CS5720 Neural Network & Deep Learning - Project

2024 Spring

Overview

Students are **required** to conduct a research project in **group (Max 4)**. The project should be related to deep learning, allow you to learn something new (and hopefully significant), and be interesting and nontrivial, preferably publishable in a top deep learning conference.

Options

Option A (Literature survey):

- Pick a problem that interests you
- Search the literature for deep learning approaches to tackle this problem
- Survey and discuss the relative strengths of each approach
- Implement algorithms

Option B (Empirical evaluation):

- Pick a problem that interests you.
- Implement and experiment with several deep learning techniques to tackle this problem.

Option C (Algorithm design):

- Identify a problem for which there are no satisfying approaches.
- Develop a new deep learning technique to tackle this problem.
- Analyze theoretically and/or empirically the performance of your technique.

Option D (Theoretical analysis):

- Identify a problem or deep learning technique for which the properties (e.g., complexity, performance) are not well understood.
- Analyze the properties of this problem or technique.

Part 1 (Proposal)

The project proposal will be due on February 25, 2024. Please concisely describe what your project is about, what are the related works, what is your execution plan, what do you expect to learn/contribute, and how are you going to evaluate your results. I expect the proposal to be more or at least **two pages** (excluding references).

Suggested structure for Proposal

Option A (Literature survey):

- What is the problem?
- Cite 6 to 10 papers that you plan to survey.

Option B (Empirical evaluation):

- What is the problem?
- What deep learning techniques do you plan to experiment with?
- Cite 3 to 6 related papers that you plan to review.

Option C (Algorithm design):

- What is the problem?
- Why are there no satisfying approaches?
- What is the intuition behind the new technique that you plan to develop?
- Cite 3 to 6 related papers that you plan to review.

Option D (Theoretical analysis):

- What is the problem or technique that you plan to analyze?
- What properties would you like to analyze/prove about this problem or technique?
- Cite 3 to 6 related papers that you plan to review.

Note: Papers should be from top-tier IEEE, Elsevier, ACM conferences and journals published onwards 2019. No plagiarism is allowed in proposal report.