CS 221 Project Proposal Guidelines

Deliverables:

- PDF writeup of proposal (2 pages max)
- Code for baseline (as zip submitted to Gradescope)

Suggested proposal structure:

- Motivation
  - What is the problem you are trying to solve? Why is it important?
- Task Definition
  - Describe the technical aspects of the problem you are trying to solve
  - Provide concrete input/output pairs for your problem (e.g., if your input is an image and output is classification, have an actual example of an image along with its classification)
- Approach
  - Baseline
    - A baseline is a simple solution to act as a benchmark to compare against your method (i.e., is your approach actually better than something simpler).
    - You should have this implemented and working by proposal deadline
  - Proposed Methods
    - Explain the techniques you plan to use in your project
    - Does not have to be overly detailed but sufficiently clear for us to know if it makes sense and is a sufficient amount of work or not
    - Can include section of extra-credit ideas
- Evaluation
  - Metric
    - Explain how you plan on evaluating your method
    - How well does the baseline perform?
    - Put the metric into context (your metric may be very domain specific, so provide context for what a good/bad score is; for example, how well would a normal human do?)
  - (Optional) Data
If your project involves ML, here is where you discuss your specific dataset

- Experiments
  - What quantitative experiments besides the metric evaluation, if any, do you plan to go with

- Qualitative Analysis
  - What kinds of non-quantitative analysis do you expect to do

- Plan
  - Team Roles
    - A very brief (can just be a few bullet points) breakdown of how you plan to divide up work. If you are working alone, obviously no need.
  - Timeline
    - A very brief breakdown of when you plan to finish up the work by.

Additional points:

- We encourage you to not do a plain Machine Learning Project
- If you do want to just do an ML project, you should either do an extra ambitious project (eg Deep Learning) or one that has a second AI technique from the class also involved:
  - Search - for state-based models, finding action sequences given an objective. Example problems include route finding, puzzle solving.
  - MDPs - state-based models, similar to search but the state transition is probabilistic and/or unknown. Example problems include robot planning with unknown environment, game playing.
  - Adversarial Games - playing games against opponents, eg chess.
  - CSPs - finding solutions to problems with constraints. Example problems include event scheduling (with time constraints), coloring problems.
  - Bayesian Methods - expressing causal relationships among variables and reasoning about probabilities. Example problems include diagnosis, object tracking.
  - Logic - model problems in terms logic formulas and infer new knowledge via logic equations. Example problems include knowledge bases.
- We encourage you not to do the whole proposal last minute (as in, start on it a day or two before the due date). Put a lot of thought into it ideally starting at least a week before the due date, so you have a good plan as soon as you finish it.
- Broad grading basis: having all the content we indicated, formatting, writing