

# ~~A3C~~ DQN and async- DQN

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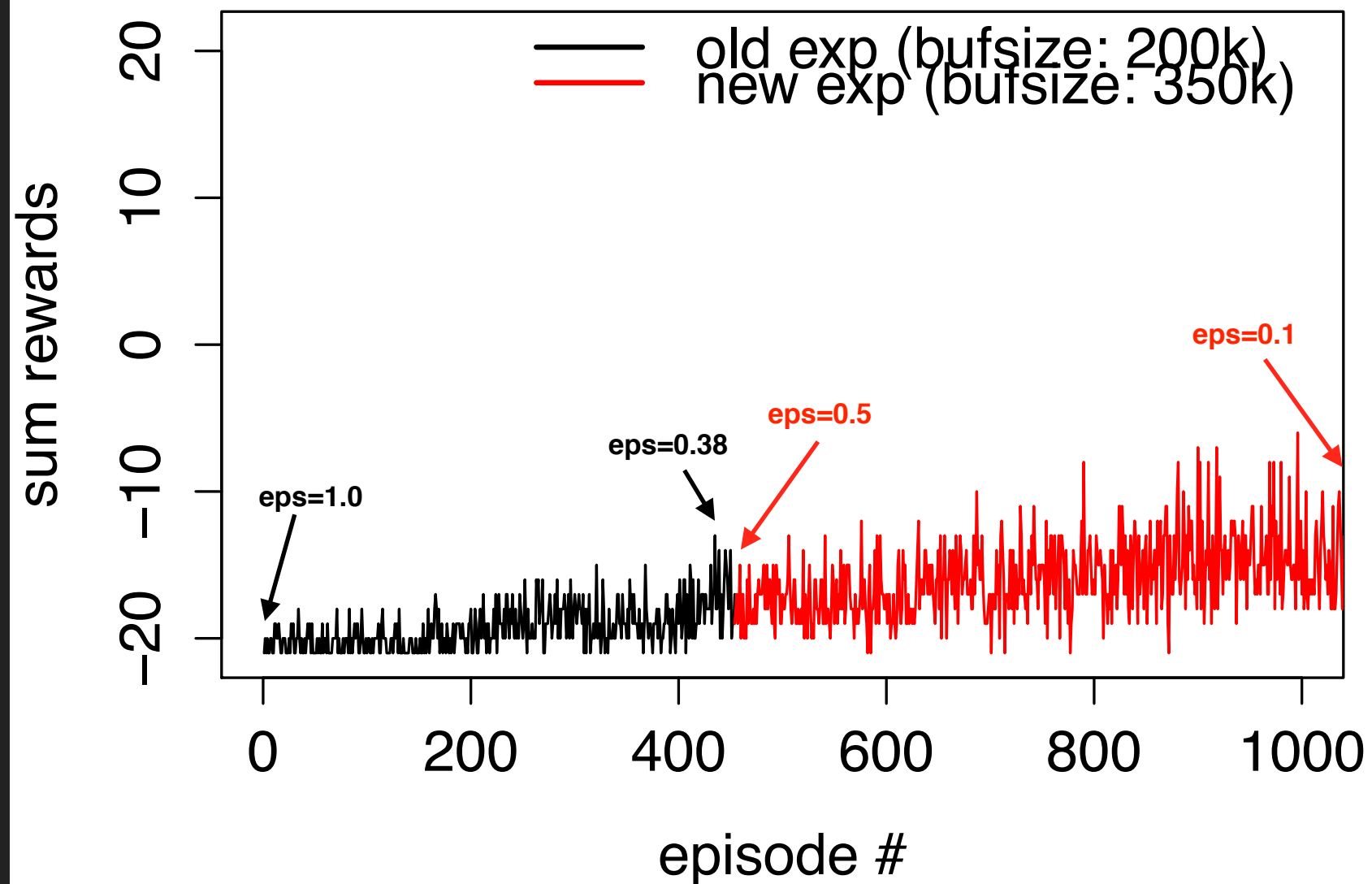
# The gist of the project

- Implement the DQN as described in:
  - Playing Atari with deep reinforcement learning (Mnih et al., 2013)
  - Human level control through deep reinforcement learning (Mnih et al., 2015)
- Implement an asynchronous version of DQN, as described in:
  - Asynchronous methods for deep reinforcement learning (Mnih et al., 2016)

