

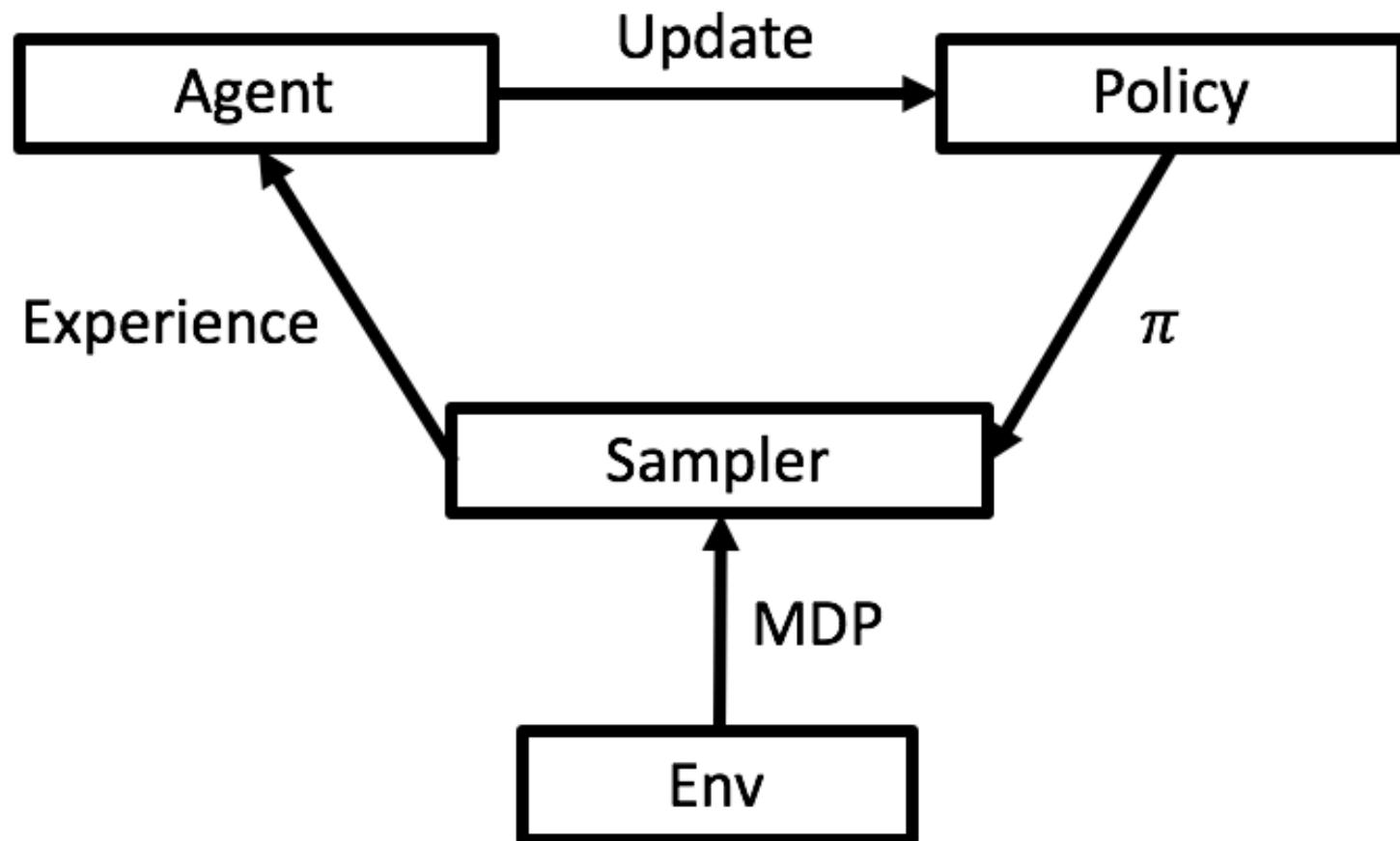
Reinforcement Learning Framework

Codebase:
[https://github.com/tianbingsz/WALL-
E](https://github.com/tianbingsz/WALL-E)

