INFO 7905:
Cornell Information Science PhD Professionalization Seminar

Allison Koenecke
Spring 2025

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About this class

A PhD, while a special job, is still a professional job

https://www.smbc-comics.com/comic/2012-01-17

How do you do *the job* of a PhD?

- The premise of this class!

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    1. Clarifying the hidden curriculum

A **hidden curriculum** is a set of lessons "which are learned but not openly intended"[1] to be taught in school such as the norms, values, and beliefs conveyed in both the classroom and social environment.[2] In many cases, it occurs as a result of social interactions and expectations.

https://en.wikipedia.org/wiki/Hidden_curriculum

How do you do *the job* of a PhD?

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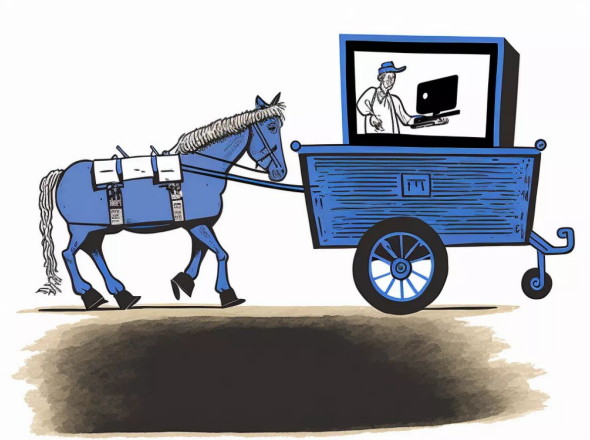
    1. Clarifying the hidden curriculum

Failure mode #1: cart before the horse
(know you need to write a paper, but don't yet have the hidden knowledge to do so with a high probability of success)



https://the-refinery.io/blog/the-cart-before-the-horse-how-system-integration-needs-an-overhaul

How do you do *the job* of a PhD?

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Failure mode #2: infinite time sink on hidden curriculum
(spend more time reading others' blogs on the academic hidden curriculum than doing your own research)

https://www.astronomy.com/science/ask-astro-frozen-stars/

How do you do *the job* of a PhD?

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1. Clarifying the hidden curriculum

THIS CLASS

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    1. Clarifying the hidden curriculum
    2. ***Practicing* tips and tricks**

How do you do *the job* of a PhD?

- The premise of this class!
    1. Clarifying the hidden curriculum
    2. *Practicing* tips and tricks
    3. **Hearing from & learning from other sub-fields across Info Sci**

Staff intro

- **Allison Koenecke** *(she/her)*
  - 3rd year as an Asst Prof at Cornell IS
  - **Academic**: MIT, Stanford (Computational & Mathematical Engineering)
  - **Industry**: big tech, consulting; research w/ non-profits
  - **Toxic traits:** Talks too fast, thinks “data” is plural
- **Office hours:** by appointment (email me at *koenecke@cornell.edu*)

INFO 7905: updated from previous years!

- In addition to seminars with different IS profs, we will also have:
  - Instructional slides
  - “Homework” (very light lift – things you should already be doing outside of coursework)
  - Peer feedback components

Tentative Schedule (1/2 of sem)

Week	Topic	Deliverable due next week
1	Professionalization & self-introductions	Draft elevator pitches
2	Finding your "intellectual community" & spaces online/offline for staying up to date with research	Generate a reading/venue list
3	Communication, Meetings, Email etiquette, Timeliness	Draft agenda for next advisor meeting
4	Time & stress management, organization, project workflows	Identify organizational methods to incorporate
5	Reading papers	Read 1 paper following this framework
6	Reviewing papers; R&Rs	Review 1 paper following this framework
7	Writing papers	Practice writing an abstract for a paper you're working on (or write an alternate abstract for an existing paper)
8	Giving presentations, conference etiquette, public communication (writing Tweet threads) & impact beyond papers	Make slides explaining a paper you read

Tentative Schedule (2/2 of sem)

Week	Topic	Deliverable due next week
9	Performance reviews & student progress review (due Apr 1); Forming a committee and expectations from PhD milestones	Draft SPR
10	Writing CVs and resumes; applying for fellowships & grants, asking for rec letters	Update CV
~~11~~	Spring Break (no class)	--
12	What does the academic job market entail?	Update personal website / online footprint
13	Applying for summer internships / jobs in industry	Identify relevant fellowships (for next year) and potential orgs of interest
14	Open discussion: making the most of your PhD (ownership of research, upskilling, navigating changes in what you consider your "intellectual community")	--

Logistics

- Materials will be posted on Canvas
- INFO 7905 attendance and assignments will be checked off in-person
- You will be graded on:

Assignment/Assessment	**Percentage of Grade/ Points**
Attendance	50%
Preparation for weekly activities	40%
Participation	10%

The average INFO 7905 class

1. Share your completed homework with a new partner each week; discuss
2. Lecture Slides
3. In-class discussion / practice on lecture content
4. Panel discussion on topic with guest speaker (IS faculty)

The average INFO 7905 class

1. Share your completed homework with a new partner each week; discuss
2. Lecture Slides*

*** Caveat: slides are my own and may not (and likely do not!) reflect the views and practices of all faculty and all sub-disciplines in IS. My goal is to give you the resources for you to find out for yourself, or start conversations with your advisor(s), about what best practices you should adhere to!**

Also required: IS Colloquium attendance

- ***What***: We invite world's leading IS researchers to Cornell
- ***When***: On average Wednesdays 3:30 (sometimes Friday 1:30) – check for emails from João!
- ***How:*** We encourage you to look at the speaker bios and their papers prior to their talk

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Why:

1. To better understand the types of research being conducted across Info Sci as a field; even if it's not in your specific sub-domain, it's important to understand how your work is positioned in the broader research area

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2. To meet potential new faculty so you can express support for their joining the department if you enjoyed their talk
3. **To figure out what features of job talks you think are effective or ineffective, so you can replicate those features in your own talks**

Self-Introductions

Self-introductions

- Let’s get to know each other!
- Think of this as elevator-pitches for yourselves

Where you're likely to make self-introductions

- Meeting new people at a conference
- Introducing yourself to visiting speakers at Cornell
- At the beginning of talks you give
- During interviews
- …

Goals of academic self-introductions

- Give people a sense of what **research community** you belong to
- **Advertise your own work** in a way that's succinct & memorable

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- Give people a sense of what **research community** you belong to
- **Advertise your own work** in a way that's succinct & memorable
    - **(Note: academic convos don't just have to be transactional! They can also just be for you to learn more about others in a friendly way, and vice versa!)**

Goals of academic self-introductions

- Give people a sense of what research community you belong to
- Advertise your own work in a way that's succinct & memorable
- In conversation with others…
  - Establish whether you have **research commonalities** / if there are things you can help each other with
  - If you know the other party's work, give **positive feedback** on it (always a nice thing to do!)

Changing self-introductions

- It’s good to practice different lengths of elevator pitches
    - If a longer intro will **detract** from the conversation at hand: keep it to 1-2 sentences (< 30 seconds)

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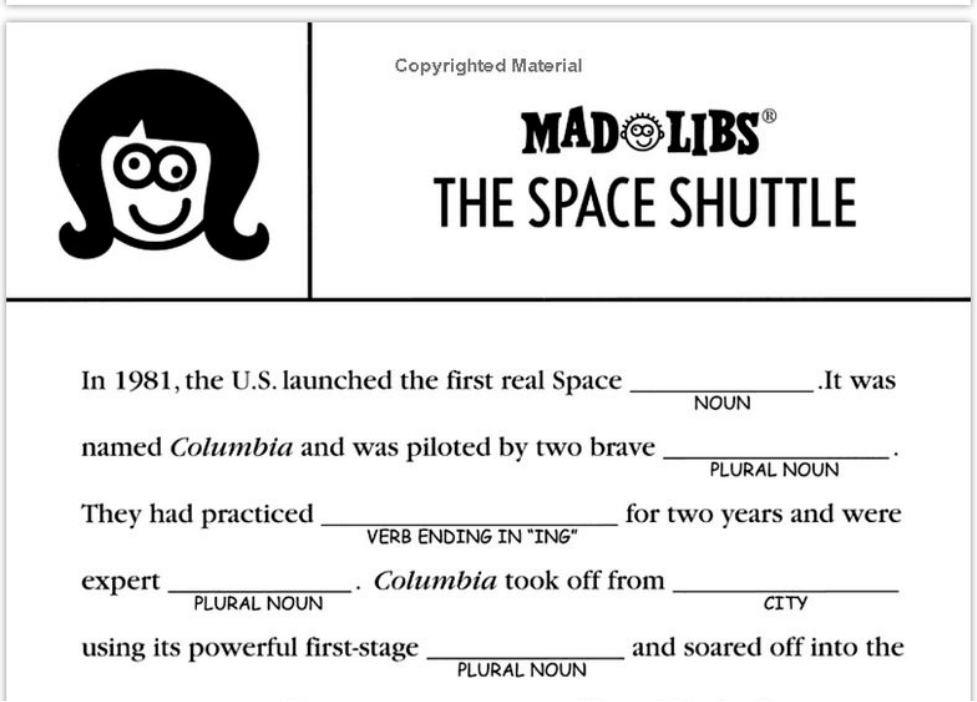
    - **In an interview**: you may have 3-4 minutes to talk about yourself in one breath
    - When meeting someone 1-on-1: you may want to update your own pitch to be **more relevant** to what the other party cares about or can help you with

A lot of academic work is mad-libs



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MAD LIBS®

THE SPACE SHUTTLE

In 1981, the U.S. launched the first real Space _____ (NOUN). It was named *Columbia* and was piloted by two brave _____ (PLURAL NOUN). They had practiced _____ (VERB ENDING IN "ING") for two years and were expert _____ (PLURAL NOUN). *Columbia* took off from _____ (CITY) using its powerful first-stage _____ (PLURAL NOUN) and soared off into the

https://brevity.wordpress.com/wp-content/uploads/2023/02/screen-shot-2023-02-08-at-2.44.01-pm.png

Guidelines: mad-libs self-intro

1. My name is **[name]**, and I'm a **[role]** at **[institution]**
2. I'm broadly interested in **[broad field]**; **[name-drop relevant people]**
3. More specifically, my projects focus on applying **[method]** to solve **[problem]**
4. I'm particularly interested in **[specific domains/applications]**

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   - ***I'm interested in the intersection of econ and CS; my advisors are Susan Athey and Sharad Goel***
   - ***I'm broadly interested in algorithmic fairness, such as the type of work that Jon Kleinberg does***
   - ***[The goal here is to establish where in the community you sit using other people as north stars]***

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   I'm particularly interested in studying algorithms that could lead to allocative harms via online resource distribution or public policy choices.

Common mistakes #1 & 2: under/over-specifying

- Just saying your name and…
  - … immediately going into overly-specific detail about your paper, when the other party has no concept of who you are or what the big-picture goal of your paper is
  - … walking away (they won't remember you!)

- How to fix: **pay attention** to how much / little feedback others are giving!

Common mistake #3: assuming common knowledge

- Assuming that people will know the fields/papers/people you namedrop
  - “Algorithmic fairness” might not mean the same thing at a biostatistics conference
  - People in different fields will not necessarily know the ‘big shot’ people in your field

- How to fix? **Focus on describing your research** in an accessible way instead

Additional things to consider (depending on situation)

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- **Are you on academic Bluesky/Mastodon/Twitter/…? *[figure out a way to stay in touch!]***

Your turn!

- Practice honing your introductions in pairs
  - Try different scenarios, e.g.:
    - meeting next week's IS colloquium speaker
    - introducing yourself at a specific upcoming conference
  - Try different variants, e.g.:
    - 30 second
    - 60 second
- Give peer feedback!

Self-introductions can & should evolve!

- It’s good to update your self-intro over time, as your own research interests and academic goals change!
- You should also keep your online(!) self-introductions updated accordingly

Self-introductions online

- I will not require anyone to create an online presence for privacy reasons, but note that it is a useful thing to do for other academics to find your work
- Online presence can be:
  - Personal websites
  - Bios on university pages
  - Social media platform bios
  - …

A personal website

Publications - Blog - Code - CV - [lastname]@cornell.edu - @dmimno (mostly BlueSky) - Gates 236

David Mimno

Bio: David Mimno is an associate professor and chair of the department of Information Science at Cornell University. He holds a PhD from UMass Amherst and was previously the head programmer at the Perseus Project at Tufts and a researcher at Princeton University. His work has been supported by the Sloan foundation, the NEH, and the NSF.

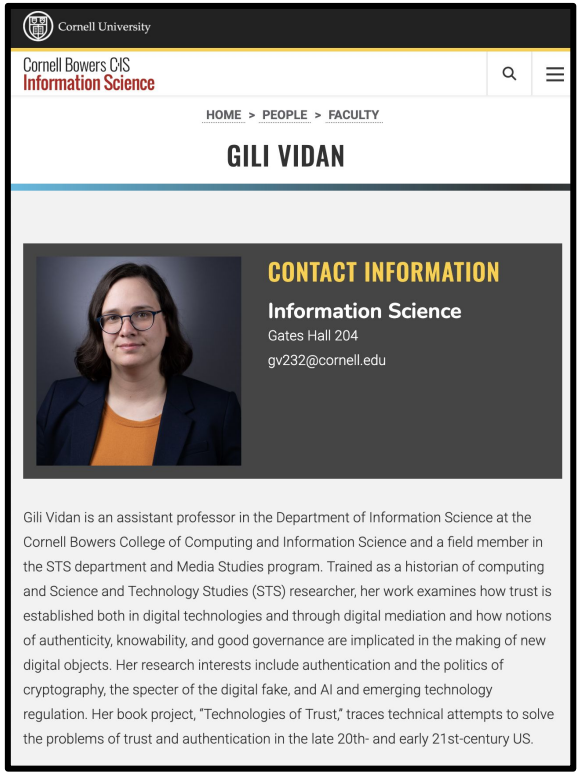
I supervise PhD students in Information Science and Computer Science.

Recent publications:

- "Similarity to the training data" doesn't predict few-shot performance. While some level of similarity helps (a model trained on

https://mimno.infosci.cornell.edu/

A Cornell website



https://infosci.cornell.edu/content/vidan

A social media bio

https://x.com/karen_ec_levy

Online presence

- Make your website easy to read & find
- How to make websites? Resources:
  - Find thorough online explainers, including for non-coders, e.g.: https://medium.com/@carlbettosi/create-a-personal-academic-website-easily-with-github-pages-and-jekyll-minimal-coding-f1115eeb5ab7
  - Ask Cornell IT or a friend in your IS cohort!

My brief *personal* opinions on academic websites

- One-page scroll is easier than forcing the user to find and click into the relevant part of your website (most traffic will be < 10 seconds!)
- Make it easy to find your contact info; people often obscure email addresses (e.g. “AT cornell DOT edu”) to avoid bots scraping our emails and adding them to spam lists

A note on expectations

- **Do not compare** your bios to those of professors!
  (You are not expected to have tons of funding sources or papers/books published at this point!)
- **Do not compare** your bios to those of other PhD students!
  (You do you! Don't feed into imposter syndrome!)

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  (You do you! Don't feed into imposter syndrome!)
- **Do** use other bios as a resource to understand the academic landscape around you

Takeaways from Lecture 1

1. Attend diverse talks! They will help you better understand the interdisciplinary landscape of IS
2. How you present yourself to others matters

HW: Reflect on how you would like to introduce yourself in different settings, and write out a few different self-introductions *("elevator pitches" for yourself)* to practice at the beginning of next class.

Finding your Intellectual Community

What is your community?

- Perhaps you thought about this when writing your self-introductions!
- Many academics self-align with specific conferences, working groups, or research initiatives

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How to figure out who your community is?

- Ask your advisor what their community is
- Read widely and figure out who your favorite authors' communities are
- Seek out talks and groups to attend
- Consider building your own community!

How to figure out who your community is?

How can you tell without talking to them?

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Check their CV!

- Do they tend to **publish** at, **give talks** at, or **review** for the same set of conferences / journals every year?
- Have they led **working groups or workshops** on certain topics regularly?
- Do they use certain **keywords** on their CV or in their bios that match certain communities?

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How do you find these?

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Within Cornell...

- Seek out & attend meetings/talks relevant to your research interests
  - You can ask to attend relevant professors' lab meetings!
  - Weekly talks in Gates (e.g. AI seminar)
  - Regular seminars elsewhere on campus (e.g. Social Inequality Seminar)
  - Regular working groups (e.g. AIPP, DLI)

On the internet...

1. There are also plenty of online seminars, e.g. for causal inference, digital econ, etc.
2. For better or for worse, online communities (e.g. Econ Twitter, now EconSky) can be an effective way of staying up to date on research in the community

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1. There are also plenty of online seminars, e.g. for causal inference, digital econ, etc.
2. For better or for worse, online communities (e.g. Econ Twitter, now EconSky) can be an effective way of staying up to date on research in the community
   a. **Pitch: Cornell CS PhD student Sophie Greenwood (and her advisor, Nikhil Garg) has made a Bluesky feed filter that just shows papers! 🎉 https://bsky.app/profile/paper-feed.bsky.social/feed/preprintdigest**

How to figure out who your community is?

- Ask your advisor what their community is
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Can I do this?

Create your own community!

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- Have friends interested in similar topics but no obvious community?
  - **Make your own Slack group** / mailing list / meetup!
    - (or see if you can get added to existing ones, e.g. the *Algo Audit Network* Slack group)

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  - **EAAMO (Equity and Access in Algorithms, Mechanisms, and Optimization) was started by grad students in 2016 and is now a full conference!**

Who is your community?

- Keywords about your research interests

- Conferences / journals / other venues where you would like to attend and publish

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- Keywords about your research interests

  E.g.: ***algorithmic fairness, algorithmic auditing, speech-to-text services, public services***

- Conferences / journals / other venues where you would like to attend and publish

  E.g.: ***FAccT, IC2S2, …***

Your turn! Who is your community?

- Do some digging for what communities your academic idols claim
- Share with your neighbors: what are relevant keywords / venues for your communities?

Now that you've established who your community is...

- How do you stay up to date with what's happening?

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- How do you stay up to date with what's happening?
  - **[Niche] Keywords:** Google Scholar alerts
  - **People:** Bluesky/Mastodon/etc. follows (or Google Scholar alerts)
  - **Venues:** Attend the conference / read its proceedings

Your turn!

- Come up with a plan to stay up to date with your community; discuss with your neighbor
  - **People/Keywords:** how will you find their work?
  - **Venues**: are there relevant workshops you can apply for, or volunteering opportunities?

Takeaways from Lecture 2

1. It's important to be able to identify what intellectual communities you belong to, or *want to* belong to
2. It's important to figure out ways to keep up to date on those intellectual communities

Homework

Implement a sustainable way of tracking updates in relevant communities / papers.