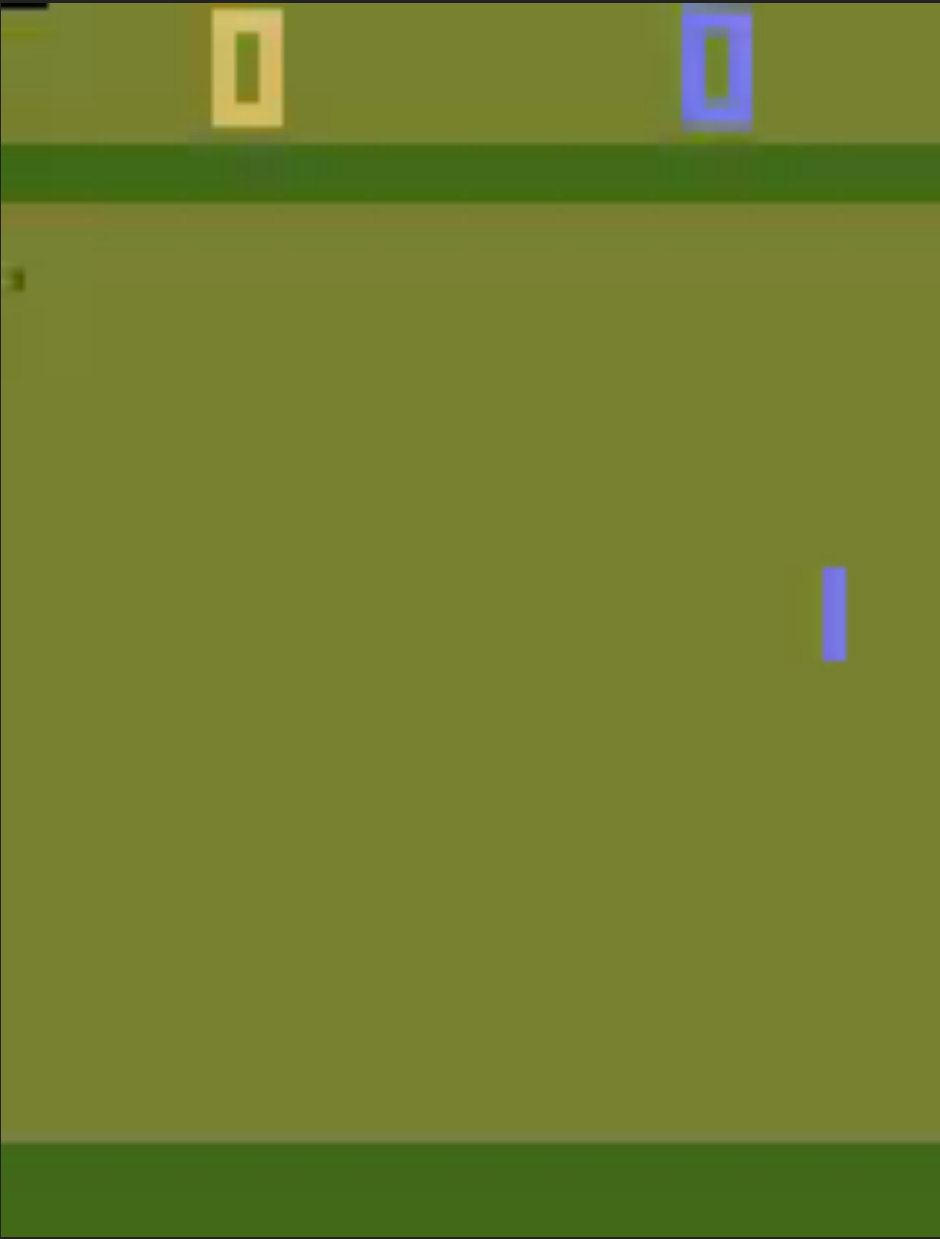
# Deep Q-learning

- Use a deep network as a function approximator for  $Q(s,a)$
- Learn from raw data (in this case, the raw pixels from Atari games)

## Pong-v0



Best reward sum: -3 :'(



# Async DQN

- No experience replay
- Each worker thread does 'hogwild' gradient descent on the parameters of the network
- Updates are meant to be 'decorrelated in time'
- Implementation currently does not work, but does run faster than GPU implementation (using 12 CPU workers)