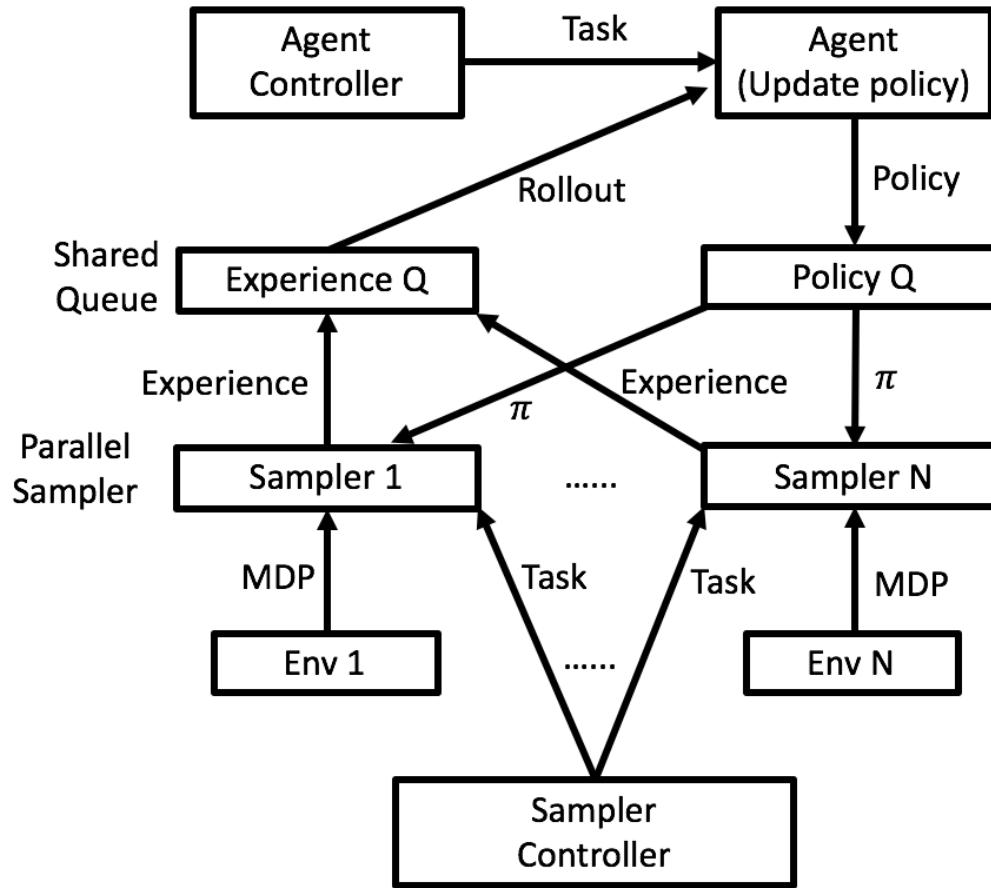
MileStone Contribution

- A long term Reinforcement Learning project to develop an efficient, yet simple RL framework
- The Rollout Time (experience collection) is a bottleneck
- **Achieve *near linear* speedup** for Rollout Time with multi-process architectural support