1. ***Who is your academic community?***
    a. *What are relevant keywords/venues for your communities?*
2. ***What is your plan for staying up to date with your community?***

Communication, Meetings, Email Etiquette, Timeliness

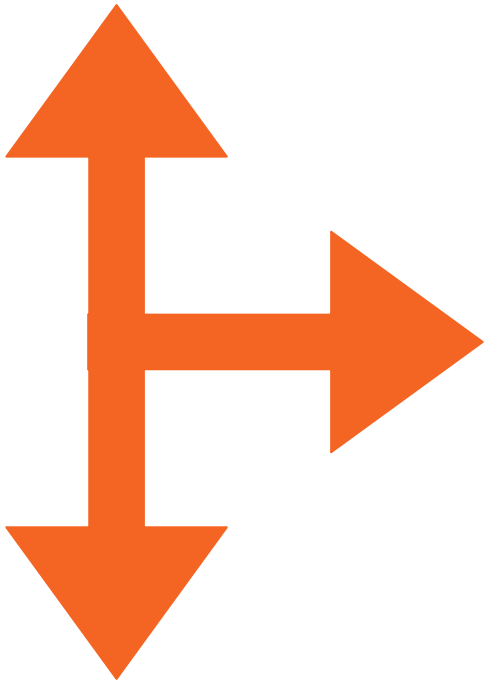
Management

- The key to managing research is managing people

- Taking ownership of your projects means that ***you*** are a manager, even if you don't feel like one!

https://en.wikipedia.org/wiki/Managing_up_and_managing_down

Managing goes in all directions!



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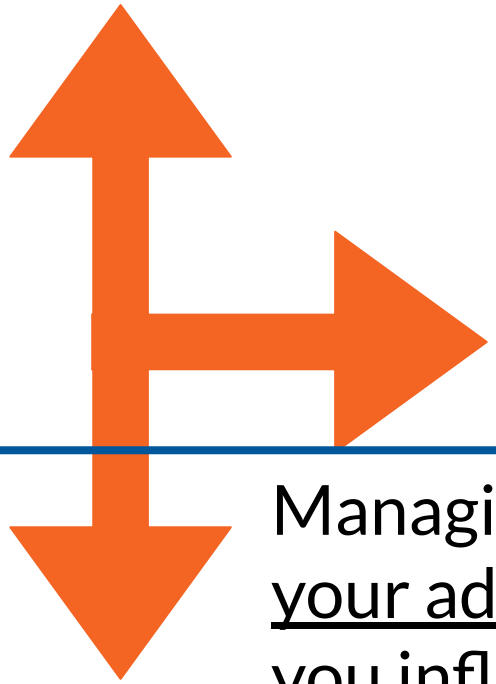
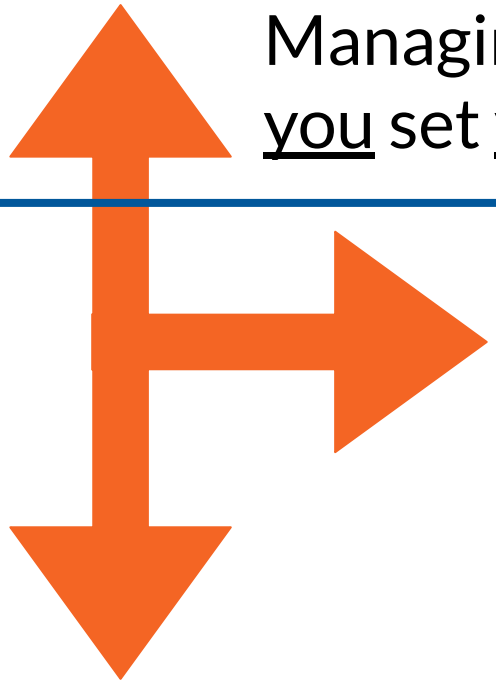


Managing **downwards**:
your advisor influences you;
you influence masters/undergrads

Managing goes in all directions!

Managing **upwards**:
you set your advisor's expectations



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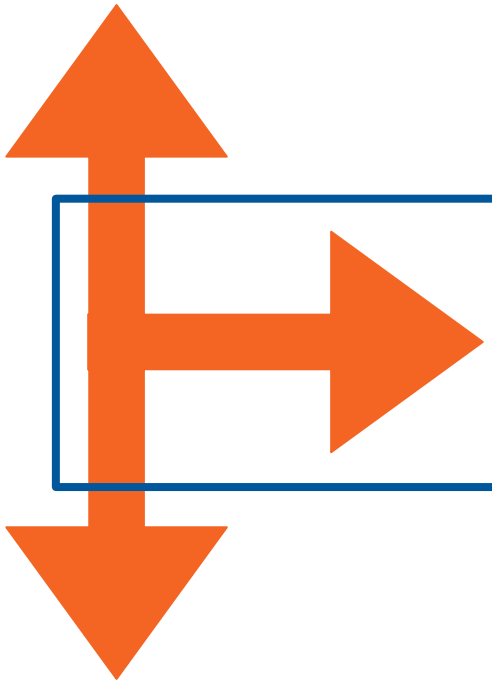

Managing **sideways**:
you set your peers' / collaborators' expectations

Key components to management

1. Understand the **modes of** communication
2. Clarify the **purpose** of communication
3. Set reasonable **expectations** (and boundaries)
4. Obtain **consensus** early and often at crucial checkpoints

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Modes of Communication

- When to use each of: [***Email? Slack? Discord? Microsoft Teams? Zoom?***]
- Figure out what works best for you and your collaborators. **Not sure? Ask!**
- Make sure your notifications are turned on during work hours!

Responding to Communications

- Different modes have different expectations for speed of response
  - **Not sure? Ask!**
- Examples (may differ for different collaborators!):
  - Upwards **emails**: ~1 week
  - Downwards **Slack** messages about ongoing work: ~1 day

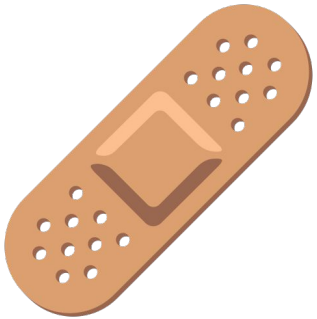
Ghosting 👻

- Communication can be intimidating, but the **worst possible thing** to do is ghost
  - E.g., *never* responding to emails / messages
  - Not giving *advance notice* re: not showing up to meetings
- Why? Collaborators will be roadblocked on planning project timelines, finding other researchers to help you, etc.

What to do instead?

- If someone asks you for something that will take a while for you to respond to, you can still **respond quickly**…

[think of this as ripping off the bandaid!]



What to do instead?

- If someone asks you for something that will take a while for you to respond to, you can still **respond quickly**…
  - **with a time estimate for your task,** instead of waiting until you have everything fully ready
  - **with relevant questions** re: task roadblocks
  - with an explanation of why you're **unable to commit** to doing the thing for XYZ genuine reasons

Communicating Lack of Progress

- Profs are generally understanding! Please talk to us if you have personal things going on that might slow down expected timelines

Communicating Lack of Progress

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- This gives us a better idea of how to support *you*, and helps us re-set more realistic expectations for project timelines – better for everyone!
- **Even better if you propose a new timeline!**

Key components to management

1. Understand the **modes of** communication
2. Clarify the **purpose** of communication
3. Set reasonable **expectations** (and boundaries)
4. Obtain **consensus** early and often at crucial checkpoints

Two communication examples

1. Emailing someone with an ask

2. Preparing for a weekly advising meeting

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   Biggest goal: differentiate yourself from spam emails

Email Etiquette

- In the first few sentences, state:
  - Who you are

    Minor pet-peeve: when people just say their name in the opening sentence with no add'l context. I can already see your name from my inbox; I want to know a **brief self-intro related to why you're emailing**!

Email Etiquette

- In the first few sentences, state:
  - Who you are
  - Why you're emailing them specifically
  - The specific ask you have

- In later paragraphs, include more details (if response is time sensitive, **bold** it upfront)

Email Etiquette: caveat

- I’m providing these as general templates so that everyone has something to start with
    - Plenty of people have different email etiquette preferences, and you may already have a great way of emailing that works for you! That is totally fine.

Email Example 1

- I am a PhD student studying X
- I recently read your related paper Y
- I am wondering whether you could point me towards the data source you used?

- Add'l details: my advisor (CC'd) and I are working on related project Z, and are interested in exploring potential overlaps…

Email Example 2

- I am organizing X workshop
- Because of your Y related expertise…
- …I would like to invite you to attend X
- X will explore [topics]. We hope to hear your **reply by [date]**.

Additional Email Thoughts

- In general, aim for **brevity, relevance, and a clear ask**
- Not all things have to be transactional (e.g., have a clear ask)! You are very welcome to cold email someone with a nice note just saying you liked their paper :)
    - This is nice to do but often does not yield a response, so keep your expectations set accordingly!

Two communication examples

1. Emailing someone with an ask

2. Preparing for a weekly advising meeting

   We have ***so many meetings.*** Forgive us for forgetting things, and help us remember what we talked about last time to get us up to speed!

Components to a meeting

- Make sure you know: what is the point of the meeting? Who is running the meeting?
- **Meetings should be productive for everyone!**

Before the meeting

- Send an **agenda** beforehand of what you want to cover
  - This is both to help you plan what will be productive for *you*…
  - …and a form of **upwards management** for your advisor (allowing us to prep for the meeting)

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- **When / what format to send agenda? Ask!**

Pre-meeting Agenda examples

- Google Slides, a Google Doc of running notes, GitHub issues, or similar are all effective if organized
- Ideally: make it easy to find for all relevant parties (e.g. a pinned URL in a Slack channel, & emailing/Slacking the link right before the meeting)

Meeting Agenda Template

1. What have you worked on **since last meeting**?
    a. Tasks started
    b. Tasks completed
        i. Key findings
2. What have you faced **blockers** on? What do you need to be unblocked?
3. What are your **action items** for next meeting? (Enumerate these!)

Meeting Agenda Template

Remember: new results can involve things you tried that *didn't work!* Null results are still valuable research!

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3. What are your **action items** for next meeting? **How do they build towards longer-term goals?**

Timing: Upwards Management

- If one of your blockers is review from someone else, make sure they have ample time to do so!
- Ask them directly how much time they'll need to review, and work backwards on when to send them items for review
  - e.g. avoid sending a collaborator the first draft of a paper the night before the submission deadline!

During the meeting

- You should **take notes** during the meeting. Why?
  - Helps you **remember** what was discussed
  - If meeting is with many people, huge bonus points for sending out a **summary afterwards** to make sure everyone stays on the same page (*sideways management*!)

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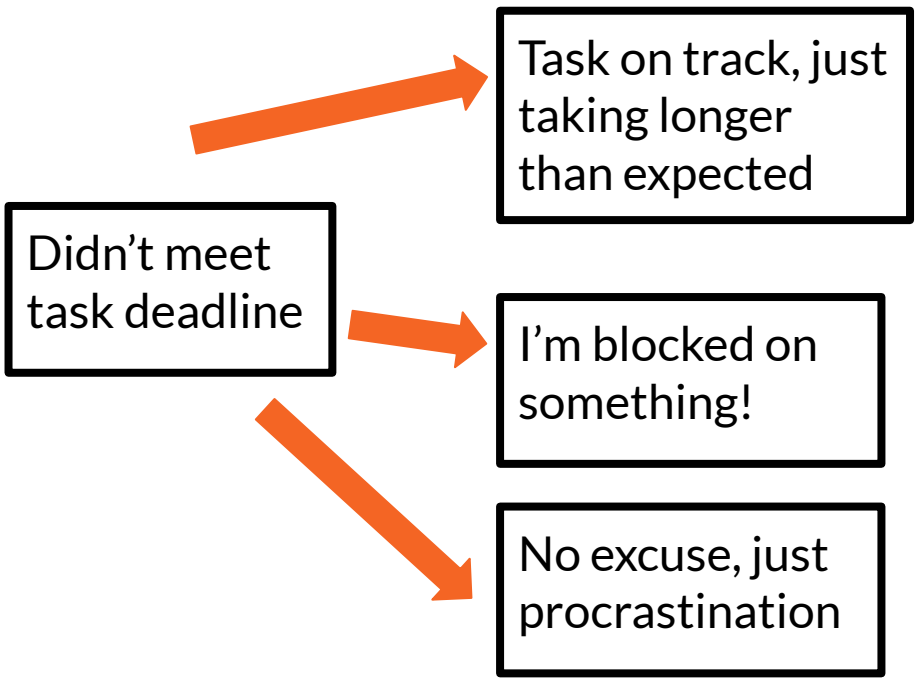
Timeliness for past tasks

- *AK opinion: the vast majority of interpersonal conflicts in academia can be managed by setting better expectations (in all directions)*

Timeliness for past tasks

- *AK opinion: the vast majority of interpersonal conflicts in academia can be managed by setting better expectations (in all directions)*
- If you didn't meet a deadline, need to unpack why *(rule of thumb: double all estimated times for doing a task)*
- If advisor expected something done but this was unclear, need to figure out why there was a breakdown in communication

Estimating task lengths



Estimating task lengths

Blameless postmortems of communication breakdowns

- Refer back to your notes from last week's meeting! Were expectations clear?
  - If not, figure out how to concretize expectations more (e.g., mechanism for confirming meeting notes, breaking tasks into smaller pieces, getting on the same page with terminology, etc.)

Timeliness for future tasks

- If you're not sure how urgent future tasks are, or how to prioritize them – **ask**!
    - *An AK-specific tip: this is why I like itemized lists for tasks more than bulletpoint lists: numbering things forces you to pick an order to do tasks!*

Setting Boundaries

- If you are working with a collaborator who consistently expects you to work weekends on top of usual work hours, or is otherwise making asks outside of academic norms, **talk to your advisor** & come up with a plan (e.g. telling the collaborator that you are only available for a certain window of time each week)

For more serious concerns, talk to your support network & consider reaching out to the ombuds office

Welcome!

The Cornell University Ombuds is a confidential, independent, informal, and impartial resource available to students, staff, and faculty at the university to address conflicts, concerns, or other issues affecting their work, life, or study at Cornell. We offer a safe place to identify options for addressing individual situations. We operate according to the principles of the International Ombuds Association.

Cornell Ombuds Office appointments are offered via Zoom, telephone, or in person and may be scheduled by email or telephone. The Ombuds Office is available to students, faculty and staff affiliated with all units of Cornell University, excluding Weill Cornell Medicine.

Email: ombuds@cornell.edu

Phone: 607-255-4321

https://ombuds.cornell.edu/

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Group decisions

- If you are in charge of a project, it is good to propose authorship orders and venues to aim for as early as possible
  - **Check with your advisor first** on these points!
  - **Authorship order**: setting expectations early helps calibrate how much work each contributor does; project shifts can also allow for updating author lists (but these should be proposed earlier rather than later)

Meeting cadence

- It may feel like the frequency of meetings is set from the top down
  - But, you can always ask your advisor to meet more frequently, or for longer blocks of time, if it would be productive for both of you to have more frequent checkpoints
- Later in the PhD, the onus is often on you to set up meetings with collaborators and decide on meeting frequencies

HW: draft a meeting agenda!

Sample Outline:

1. **Tasks** started/completed & **key findings**
2. **Blockers** / what you need to be unblocked
3. **Action items** for next meeting

Time & Stress Management, Organization, Project Workflows

How many hours is your job?

- When in doubt: ***ask your advisor*** for expectations!

- As a general rule of thumb, it's important to remember that the job of research takes *all kinds of forms*
  - *Reading & thinking* takes time
  - *Trying things that don't work* takes time
  - Don't fall into the trap of thinking: if I'm not **actively doing** research, it doesn't count as work!

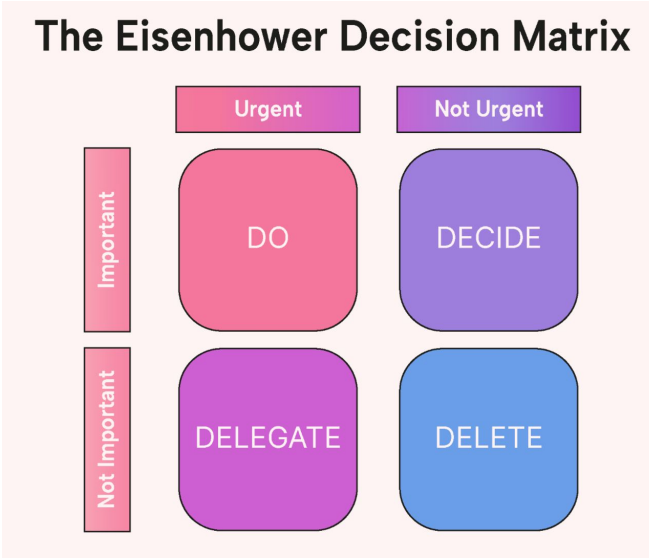
Patterns I've* observed *your advisor may think differently!

- Early in the PhD, ~ half of your total work hours is "active research", whereas the other half is [classes, TAing, brainstorming research ideas, going to seminars, etc.]

- As your PhD progresses, the % of "active research" work hours increases but will never hit 100% (since you'll still attend seminars, brainstorm new ideas, etc.)

Much of PhD time is unstructured

- Without a clear idea of what you want to spend time on, it's very easy for a specific genre of tasks to sponge up your time



https://www.usemotion.com/blog/four-quadrant-time-management

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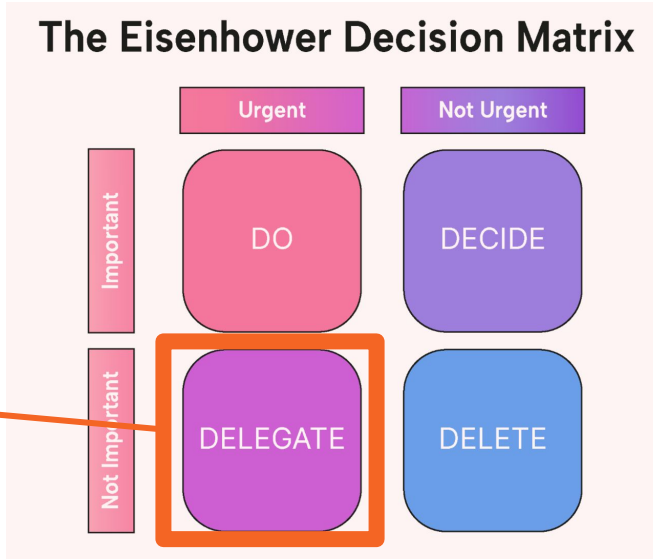

- low-stakes email responses

https://www.usemotion.com/blog/four-quadrant-time-management

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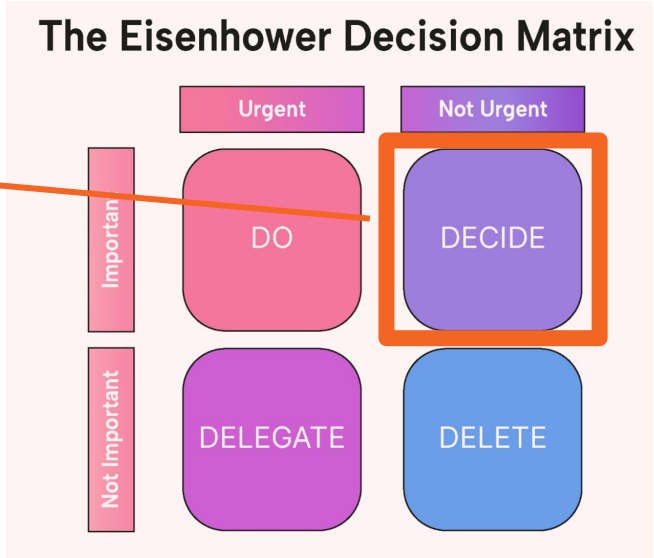
- making lists of potential conference/journal submission venues,
- trying different organizational and time management methods, etc.



