Project logistics

The final project can either be a literature review or an original research.

1. **Literature review.** We will provide a list of related papers not covered in the lectures, and the literature review should involve in-depth summaries and exposition of one of these papers.

2. **Original research.** It can be either theoretic or experimental (ideally a mix of the two), with approval from the instructor. If you choose this option, you can do it either individually or in groups of two. You are encouraged to combine your current research with your final project.

There are 3 milestones / deliverables to help you through the process.

1. **Proposal (due Feb. 28).** Submit a short report (no more than 1 page) to the instructor stating the papers you plan to survey or the research problems that you plan to work on. Describe why they are important or interesting, and provide some appropriate references. If you elect to do original research, please do not propose an overly ambitious project that cannot be completed by the end of the semester, and do not be too lured by generality. Focus on the simplest scenarios that can capture the issues you’d like to address.

2. **In-class presentation (Apr. 26 and Apr. 28).** Prepare an oral presentation with slides (the exact time will depend on the number of projects in the class). Focus on high-level ideas, and leave most technical details to your report.

3. **A written report (due May 9).** You are expected to submit a final project report up to 8 pages in NeurIPS format with unlimited appendix summarizing your findings / contributions. You must turn in an electronic copy to the instructor or submit via gradescope.

Project topics

The following are a few references collected under certain topics. You are free to dig up more references of relevance for the project you end up pursuing.

Deep learning theory


**Computational and statistical gaps**


**High dimensional estimation**


• Hua Wang, Yachong Yang, Zhiqi Bu, and Weijie Su. The complete lasso tradeoff diagram. *Advances in Neural Information Processing Systems*, 33, 2020


**Multiple hypothesis testing**


**Statistical learning**


References