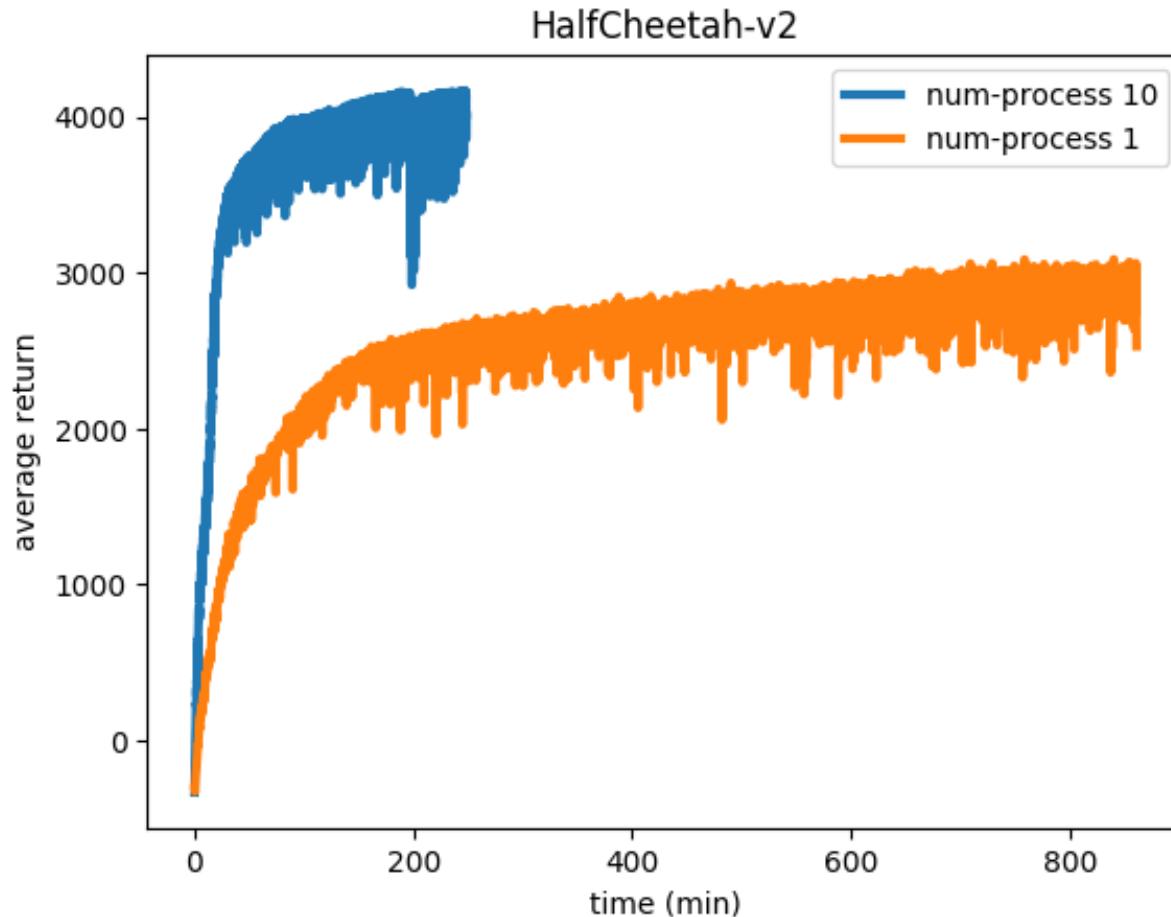
General Reinforcement Learning Framework



