Presentation Template

Machine Learning in Practice Reading Group

Duke B&B

February 6, 2023

Presented by Matthew Engelhard

Presentation Goals

As presenter

- Understand the paper well enough to (a) review it, or (b) begin to implement the approach. Expect this to take time!
- Practice presentation skills
- You are contributing to the knowledge and progress of the group!

As attendee

- Understand the purpose of the paper
- Begin to understand technical details (depending on your level)
- Recognize background knowledge you may be missing
- Determine whether a deeper dive is warranted
- Broaden knowledge of the ML literature

Stimulate discussion, questions, and ideas! Participation is a critical component of this.

Section 1: Introduction

Purpose
- What limitation of current methods does this paper address?
- What new problem settings or variations (if any) does it explore?
- **Why does this paper matter?**

Intuition: Provide a brief overview of the authors' approach from an intuitive perspective.

Potential Applications
- What applications do the authors explore?
- Give at least one example of how the work could be applied to clinical data.
- Ideally, provide an example relevant to your own work.

Section 2: Background

List or briefly describe background knowledge required to understand and implement the paper.

- This material may be covered in the related work section or preliminary portion of the methods.
- Typically there won't be enough time to present background material in detail.
- If possible, recommend resources your fellow group members might consult if they want to get up to speed.

Section 3: Methods

This is the heart of the presentation, and will often be the most time-consuming portion. Still, limiting your presentation to ∼30 minutes means you'll need to focus on the high points.

Some recommendations:

- Stick to the authors' notation **even if you see ways to improve it**. Attendees will reference both your presentation and the paper. Changing notation may create more confusion than it solves.
- If the authors created figures that help explain the concept, include them.
- Focus on presenting key equations rather than covering everything.
- Derivations are often overkill in this context. Attendees should consult the paper for full details.

Often – but not always – the methods can be divided into:

1. Problem setup and notation
2. Description of model
3. Description of learning/optimization

Section 4 (optional): Theoretical Results

It is not possible to present detailed theoretical results in a 30-minute presentation. Instead:

- Present key results and the assumptions underlying them
- **Don't** present proofs, but **do** briefly outline the argument if possible
- Describe practical takeaways

Readers who wish to fully understand the results will need to consult the paper.

Section 5 (optional but strongly recommended): Implementation Details

Imagine you (or an attendee) will need to implement the proposed methods. How would you do it? These details are often omitted or buried (e.g. in the experimental results) to make the paper seem more general or elegant. This is your opportunity to make things more concrete and approachable.

- List steps required to implement
- What tools/software are required?
- How does the math translate into code?
- What details (if any) are unclear?

Section 6: Experimental Results

Briefly present experimental results that support the effectiveness of the proposed method(s).

- Include key figures or tables
- **Don't** spend time recreating tables in LaTeX. A high-resolution screenshot (e.g. of a table) is fine.
- If you have doubts about the results, please describe them!

Section 7 (optional): Recommendations

After presenting experimental results, you may want to provide concluding commentary, such as:

- Whether you found the methods and/or experimental results compelling
- Whether or in what settings you'd recommend using the proposed approach
- Limitations of the methods or ways to overcome them
- Ideas for your work or the group that were inspired by the paper