# A.3 Final Project

Submit Assignment

**Due** Saturday by 11:59pm **Points** 100 **Submitting** a file upload
**Available** Oct 28 at 12am - Dec 7 at 11:59pm about 1 month

## Project Nature and Content

For this project, you will have chosen a research question and developed an appropriate network. You will have gathered and preprocessed your data, designed and refined your network structure, trained and tested the network, varied the hyperparameters to improve performance, and analyzed / assessed the results.

The most important thing is not just to give a summary of classification rates / errors. I trust that you can get a working classifier, or can train a network to do any useful task.

The important things are:

1. ***Understand WHY you are selecting your final structure***; this means that you'll have analyzed the behavior of the hidden nodes, and
2. ***Developing an elegantly sparse network:*** You'll have worked towards a "parsimonious" network design; that means, you shouldn't be presenting a network with ten hidden layers and fifty nodes per layer, unless EACH AND EVERY single layer can be justified and you can explain what kinds of features are being generalized through successive layers.

In your Final Report, you will ***recapitulate and summarize*** the points that you've been making over these past few weeks. ***Identify*** key insights. ***Interpret*** analytic findings, as appropriate.

- The project that you were addressing, the challenges, and the data that you used.
- Your neural network architecture, and any interesting design considerations / challenges that you encountered, and how you solved them.
- Your actual results together with your interpretation.

## Note on Computing Resources

You will likely be running a more compute-intensive program for this Final Project. Please refer to:

- **Note on Computing Resources**

## Deliverables and Grading Guidelines

***Assignment 3 (100 points):*** Your Final Project report. Due end of Week 10. You should have the following:

- ***Your Final Project "problem" or task that you're addressing - in brief form*** (e.g., cut each section back to a paragraph or so - unless you need to expand on it. **(10 points.)** ***Brevity is key.*** Figures are good. Especially if they are "project at a glance."
- ***The real gnarly problems that surfaced*** **(10 points)** as you were working on your stuff. This is a more insightful presentation of the "gotcha's."
- ***Your results.*** **(30 points)** Summarized. Tabularized. ***Easy to read.*** Trim off excess (ridiculous) significant figures and otherwise tidy up your work. Figures must be LEGIBLE. This will often mean cutting and pasting a figure into a PPT slide, and totally REDOING the legend so that it's readable. Then save the thing as a JPG. Then take the JPG into a picture-processing program and crop it. Then insert it into your document or final PPT, and write a (meaningful) caption. I know, ***this takes time.*** You hate it. (I'm having to do this for my own work.) It sucks. ***Do it anyway.*** I will start taking off DRAMATIC POINTS if I can't EASILY read your stuff. (***Think:*** your professor is working late at night, lighting is not great, her eyes are tired, and she's getting tired and pissy. And then she comes across your stuff.)
- ***INTERPRETATION,*** dammit! **(40 points)**The last thing that I need is list of numbers. I need to know that you took your final results, and really dug into them and ***figured out what they really meant.***This is going to be a BIG PART of your total 100 points.
  - You may find that your EARLIER work on this project led you to go back and do more analysis, or rework your architecture, etc. This is good. Totally get it. Points given for following paths that led nowhere, realizing this, recovering and figuring out a new path. Not saying that you have to do this, but if this is what happened, these "lessons learned" are worthwhile and don't feel that you have to toss them away. They're a useful part of the learning process.
  - You may have spent a lot of time writing / rewriting code. This counts also. Summarize lessons learned.
- ***Summary / Conclusions.*** **(10 points.)** Attempt to be meaningful. If in doubt, look at some quality papers (e.g., check some of the assigned / recommended readings), and see how those authors handled things. This is the time to pull back on your focus and consider what your work means in a broader perspective. You may also, optionally, include a *Future Directions* section. I'll consider this (from a points perspective) to be part of the *Conclusions*, but it is obviously a different thing. Use this if you really plan to move forward - as many of you will.

**Final Guidance:**

- Any citations should be APA style. Put supporting details into appendices. Try to keep the flow in your report readable.