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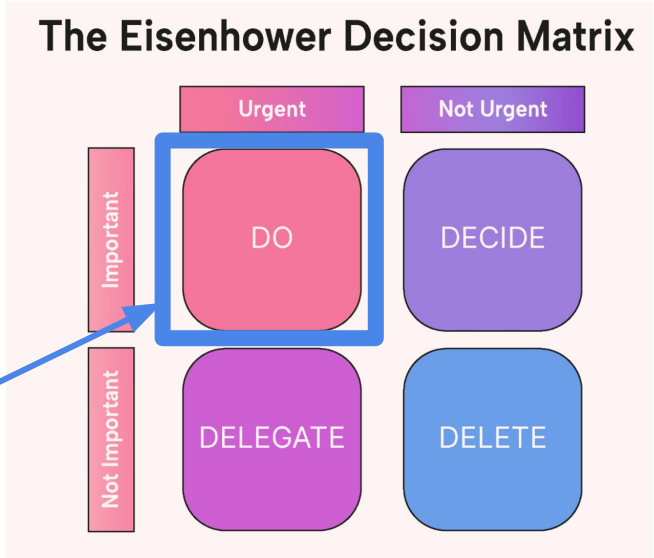
All of these are fantastic to do *up to a certain point*, but it is very easy for tasks like these (that feel productive) to **take time away from actually doing the work** that will get you accepted to these venues!



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Dealing with unstructured time

- Come up with an **ordered, priority-based list** of what needs to get done each day and each week
  - Callback to last week:
    - Important to figure out order of **task priority** from research meetings
    - Important to train yourself on better **time estimates** (so you can realistically block off appropriate amounts of time for each task)
- Then, timeblock!

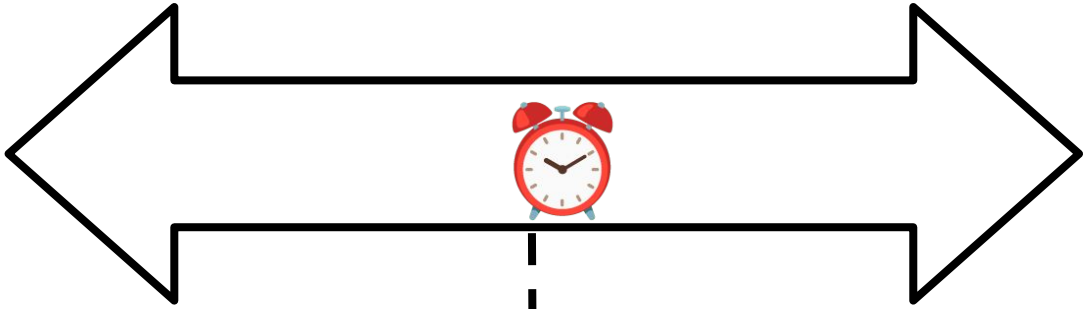
Dealing with unstructured time

- Timeblock, timeblock, timeblock!
  - Block out **long, contiguous timeblocks** (e.g. several hours when you're most productive – morning or afternoon) for specific research tasks

- How to track all of these things? Up to you
  - I use Google Calendar & Trello
  - Plenty of other resources (e.g. online or physical schedulers, Google Time Insights, or apps like Structured) to help with this

Dealing with unstructured time

- Two failure modes as an early PhD student



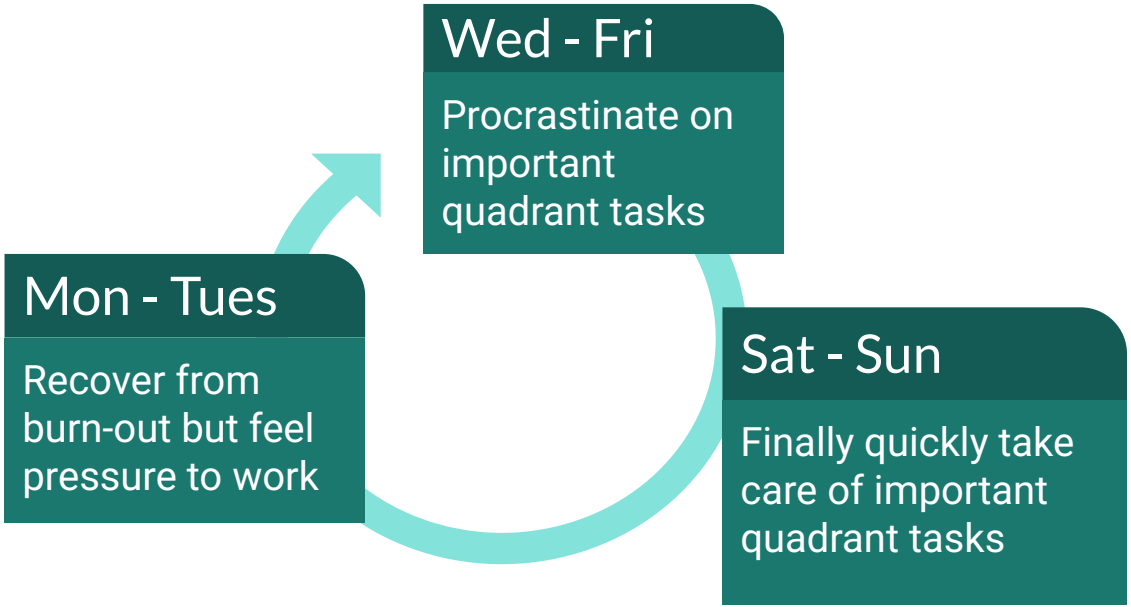
Trying out a new timeblocking method for one day, deciding it doesn't work, and moving on

- Habits take a long time to stick!

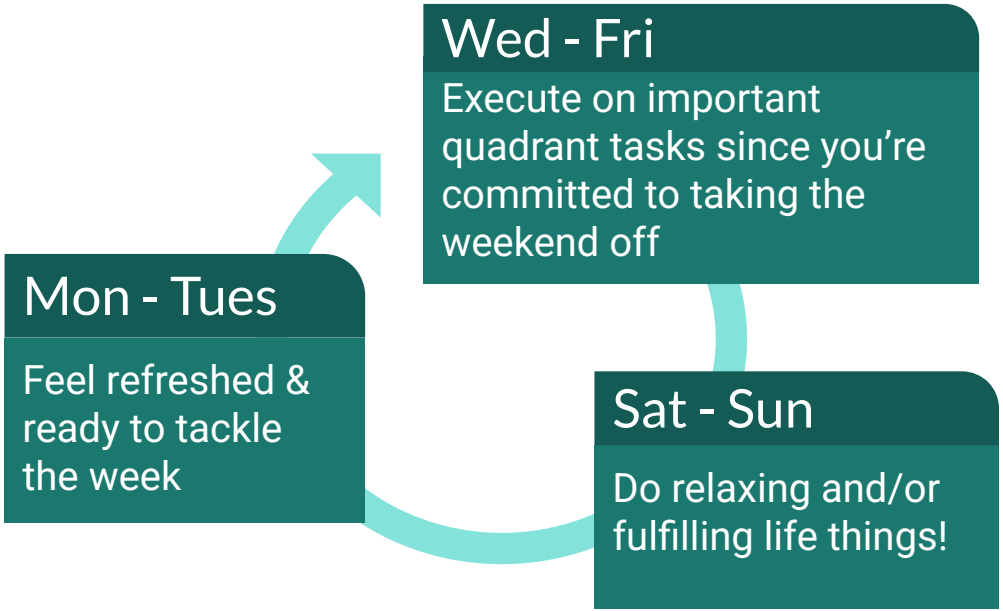
Spending a long time hunting for specialized or expensive software that may or may not end up working for you

- This time could be spent on research!

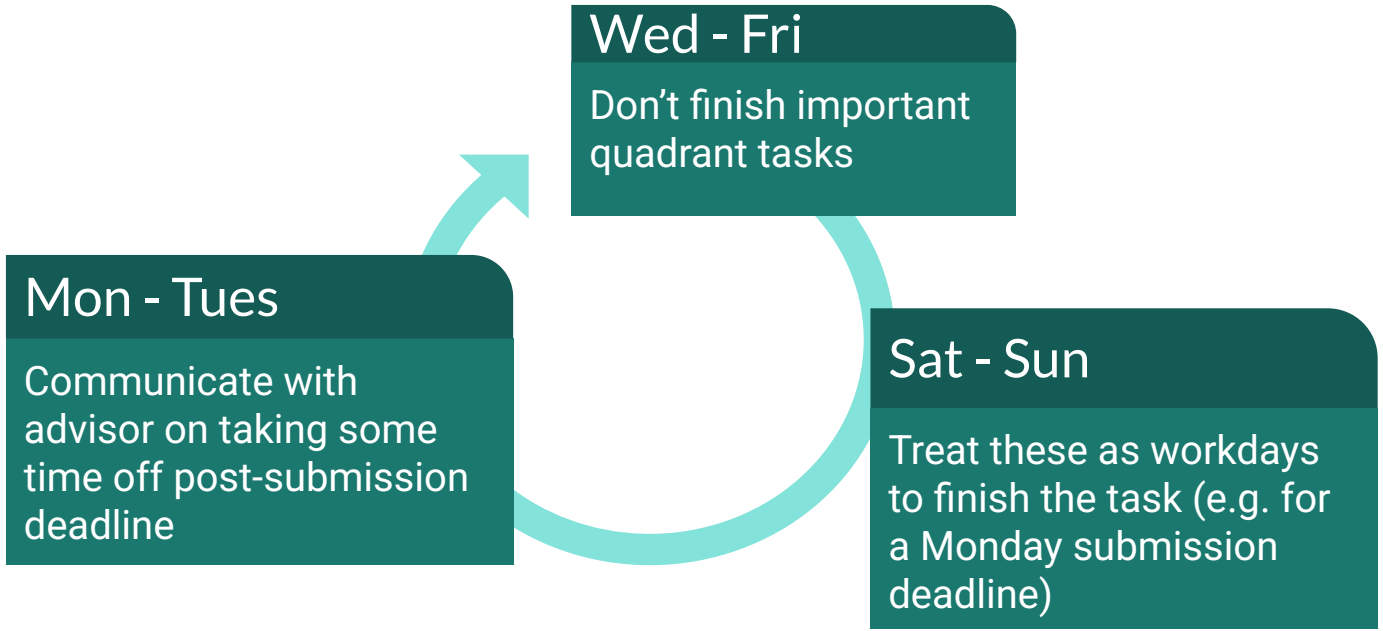
Make sure to also build in non-work time! A common failure mode:



One timeboxing-based solution



Another timeboxing-based (bandaid) solution



Split your work into smaller chunks & use ‘study with me’ videos!

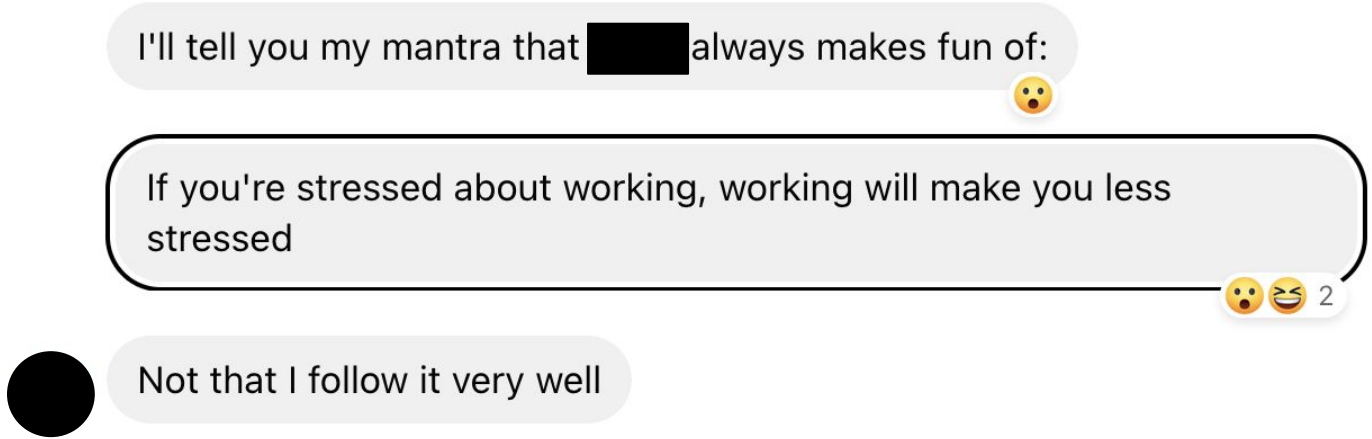
- Use techniques like Pomodoro to adhere to 25-minute blocks of time for specific sub-parts of high-priority tasks
- “Study with me” videos can help incentivize you to stay working, and some of them also adhere to a pomodoro clock

https://en.wikipedia.org/wiki/Pomodoro_Technique

Make your work environment as nice as possible!

- Surround yourself with friends/colleagues (by coming into the office) & hold each other accountable
- Keep an ergonomic setup (see if your advisor can help with e.g. monitor purchases!)
- Keep snacks, drinks, etc. nearby so when you're "in the zone" it's easy to stay in the zone!
    - If you're at home, cozy music and smells can help!

A mantra from another professor



Time Management

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  - E.g., which emails can you wait to respond to, which need to be sent *now*
  - When to say ‘no’ (e.g. for review requests: if you’ve already reviewed 4x more papers than you submitted this year, you’re busy on the job market, and/or the venue isn’t very relevant to your expertise)

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Fairly field-specific, but one rule of thumb is that you should review about as many papers as the number of reviewers who’ve reviewed your submissions (so there’s a roughly stable reviewing ecosystem)

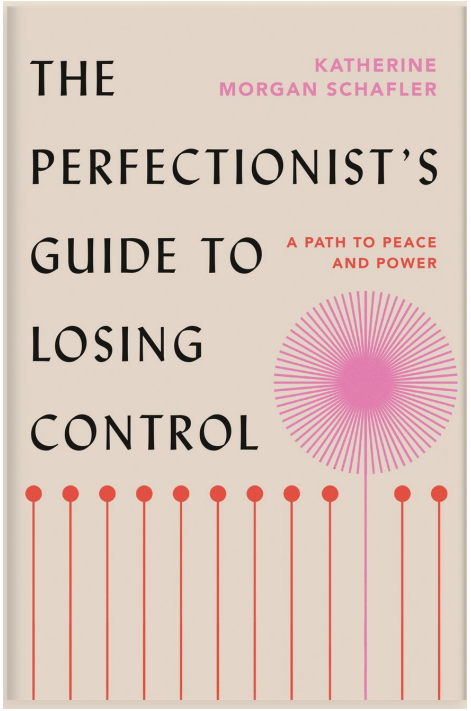
Stress management

- Mental health is physical health
- Your most creative research ideas will occur when you're least stressed & doing not-research things
- Talk to your advisor! We are here to help
  - This is especially the case for when you take longer time off (e.g. vacations during breaks)

Cornell Resources

- In Ithaca: https://mentalhealth.cornell.edu/get-support/ithaca
- At Cornell Tech: https://mentalhealth.cornell.edu/get-support/tech
- Cornell Health offers both **CAPS** (counseling, workshops) *and* **well-being** coaching
- Cornell's **Learning Strategies Center** has lots of resources: https://lsc.cornell.edu/managing-time-and-stress/

Book Recommendations from Sam Zhang!



https://www.perfectionistsguide.com/

https://www.hup.harvard.edu/books/9780674737709

Organizational Tools

- Organization comes in many forms!
  - Communication (Email, Slack, etc.)
  - Calendar, Scheduling
  - Tasks
  - Notetaking
  - Code, Terminal
  - Papers, Bookmarking
  - Other (browsers, search tools, AI chatbots)
- Maria Antoniak (fantastic former Cornell PhD student, incoming prof at CU Boulder!) describes her toolkit: https://maria-antoniak.github.io/2024/12/30/organizational-toolkit-2024.html

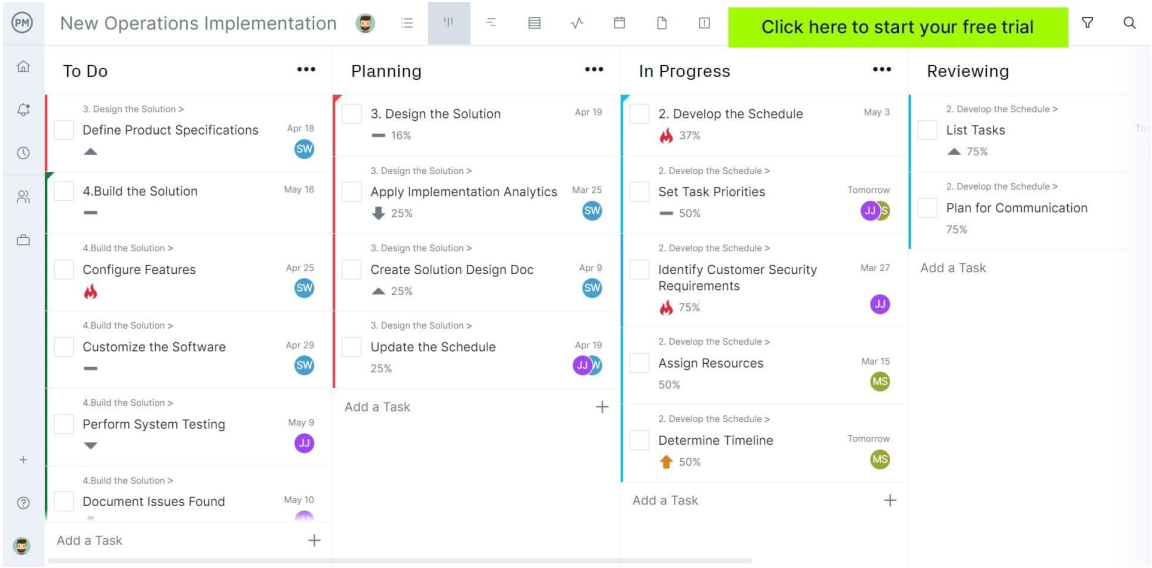
Decisive shortcuts can save time

- Making minor changes to my email settings (e.g. left swipe to archive) and Slack settings (e.g. setting notifications to only work hours) has saved me a lot of time & mental load!

- Can similarly do this kind of configuring with calendar color options, syncing with scheduling apps (e.g. Calendly or Trello), etc.

Task Organization

- Figure out free ways to emulate Jira kanban boards (Trello, Google Sheets, etc.)



https://www.projectmanager.com/blog/jira-kanban-board

Note-taking Organization

- It is important to keep notes in some sort of folder hierarchy (don't just rely on Google Drive searching)!
  - From last week: take notes at **meetings**!
  - Also, take notes on items that you do *as you do them* (**lab logs**, commenting your code, do **version control** of your writing)
  - Keep track of your own **latest research ideas** somewhere (e.g., a Google doc, Overleaf, etc.)

Figuring out your work workflow

- **Qualitative**: How to save documents and your notes?
  - E.g., use tools like Zotero, Mendeley, or Paperpile to save papers & make generating bibliographies easier when you eventually write a paper
- **Quantitative**: How to keep analyses reproducible?
  - E.g., use Git for version control & back up everything! See notes by UofT PhD student Kevin Bryan on virtual environments, Overleaf, etc.: https://kevinbryanecon.com/PhDTechStack2024.pdf

What about project workflows?