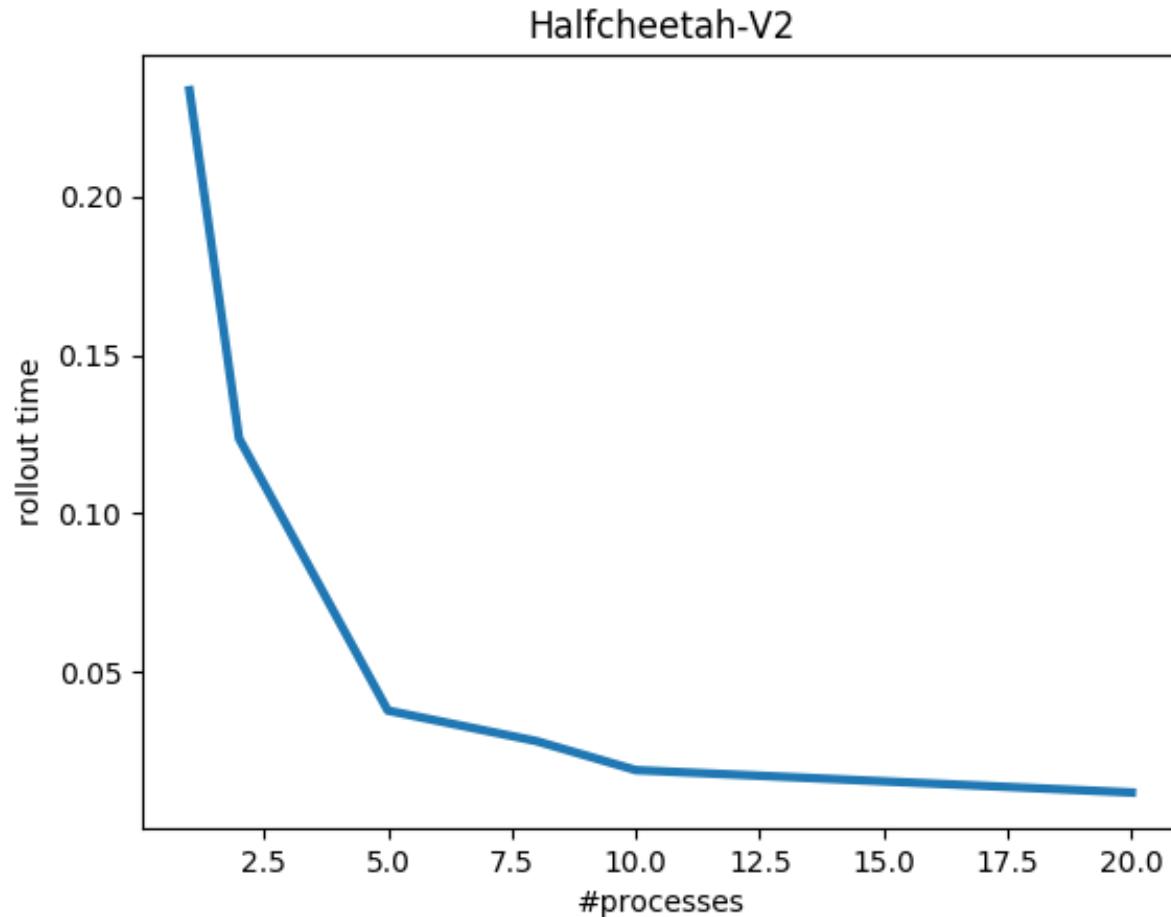
RL Framework with Multi-Process Experience Collection



