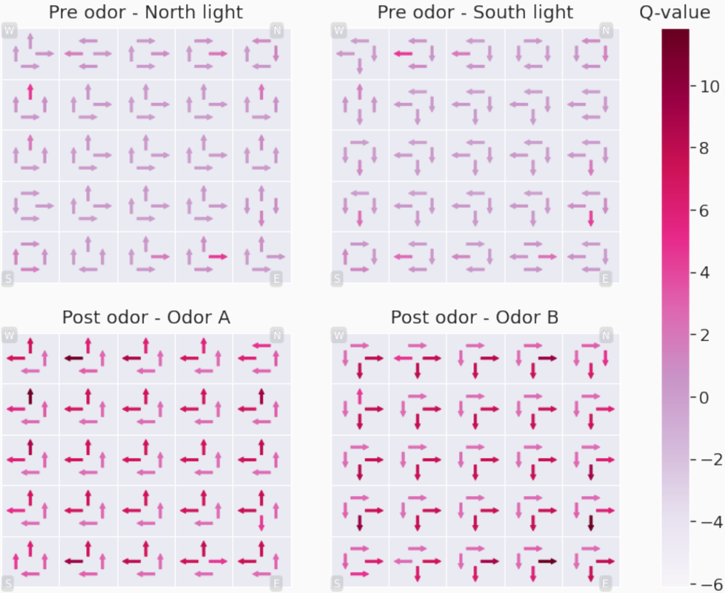
→ Reduced from 400 to 100 locations (25 locations x 4 head directions) + 16 cues (4 cues x 4 head directions)



Rewards and steps – egocentric agent



Q-values learned – egocentric agent



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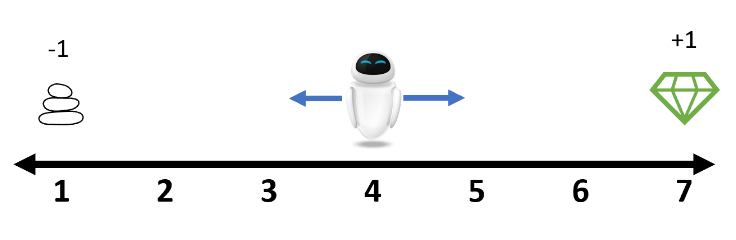
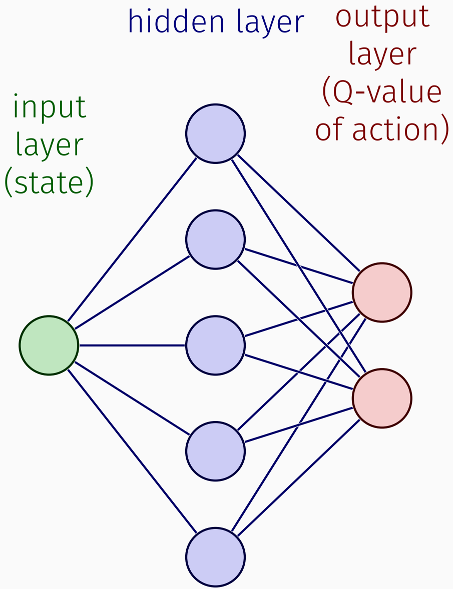
Toy task : Random Walk 1D



Network used

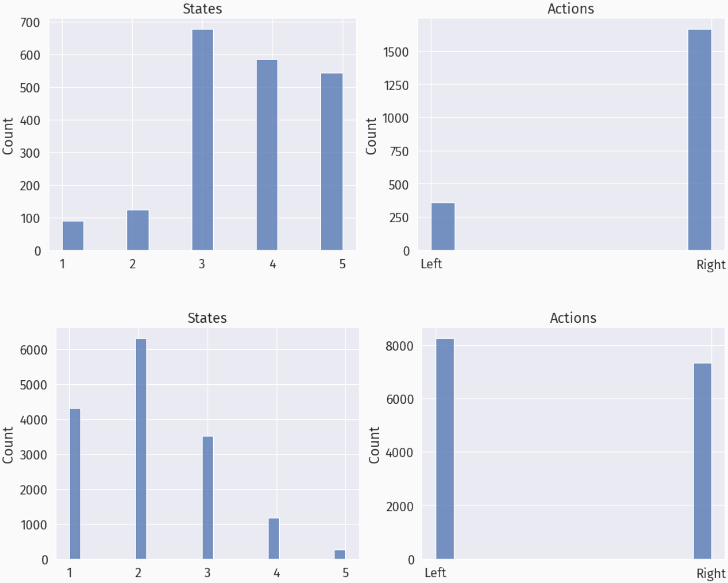


Algorithm

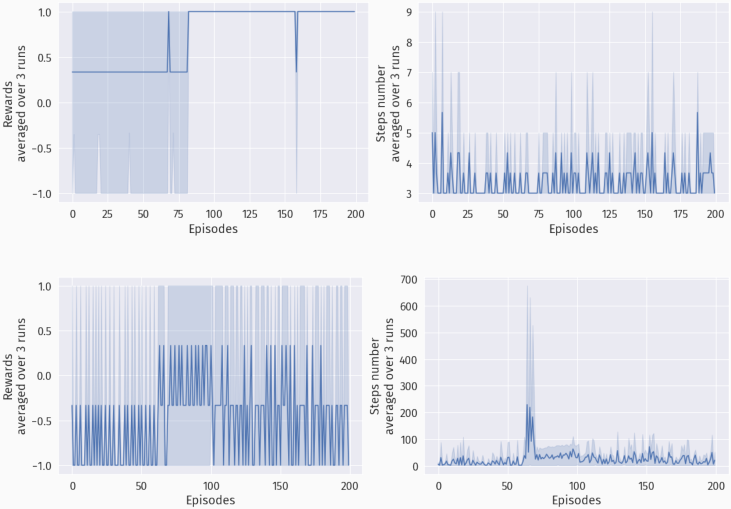
Algorithm 1: An algorithm with caption

```
Data: $X = [S_1, S_2, S_3, \ldots, S_n]$
Data: $y = [q_1, q_2, q_3, \ldots, q_n]$
Result: $y = x^n$
$q' \leftarrow r + \gamma q$;
$Loss \leftarrow (y - \hat{y}_{pred}) \times \Delta W$;
while $N \neq 0$ do
    if $N$ is even then
        $X \leftarrow X \times X$;
        $N \leftarrow \frac{N}{2}$ ;        /* This is a comment */
    else
        if $N$ is odd then
            $y \leftarrow y \times X$;
            $N \leftarrow N - 1$;
        end
    end
end
```

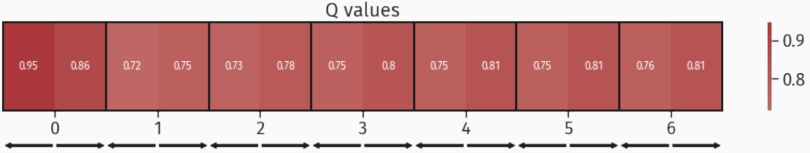
States and actions

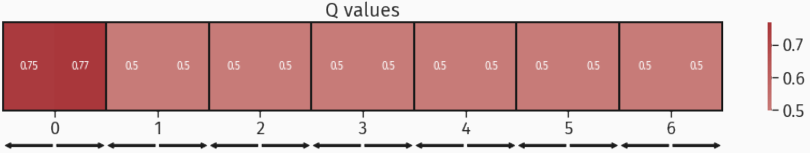


Rewards and steps



Q-values learned





Questions ?