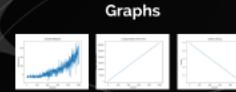
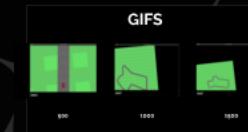


## Deep Q-Network



### Roadmap



Scope and importance



Implications

### Q-Learning



# FAI Final Project

## A Race Track AI Project by

Pranav Viswanathan, Siddhesh Shingate, Meet Jain and Gyula Planky

# Roadmap

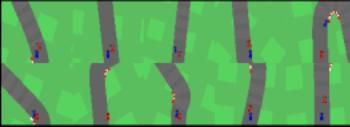
## Where we started

- RL pipeline for simulated racetrack driving
- Q-Learning
- Handled continuous states via discretization/binning



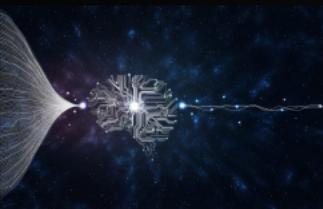
## Where we ended up

- Adopted CarRacing-v3 Gymnasium environment
- Continuous control driving simulator
- Transitioned from tabular Q-learning to DQN



## Scope and importance

- Foundation for developing autonomous navigation systems
- Extendable to real-world simulation platforms
- Adaptable learning framework



# Where we started

- RL pipeline for simulated racetrack driving
- Q-Learning
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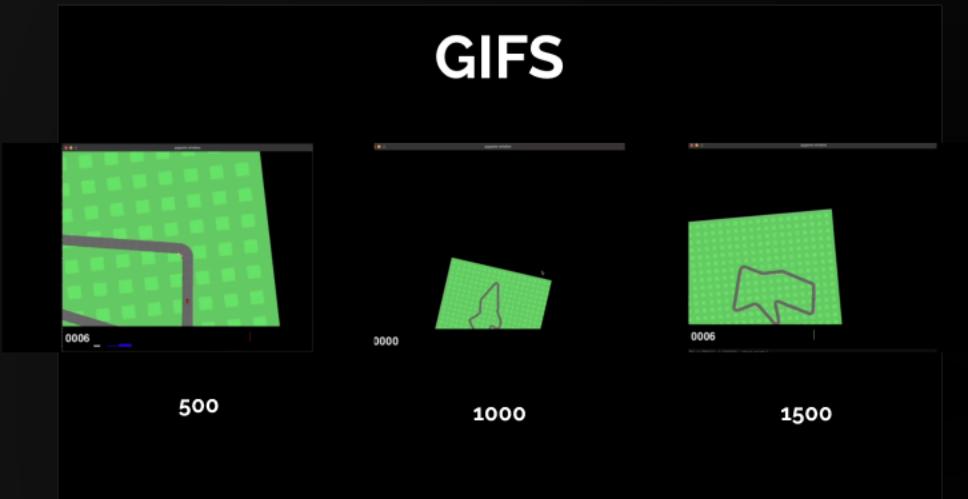