- So far we've focused on day-to-day activities

- It is important to think about overarching project organization & workflows as well!
  - Especially things you may not think of if it's the first time doing them: e.g., **IRB** and **pre-registration**, running pilot studies, etc.

Longer-term Planning

- Gantt charts can be useful for grant submissions

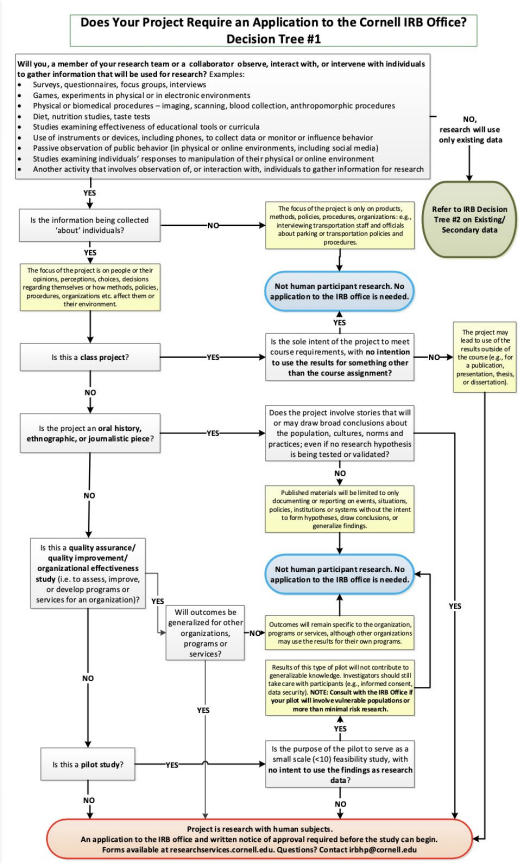
SIMPLE GANTT CHART by Vertex42.com
https://www.vertex42.com/ExcelTemplates/simple-gantt-chart.html

TASK	ASSIGNED TO	PROGRESS	START	END
Initiation				
Define goals	Gokce Aslan	50%	7/27/23	7/30/23
Conduct studies	Hayden Cook	60%	7/30/23	8/1/23
Establish comms	Jens Martensson	50%	8/1/23	8/5/23
Develop charter	Nuria Acevedo	25%	8/5/23	8/10/23
Set up team	Olivia Wilson		7/31/23	8/2/23
Planning and design				
Create schedule	Gokce Aslan	50%	8/1/23	8/5/23
Identify deliverables	Hayden Cook	50%	8/3/23	8/8/23
Develop budget	Jens Martensson		8/8/23	8/11/23
Define scope	Nuria Acevedo		8/8/23	8/10/23
Identify risks	Olivia Wilson		8/8/23	8/11/23
Execution				
Execute tasks	Gokce Aslan	50%	8/11/23	8/16/23
Monitor progress	Hayden Cook	60%	8/17/23	8/21/23
Manage resources	Jens Martensson	50%	8/22/23	8/27/23
Provide updates	Nuria Acevedo	25%	8/28/23	9/1/23

https://create.microsoft.com/en-us/template/simple-gantt-chart-4bf6b793-490f-4623-84ca-c9c6251a91fc

What is the IRB?

- The Institutional Review Board (IRB) is responsible for all human subjects research; you must take ethics training online through CITI
- Do you need IRB approval before starting a project?



https://researchservices.cornell.edu/sites/default/files/2019-05/IRB%20Decision%20Tree.pdf

What is the IRB?

- The Institutional Review Board (IRB) is responsible for all human subjects research; you must take ethics training online through CITI
- Do you need IRB approval before starting a project?
- **If you're not sure, you can email them (or just fill out the IRB form on https://rass.cornell.edu/ anyways – it's a useful exercise in understanding what materials you should pull together before you run a study, and better safe than sorry!)**

What do you need to send the IRB?

- Project summary
- Participant recruitment
- Intervention details
- Informed consent
- Risks & benefits to human subjects
- Privacy & confidentiality
- Data storage
- Additional documents (e.g. interview protocol)
- etc.

https://researchservices.cornell.edu/compliance/human-research

What do you need to send the IRB?

Ask your advisor / labmates for help – we likely have templates for many of these questions!

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What does the IRB do?

- Someone is assigned to review your submission (and may kick it back for updates, which you can then complete in the RASS portal as well), and if you're doing things ethically, you should either get exempt or approved status!
- Tip: If you're in a time crunch because you're applying for a grant and want to say that an IRB has approved your project, there is a specific category that you can apply for ("Prescreening") which will give you an IRB number, that you'd then flesh out once you've gotten the grant

https://researchservices.cornell.edu/compliance/human-research

After IRB approval

- You can ethically collect data for your project!

- How much data do you collect (n = ?), what analyses do you run, what's your hypothesis, etc.?
  - → Preregistration!

Eating behaviors

Fattening Fasting: Hungry Grocery Shoppers Buy More Calories, Not More Food

Preordering School Lunch Encourages Better Food Choices by Children

Super Bowls: Serving Bowl Size and Food Consumption

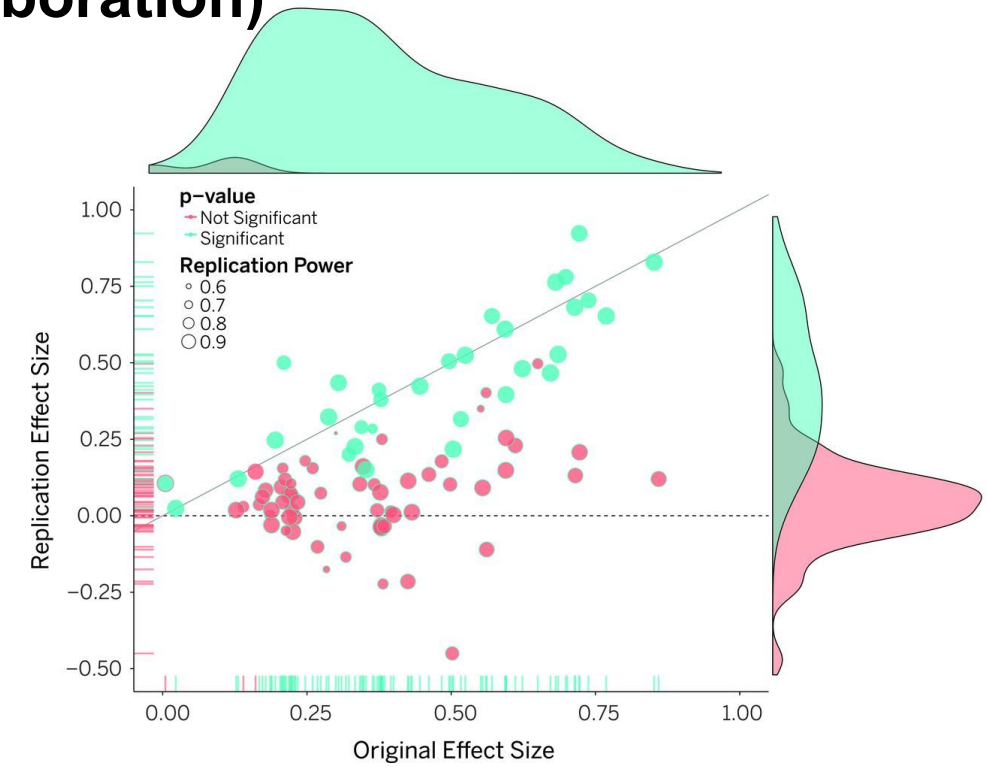
Eating behaviors: P-hacked

Even if you've never heard of Wansink, you're probably familiar with his ideas. His studies, **cited more than 20,000 times**, are about how our environment shapes how we think about food, and what we end up consuming. He's one of the reasons Big Food companies started offering smaller snack packaging, in 100 calorie portions. He once led the USDA committee on dietary guidelines and influenced public policy. He helped Google and the US Army implement programs to encourage healthy eating.

According to **BuzzFeed's Lee**, who obtained Wansink's emails, instead of testing a hypothesis and reporting on whatever findings he came to, Wansink often encouraged his underlings to crunch data in ways that would yield more interesting or desirable results.

https://www.vox.com/science-and-health/2018/9/19/17879102/brian-wansink-cornell-food-brand-lab-retractions-jama

Estimating the reproducibility of psychological science (Open Science Collaboration)



https://www.science.org/doi/full/10.1126/science.aac4716

P-hacking

"Perhaps the worst fallacy is the kind of self-deception for which psychologist Uri Simonsohn of the University of Pennsylvania and his colleagues have popularized the term *P*-hacking; it is also known as data-dredging, snooping, fishing, significance-chasing and double-dipping. 'P-hacking,' says Simonsohn, 'is trying multiple things until you get the desired result' — even unconsciously. It may be the first statistical term to rate a definition in the online Urban Dictionary, where the usage examples are telling: 'That finding seems to have been obtained through *p*-hacking, the authors dropped one of the conditions so that the overall *p*-value would be less than .05,' and 'She is a *p*-hacker, she always monitors data while it is being collected.'"

- *Regina Nuzzo*

https://www.nature.com/articles/506150a

P-hacking's family

Preregistering the study and documenting a final analysis plan avoids several pitfalls associated with the recent replication crisis: questionable research practices (John et al., 2012), HARKing -- hypothesizing after results are known (Kerr, 1998), gardens of forking paths (Gelman and Loken, 2014), and p-hacking (Schuemie et al., 2018).

- *Mike Powell, Allison Koenecke, et al.*

https://www.frontiersin.org/articles/10.3389/fphar.2021.700776/full#B65

Only interesting results get published

"For any given research area, one cannot tell how many studies have been conducted but never reported. The extreme view of the "file drawer problem" is that journals are filled with the 5% of the studies that show Type I errors, while the file drawers are filled with the 95% of the studies that show nonsignificant results."

- *Robert Rosenthal*

https://www.walmart.com/ip/Filing-Cabinet-18-W-3-Drawer-Organizer-File-Black/20470615

https://psycnet.apa.org/record/1979-27602-001

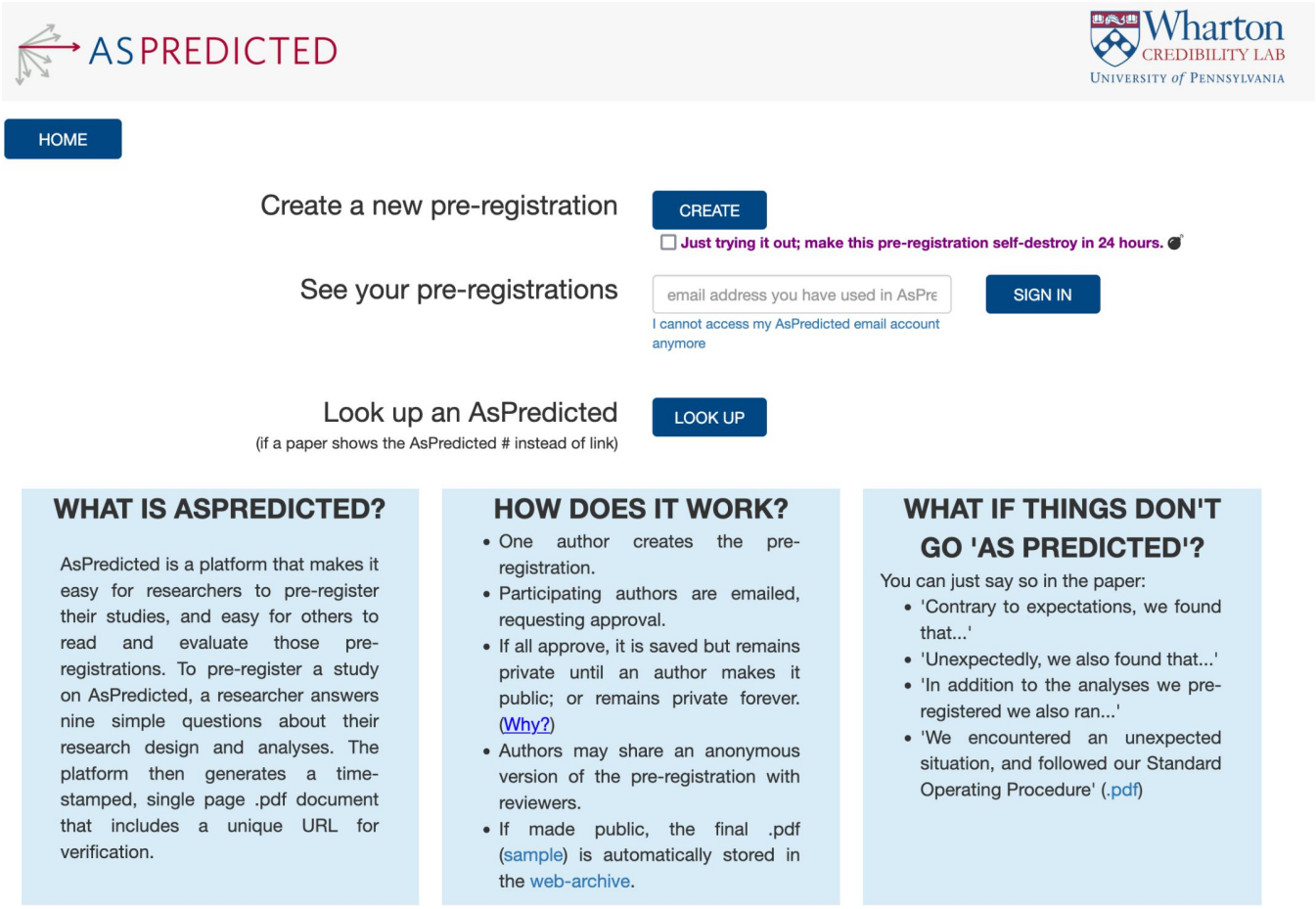
What happens when publishing $p < 0.05$

> One implication is that about 1 in 20 "significant" findings is likely to be a fluke. In practice, the number may be far larger, as scientists often don't publish papers that fail to find a significant result. So, published research is likely to overrepresent the flukey 5 percent. And if the flukey 5 percent are especially interesting, perhaps because of their novel and unexpected findings, then media coverage may exaggerate this overrepresentation even further.
>
> - *Tania Lombrozo*

https://www.npr.org/sections/13.7/2013/02/25/172779912/science-a-relationship-you-may-not-understand

Preregister your hypotheses!

- We can avoid p-hacking by being open about our science!
- Open access to **data** (if legal and ethical): GitHub, OSF
- **Preregistering** analyses and hypotheses (e.g. researchers might use AsPredicted.org or OSF)
  - **Pre-establish what analysis you'll run, how many times you'll run it, etc. so we know you aren't cherry picking results**
  - **Always report the findings from your preregistered analyses, even if they're null results!**



https://aspredicted.org/

Make sure everything you do in the project is reproducible!

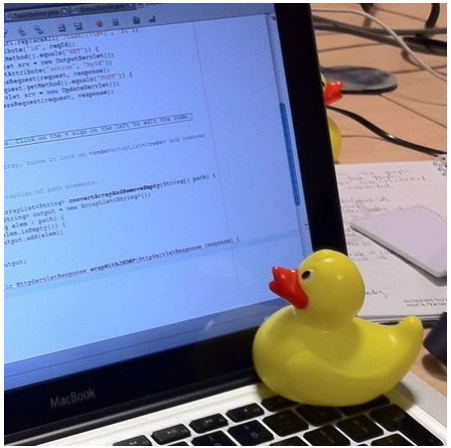
- Ask your advisor about best-practices guides to follow
  - E.g., for more data-centric work, see the Gentzkow & Shapiro guide https://web.stanford.edu/~gentzkow/research/CodeAndData.pdf
  - E.g. from HRDAG, Principled Data Processing
  - This includes both organizational tips, and reproducibility notes (e.g. remember to set seeds when you randomize!)

Ownership of Work

- Academia is one of the few places where you can produce extremely high-impact work (published research, cited by the press, etc.) *without* built-in fact-checking
  - Reviewers will read your paper, but often won't go through your code line-by-line for bugs
  - Correctness of work is **on you**, but you can make sure your workflow helps you!

Workflows can help with correctness

- **Standardized workflows can** *help you help yourself* double check your work. Examples:
  - Commenting your code so you can figure out what you were doing months ago
  - Coding test cases
  - Having one code file that automates all paper figure outputs
- You can (and should!) talk to your peers to make sure your code logic is airtight (see also: rubber ducking), do pair programming, or ask for code reviews!



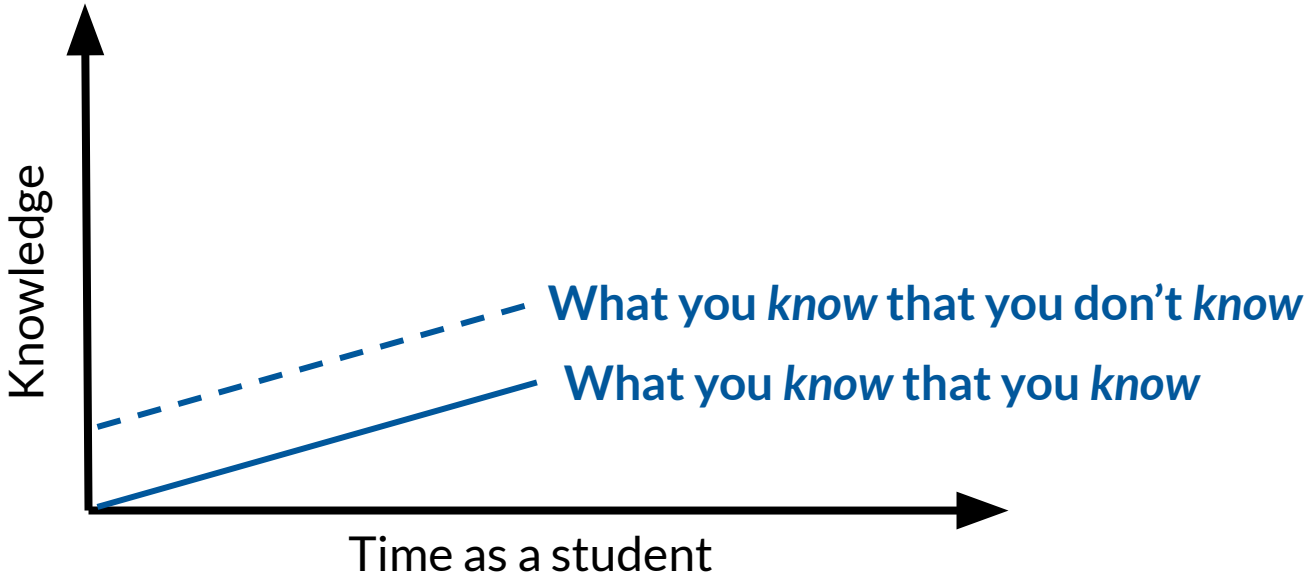
https://en.wikipedia.org/wiki/Rubber_duck_debugging

HW: identify organizational methods to incorporate, and start incorporating them consistently

Reading Papers

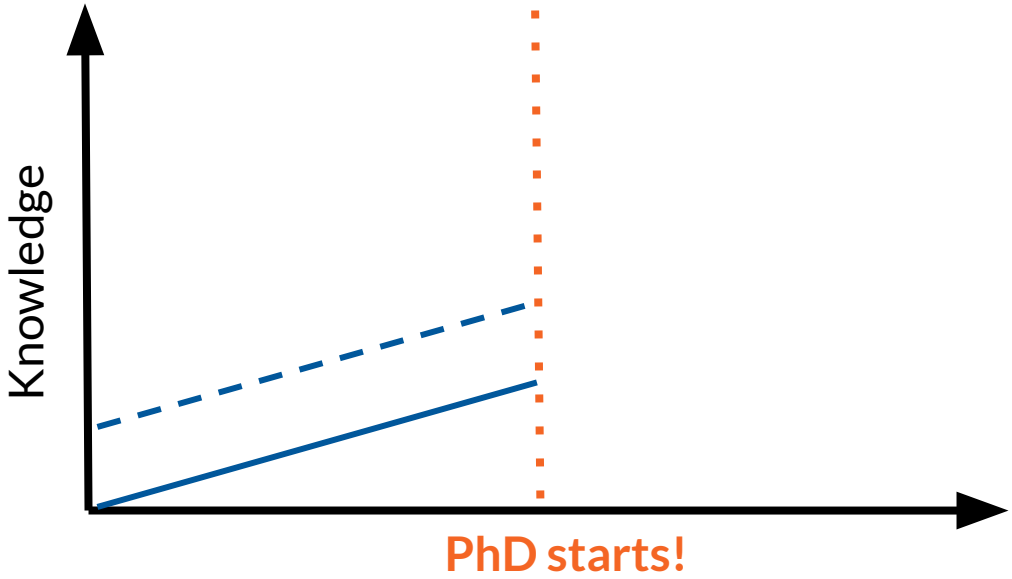
What does imposter syndrome have to do with reading papers?

