# Reverse Curriculum

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Project Idea

- Reproduce the results of „Reverse Curriculum Generation for Reinforcement Learning" [1]
  - Using Code provided by the authors of the paper
  - Using a RL environment from the paper and OpenAI baselines RL algorithm
- Reverse Curriculum idea: Start training from states close to the goal and gradually move further away
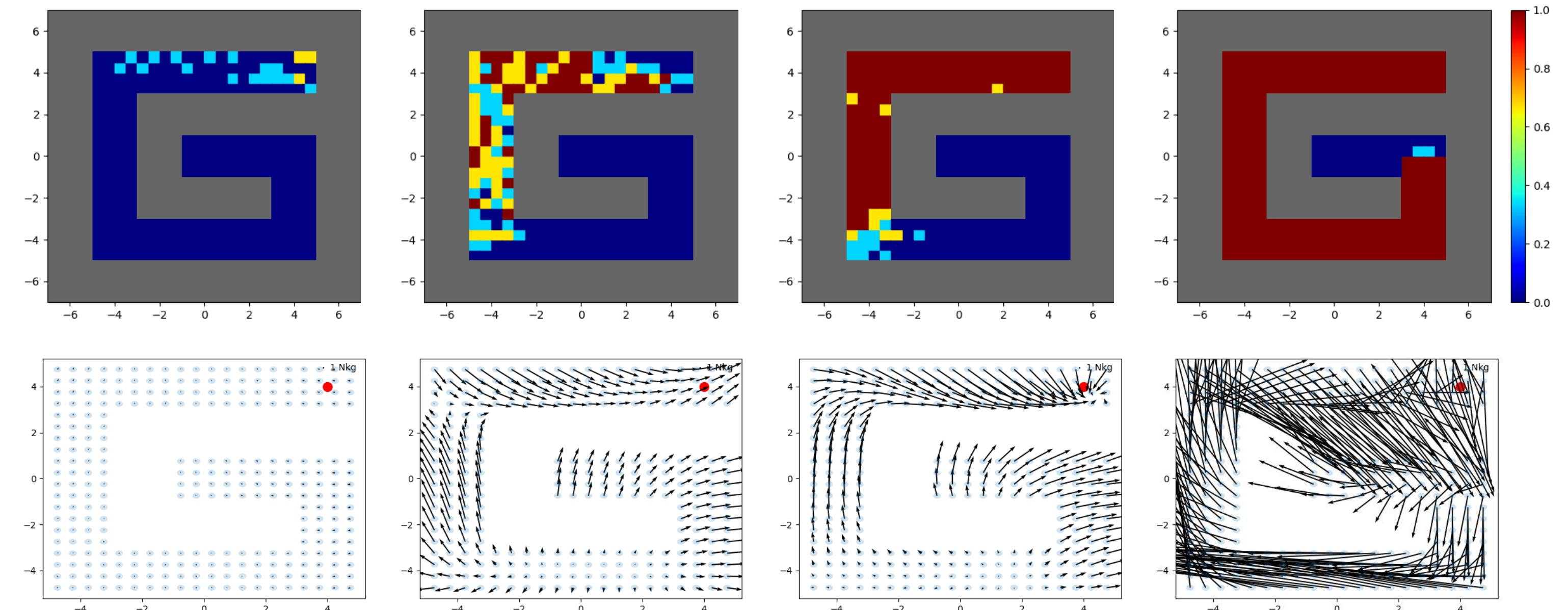
Adaptive Curriculum Generation