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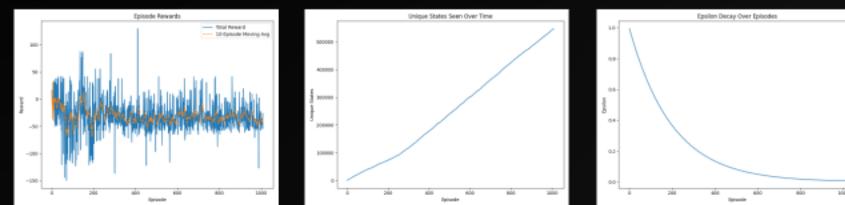
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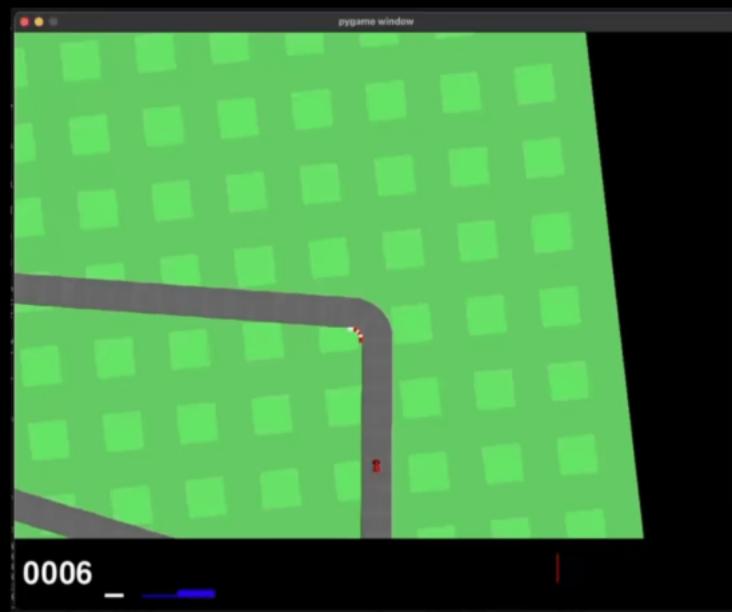
# Q-Learning



