Institute of
Artificial Intelligence

Leibniz
Universität
Hannover

Curiosity-Driven Learning

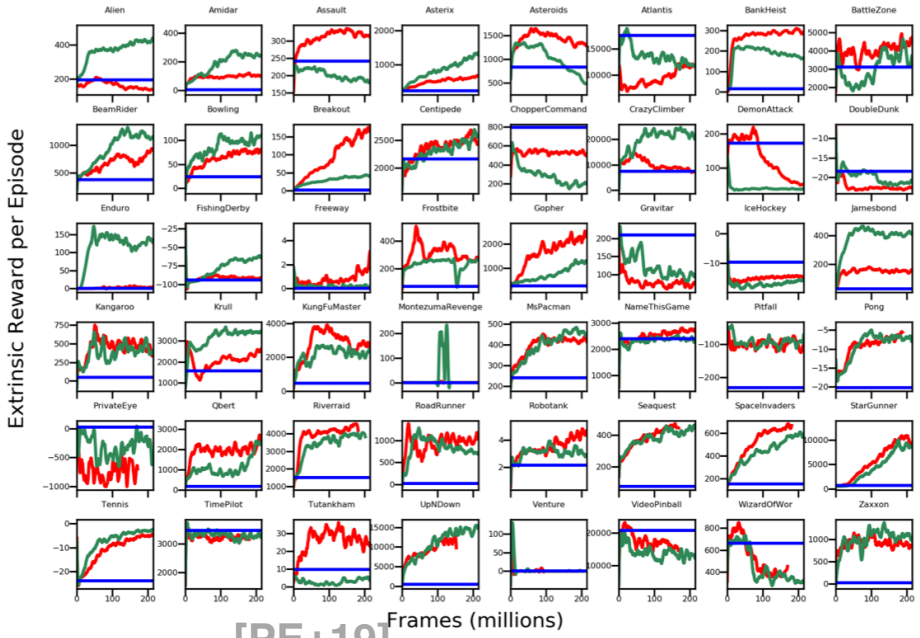
Artur Ganzha 10019651

Intrinsic Rewards [PE+19]

- Curiosity is classified as a intrinsic reward function
- Can utilize visitation counts and prediction error for reward function
- Idea is intuitive: trying to find a reward function which programs „motivation“ to the agents properties
  - e.g., Babies explore their environment out of curiosity == no goal-driven behavior
  - results show that if done right the agent learns much faster after pre-training
  - by encoding a „surprise“ the agent is motivated to explore areas where less time was spent on
- Negative aspect: hard to design in many use-cases especially if the exploration has no correlation to the external reward
- Suggested approach: combine both ideas

Experiment Results [PE+19]

- Intrinsic + Extrinsic (yellow) achieve higher reward
- Extrinsic approach (grey): converges at approx. 80%
- Does not work on every game (left figure)
- To lead the agent to desired goals sparse extrinsic rewards are used (right figure)



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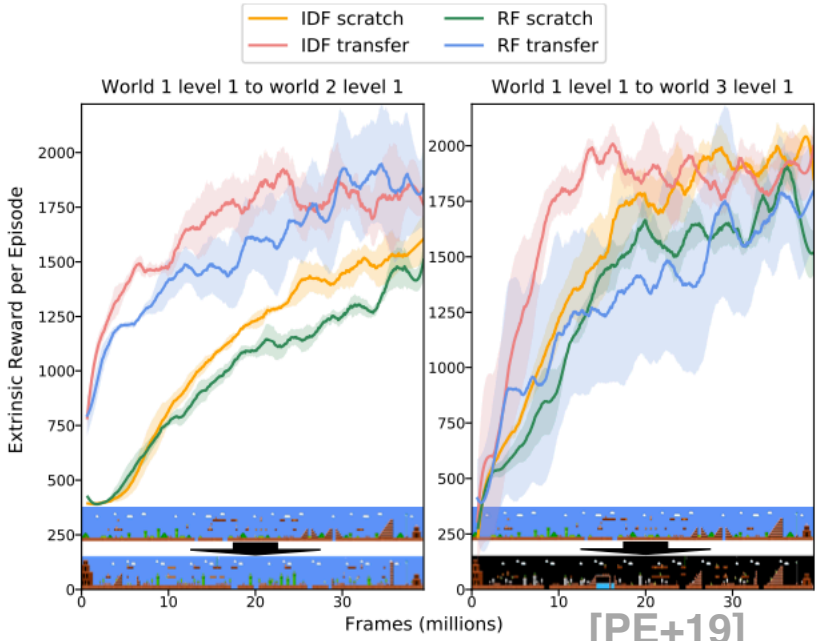

[PE+19]

Sources

[PE+19] https://pathak22.github.io/large-scale-curiosity/resources/largeScaleCuriosity2018.pdf