- Alternative to uniform sampling over all states
- Sample from Start States of current iteration
- Generate new Start States with Brownian Motion
- Select starts according to sampling method
  - From all Previous
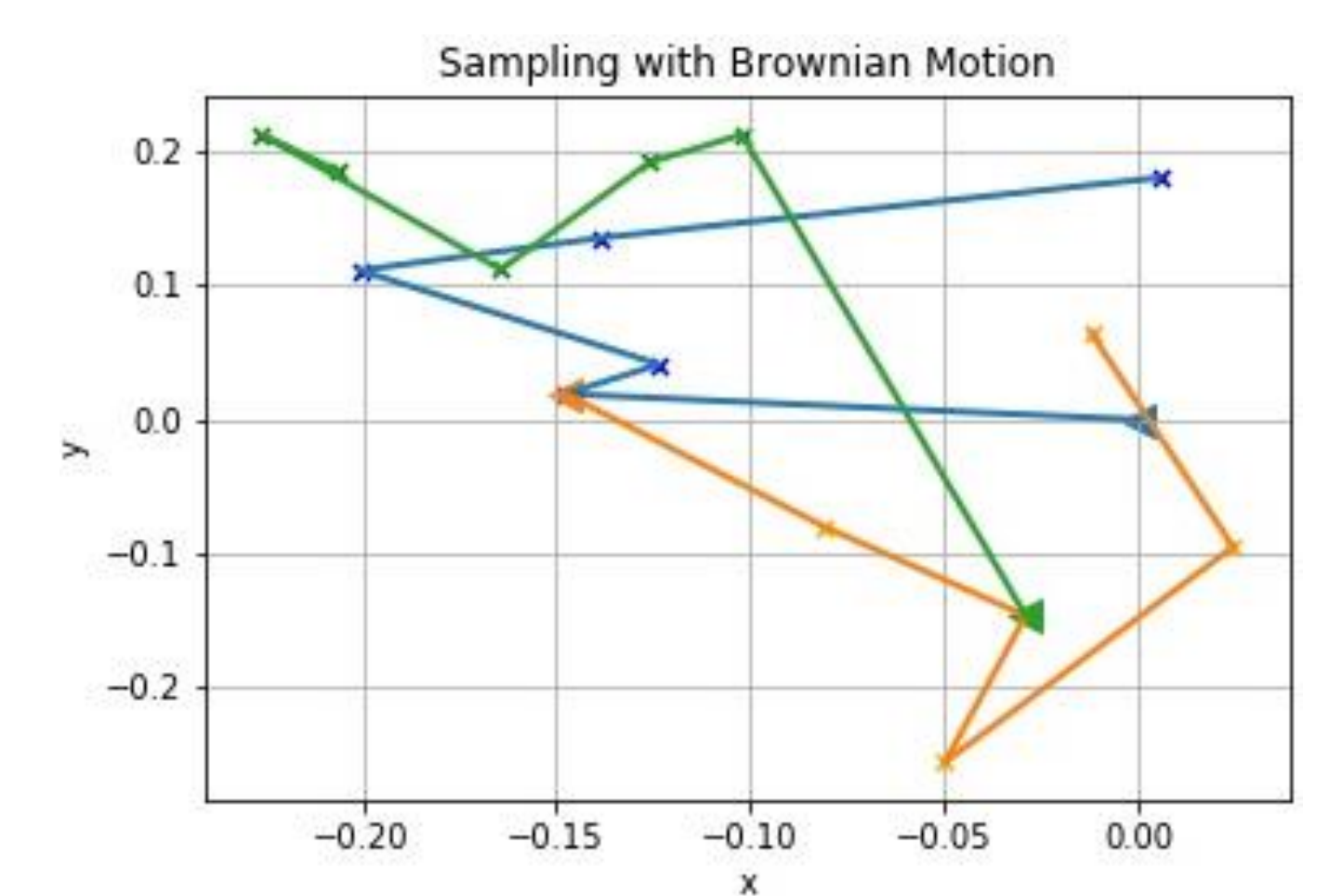 - Good Starts only
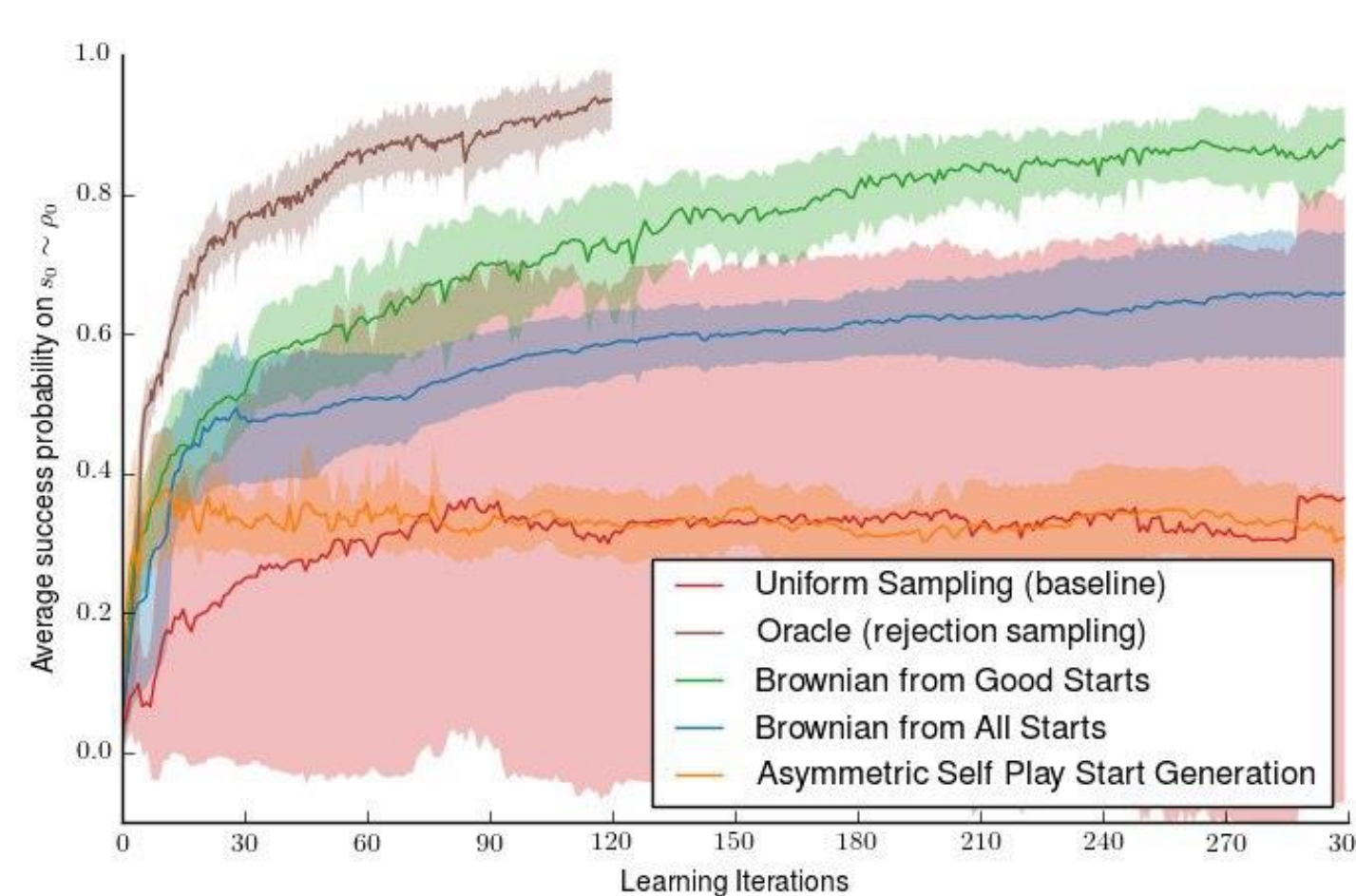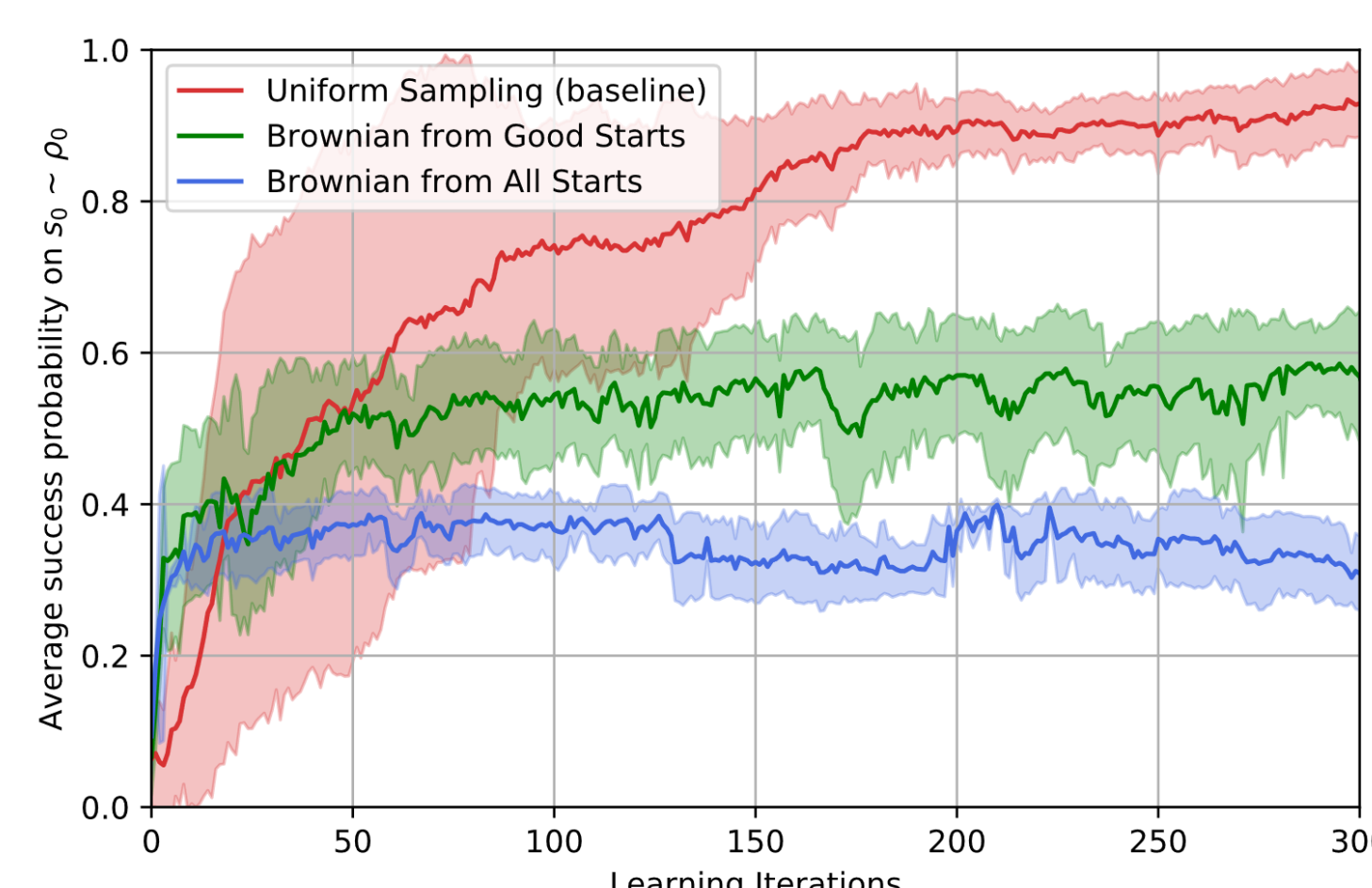