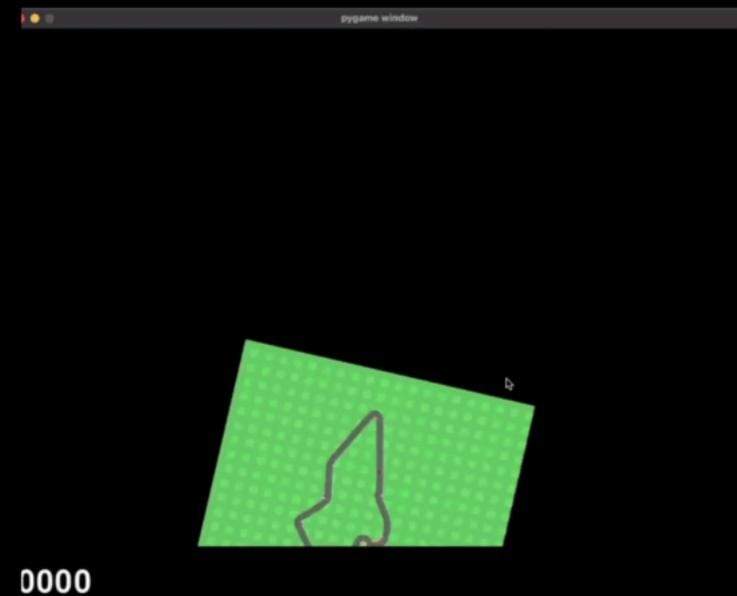
## Graphs



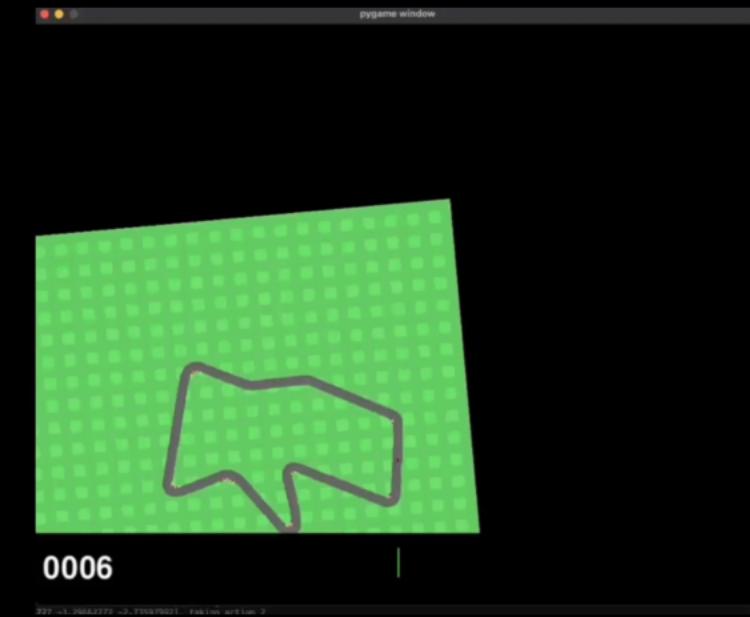
# GIFS



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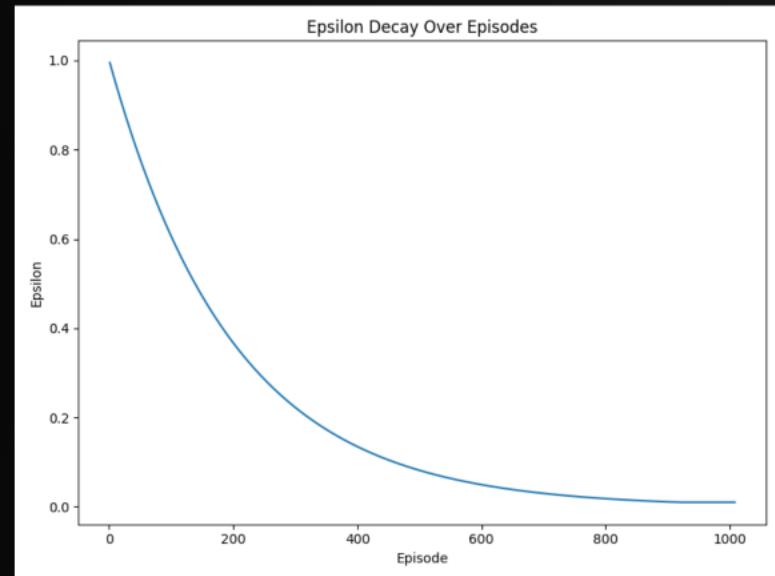
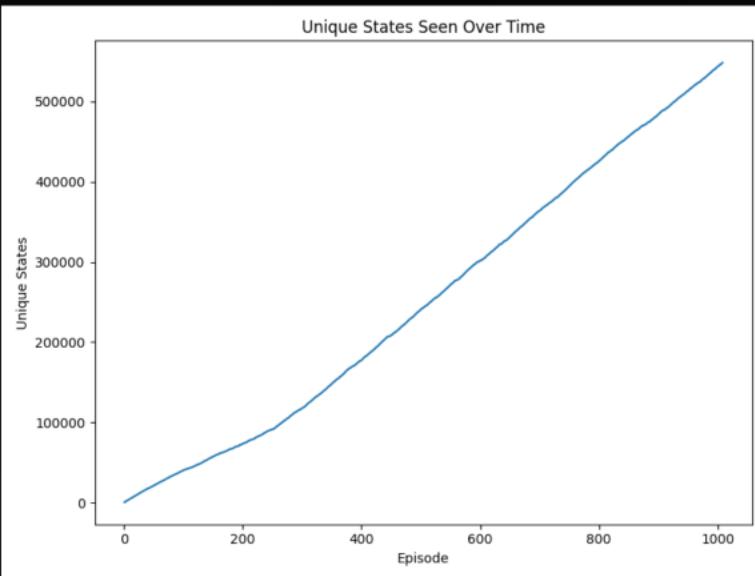
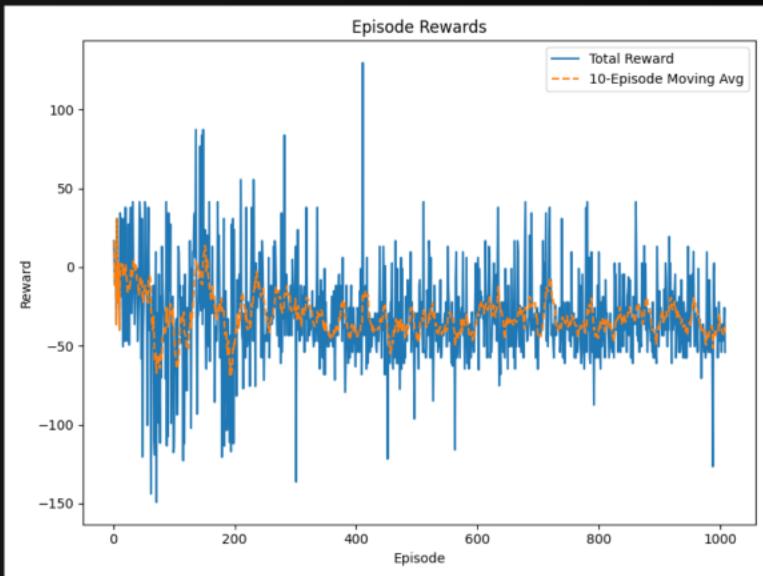


