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Daily Log

Monday January 6

I found a better implementation of soft actor critic. THe spinning up version was the first one. Since then, there was a big improvement made which simplified the algorithm so it now only needs an actor, 2 critics, and a ”temperature” optimizer. This new implementation is also nice because I don’t need to deal with having a comprehensive library, just the part I need. I still need to adapt it for handling discrete output.

Wednesday January 8

Hierarchical Actor critic has a big problem in that it is unable to work for discrete action spaces. That’s a problem because atari ram environments are discrete. The agent is essentially pushing buttons. Instead of using HAC, I think I will use a Double DQN. I’m interested in seeing the progression in performance from a simple algorithm, to more complex ones. I also tried to get the docker file for DIAYN to run, but it wouldn’t work. I plan on using next week to figure out what’s wrong and finally make it work. I have to learn a bit about docker first so that I can better understand what is going on.

Friday January 10

I got set up in the docker group in Duke. I learned about basic docker commands. I plan on creating a separate docker file for each algorithm to make it easier to run my project because they all have their own dependencies. One of them already has a docker file, so I just need one for mine and soft-actor critic. I spent the rest of class learning the basics of docker.

Timeline

Date	Goal	Met
Today minus 2 weeks	Implement soft actor critic and its discrete version. Test it on cart-pole and some discrete environment	No, this will probably take another week
Today minus 1 week	No, I downloaded the papers implementation of DIAYN, but haven't tested it because I was working on HAC and soft actor-critic	
Today	Make the project more realistic to complete	Yes, I reduced the number of things that I have to do.
Today plus 1 week	Get DIAYN Running	
Today plus 2 weeks	Put Soft actor critic and DQN in dockers. create one for Hierarchical DIAYN	

Reflection

Since the deadline of this project is fast approaching, I had make my project even less ambitious. I didn't expect some of the minor tasks like running and adapting other peoples codes for my purposes to be this hard. I guess I am not used to it, because we never really work with other people's code in cs courses at TJ. The 3 small hurdles are 1) Get DIAYN to work 2) Put each algorithm in a docker file 3) Set each of the algorithms up for completing Atari RAM enviornments

Then I get to finally work on Hierarchical DIAYN. This field moves really fast. As part of an english assignment, I had to research 3 papers in the topic of my senior research project. There seem to be many new HRL methods. I think one big problem with this area is there isn't a great benchmark to compare all these different algorithms. Everyone picks their own environments based on what is most convenient. All abstracts seem promising, but there is always a big caveat that makes it hard to work with and judge its value. For example, HAC assumes a continuous action space. Many assume a defined hierarchy width and height. Some don't work unless it has access to the entire state-space. Then again, everyone researches for a different purpose, so their environments reflect that.