Algorithm 1 from [1]

Wrapper

- Contains our implementation
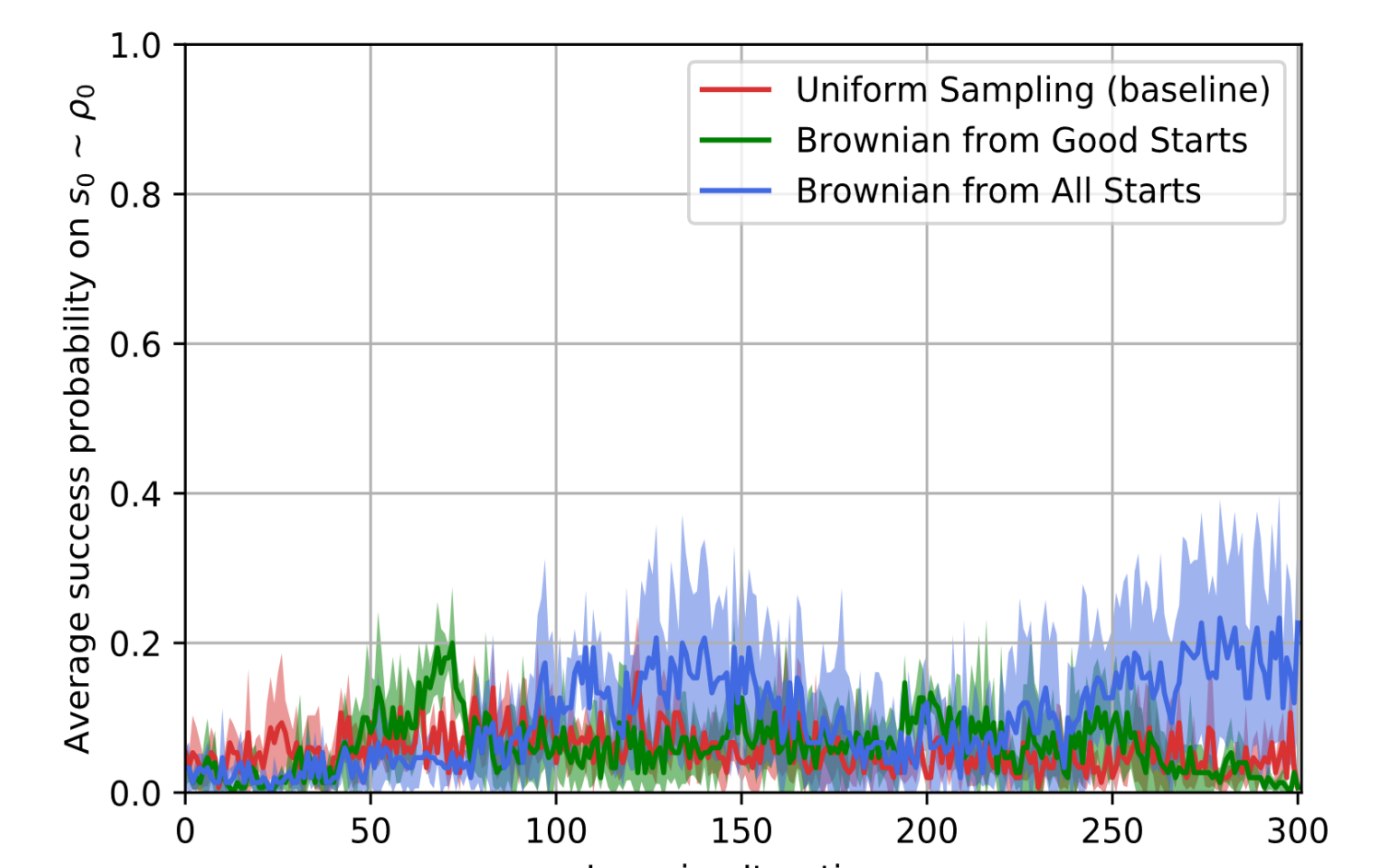- Connects OpenAI to rllab curriculum environment
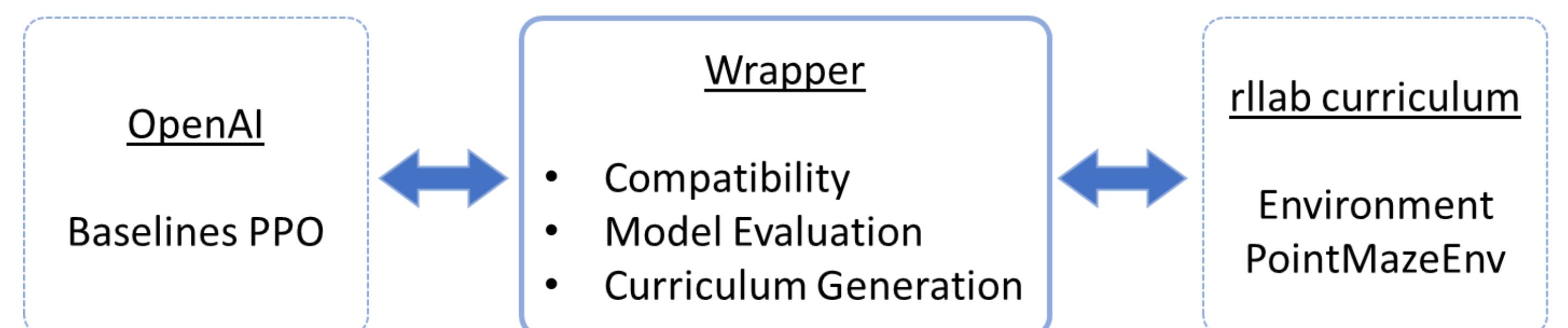
Results

(a) Original results from [1]

(b) Reproduced results with rllab curriculum code

(c) OpenAI Baselines PPO

- We were not able to reproduce the results: substantial differences between their results in (a) and the results rerunning their code (b)
- Surprisingly, uniform sampling outperformed the more sophisticated methods
- Reimplementation of Algorithm 1 and using Proximal Policy Optimization as training method shows bad results, see (c)
- Brownian Motion from both Good and All Starts performed better than Uniform Sampling in our implementation

Issues

- Problems in original code (rllab curriculum)
- Incompatibility of OpenAI algorithms and rllab curriculum environments
- Differences between code and paper

References

- [1] Florensa, C., Held, D., Wulfmeier, M., Zhang, M. & Abbeel, P.. (2017). Reverse Curriculum Generation for Reinforcement Learning. Proceedings of the 1st Annual Conference on Robot Learning, in PMLR 78:482-495