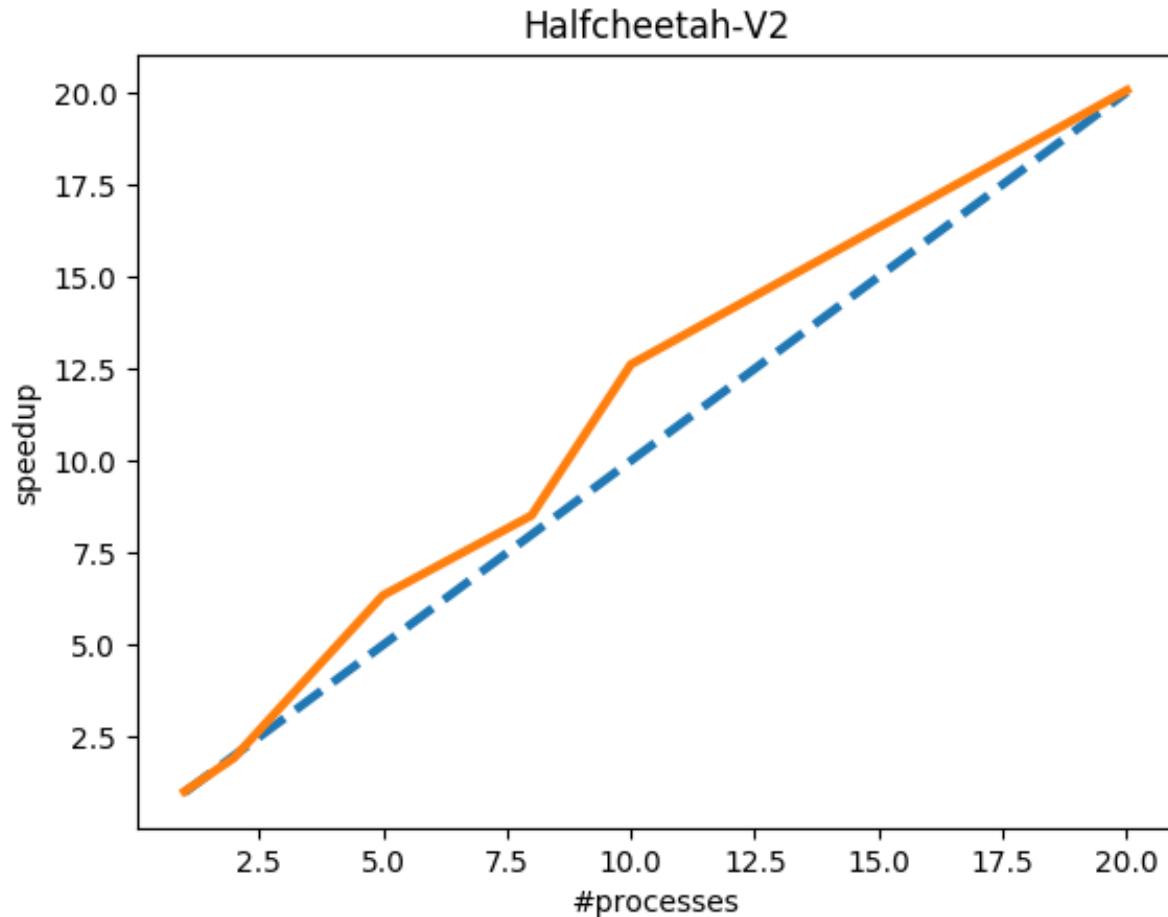
Result on Mujoco Control task



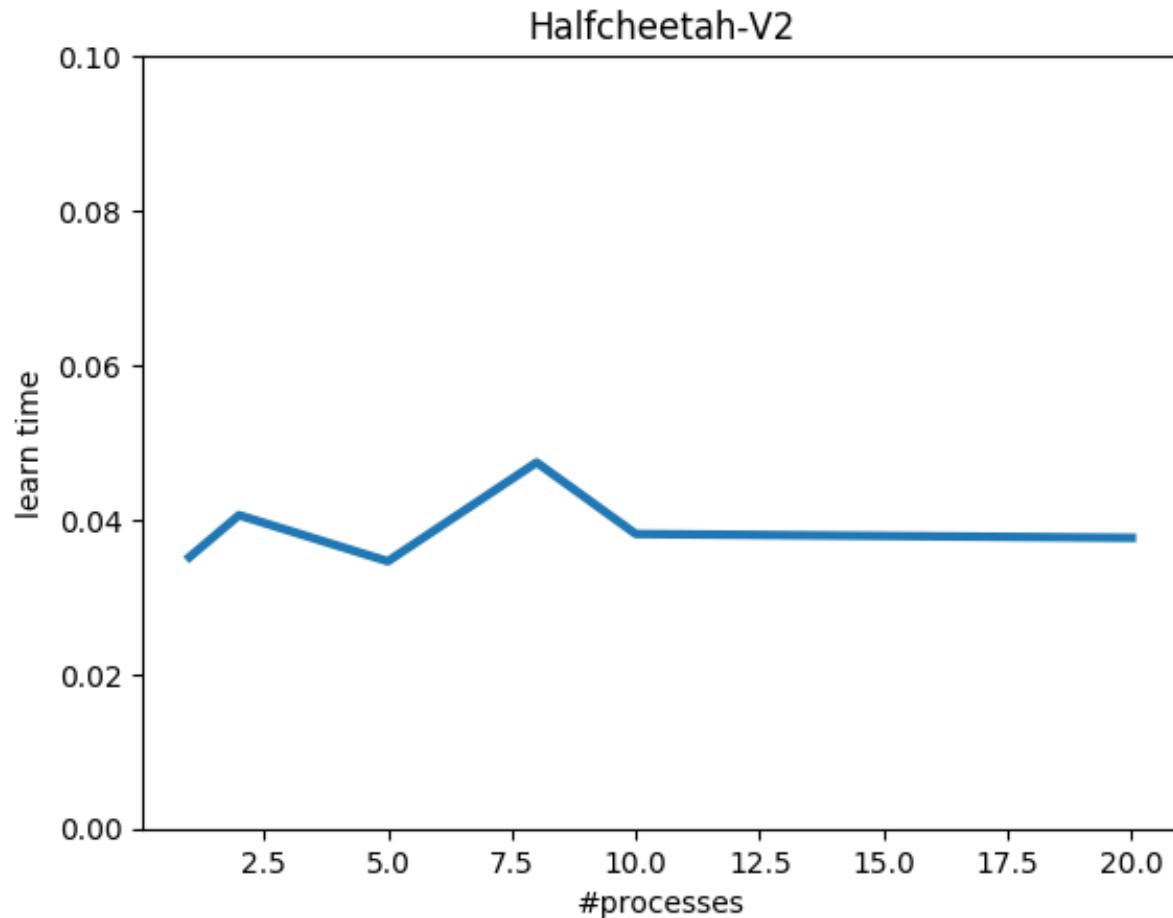
Rollout time Reduction w.r.t Processes



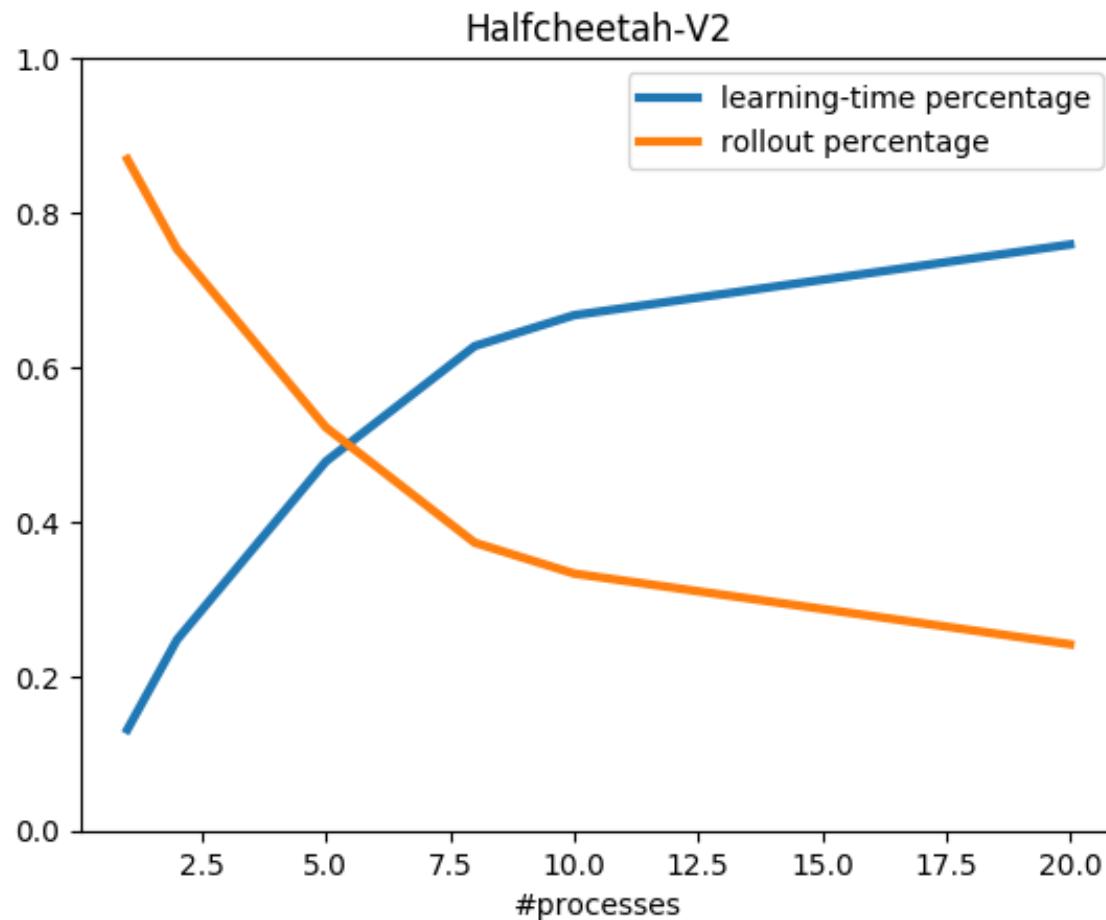
Rollout time (near linear) Speedup



Policy Learning Time w.r.t. Processes