Pre-PhD, you learn about the knowledge in the world based on courses. What you don't know is scoped out in syllabi!

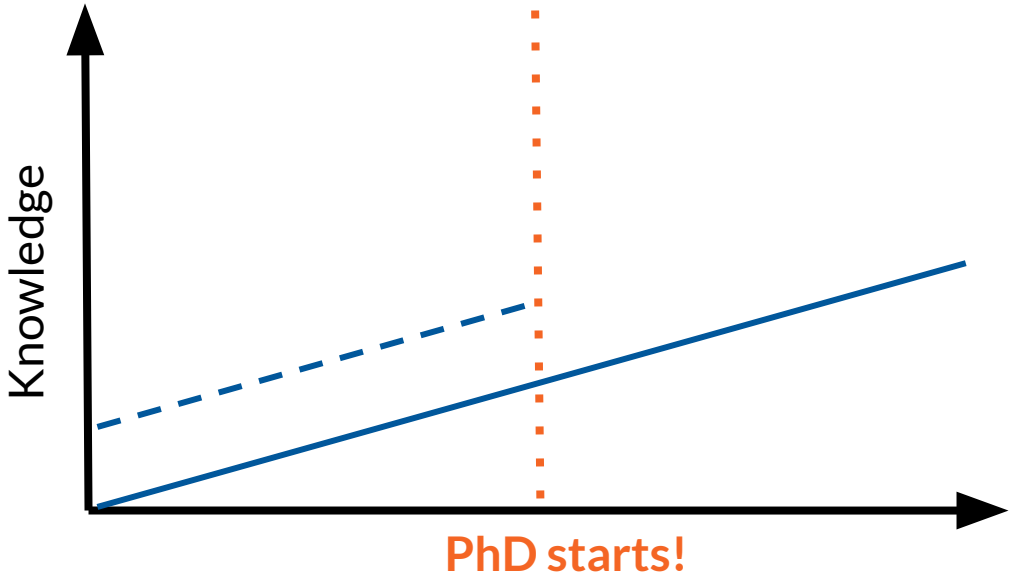


What does imposter syndrome have to do with reading papers?

Then you start your PhD…



What does imposter syndrome have to do with reading papers?



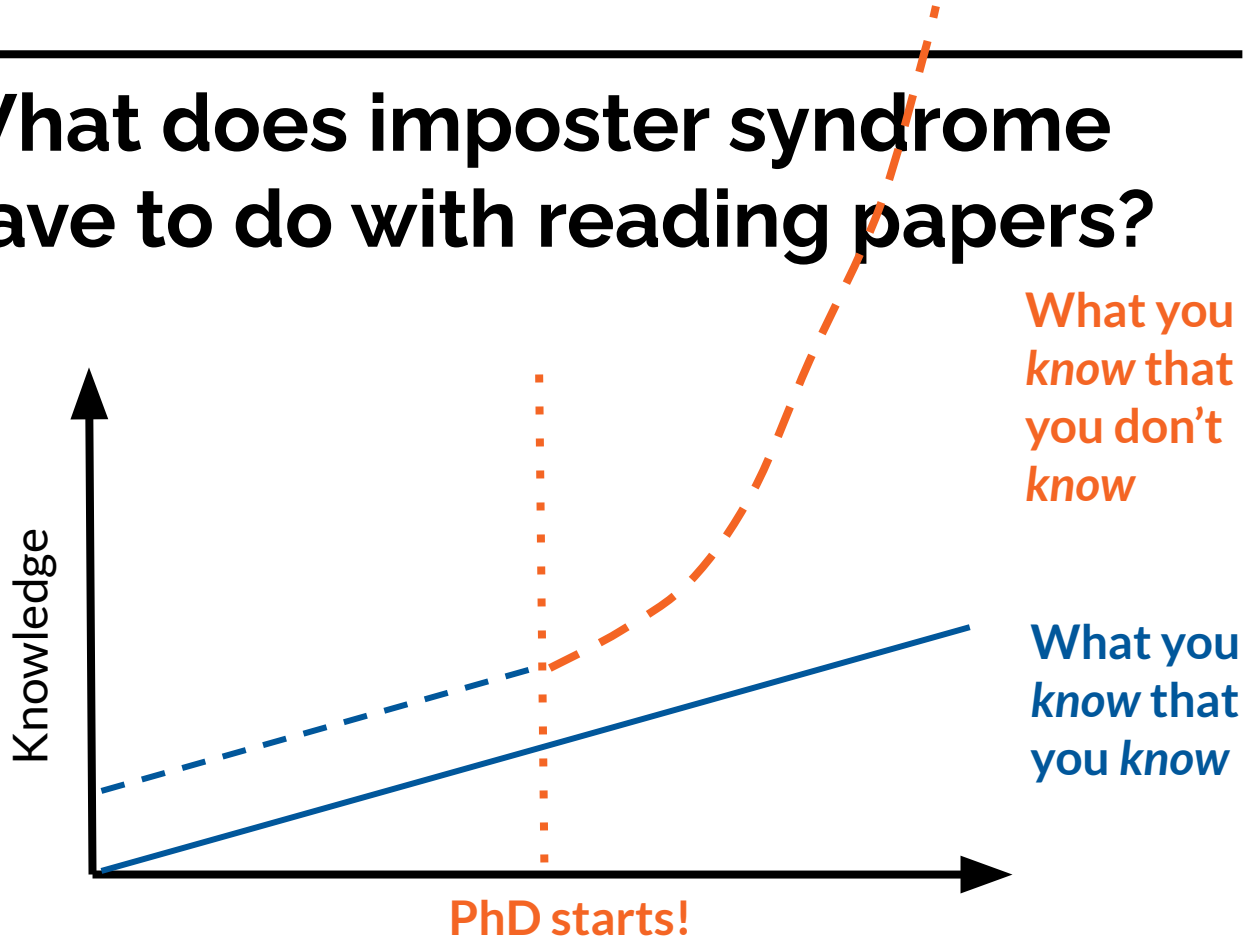
What you *know* that you don't *know*

What you *know* that you *know*

You learn so much more knowledge during a PhD!

What does imposter syndrome have to do with reading papers?

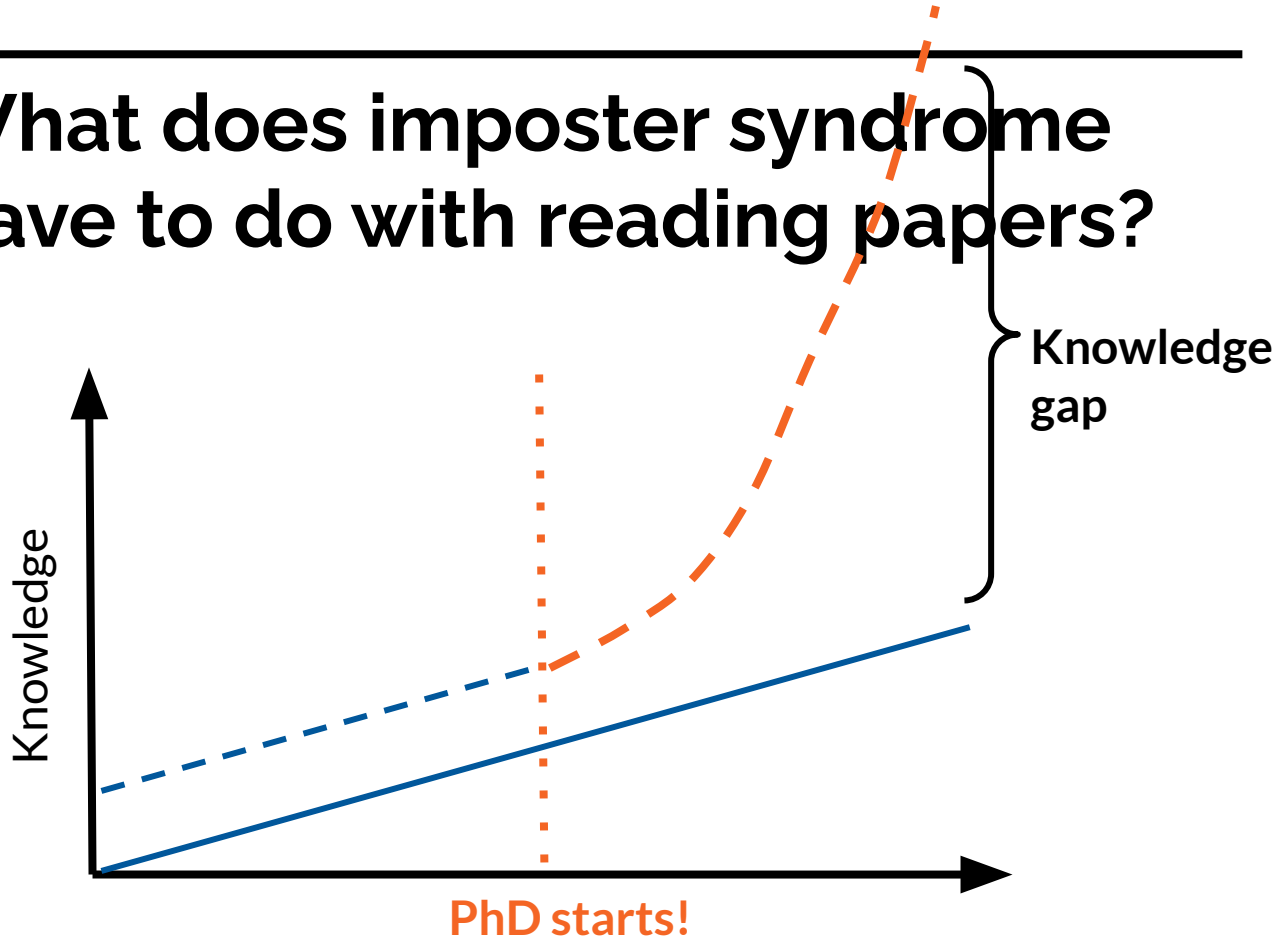
But, the more papers you read, the more you realize there's *so much* that you don't know!



What does imposter syndrome have to do with reading papers?

This gap is what leads to imposter syndrome!

Important to remember that you are *still learning!*



Credit to Prof. Margot Gerritsen for this theory!

Reading across domains

As interdisciplinary scholars, it's important to know what's going on across relevant domains! (In this medical journal example, calculus)

A Mathematical Model for the Determination of Total Area Under Glucose Tolerance and Other Metabolic Curves

MARY M. TAI, MS, EDD

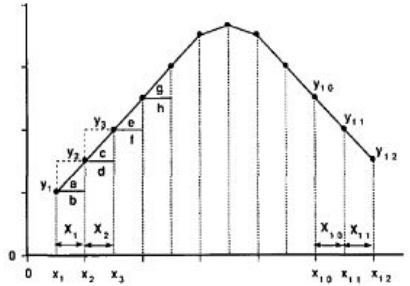


Figure 1—*Total area under the curve is the sum of individual areas of triangles a, c, e, and g and rectangles b, d, f, and h.*

https://diabetesjournals.org/care/article/17/2/152/17985/A-Mathematical-Model-for-the-Determination-of

Doing Literature Reviews

- **Step 1:** figuring out what papers to read
- **Step 2:** skimming many seemingly-related papers
- **Step 3:** deeply reading a subset of most-related papers
- **Step 4:** synthesizing what you read (most likely by writing!)

Choosing papers to read

- Generally, aim for “reputable papers”... but how to identify them?
- For a given paper, citation count varies widely by field
  - Massive #s in health/CS, much lower in stats/sociology
- What about looking at *where* the paper is published?

Impact Factors

Nature's IF in 2017:

$$\mathrm{IF}_{2017} = \frac{\mathrm{Citations}_{2017}}{\mathrm{Publications}_{2016} + \mathrm{Publications}_{2015}} = \frac{74090}{880 + 902} = 41.577$$

https://en.wikipedia.org/wiki/Impact_factor

Impact Factors aren't everything!

+ Researchers in developing countries may not be publishing in venues we mention for myriad reasons (cost, accessibility, …)

https://en.wikipedia.org/wiki/Impact_factor

Choosing papers to read

- As information scientists, you'll often need to read **across disciplines**, and will need to know what relevant venues and standards are for different disciplines
  - "Feed" yourselves with good papers!

- You'll also need to learn how to read papers that **look very different** by discipline!

CS conferences (on average, more popular than journals)

Rank	Conference Details	Impact Score
1	**Computer Vision and Pattern Recognition** 18-06-2023 - 22-06-2023 - **Vancouver**	63.10
2	**Neural Information Processing Systems** 12-12-2023 - 14-12-2023 - **New Orleans**	42.30
3	**International Conference on Computer Vision** 11-10-2021 - 11-10-2021 - **Montreal**	40.60
4	**European Conference on Computer Vision** 24-10-2022 - 28-10-2022 - **Tel Aviv**	33.20
5	**International Conference on Machine Learning** 17-07-2022 - 23-07-2022 - **Baltimore**	32.40
6	**AAAI Conference on Artificial Intelligence** 07-02-2023 - 14-02-2023 - **Washington DC**	32.10
7	**International Conference on Learning Representations** 01-05-2023 - 05-05-2023 - **Kigali**	31.80
8	**Meeting of the Association for Computational Linguistics** 22-05-2022 - 27-05-2022 - **Dublin**	26.80
9	**Empirical Methods in Natural Language Processing** 07-12-2022 - 11-12-2022 - **Abu Dhabi**	23.10
10	**International Joint Conference on Artificial Intelligence** 23-07-2022 - 29-07-2022 - **Vienna**	19.20

https://research.com/conference-rankings/computer-science

Econ “T5”

A single publication in one of the big five—*The American Economic Review*, *Econometrica*, the *Journal of Political Economy*, the *Quarterly Journal of Economics*, and the *Review of Economic Studies*—is sometimes the difference between getting tenure and restarting a career elsewhere.

https://www.aeaweb.org/research/charts/publishing-promotion-economics-top-five

Public health

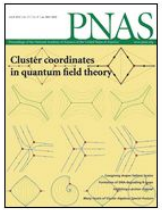
https://guides.library.cornell.edu/public-health/journals

General Interest Journals

- For example:
  - Nature (and its subsidiaries, e.g. Nature Communications)
  - Science
  - PNAS
  - Annual Reviews
  - …

- They will also often publish “special issues” (a collection focused on a specific topic) – check websites for details

General Interest Journals



July 8, 2014; 111 (27)

Many Facets of Cluster Algebras

April 29, 2014; 111 (17)

The Modern View of Domestication

March 25, 2014; 111 (Supplement 1)

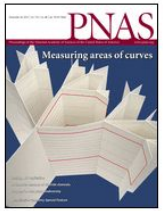
Quantum Turbulence

March 4, 2014; 111 (9)

Global Climate Impacts: A Cross-Sector, Multi-Model Assessment

December 24, 2013; 110 (52)

Livestock and Global Change



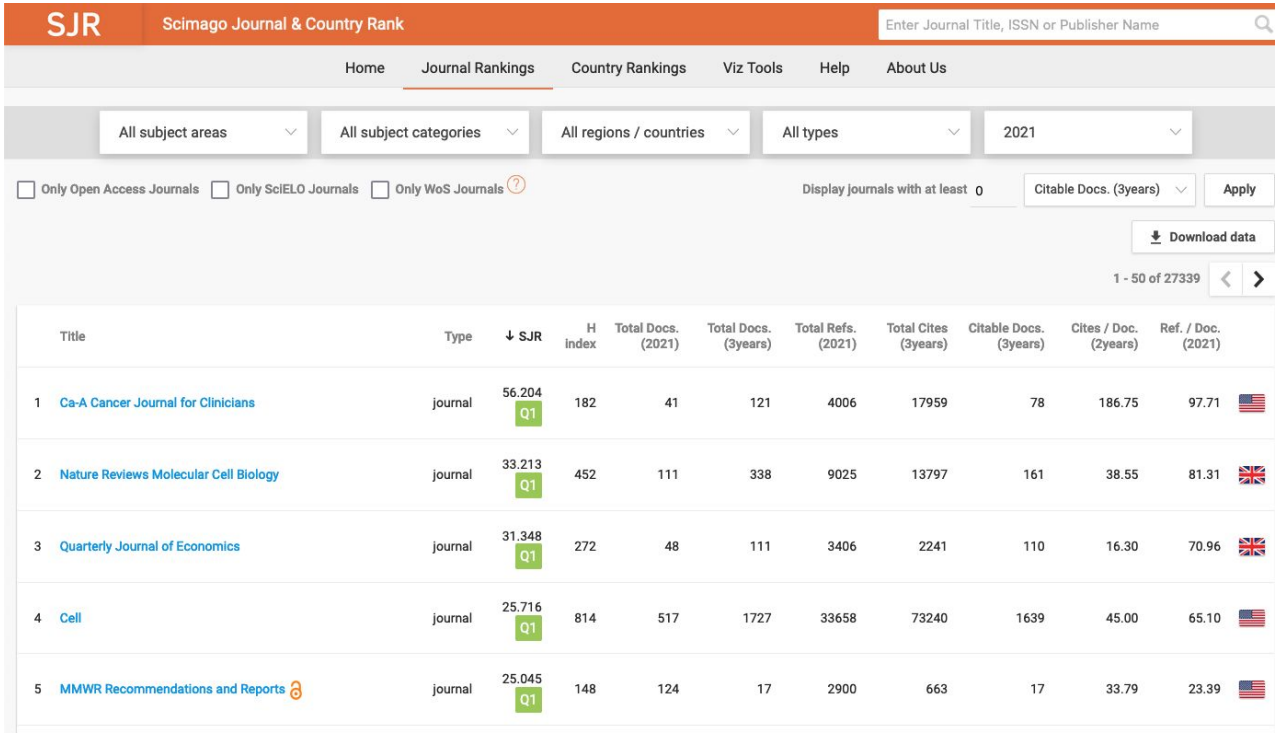
November 26, 2013; 110 (48)

Quantitative Geometry

- They will also often publish “special issues” (a collection focused on a specific topic) – check websites for details

https://www.pnas.org/about/special-features/continued

Journal Ratings (esp. health)



	Title	Type	SJR	H index	Total Docs. (2021)	Total Docs. (3years)	Total Refs. (2021)	Total Cites (3years)	Citable Docs. (3years)	Cites / Doc. (2years)	Ref. / Doc. (2021)
1	Ca-A Cancer Journal for Clinicians	journal	56.204 Q1	182	41	121	4006	17959	78	186.75	97.71
2	Nature Reviews Molecular Cell Biology	journal	33.213 Q1	452	111	338	9025	13797	161	38.55	81.31
3	Quarterly Journal of Economics	journal	31.348 Q1	272	48	111	3406	2241	110	16.30	70.96
4	Cell	journal	25.716 Q1	814	517	1727	33658	73240	1639	45.00	65.10
5	MMWR Recommendations and Reports	journal	25.045 Q1	148	124	17	2900	663	17	33.79	23.39

https://www.scimagojr.com/journalrank.php

What about workshop papers?