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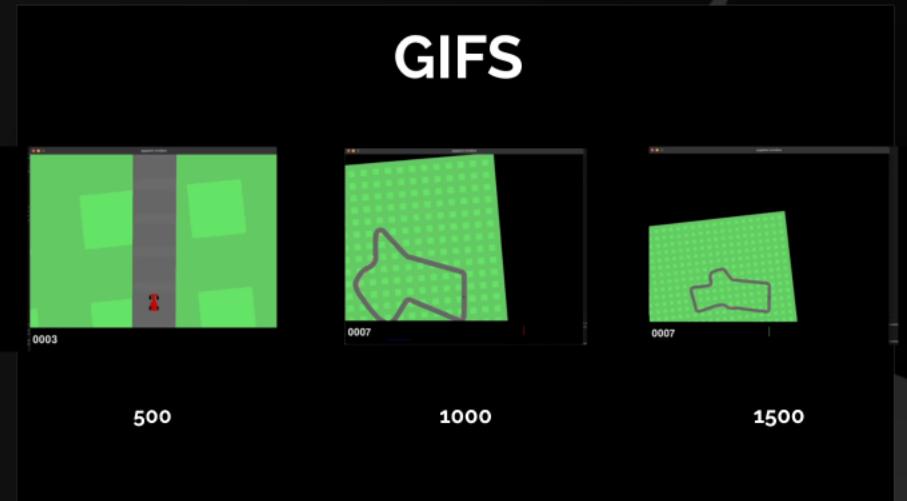
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# Graphs



# Deep Q-Network

GIFS

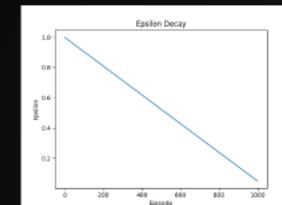
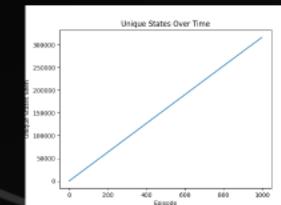
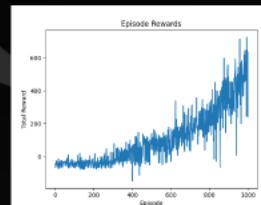


