Advanced Machine Learning GR5242
Fall 2020

Homework 5

Due: Monday 14 December 4pm (for both sections of the class)

1. **Project Report Progress** (100 points)
   This question will provide some guidance on how to structure the final report. Submit your answers to this question by filling out the project tex template, compiling, and submitting the pdf. Each student should submit the pdf, though we expect that the group will complete the assignment together and that the pdf will be identical across each group.

   Questions:

   (a) Header info: add your project title and the group members to the appropriate fields in the tex template. Make sure the pdf does not anonymize the authors.

   (b) Introduction section: describe the problem you are trying to solve, in 5-7 sentences. It is understood that this text may change in the final report, but it doesn't need to.

   (c) Introduction section: describe the papers that you have read and used to inform your work here. Create a bibliography containing these references, and include some sentences on how these papers are related and how you used them to build your project. If you used an online resource (such as a tf.agents tutorial or something similar) as a starting point, you should include that as a reference also.

   (d) Introduction section: describe the data you have for this problem. For example, how many training/validation/test samples do you have? What are the dimensionalities of the inputs and outputs? If an RL problem, what are the details of the states/actions/rewards?

   (e) Methods section: what is your starting point? For example, will a simple logistic regression get you started? What approaches already exist to solve this problem, and how difficult are they to implement? Describe in 3-5 sentences what first steps you have taken to start from something simple and move to more complex networks. This progression, as we have discussed in class on several occasions, is critical to empiricism and working with deep learning.

   (f) Methods section: what architectures/problem setups will you try to get you from this simple method to your end goal? For example, will you use dropout or batch normalization, will you implement a custom tf.agent, or otherwise? Note it is not necessary to make these choices final; this part is about showing progress.

   (g) Results section: what results do you intend to incluude, and why will they demonstrate success? Add a list of your intended results and what you hope they will show. If you have early results, you may include figures demonstrating the results (optional).

   (h) Discussion section: what are the important takeaways from your work? what problems/opportunity for further work (after the semester) do you see for this project? Some of this section will be incomplete or speculative since the project is still underway, and that is acceptable (of course it should be complete upon final project submission).