Spatial State Representations for Deep Reinforcement Learning, Milestone 6
15-400, Spring 2019

Joshua Zhanson
http://jzhanson.com/15400-s19

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1 Major Changes

No major changes.

2 What You Have Accomplished Since Your Last Meeting

We began running a smaller version of our best-performing spatial model to see whether it would be able to achieve comparable performance as our large model but without the lengthy training time. We are also continuing work on a synchronous-update version of our A3G training algorithm, A2G. Finally, we are brainstorming harder environments, since some significant amount of thought is required to avoid running into unsolvable problems down the road when designing environments.

Unfortunately, we were not able to obtain a letter of collaboration from Professor Russ Salakhutdinov in time for the SURF summer deadline. However, we received notification from the Structure & Priors in Reinforcement Learning workshop at the International Conference on Learning Representations 2019 (SPiRL @ ICLR 2019) that our paper was accepted! Reviewers echoed the themes that (1) improvement over the baseline is modest, (2) we should explain how we trained the policy in greater detail, and (3) we should explore environments with greater complexity.

3 Meeting Your Milestone

I did not meet my milestone this week mostly due to classwork taking much longer than I expected. However, around the time of this meeting, my schedule should free up significantly and I should be able to focus back on this project.

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

It was a little surprising (in a good way) that our paper received positive (or neutral) receptions by the reviewers and that it was accepted to this workshop. Since ICLR 2019 is Monday May 6 - Thursday Thursday May 9 (the week of finals) and I will most likely need to attend this workshop and would like to attend the rest of the conference, I will have to ask my 15-418 professor whether my partner can present at the project poster session on Tuesday May 7 in my place. I will also have to ask Professor Todd Mowry or Professor Jonathan Aldrich whether it is possible to skip Meeting of the Minds on Wednesday May 8 (of course, still submitting a poster) for the same reason. I will also have to check whether there will be any financial support from the workshop organizers or the Computer Science Department or Machine Learning Department, since a student ticket is $500+, not including travel and lodging.

5 Looking Ahead

There is almost exactly one month until the camera-ready deadline for the workshop. I intend to spend this time building and training on more complex environments, as well as trying to gather more evidence and intuition on the role of spatial and temporal information in learning a walking policy. I will also continue work on a synchronous version of our training algorithm.

6 Revisions to Your Future Milestones

I am pushing most of the current milestone to the next milestone, that is, to have more complex environments implemented and be running experiments on them as well as more general experiments to verify the helpfulness of spatial and temporal information in locomotion policy learning.

7 Resources Needed

Besides the significant financial component of attending a conference, I have all the resources I need.