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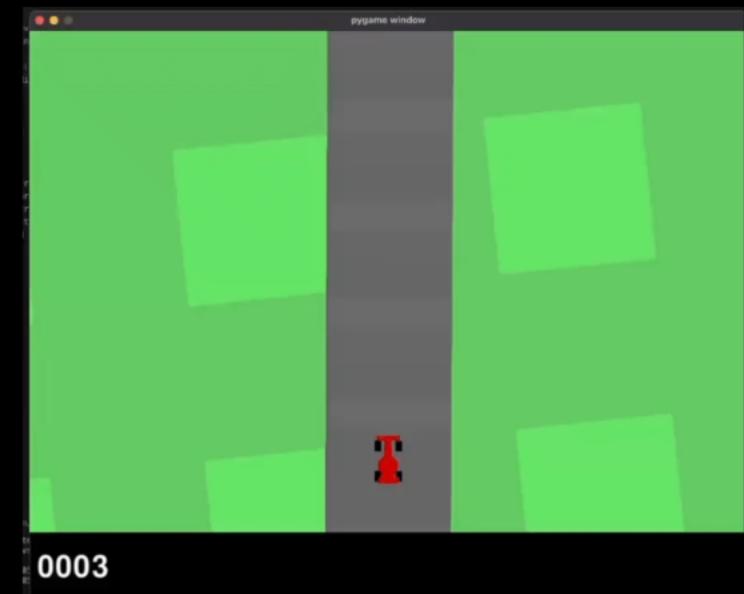
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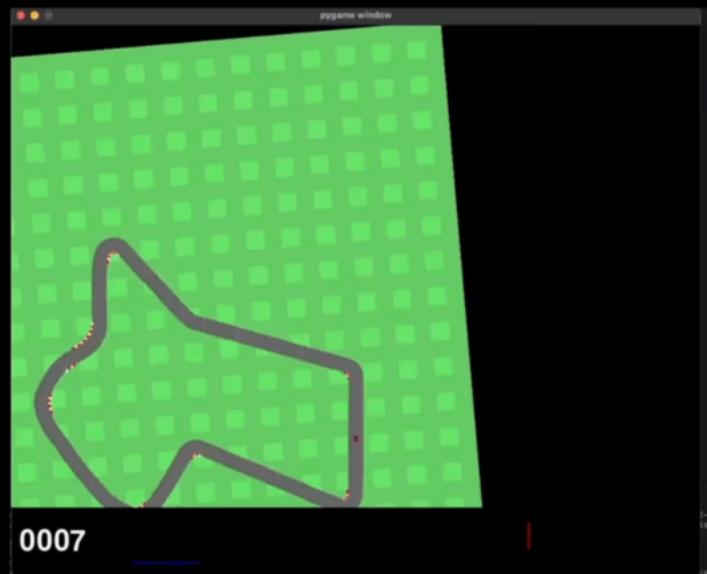
Graphs



