

Initial Progress in Transfer for Deep Reinforcement Learning Algorithms

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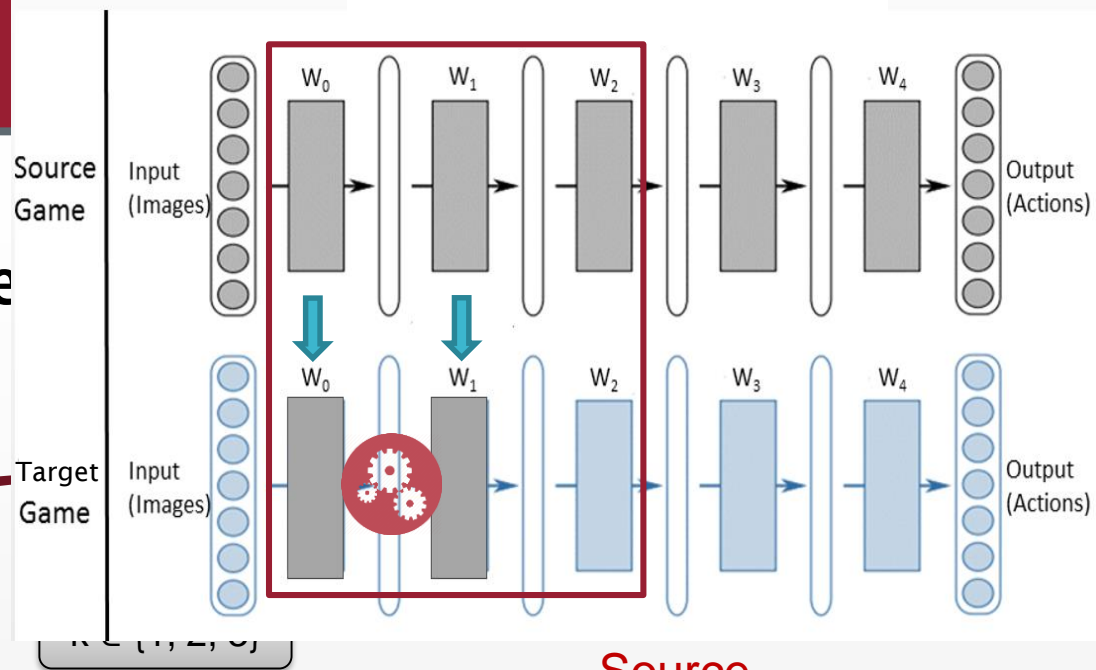
July 11 2016, NYC



Transfer for the Deep Q-network Algorithm

- Problem
 - DQN requires long training time to train a single task
- Solution
 - Apply transfer learning (TL) to speed up learning
- Experiments and Results
 - Atari Game: Breakout & Pong
 - Cart-Pole

Transfer in Atari Game

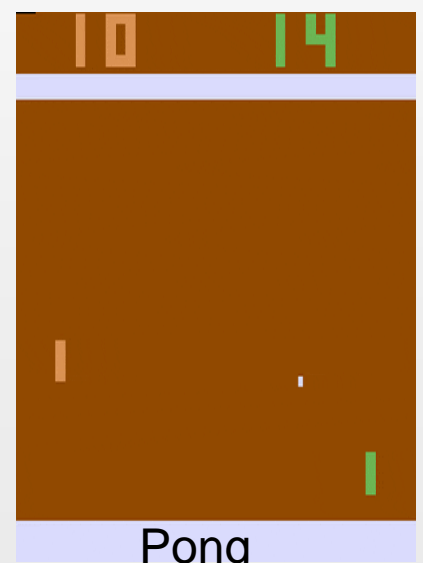


Target



Breakout (B-base)