- *Workshops* at CS conferences might be where authors presented initial work; trace to find them later published at other venues

- Reminder: if you can only find papers on arXiv / medrXiv / OSF, they may not have been peer-reviewed yet!

Finding papers through people

- In addition to finding venues through academic idols (per Lecture 2), you can check specific prolific academics' websites and:
  - Check out their other papers
  - Check their collaborators' papers
- Popular papers in the field may change a lot, but authors will vary less in their writing. Find them & read them!

Doing Literature Reviews

Key to doing this quickly & effectively is knowing how different types of papers are structured

- **Step 1:** figuring out what papers to read
- **Step 2:** skimming many seemingly-related papers
- **Step 3:** deeply reading a subset of most-related papers
- **Step 4:** synthesizing what you read (most likely by writing!)

Different paper venues look different!

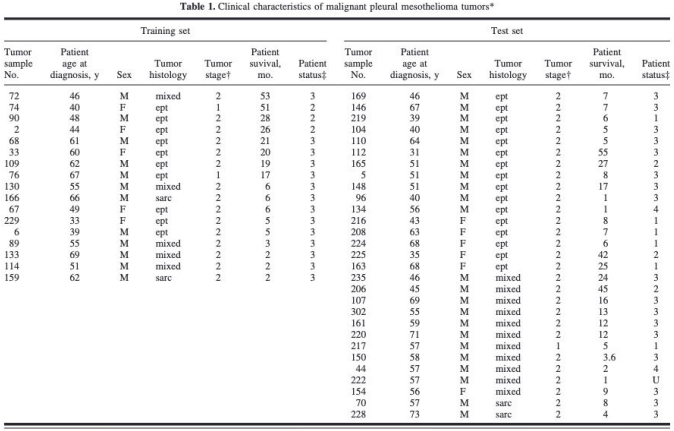


Table 1. Clinical characteristics of malignant pleural mesothelioma tumors*

Training set							Test set						
Tumor sample No.	Patient age at diagnosis, y	Sex	Tumor histology	Tumor stage†	Patient suvival, mo.	Patient status‡	Tumor sample No.	Patient age at diagnosis, y	Sex	Tumor histology	Tumor stage†	Patient survival, mo.	Patient status‡
72	46	M	mixed	2	53	3	169	46	M	ept	2	7	3
74	40	F	ept	1	51	2	146	67	M	ept	2	7	3
90	48	M	ept	2	28	2	219	39	M	ept	2	6	1
2	44	F	ept	2	26	2	104	40	M	ept	2	5	3
68	61	M	ept	2	21	3	110	64	M	ept	2	5	3
33	60	F	ept	2	20	3	112	31	M	ept	2	55	3
109	62	M	ept	2	19	3	165	51	M	ept	2	27	2
76	67	M	ept	1	17	3	5	51	M	ept	2	8	3
130	55	M	mixed	2	6	3	148	51	M	ept	2	17	3
166	66	M	sarc	2	6	3	96	40	M	ept	2	1	3
67	49	F	ept	2	6	3	134	56	M	ept	2	1	4
229	33	F	ept	2	5	3	216	43	F	ept	2	8	1
6	39	M	ept	2	5	3	208	63	F	ept	2	7	1
89	55	M	mixed	2	3	3	224	68	F	ept	2	6	1
133	69	M	mixed	2	2	3	225	35	F	ept	2	42	2
114	51	M	mixed	2	2	3	163	68	F	ept	2	25	1
159	62	M	sarc	2	2	3	235	46	M	mixed	2	24	3
							206	45	M	mixed	2	45	2
							107	69	M	mixed	2	16	3
							302	55	M	mixed	2	13	3
							161	59	M	mixed	2	12	3
							220	71	M	mixed	2	12	3
							217	57	M	mixed	1	5	1
							150	58	M	mixed	2	3.6	3
							44	57	M	mixed	2	2	4
							222	57	M	mixed	2	1	U
							154	56	F	mixed	2	9	3
							70	57	M	sarc	2	8	3
							228	73	M	sarc	2	4	3

- **Health**: ~6 pages, patient attribute table
- **ML**: ~6 pages, evaluation metrics table
- **Econ**: >40 pages, regression tables

https://www.jblumenstock.com/files/papers/jblumenstock_jnci03.pdf

Different paper venues look different!

Method	Uncertainty by labelers	Accuracy	Precision	Recall	F1	# Samples
Frequency-based	overall	0.706	0.633	0.762	0.692	1000
	not confident at all	0.521	0.419	0.646	0.508	376
	somewhat confident	0.598	0.543	0.690	0.608	892
	very confident	0.810	0.762	0.827	0.793	1732
Segment-based	overall	0.845	0.778	0.898	0.834	1000
	not confident at all	0.566	0.452	0.625	0.525	376
	somewhat confident	0.781	0.713	0.864	0.781	892
	very confident	0.901	0.865	0.920	0.892	1732

- ML: ~6 pages, evaluation metrics table

- **Econ**: >40 pages, regression tables

https://www.jblumenstock.com/files/papers/jblumenstock_2020_PLOSOne.pdf

Different paper venues look different!

TABLE 1—THE DEFAULT EFFECT ON PARTICIPATION AND CONTRIBUTIONS

	(1)	(2)	(3)	(4)
Panel A. Dependent variable = participates (non-zero contribution rate)				
Default in (= 1)	0.40	0.47	0.44	0.29
	(0.03)	(0.04)	(0.05)	(0.05)
Constant	0.28	0.01	0.27	0.57
	(0.02)	(0.01)	(0.04)	(0.04)
Sample	Complete	0% Match	25% Match	50% Match
Observations	936	315	312	309
R^2	0.161	0.304	0.190	0.105
Panel B. Dependent variable = contribution rate (percent of salary)				
Default in (= 1)	1.77	2.38	2.22	0.61
	(0.26)	(0.21)	(0.46)	(0.48)
Constant	2.70	0.03	2.61	5.54
	(0.20)	(0.03)	(0.35)	(0.39)
Sample	Complete	0% Match	25% match	50% match
Observations	936	315	312	309
R^2	0.046	0.293	0.071	0.005
Panel C. Dependent variable = total M-Pasandaz contributions (Afs)				
Default in (= 1)	2,426.40	2,244.30	2,996.73	2,052.39
	(750.24)	(656.96)	(1,335.00)	(1,567.93)
Constant	4,724.44	416.75	5,015.57	8,797.03
	(465.52)	(157.60)	(802.11)	(1,040.07)
Sample	Complete	0% match	25% match	50% match
Observations	949	319	316	314
R^2	0.011	0.036	0.016	0.005

- **Health**: ~6 pages, patient attribute table
- **ML**: ~6 pages, evaluation metrics table
- **Econ**: >40 pages, regression tables

https://www.jblumenstock.com/files/papers/bcg_2018_aer.pdf

Different paper venues look different!

- **Health**: ~6 pages, patient attribute table
  Often have a “structured abstract”

- **ML**: ~6 pages, evaluation metrics table
  In general interest journals, methods section comes at the end!
- **Econ**: >40 pages, regression tables
  Figures come at the end!

Tips for reading papers

Three-pass method from *Keshav 2007*

1. Title/Abstract/Intro, section headings, conclusions
2. Figures
3. “Virtually re-implement” the paper

http://ccr.sigcomm.org/online/files/p83-keshavA.pdf

Tips for reading papers

The key to both skimming and reading deeply!

Three-pass method* from *Keshav 2007

1. Title/Abstract/Intro, section headings, conclusions
2. Figures
3. “Virtually re-implement” the paper

http://ccr.sigcomm.org/online/files/p83-keshavA.pdf

Tips for reading papers

Three-pass method* from *Keshav 2007

1. Title/Abstract/Intro, section headings, conclusions
2. Figures
3. “Virtually re-implement” the paper

Necessary for a deeper understanding

http://ccr.sigcomm.org/online/files/p83-keshavA.pdf

The First Pass

*"The first pass is a **quick scan to get a bird's-eye view** of the paper. You can also decide whether you need to do any more passes. This pass should take about **five to ten minutes** and consists of the following steps:*

1. *Carefully read the title, abstract, and introduction*
2. *Read the section and sub-section headings, but ignore everything else*
3. *Read the conclusions*
4. *Glance over the references, mentally ticking off the ones you've already read*

"

Three-pass method from Keshav 2007 http://ccr.sigcomm.org/online/files/p83-keshavA.pdf

The Second Pass

*"...read the paper with **greater care, but ignore details** such as proofs. It helps to jot down the key points, or to make comments in the margins, as you read… **should take up to an hour**.*

1. *Look carefully at the figures, diagrams and other illustrations in the paper. Pay special attention to graphs…*
2. *Remember to mark relevant unread references for further reading (this is a good way to learn more about the background of the paper).*

"

Three-pass method from Keshav 2007 http://ccr.sigcomm.org/online/files/p83-keshavA.pdf

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1. *Look carefully at the figures, diagrams and other illustrations in the paper. Pay special attention to graphs…*
2. *Remember to mark relevant unread references for further reading (this is a good way to learn more about the background of the paper).*

"

If multiple high-quality papers are citing a key paper you haven't read, you should probably read it!

Three-pass method from Keshav 2007 http://ccr.sigcomm.org/online/files/p83-keshavA.pdf

The Third Pass

*"...attempt to **virtually re-implement the paper:** that is, making the same assumptions as the authors, re-create the work. By comparing this re-creation with the actual paper, you can easily identify not only a paper's innovations, but also its hidden failings and assumptions…*

*This pass can take about **four or five hours** for beginners. At the end of this pass, you should be able to reconstruct the entire structure of the paper from memory, as well as be able to identify its strong and weak points.*
"

Three-pass method from Keshav 2007 http://ccr.sigcomm.org/online/files/p83-keshavA.pdf

What you should know by the end of the first pass

The 5 C's from *Keshav 2007*

1. *Category*: What type of paper is this? A measurement paper? An analysis of an existing system? A description of a research prototype?

2. *Context*: Which other papers is it related to? Which theoretical bases were used to analyze the problem?

3. *Correctness*: Do the assumptions appear to be valid?

4. *Contributions*: What are the paper's main contributions?

5. *Clarity*: Is the paper well written?

http://ccr.sigcomm.org/online/files/p83-keshavA.pdf

Doing Literature Reviews

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- **Step 3:** deeply reading a subset of most-related papers
- **Step 4:** synthesizing what you read (most likely by writing!)

Getting the most out of reading papers

- Figure out what works best for you with reading / note-taking, e.g…
  - Printed & on-paper notes → transcribe to a Google doc?
  - iPad / computer notes in Adobe / apps → transcribe to Zotero?

Getting the most out of reading papers: writing

- Take notes on the 5 C's and other items that might be important for your research
- Synthesize the work you've read
  - Can you make connections between the different papers you've read?

Is reading hard?

Yes, but it's a skill! In the meantime, try to supplement your understanding of a paper with other mediums from the paper authors!

- Written
  - News articles
  - Blog posts
  - Bluesky/X threads
- Audio-Visual
  - Talks or summaries posted on Youtube

Is reading hard?

Yes, but it's a skill! In the meantime, try to supplement your understanding of a paper with other mediums from the paper authors!

- Written
  - News articles
  - Blog posts
  - Bluesky/X threads
- Audio-Visual
  - Talks or summaries posted on Youtube

Unrelatedly, if I'm not sure how to pronounce an academic's name, I look for videos of them introducing themselves at a talk!

In-class Exercise!

On Canvas, I've uploaded 6 papers, appearing in:

- An HCI conference
- A ML conference
- An economics journal
- A general interest journal
- A medical journal
- A generic-science journal

Identify which paper is which, and try taking a "first pass" through the papers with your partner! Comment on similarities and differences between venues.

Homework

1. Read *Keshav 2007* (3 pages, posted on Canvas)
2. Apply *Keshav 2007*'s three-pass reading method to a paper of your choice, and take notes on the 5 C's.

Paper Reviews

What is a review?

Maybe more like a lit review…

Comment

https://doi.org/10.1038/s41467-022-32413-x

To create serious movement on climate change, we must dispel the myth of indifference

Cynthia McPherson Frantz

Check for updates

Public underestimation of support for climate change policy is striking. Social science research tells us this is bad news, but also tells us what to do about it. Climate change communication must hammer home the overwhelming support for action.

Seventy eight percent of Americans—including 66% of Republicans—are concerned about climate change, a number that has increased dramatically in the last 3 years[1]. Climate models and recent anomalous weather events such as a "once in a millennium" heat dome in the Northwest[2] and unprecedented wildfires in California[3] make clear that urgent action is needed. Numerous policy[4] and technological[5] solutions stand waiting to be implemented, yet the United States remains in a state of fragmented and incremental progress, led primarily by NGOs, local governments, and pockets of the private sector. Why?

Gregg Sparkman and colleagues[6] help illuminate this question by providing a crucial and thorough evaluation of public perception of climate policy support. Through an analysis of a large-N representative panel survey of US adults (from Ipsos eNation Omnibus), they demonstrate that virtually all segments of the general public dramatically underestimate the extent to which other people are concerned about climate change, as well as their support for policies to address it. Sparkman et al. explore a number of plausible (and non-mutually exclusive) explanations for this misperception, all of which warrant further study. Regardless of its cause, the magnitude of inaccuracy Sparkman et al. document is staggering: the number of Democrats who support climate policies such as a carbon tax or the Green New Deal is double the number that people estimate, and Republican support is much higher than otherwise thought.

Public misperception matters, because what we think other people think strongly impacts our own behavior[7]. Entertain this thought experiment: Imagine you are in a meeting with nine strangers, and you are quite hot. A window could be opened to let in cool air from outside. You look around the room and it seems that only 3 other people look like they might be warm. The rest seem to be quite comfortable. Would you suggest opening the window? You might, but you might not. Now imagine that instead you estimate that 6 other people look like they may be uncomfortably warm. Does that make you more likely to act? Now imagine that those 6 other people are talking about how warm it is. Suddenly it becomes obvious that you should get up and open the window.

Sparkman et al. discuss one explanation for why others influence us—namely, that social norms (what we believe others are doing and thinking) are important and powerful determinants of behavior[8]. We tend to do what we see others do. Currently, worrying about climate change is something people are largely doing in the privacy of their own minds. Based on this new data and the recent work of others on pluralistic ignorance[9], it becomes clear that we are locked in a self-fulfilling spiral of silence. People believe that others are not concerned—or that they are even skeptical of climate change—which encourages them to refrain from discussing it with others. The lack of public discussion reinforces the norm that others are not concerned and hampers the likelihood of collective organization to address climate change. Misconceptions take on an even larger significance when we remember that those in positions of power are people too. Any misconceptions on their part influence how they behave, i.e., their willingness to support aggressive policies, make bold statements in their public outreach, or create "balanced" media coverage of climate change.

Another key determinant of human behavior with extensive empirical support is efficacy, or our belief that we can do something. If you believe the window in our thought experiment above is glued shut, you won't even get out of your chair. Note that the window might not be glued shut! Your erroneous belief will stop you from trying anyway. Because climate change is a collective problem, taking action hinges on not just what we believe we personally can do, but on what we think others will do[7]. This is known as collective efficacy. Sparkman et al.'s data provide a siren call: Americans believe a minority are willing to support climate policies, when in fact a supermajority do. While not addressed directly by their data, the implications are clear: Creating a sense of collective efficacy, that *we* can respond effectively to climate change, is all but impossible under this level of misperception. The good news is that Sparkman et al. find that support for climate policy is, in fact, overwhelming; social norms can be changed, collective efficacy can be built, and these developments can occur quickly. It simply requires that people be exposed, over and over from sources they trust or identify with, to the fact that they are not alone in their concern and their willingness to take action[10].

There are many scalable ways that this could happen. Individuals, faith organizations, non-profits, and businesses can make public statements via traditional means (such as letters to the editor) as well as through more modern ones (through the use of online forums such as Twitter and Instagram). Those with the opportunity to speak to wider audiences (celebrities and other public figures; elected officials; directors of parks, zoos and museums; educators) can not only speak directly to many, but can also encourage the wider public to speak up. The empowering truth is that every public statement counts, and the more diverse the voices, the more effective the message will be. Further, when every member of society has the chance to see "someone like them" speaking in favor of action on climate change, powerholders have a stronger mandate from which to work, and activists have a

https://www.nature.com/articles/s41467-022-32413-x

Maybe more like an argument…

PNAS · LETTER

Testing the potential benefits of small fields for biocontrol needs a landscape perspective

Lorenzo Marini[a,1], Péter Batáry[b], and Teja Tscharntke[c]

Rosenheim et al. (1) present an interesting study testing the effect of focal field size on pest suppression across multiple cropping systems. The main conclusion of their study is "The idea that larger field sizes consistently disrupt natural pest control services is without foundation in either the theoretical or empirical record." We argue that this general conclusion should be considered with more caution. First, Rosenheim et al. focused on the local effect of field size comparing pest density in small vs. large fields irrespective of the configuration of the surrounding landscape. However, most of the empirical research providing evidence for a positive effect of reducing field size on pest suppression or natural-enemy enhancement has tested the effect of landscape configuration (e.g., gradients in field size or edge density in the surrounding), usually adopting specific designs to control for differences in landscape composition (2–5). Decreasing field size at the landscape scale is expected to have more pervasive effects than the size of the focal field alone. Fine-grained landscapes usually have a higher density of margins and higher microhabitat diversity, resulting in improved landscape complementation and in the facilitation of spill-over of organisms between crop and noncrop patches (6). This scale dependence was not fully acknowledged in the study, generating confusion between the reported lack of a local effect and the potential—but not investigated—effect of reducing mean field size at larger spatial scales.