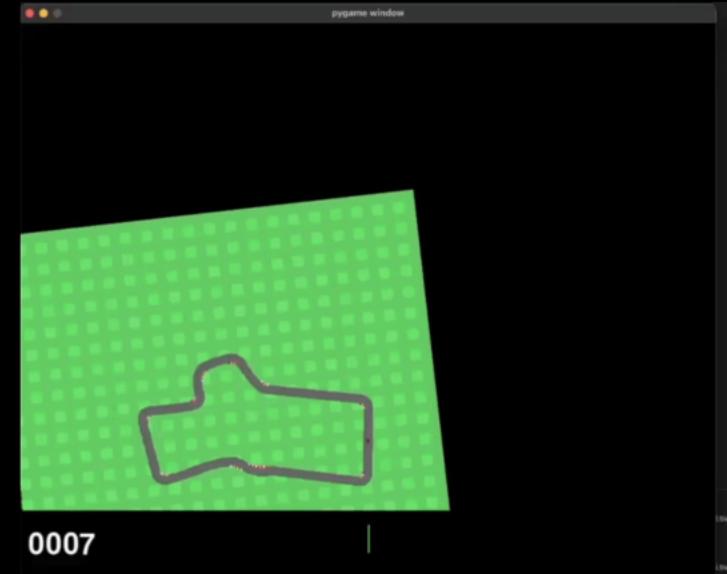
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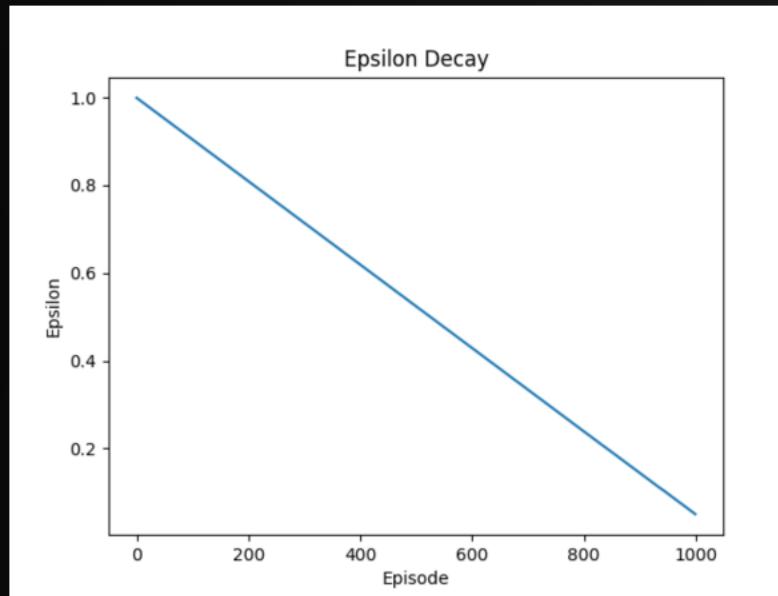
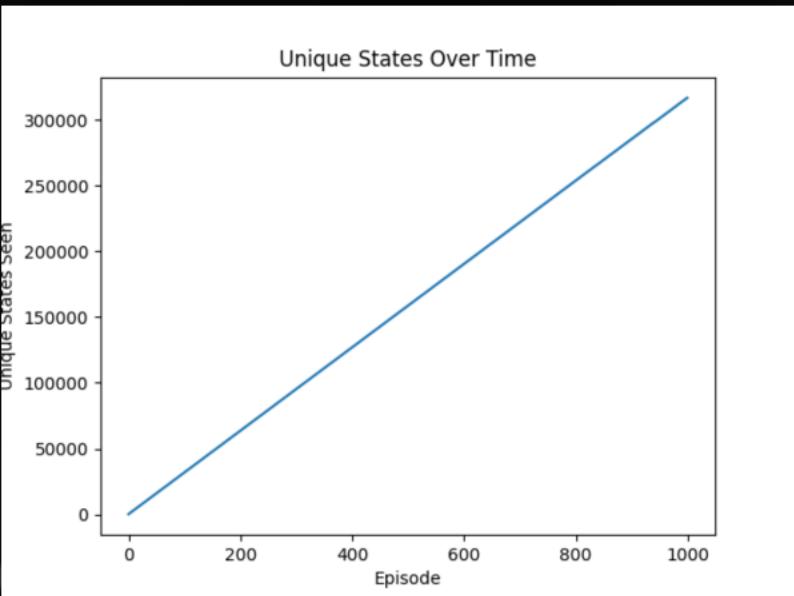
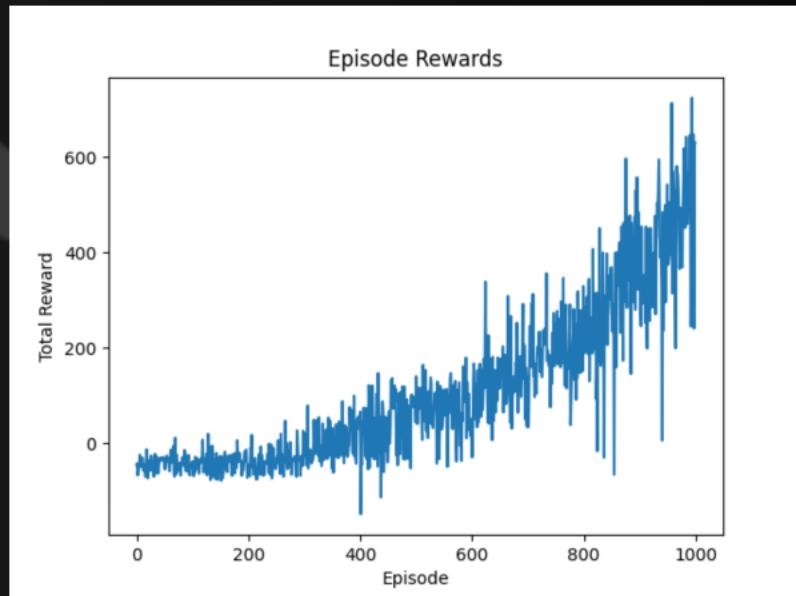


