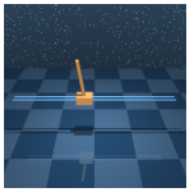
Individual Assignment – learn to balance the cart-pole using an actor-critic continuous control method of your choice (such as DDPG, TD3, SAC, PPO).

Due date: 11/30/2025

Report:

- Approximately 2 pages in IEEE publication format.
- Include an accessible link (GitHub/Colab link) to your implementation code (failed to do so will result in major deduction).
- Discuss your method and its implementation.
- Provide your hyperparameter choices.
- Train your control policy using 3 seeds (0, 1, 2).
- Evaluate your control policy using 1 seed (10).
- Plot your learning curve (reward vs learning updates/epochs) using (mean ± std) to show both training and evaluation results.



Cart-pole (4, 1, 5): Swing up and balance an unactuated pole by applying forces to a cart at its base. The physical model conforms to (Barto et al., 1983). Four benchmarking tasks: in `swingup` and `swingup_sparse` the pole starts pointing down while in `balance` and `balance_sparse` the pole starts near the upright.

Remarks

- You can discuss with your team. But you need to create your own product.
- This is a small problem that can be done using a typical CPU.
- You may take reference of RL libraries such as Stable-Baselines3, CleanRL.
- Grades will emphasize correctness, reproducibility, and clarity of presentation more than raw performance of high reward value.
- Details about the task and the Deepmind Control Suite (DMC) can be found below.

DeepMind Control Suite

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Yazhe Li, Diego de Las Casas, David Budden, Abbas Abdolmaleki, Josh Merel,
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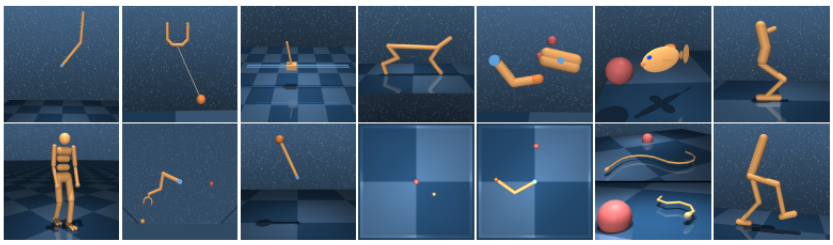

Figure 1: Benchmarking domains. *Top*: Acrobot, Ball-in-cup, Cart-pole, Cheetah, Finger, Fish, Hopper. *Bottom*: Humanoid, Manipulator, Pendulum, Point-mass, Reacher, Swimmer (6 and 15 links), Walker.