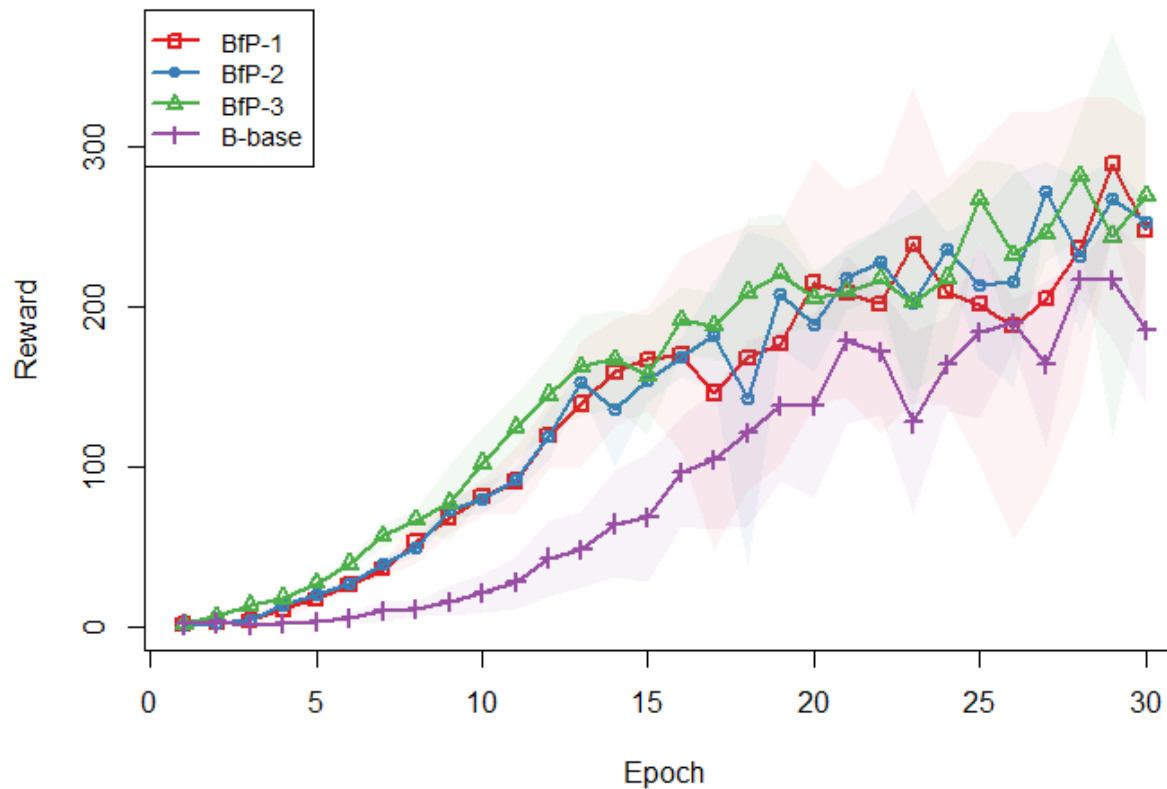
Source



Pong (P-base)

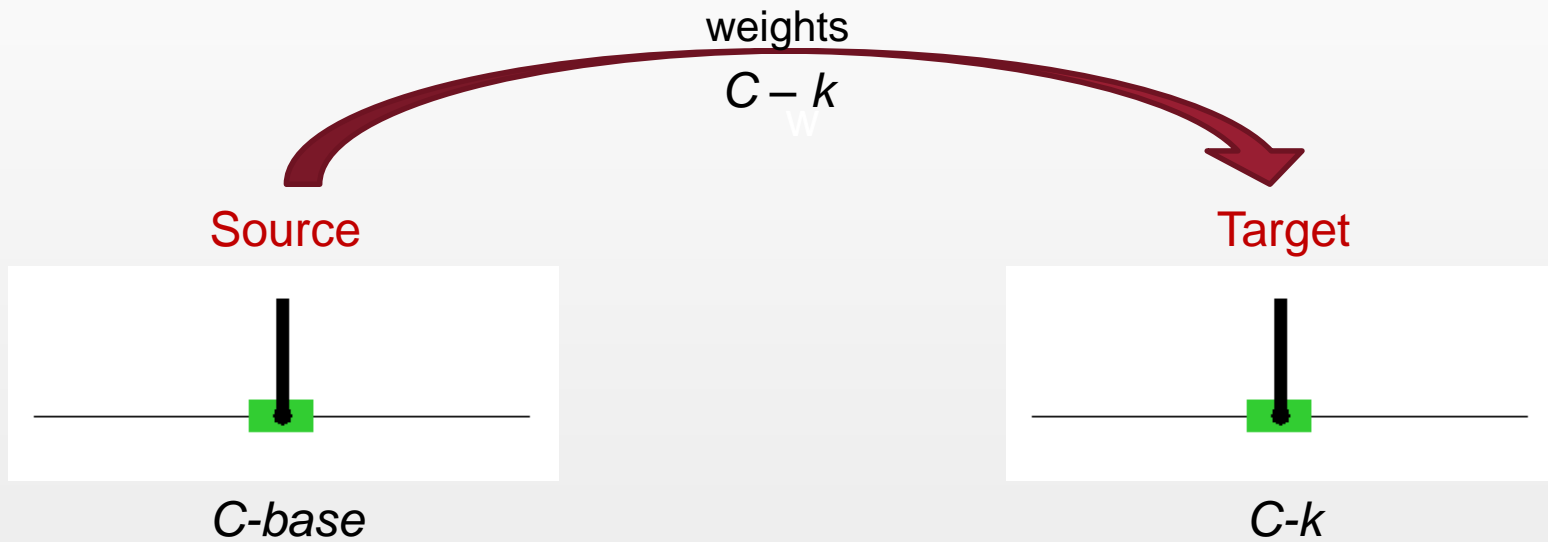
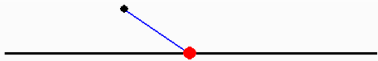
Transfer in Atari Games