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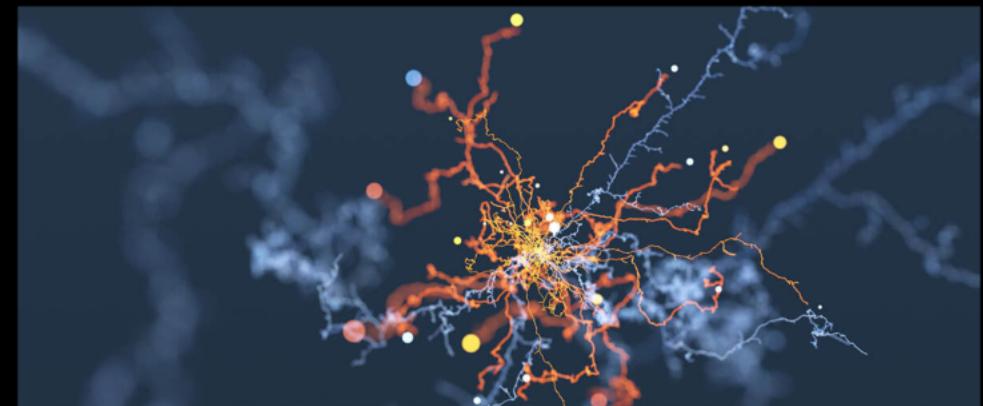
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# Graphs



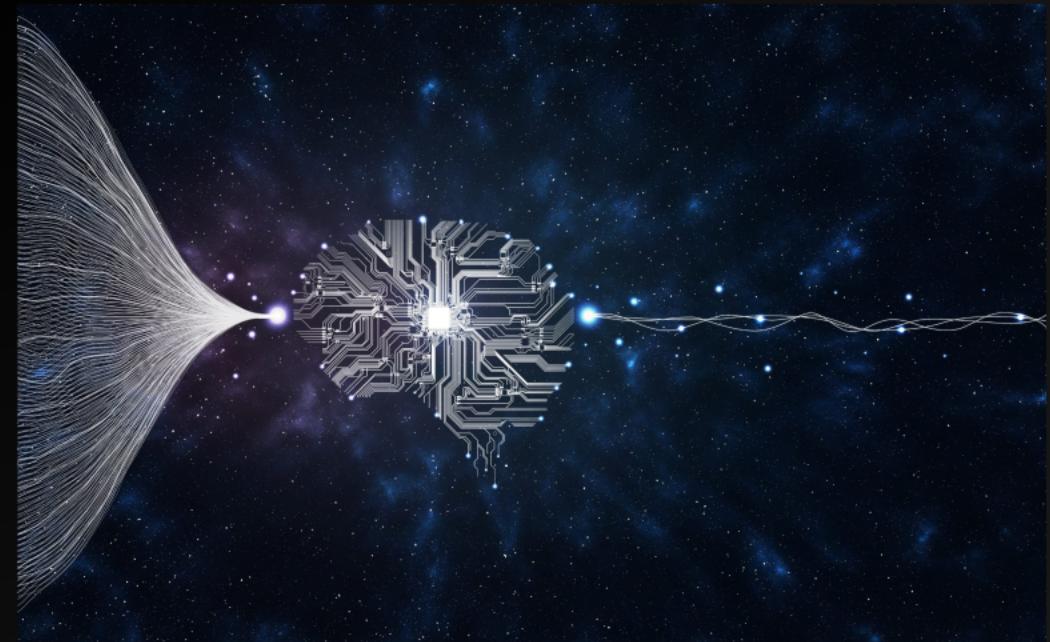
# Conclusion

- Scalability of Deep RL than tabular methods
- Importance of Model Architecture and Training Stability



# Scope and importance

- Foundation for developing autonomous navigation systems
- Extendable to real-world simulation platforms
- Adaptable learning framework



KAHOOOOOOT  
(if we have time left)

# References

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