Running Time = Rollout Time + Policy Learning Time

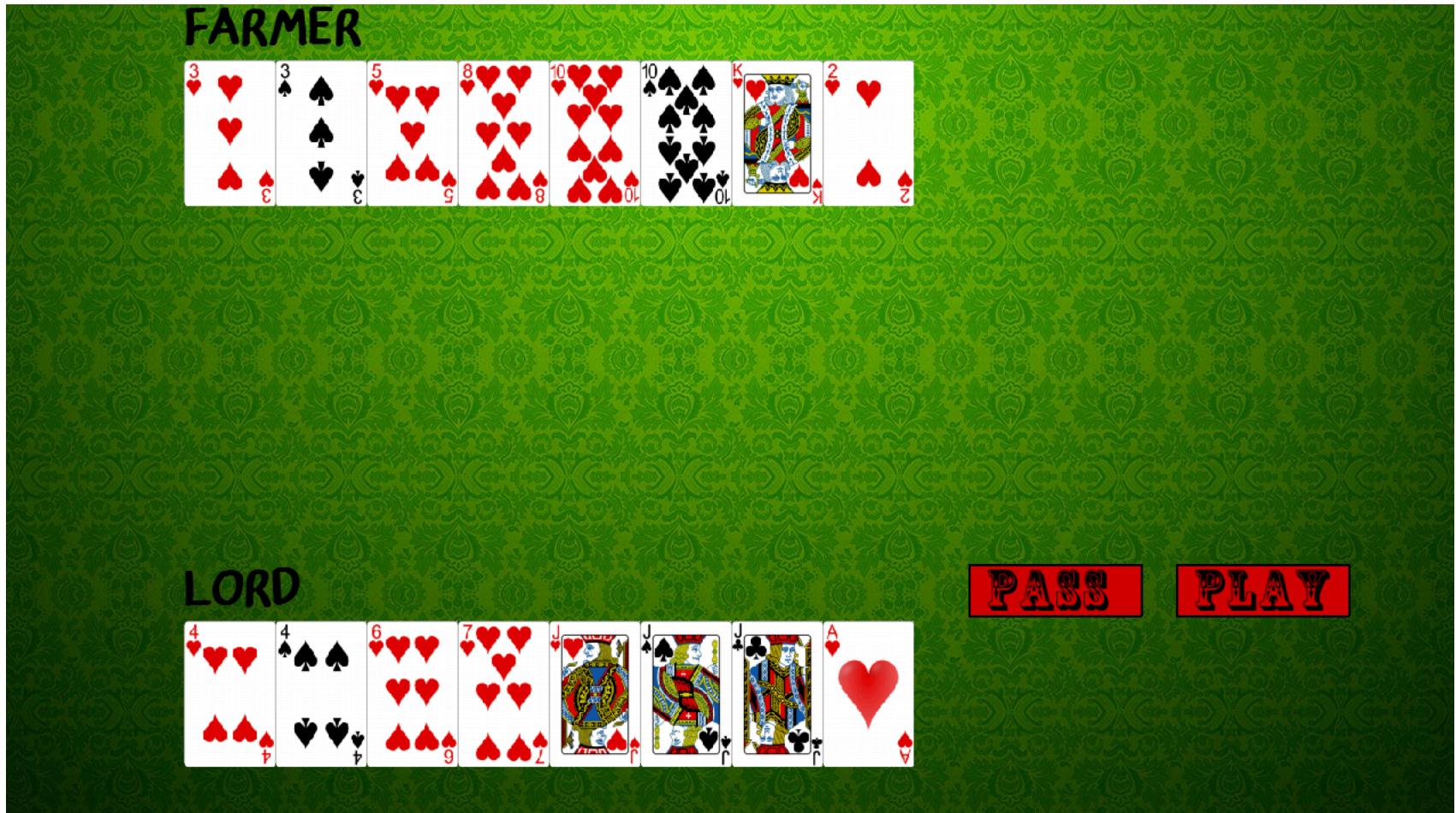


Future work

- Speedup Policy Learning (Perception to Control Policy Network) with Multi-GPU support
- Generalize the codebase to support off-policy learning
- Model-based RL, Planning, Exploration and more for Robotics

Game AI (Lord vs Farmer)

Codebase (C++/Python) <https://github.com/tianbingsz/LordGame>



Game AI

- Build Agents Playing Poker with Human
- Generate cards by interactive adversarial self-play

$$\min_{\pi_F} \max_{\pi_L} R(\text{Lord}, \text{Farmer})$$