Spatial State Representations for Deep Reinforcement Learning, Milestone 5
15-400, Spring 2019

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1 Major Changes

No major changes.

2 What You Have Accomplished Since Your Last Meeting

We submitted our anonymized five-page extended abstract to the SPiRL @ ICLR 2019 workshop early the morning of March 8th. In the two weeks leading up to that submission, there was a great deal of overseeing evaluations and getting some final model training in, as well as in model selection and picking model checkpoints to evaluate on the held-out test set. I also spent some time getting videos of the trained models and stitching them together into a demo video. I created an anonymized project website under a throwaway Google account and posted the video and abstract. We also spent quite some time generating and regenerating figures and tabulating evaluations with different metrics (e.g. do we consider a body "solved" by a model if it can reach the end of the level once or 50% of the time, etc) and revising the paper.

During/after spring break, I did a lot of housekeeping, such as freeing memory on the cluster and reverting some last-minute hacks I added to the evaluation and plotting scripts. I'm also thinking about what we learned from the final revising of the paper and where to take the research next for the camera-ready copy (if it's accepted). I also wrote my SURF grant proposal to continue this research or a related topic this summer.

3 Meeting Your Milestone

After completing the extended abstract and submitting, I've been thinking about where to take the research next. I will likely start training models on the canonical raptor body and make sure the randomized raptor datasets are in order, but one thing I might take a week or two to investigate is whether spatial information is actually helpful. Any efforts toward confirming or refuting our intuition would be tremendously helpful in this project going forward and a good use of time, since (due to an unforseen model architecture deficiency in our baseline model with added spatial information) it is not entirely clear whether the addition of spatial information really helps learning of a locomotion policy.

4 Surprises

A great deal of work goes into putting a paper together, especially the night of the submission deadline. Also, as mentioned above, it would be interesting to investigate further whether spatial information really helps policy learning in a series of more rigorous ablation studies.

5 Looking Ahead

I plan to devise experiments to determine whether relative positional information is helpful in policy learning and run them concurrently with the experiments on the raptor body. I also will be waiting with fingers crossed for the paper decision on Thursday, March 28. Depending on how those progress, I may also begin building a 3D environment in the MuJoCo physics simulator. I would also like to talk with Emilio a bit more about where the project is likely to go in the future.

6 Revisions to Your Future Milestones

No revisions. Next milestone is to have be running experiments or evaluations for both the deeper experiments for spatial information and raptor bodies.

7 Resources Needed

I have all the resources I need. Professor Russ Salakhutdinov is very busy, so I might be hard pressed to find a time to meet with him to discuss future directions for the project or for summer research ideas, especially since the SURF proposal deadline is Friday.