SNAKE GAME 2D – REINFORCEMENT LEARNING

AGENT-BASED SYSTEMS 2022/2023

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ARTIFICIAL INTELLIGENCE

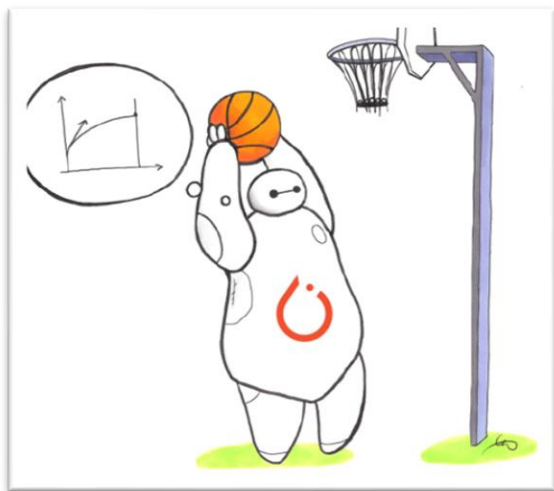Widely spread

Agent into action

Reinforcement Learning

REINFORCEMENT LEARNING

- Set of principles, algorithms and applications
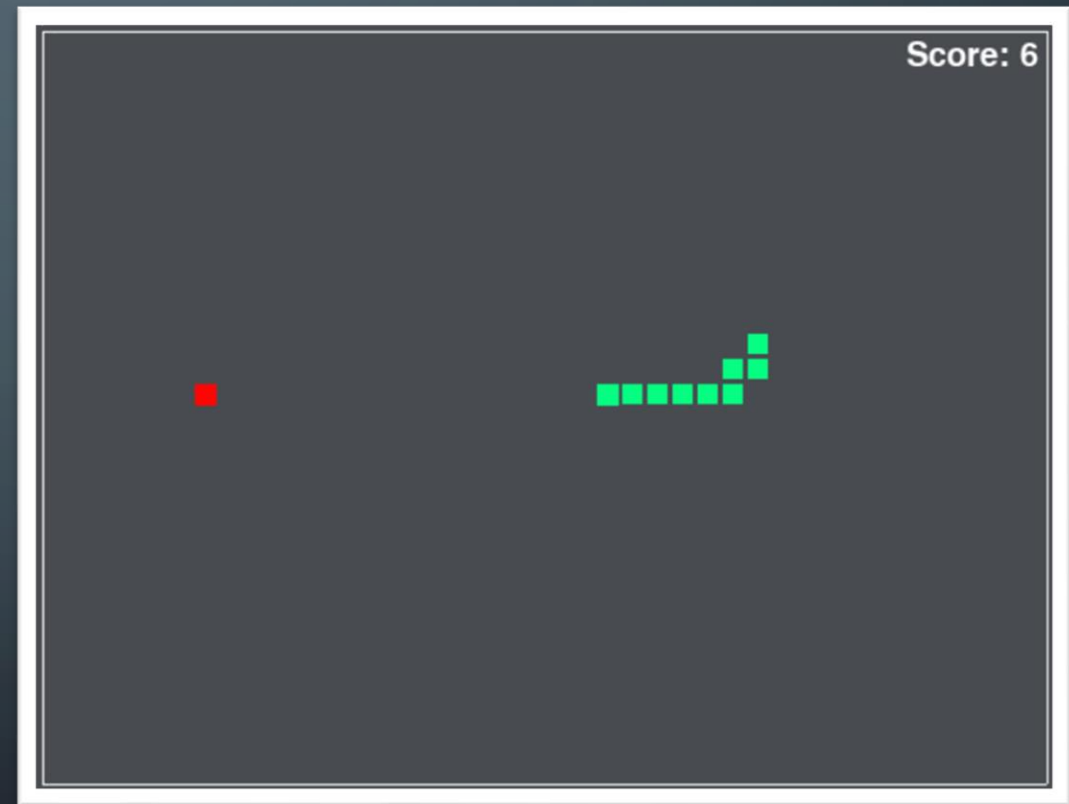
SNAKE GAME 2D – RL

- Observation, decision, action and reward

- Pygame, Gym, StableBaselines3

SNAKE GAME 2D – RL

- Rewards and penalties
  - Death: -100
  - Eating an apple: +10
  - Distance: +1/ -1
  - Wasting time

SNAKE GAME 2D – RL

- Training algorithms
  - PPO (Proximal policy optimization)
  - A2C (Advantage Actor-Critic)

```
---------------------------------------
| rollout/            |         |     |
|    ep_len_mean      | 28.1    |     |
|    ep_rew_mean      | -101    |     |
| time/               |         |     |
|    fps              | 19      |     |
|    iterations       | 200000  |     |
|    time_elapsed     | 51072   |     |
|    total_timesteps  | 1000000 |     |
```

```
| train/                         |        |
|    entropy_loss                | -0.465 |
|    explained_variance          | 0.442  |
|    learning_rate               | 0.0007 |
|    n_updates                   | 379999 |
|    policy_loss                 | 1.36   |
|    value_loss                  | 38.6   |
```

SNAKE GAME 2D – RL

- Visual representation on TensorBoard

CONCLUSION

- Exhausting and fun ☺

- Enough to dive into the real realm of knowledge

- Watching how machines play video games

QUESTIONS?

THANK YOU !