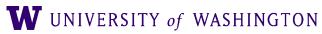
The Process: Running Experiments, Writing, Presenting

LING575 Analyzing Neural Language Models Shane Steinert-Threlkeld Apr 23 2021

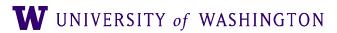
h/t Bowman, MacCartney, Manning, Potts, ...







Running Experiments







Getting Started

- As soon as possible (all in your shared repo):
 - Find/build code to read your data
 - Find/build evaluation code
 - If you're using e.g. diagnostic classifiers, use existing libraries' evaluations
 - For some analysis projects, this might be harder to find
 - Get simplest version possible of pipeline running (e.g. one pre-tained model)
 - Play with very small / toy data, etc., so you can iterate quickly







Experiments

- Main point: log everything!! (Think: modern lab notebook.)
- For each experiment, record (e.g. in a spreadsheet):
 - Command ran
 - Any relevant parameters included here
 - Including random seeds! (specify via command-line or, e.g. in AllenNLP config)
 - [NB: `allennlp train` writes the conf to the serialization dir]
 - Git checkpoint used
 - Notes on why you ran / what the outcome was







Iterate

- Once the basic infrastructure is setup, research becomes an "anytime" algorithm"
- Submit condor jobs, wait, log / analyze results, think about what to do next
- Your future self will also *very strongly* thank you for keeping detailed records
 - Very helpful when writing







Writing a Paper







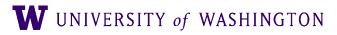
Typical Format

- Conference papers: eight (or four) pages, two-column ACL format
- Sections:
 - Introduction
 - Related Work (possibly later)
 - Model/proposal
 - Data
 - Experimental setup
 - Results
 - Discussion
 - Conclusion (future work / possible follow-ups)













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- It's a story, but the characters are ideas, not people (not you, not previous researchers).

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Introduction

- 1-2 paragraphs general setup + motivation
 - Somewhat general, but with some citations to prior work
 - Culminating in your main research question / hypothesis
- 1 paragraph summary of main contributions and results of your paper
 - How you're advancing the state of knowledge just described
- 1 paragraph "sign-posting" the rest of the paper
 - More than just "Next is methods, then results, then discussion."





Related Work

- Brief discussions of prior research that's related to your paper
- NOT a mere summary of everything that's come before
- Should be used as part of motivation:
 - Limitations in prior work
 - Differences between it and yours
- end of paper.)

• (If this is hard to do without seeing your results first, *can* be put towards









Model / Proposal

- Goal: a researcher in the field should be able to roughly reproduce your experiments from reading this section
 - Complete reproducibility details can be in appendices / code repositories
- Describe: datasets, models, evaluations
 - Citing existing examples when possible
- Include math only if necessary for understanding, not for its own sake
 - Some tips for formatting



Hot take: Mathiness [1] is like an adversarial patch [2] for ML conference reviewers: Mathiness causes a reviewer to classify the paper as "accept" regardless of whether the math is useful/valid and the paper is any good. [3] Fig. 6 has some empirical evidence of this. (refs

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Results

- Tables, elaborating your evaluations in your different conditions
- Ideally:
 - Comparisons to baselines (when applicable)
 - Several runs / random seeds (avg plus std)
- Guide the reader through the main take-aways: tables are hard to read!







Discussion

- What do we learn from the results?
- Frame in terms of your motivating question / hypothesis
- A great place for some *qualitative analysis*
 - Example outputs
 - Suggestions for what might be causing results









Conclusion

- One sentence re-iterating the design
- Drive home the take-away message; make sure the reader knows what the main point is
 - Repetition is not a bad thing!!
- Finish with future work / next directions
 - Not necessarily what you are going to do, but what kinds of questions this work opens up







Publishing and Presenting







From course to conference

- Course papers are "proto-papers"
 - Ask the right question / formulate the right hypothesis
 - Preliminary results with suggestive conclusions
- Paper:
 - More thorough controls / experiments
 - Detailed analysis and discussion
- can you convince them to be excited about your project

• Think in terms of "audience design": who's the intended reader, and how







Abstract

- Open with broad overview: glimpse of the main problem
- Middle: elaborate, by connecting with the central results of the paper
- Finish: link the results with broader questions / implications
 - So reviewer / reader can easily answer: does it make a substantive / original contribution







Venues • Major conferences: ACL, EMNLP, COLING, CoNLL, CogSci, AAAI, ICML,

- NeurIPS, ICLR, ...
- Upcoming:
 - Not many announced yet, but usually Summer deadlines are
 - AAAI
 - COLING
 - CoNLL
 - BlackboxNLP [August 5]









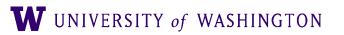
Venues (cont)

- While there are obvious time pressures for your CVs, *there's always* another conference
 - Do the best work you can, find the right home for it
- arXiv: in general, do post there; the CL/NLP communities follow it
 - But: don't rush! It can become authoritative, impact your reputation
 - Check: anonymity periods of major conferences
 - EG: ACL doesn't allow posting within one month of deadline, and no major advertising on social media of arXiv papers













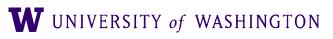
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• Decisions made

. . .

arbitrary. Nothing to be ashamed of. Try and try again.

• NB: rejection is the mode!! Many hard decisions have to be made; often feels







What Reviewers Do

- ACL form, almost entirely:
 - What is the paper about? Main strengths and weaknesses?
 - Reasons to accept
 - Reasons to reject
 - Overall recommendation (numeric)
 - Reviewer confidence (numeric)
 - Feedback for authors:
 - Questions
 - Missing references
 - Typographic
 - **Ethics review**
 - Reproducibility score







Presentations







- Mirrors paper, but briefer
- Beginning:
- Middle:
 - Data, model, evaluation
- End:
 - Results, what techniques contributed the most, *examples*

Basic Structure

• What problem? Why is it interesting? Why have previous solutions failed?







Pullum's Five (Six) Rules

- Don't ever begin with an apology
- Don't ever underestimate the audience's intelligence
- Respect time limits
- Don't survey the whole damn field
- Remember that you're an advocate, not the defendant
- Expect questions that will floor you







My Guiding Principle

own work.

• Your talk will be amazingly successful if each audience member can remember one thing from it.

- So: make compelling figures.
 - you're an expert. Tell them the take-home message a few times.

The audience is intelligent, but also tired. And you are the expert on your

• Don't be afraid to be repetitive: they're hearing this for the first time and







Practical points

- Turn off notifications
- Make sure your screen stays awake
- Shut down running applications
- world to see
- If using Google Slides/Keynote/Powerpoint, make a PDF backup

• Make sure desktop/browser/anything is free of content you don't want the







- Mainly: make the audience feel like their question has been addressed.
- Try to view it as joint inquiry, not an interrogation.
- Pause before answering
- Be honest when you don't know.
 - But say more than "I don't know." Add "but..." Or "That reminds me of..." "One thing that suggests to me..."
- Questions don't always make sense. Try to bend it into something that does and that makes the questioner feel valued. Everyone will love you.







Next Time

- Special Topics presentations!
- Reminder: everyone is expected to contribute to the discussion. Come to class having done the suggested readings.
- I will post more explicit guidelines about final papers soon.