Second, the data used (1) come from unplanned field observations by farm staff, consultants, and pest control advisors who quantified pest pressures without any sampling design. As pest suppression is often context dependent, many potential biotic and abiotic drivers of success or failure exist (7, 8). Without a robust design, observational landscape studies usually suffer from nonindependence of composition and configuration metrics and reduced ranges in landscape gradients (2). Although the authors tried to statistically control for some potential predictors besides focal field size, the lack of landscape configuration metrics makes it difficult to test field size at multiple spatial scales. Moreover, effects of field size at both the local (9) and landscape scales (3) were often detected in interaction with other landscape metrics, something that was not fully explored in the study by Rosenheim et al.

We agree with Rosenheim et al. that there is a great variability in how pest control relates to local and landscape management (4, 10) and that it is too simplistic to assume that reducing local field size would automatically result in improved pest suppression. Nevertheless, robust evaluations of the effect of crop field size need a landscape perspective with well-designed predictors in local and landscape predictors that allow testing both main effects and interactions (Fig. 1). So far, published empirical evidence suggests that landscape-level reductions in field size are a still underestimated way to enhance biodiversity (2), pollination (3), and pest control alike (9), without compromising crop yields (5). We hope that this discussion will stimulate more hypothesis-driven research on this very important—but still underinvestigated— research area.

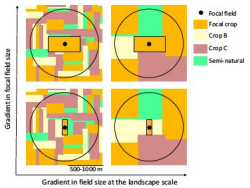

Fig. 1. Example of sampling design to test the effect of field size at both the local and landscape scales. This design requires one to sample multiple landscapes with different configurations controlling for other landscape variables such as cover of seminatural habitats or crop diversity. This design will allow to effectively test both main effects and interactions between local and landscape predictors. We expect that the gradient at the landscape scale is more important for biocontrol than the gradient in focal field size.

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Author contributions: L.M., P.B., and T.T. designed research; and wrote the paper.

The authors declare no competing interest.

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Published December 27, 2022.

1. J. A. Rosenheim *et al.*, Increasing crop field size does not consistently exacerbate insect pest problems. *Proc. Natl. Acad. Sci. U.S.A.* **119**, e2208831119 (2022).
2. C. Sirami *et al.*, Increasing crop heterogeneity enhances multitrophic diversity across agricultural regions. *Proc. Natl. Acad. Sci. U.S.A.* **116**, 16442–16447 (2019).
3. E. A. Martin *et al.*, The interplay of landscape composition and configuration: New pathways to manage functional biodiversity and agroecosystem services across Europe. *Ecol. Lett.* **22**, 1083–1094 (2019).
4. A. Bosem Baillod, T. Tscharntke, T. Clough, P. Batáry, Landscape-scale interactions of spatial and temporal cropland heterogeneity drive biological control of cereal aphids. *J. Appl. Ecol.* **54**, 1804–1813 (2017).
5. P. Batáry *et al.*, The former iron curtain still drives biodiversity–profit trade-offs in German agriculture. *Nat. Ecol. Evol.* **1**, 1279–1284 (2017).

https://www.pnas.org/doi/epdf/10.1073/pnas.2218447120

PNAS · LETTER

Reply to Marini et al.: Insect spill-over is a double-edged sword in agriculture

Jay A. Rosenheim[a,1], Emma Cluff[a], Mia K. Lippey[a], Bodil N. Cass[a], Daniel Paredes[b], Soroush Parsa[c], Daniel S. Karp[d], and Rebecca Chaplin-Kramer[e]

Agroecologists have long suggested that increasing the size of agricultural fields, one of the main features of agricultural industrialization, worsens problems with insect pests (1, 2). Recent research has examined the effects of mean field size across landscapes, suggesting highly context-dependent outcomes (3, 4). But, despite elegant theory describing insect responses to the size of a particular focal crop field (5, 6), there is a surprising deficit of empirical research addressing the question: should farmers plant smaller fields to improve pest control? Our study addressed this knowledge deficit. We found that smaller fields are sometimes associated with ameliorated pest impacts (the conventional expectation), but more often are associated with unchanged or worsened pest impacts (7).

As Marini et al. (8) note, our work examined the size of a single focal field and not the mean size of fields in the surrounding landscape. Generating knowledge about focal field size is important, as individual farmers can adjust the size of their fields, but often cannot implement changes across landscapes. Nevertheless, we agree that landscape context is important and that additional research is needed to explore landscape-scale mean field size, as well as many other factors that could modulate focal field size effects. We further concur with Marini et al. (8) that fine-grained landscapes may result in "improved landscape complementation and the facilitation of spill-over of organisms between crop and non-crop patches." This does not necessarily imply improved pest control, however. Enhanced resource complementation and spill-over of organisms are double-edged swords: they may augment not only predators but also pests.

We respectfully disagree with Marini et al. (8) that our results failed to consider landscape-level factors sufficiently. Our statistical models controlled for landscape context by i) including key landscape-level covariates (natural habitat remnants; amount of the focal crop); ii) fitting spatial smoothers that corrected for regional differences in pest abundance; and iii) including fixed effects for ranch identity. Controlling for ranch identity isolates the effect of focal field size while holding constant features of the broader surrounding landscape. Furthermore, if any landscape effects leaked through our attempts at statistical control, we would expect them to make our conclusions more conservative. Smaller fields are most often found in landscapes with other small fields; thus, if small-field landscapes enhance pest control, it should only have made it more likely that we would observe lower pest densities in smaller focal fields. We did not observe that.

The sampling design proposed by Marini et al. (8) has clear efficiencies for parsing potential interactions of local and landscape field size. Maximizing efficiency is important when researchers must gather data with their own hands. However, the ecoinformatics methods that we used capitalize on farmer-generated data, decentralizing the labor-intensive task of data collection and yielding larger (ca 100×) data sets that are likely to include a broad array of landscape contexts (9). Such datasets could readily be analyzed to examine interactions of local- and landscape-scale factors. We agree with Marini et al. (8) that such work is worth pursuing.

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Author contributions: J.A.R., M.K.L., B.N.C., D.P., S.P., D.S.K., and R.C.-K. designed research; J.A.R., E.C., M.K.L., B.N.C., D.P., S.P., D.S.K., and R.C.-K. performed research; and J.A.R. and D.S.K. wrote the paper.

The authors declare no competing interest.

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Maybe to decide on paper acceptance/rejection

Small contribution on transfer in MT for underresearched African languages

ICLR 2021 Conference Paper3267 AnonReviewer4

28 Oct 2020 (modified: 30 Nov 2020) ICLR 2021 Conference Paper3267 Official Review Readers: Everyone

Review:

This paper motivates clearly the need for research in machine translation of underresourced (and thus underresearched) African languages, and proposes ways to aid the training of MT systems using data from related languages. The main contribution is that two ways (and a random baseline) to select a langauge to add to the training of an MT model are evaluated (one based on linguists' clustering, one based on probabilities assigned through a language model of the target langauge) on pairs drawn from a set of three langauges, choosing new langauges from a set of 13.

Strengths/what I loved:

- The paper performs a very clearly motivated and well set-up experiment with appropriate analysis.
- I loved to see a focus on datasets for underresourced langauges and the paper's repeated focus on whether or not previous work was reproducible and how this paper tries to be as reproducible as possible (even if that is not possible with Bible data for legal reasons).
- I always like to see attention to detail and explanation as i the "Due to the multi-task nature..."-paragraph on page 7!
- The observation that adding weakly related languages *hurt* was very interesting to see, thank you for including it!

Criticism/weaknesses:

- While the overall setup (choose a language to add using either linguistic knowledge or automatic metrics) is solid and interesting, the setup and contributions promised on pg. 2 make it sound especially like you are proposing a way to infer linguistic relations between languages ("a method for aggregating languages based on [a number of features]").
- The related work section is rather unfocused: it might help to make clear at the beginning of each paragraph how all the work cited in that paragraph relates to the present paper (e.g., "There are a number of papers on translation of African langauges, covering English to Setswana (Abbott & Martinus (2018); Transformers on the Autshumato dataset (Groenewald & Fourie (2009) reaching BLEU 33.53), English to Afrikaans..." or something along these lines. The division between the first and the second paragraph isn't quite clear to me and I am not sure what the third paragraph is on: transfer in MT?
- Not only training, but unfortunately also validation is performed only on Bible data and only on a cluster of 3 languages. The first is an issue because while I understand that Bibles are the easiest data to come by and that for training one takes what one can get, any results that stay within this Bible domain are unlikely to transfer well to real-world settings, making me doubt the practical use of the paper as-is. The latter exacerbates the issue, because essentially as a paper motivated by poor MT performance or nonexistence on many African languages it fails to convince me that it is indeed solving that task and not one of Bible translation, and as a paper that talks about linguistic features in general, the extremely narrow focus on a cluster of literally only 3 languages seems unnecessarily restrictive if we are already settling for Bible data. (Note that I think it is fair to say that these limitations were necessary because individual experiments are too costly to run more than this very barebones proof-of-concept, but that claim should be made and substantiated.)
- Experiments are not tested for statistical significance or otherwise qualified through a sense of the variance that's inherent in these results. This is especially unfortunate for the "Random" baseline, which given the small set of candidates will produce rather unreliable estimates when only tested on 1 sample (please let me know if I misunderstood!)

Questions:

- Point 2 of the Motivation section claims that language barriers aid the spread of misinformation... that's not quite clear to me: shouldn't any barrier impede information flow and in fact easy machine translation help the spread? Unless it is correcting counter-information that you want to advocate for...
- Page 5 says you used an English tokenizer for all languages. Just to clarify: this is tokenizing before applying BPE, right? Did you try to go without tokenization at all, i.e., using BPE as a standalone tokenizer?
- What is the point of the last two paragraphs of section 5, i.e., talking about clustering? From my understanding you don't use that for your experiments, as there you only choose the 1 nearest neighbor—and if you did want to build larger clusters, the greedy approach sketched in here would be a needlessly restricted choice: there are a number of better agglomerative clustering algorithms out there!

https://openreview.net/forum?id=Q5ZxoD2LqcI&noteId=0MSuxulQxz3

Why peer reviewing?

- In peer-reviewed venues, the goal is to be able to say: academic peers reviewed this work and thought it was a valid argument, contributes something novel to the body of knowledge, and was well-written

A paper review process

1. You submit the paper
2. ~3 academics are assigned to read and review your paper (“reviewers”)
3. Someone (e.g. an area chair, “AC”) writes a “metareview” summarizing these reviews
4. Your paper is either accepted or rejected based on the metareview

A paper review process

Some papers might be “desk rejected” for being irrelevant or formatted incorrectly

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A paper review process

Sometimes there aren't enough experts in the topic, and there are fewer reviewers!

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Sometimes the venue will have an opportunity for authors to *rebut* the points made by reviewers, who can update their reviews

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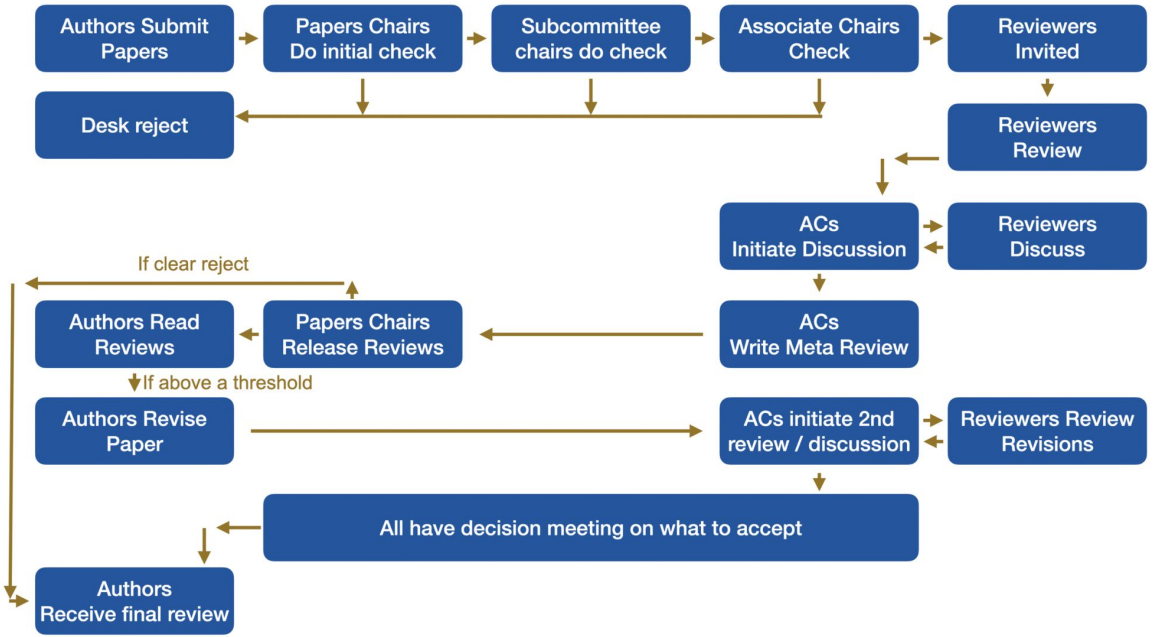
4. Your paper is either accepted or rejected based on the metareview

Some venues allow decisions like “conditional accept” (if you make changes suggested by reviewers), or “revise and resubmit”

One paper review process



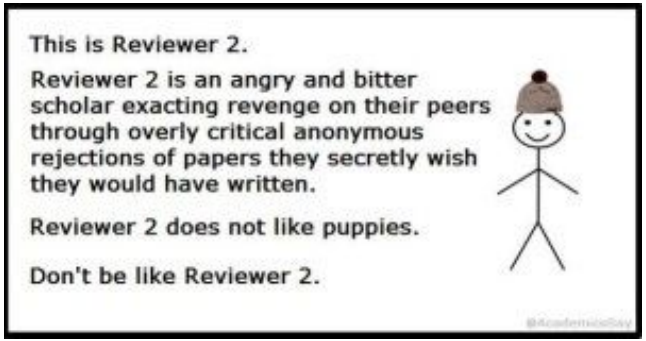
https://chi2024.acm.org/submission-guides/papers-review-process/

Blindedness

- “Single-blinded”: reviewers know who authors are, authors don’t know who reviewers are (common for journals)
- “Double-blinded”: authors don’t know who reviewers are, reviewers don’t know who authors are (common for conferences)
- Metareviewers/editors know who reviewers are, ~always
- Avoid getting desk-rejected if double-blinded: make sure to remove identifying information about yourself, your affiliation, personal github links, etc.
    - https://anonymous.4open.science/ for anonymizing repos

Glossary of terms

- R&R = “revise and resubmit”
  - The process by which you update the paper per reviewer suggestions, and then resubmit to the same venue
- R2 = “reviewer 2”



http://relationsinternational.com/dont-be-reviewer-2/

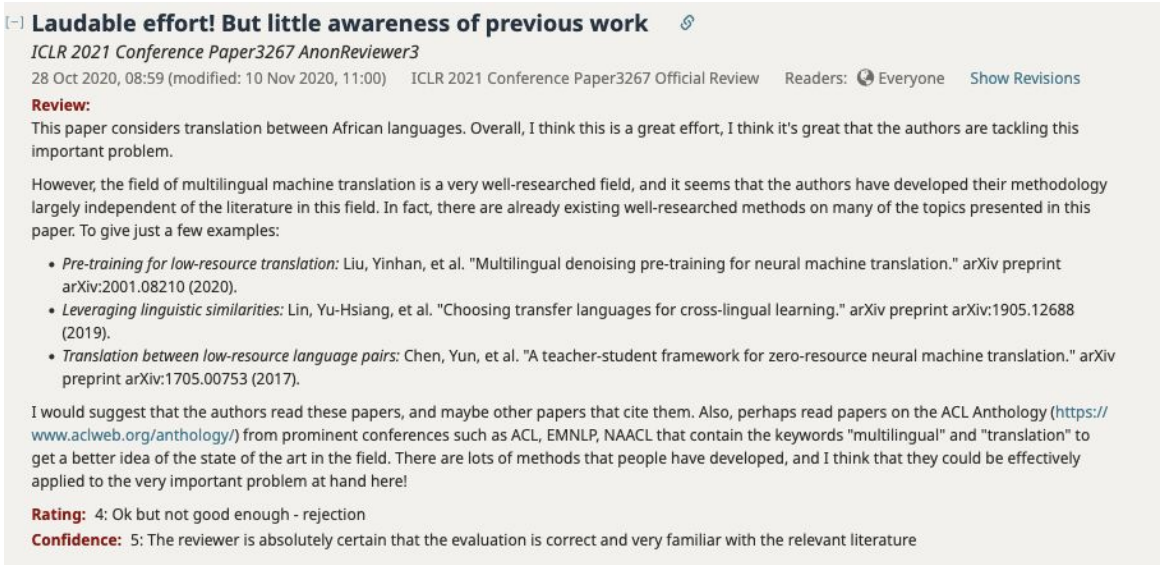
How does the reviewing process happen?

- Entirely through a venue's chosen system
  - For journals, this is usually specific to the journal (e.g. a *Nature* or *Science* portal)
  - For conferences, this is often done on one of several separate review systems (***OpenReview, HotCrp, EasyChair***)
    - Useful to make accounts on these!

On the reviewing site, reviewers can see the submission pdf, and post their reviews

this is a random submission with reviews publicly available on OpenReview – no shade to the authors!

For ICLR, the reviewer posts a title for their review, their review, a rating #, and a confidence #



Laudable effort! But little awareness of previous work

ICLR 2021 Conference Paper3267 AnonReviewer3

28 Oct 2020, 08:59 (modified: 10 Nov 2020, 11:00) ICLR 2021 Conference Paper3267 Official Review Readers: Everyone Show Revisions

Review:

This paper considers translation between African languages. Overall, I think this is a great effort, I think it's great that the authors are tackling this important problem.

However, the field of multilingual machine translation is a very well-researched field, and it seems that the authors have developed their methodology largely independent of the literature in this field. In fact, there are already existing well-researched methods on many of the topics presented in this paper. To give just a few examples:

- *Pre-training for low-resource translation:* Liu, Yinhan, et al. "Multilingual denoising pre-training for neural machine translation." arXiv preprint arXiv:2001.08210 (2020).
- *Leveraging linguistic similarities:* Lin, Yu-Hsiang, et al. "Choosing transfer languages for cross-lingual learning." arXiv preprint arXiv:1905.12688 (2019).
- *Translation between low-resource language pairs:* Chen, Yun, et al. "A teacher-student framework for zero-resource neural machine translation." arXiv preprint arXiv:1705.00753 (2017).

I would suggest that the authors read these papers, and maybe other papers that cite them. Also, perhaps read papers on the ACL Anthology (https://www.aclweb.org/anthology/) from prominent conferences such as ACL, EMNLP, NAACL that contain the keywords "multilingual" and "translation" to get a better idea of the state of the art in the field. There are lots of methods that people have developed, and I think that they could be effectively applied to the very important problem at hand here!

