

## Daily Log

### Monday November 11

Worked on creating a realistic winter goal. While it would be nice to have an agent that can work from just partial observations, I'm not well informed enough to research in that area. The ATARI ram environments are fully observable MDP's, are a common benchmark used to test HRL algorithms, regardless of the game the RAM size is the same, so I can test on multiple games and show my model can perform well on all of them at once, and the game screen can still be shown to audience for the wow factor.

### Wednesday November 13

I kept thinking about the diversity paper and how I could use its methods of option discovery in my project. The hierarchy in my algorithm is based on time. The higher level options focus on long term planning and the lower ones on short term planning. The lowest level options in the hierarchy can be discovered by diversity methods. These options can then be thought of as the new state space for the next level in the hierarchy. This approach sounds promising, but then I'm not sure what to do when a new environment is given. The question is how do I add new options to the hierarchy. I guess this is the hard part that if I could solve, it would be a notable achievement.

### Friday November 15

I joined github classroom and uploaded a few files including the hierarchical actor critic model that I'm going to compare my algorithm to. I also sent an email to an author of another paper I read hoping that he could send me his implementation of the paper he helped write.

## Timeline

| Date               | Goal  | Met  |
|--------------------|---|--|
| Today minus 1 week | Figure out when to make new options   | I have an interesting idea, but I'd have to test it, so I guess met for now.                         |
| Today minus 1 week | Figure out when to make a new layer in the hierarchy  | Yea because I revised my method of expansion so it does both now.                                    |
| Today              | Research more on state abstraction  | This was a vague goal, but I did make progress in this area and found a solution to a problem I had. |
| Today plus 1 week  | try to make HAC to run on my laptop (install dependencies and dual-boot linux on my new laptop) |  |
| Today plus 2 weeks | Start coding my algorithm for just one ram environment  |  |
| Winter goal        | Implement the algorithms I am comparing my model to   |  |

## Reflection

I didn't really start on my winter goal yet because I wanted to wrap up what I was doing before, but now I am going to start. I know I am going to implement HAC because most of the work was done by the authors (the code is on github), but it's still non-trivial because I have to understand their code and make adaptations. Also making sure I have dependencies installed takes some time. I am not too familiar with linux and have to work with it from now on. As I said before, the more I learn, the less I think I can do with my project because it's a very new domain and innovating too much at once is impossible. At this point, I'm looking at just taking an existing algorithm and tweaking it. That's what you said earlier in the year, which I hoped to do more than, but it is realistic.