Breakout Transfer from Pong

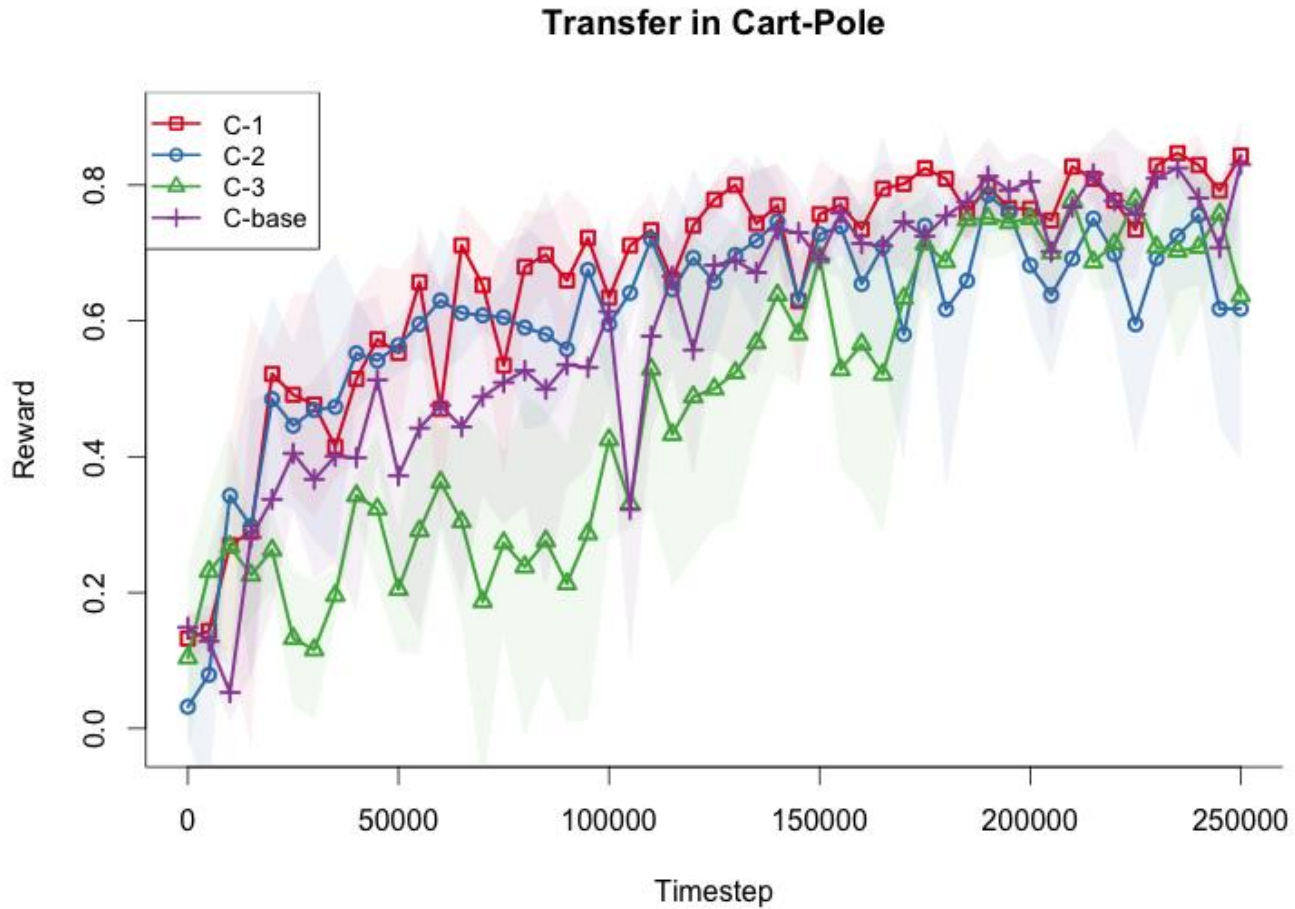


Transfer in Cart-Pole

- distance from the cart to the pole's center of mass (ℓ)
- mass of the pole (m)
- pole's friction coefficient (μ_p)
- cart's friction coefficient (μ_c)



Transfer in Cart-Pole





Take Away

- TL is a promising method to improve the time efficiency of the DQN algorithm
- Future study
 - Transfer in other Atari games
 - Knowledge selection for each layer in DQN
 - Robust source/target task selection mechanism
 - Apply DQN to physical robots

Thank You!

Poster session: 3-4 PM

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