Rating: 4: Ok but not good enough - rejection

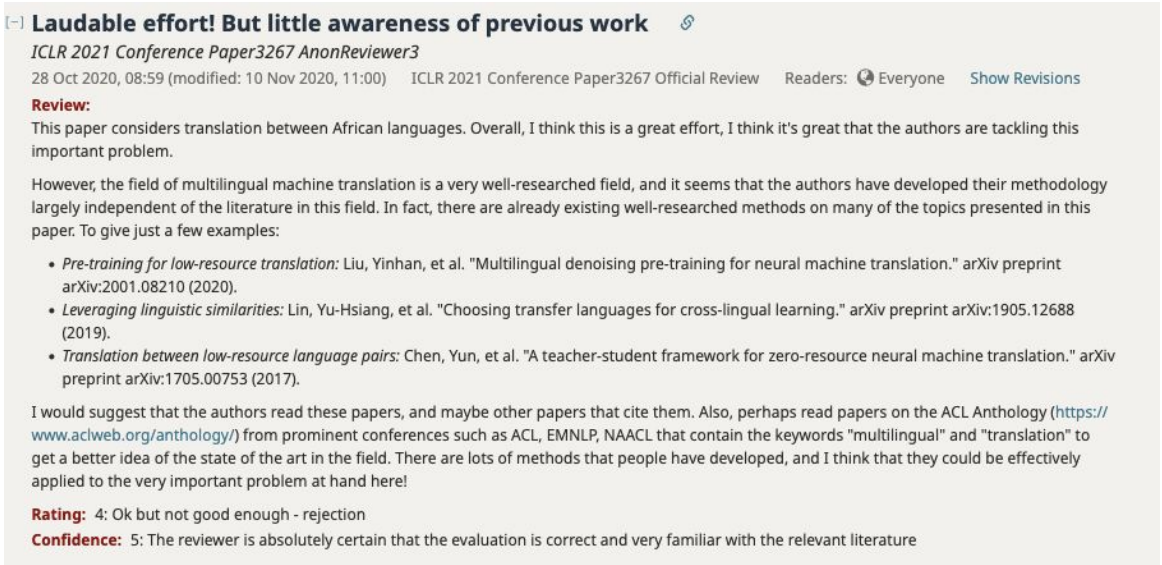
Confidence: 5: The reviewer is absolutely certain that the evaluation is correct and very familiar with the relevant literature

https://openreview.net/forum?id=Q5ZxoD2LqcI

On the reviewing site, reviewers can see the submission pdf, and post their reviews

this is a random submission with reviews publicly available on OpenReview – no shade to the authors!

As a reviewer, you can't see other reviews before you post your review (but you can see other reviews after you submit your review)



Laudable effort! But little awareness of previous work

ICLR 2021 Conference Paper3267 AnonReviewer3

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Rating: 4: Ok but not good enough - rejection

Confidence: 5: The reviewer is absolutely certain that the evaluation is correct and very familiar with the relevant literature

https://openreview.net/forum?id=Q5ZxoD2LqcI

Authors can then rebut each posted review (for this particular venue)

state of the art in the African context

ICLR 2021 Conference Paper3267 Authors

22 Nov 2020, 16:09 ICLR 2021 Conference Paper3267 Official Comment Readers: Everyone Show Revisions

Comment:

Dear Reviewer 3, thank you for your positive feedback and constructive suggestions.

We are going to study these papers in depth and see how to apply them in our case. We have focused more on the state of the art in the African context in our paper, i.e. exploiting the multilingual aspect (and the associated similarity) encountered in the context of African languages to improve the performance of machine translation systems; something that has long been unexploited by existing research. From a replicability point of view, XLM was the best choice to conduct our experiments.

https://openreview.net/forum?id=Q5ZxoD2LqcI

Reviewers can respond again, and afterwards the metareviewer summarizes into a final decision

Final Decision

ICLR 2021 Conference Program Chairs

07 Jan 2021, 12:26 (modified: 12 Jan 2021, 12:53) ICLR 2021 Conference Paper3267 Decision Readers: Everyone Show Revisions

Decision: Reject

Comment:

This paper introduces a new multilingual parallel Bible dataset for African languages, a new method for determining similarities between languages, and a collection of experiments to evaluate methods for choosing an additional language based on (a) similarity and (b) language history to include in a multilingual MT system. Results show that strategic inclusion of an additional language can substantially improve BLEU. Reviewers universally agree that progress on MT for African languages is a very important goal. However, reviewers pointed to several major concerns with the current draft: (1) lack of sufficient detail for replicating experiments, (2) missing analysis to interpret why experimental gains are so large, and (3) missing discussion and comparison with already existing methods in multilingual MT (e.g. multilingual training for low-resource languages). I agree with reviewers that the paper is not ready for acceptance in its current form, but encourage re-submission, possibly at an NLP conference.

https://openreview.net/forum?id=Q5ZxoD2LqcI

Who are reviewers?

- Generally, people “in” that intellectual domain
  - E.g., people who have previously published at that conference venue
  - Or, people who have written journal papers on similar topics

Reviewing papers

- Who do do you think tend to be the harshest reviewers?

  A. PhD students
  B. Untenured Professors
  C. Tenured Professors

Reviewing papers

- Who do do you think tend to be the harshest reviewers?

  A. PhD students

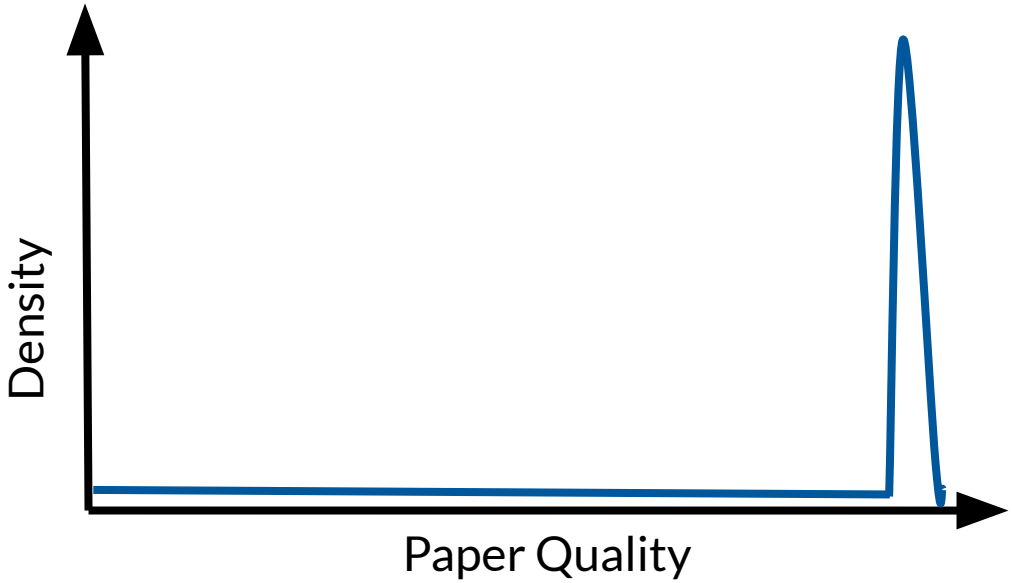
  B. Untenured Professors

  C. Tenured Professors

Why?

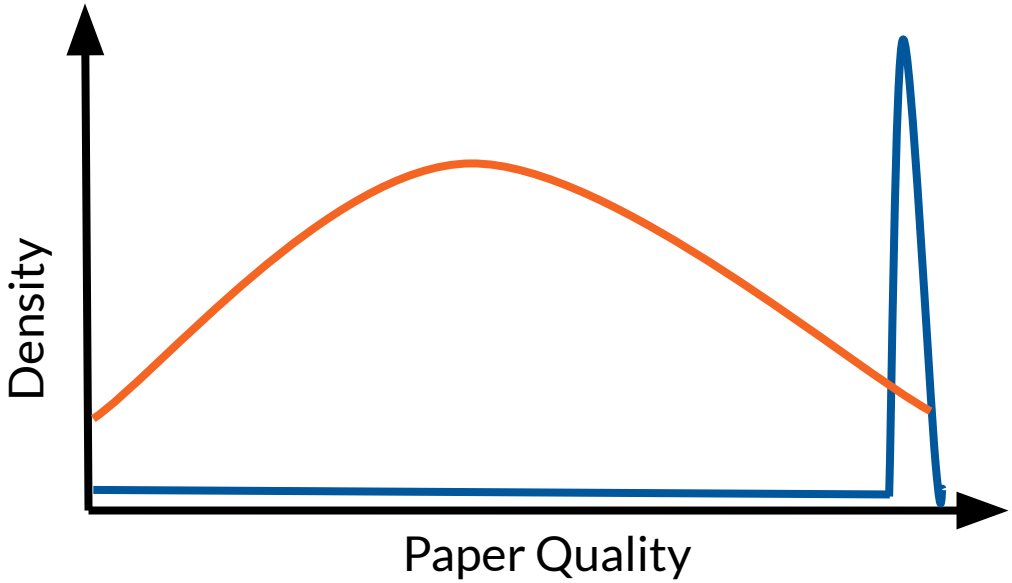
What papers have you read?

The majority of the papers you're assigned to read (by your advisor, or in class) are *classics* that have stood the test of time, and are *exceptionally good*



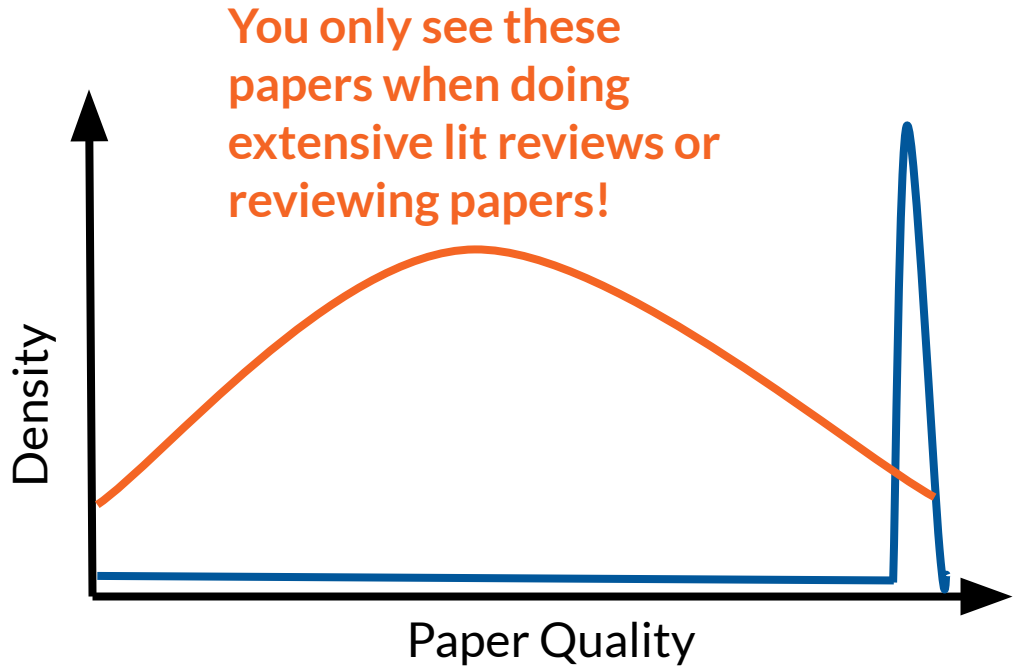
What papers have you read?

But the distribution of papers in the world are very different!



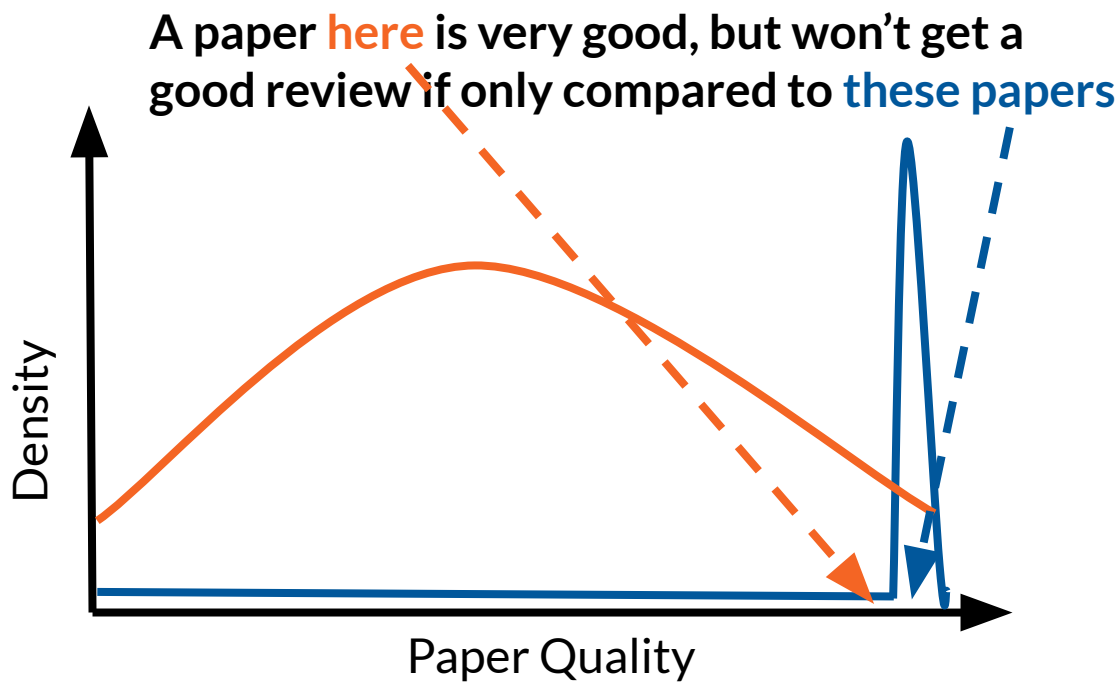
* distributions for illustrative purposes & probably not true to scale

What papers have you read?



* distributions for illustrative purposes & probably not true to scale

Paper Reviewing



* distributions for illustrative purposes & probably not true to scale

Reviewing papers

- Who do do you think tend to be the harshest reviewers?

  A. PhD students

  B. Untenured Professors

  C. Tenured Professors

An argument for B: it's easier for us to spot bugs relative to A, because we've seen/made so many similar errors

Golden rule(s) for reviews

- Don’t be mean, ever

- Don’t advocate for rejecting a paper because they didn’t do X, where X is impossible to do
  - Think through what you’re proposing! If you wouldn’t realistically be able to conduct that research, should you expect others to?

Tips for writing paper reviews

- *“Your opinion of a paper can change by being forced to explain it”* – Roscoe 2007

https://www.cl.cam.ac.uk/teaching/1011/R01/review-writing.pdf

Tips for writing paper reviews

- *"Your opinion of a paper can change by being forced to explain it"* – Roscoe 2007

1. **Summarize** the paper
2. State what you think the **contributions** are
3. Specific **comments** on the paper (good and bad!): novelty, writing style, technical flaws, unaddressed gaps, potential to spur interesting discussion, …?

https://www.cl.cam.ac.uk/teaching/1011/R01/review-writing.pdf

What you should know by the end of the first pass

The 5 C's from *Keshav 2007*

1. *Category*: What type of paper is this? A measurement paper? An analysis of an existing system? A description of a research prototype?

2. *Context*: Which other papers is it related to? Which theoretical bases were used to analyze the problem?

3. *Correctness*: Do the assumptions appear to be valid?

4. *Contributions*: What are the paper's main contributions?

5. *Clarity*: Is the paper well written?

http://ccr.sigcomm.org/online/files/p83-keshavA.pdf

Combining these tips

1. **Summarize** the paper, including the **category** of paper
2. State what you think the **contributions** are, and how it fits in with the field's **context** (e.g. novelty)
3. Comments: technical **correctness**, written **clarity**, etc.
4. **Questions** for the authors (e.g. unaddressed gaps / assumptions, methods used, etc.)

http://ccr.sigcomm.org/online/files/p83-keshavA.pdf
https://www.cl.cam.ac.uk/teaching/1011/R01/review-writing.pdf

What constitutes a “good” review? How do you evaluate if your review is reasonable?

Lots of different rubrics you could use!

From University of Waterloo (Stephen Mann):

1. Outline the paper
2. Highlight the contribution of the paper, both what the authors perceive it to be and what you perceive it to be, as well as how significant it is
3. State your recommendation and why
4. State ways to improve the paper

https://cs.uwaterloo.ca/~smann/Research/review-conference.txt

Lots of different rubrics you could use!

From University of Washington (Michael Ernst, CS264):

1. Provide a short summary of the paper (1-2 paragraphs)
2. List the strengths of the paper
3. List the weaknesses of the paper, along with justifications for why you think these are weaknesses and ways you think the paper could be improved to correct these weaknesses

https://homes.cs.washington.edu/~mernst/advice/cs264-reviews.pdf

Lots of different rubrics you could use!

From McMaster University:

ABSTRACT / SUMMARY

1. Is the abstract intelligible?
2. Does the abstract accurately describe the objectives and results obtained?
3. Does the abstract include data not presented in the paper?
4. Does the abstract include material that cannot be substantiated?

INTRODUCTION

1. Did the authors indicate why the study was undertaken?
2. Was the background information provided adequate to understand the aims of the study?

METHODS

1. Were the methods described in sufficient detail for others to repeat or extend the study?
2. If standard methods were used, were adequate references given?
3. If methods were modified, were the modifications described carefully?
4. Have the authors indicated the reasons why particular procedures were used?
5. Have the authors indicated clearly the potential problems with the methods used?
6. Have the authors indicated the limitations of the methods used?
7. Have the sources of the drugs been given?
8. Have the authors specified the statistical procedures used?
9. Are the statistical methods used appropriate?

RESULTS

1. Were the experiments done appropriate with respect to objectives of the study?
2. Do the results obtained make sense?
3. Do the legends to the figures describe clearly the data obtained?
4. Are the data presented in tabular form clear?
5. Are the legends to the tables clear?
6. Has appropriate statistical analysis been performed on the data?

DISCUSSION

1. Were the objectives of the study met?
2. Do the authors discuss their results in relation to available information?
3. Do the authors indulge in needless speculation?
4. If the results obtained were statistically significant, were they also biologically significant?
5. If the objectives were not met, do the authors have any explanation?
6. Do the authors adequately interpret their data?
7. Do the authors discuss the limitations of the methods used?
8. Do the authors discuss only data presented or do they refer consistently to unpublished work?

REFERENCES

1. Do the authors cite appropriate papers for comments made?
2. Do the authors cite their own publications needlessly?

https://www.science.mcmaster.ca/biopharm/images/files/handouts/critanal.pdf

Lots of different rubrics you could use!

From University of Toronto CSC290:

- A brief summary, so that a reader can understand your evaluations:
  - What was the purpose of the study?
  - What was the methodology?
  - What did the author conclude?
- An analysis of whether the methodology is sound:
  - What assumptions does the author make?
  - Does the author account for all of the data, or are portions left out?
  - Are there logical flaws in the argument?
  - How can the author improve upon the study?

https://www.cs.toronto.edu/~lczhang/290/lec/tut03.pdf

Lots of different rubrics you could use!

From University of Toronto CSC290:

1. Summarize
2. Quality of analysis
3. Support of analysis
4. Organization & content
5. Grammar & mechanics

https://www.cs.toronto.edu/~lczhang/290/files/cr_rubric.pdf

Lots of different rubrics you could use!

Oftentimes, the venue itself will have a specific set of rubrics/guidelines. Examples:

- FAccT: https://facctconference.org/2025/rform
- NeurIPS: https://neurips.cc/Conferences/2024/ReviewerGuidelines

Other resources on writing reviews, compiled by Irene Chen (https://irenechen.net/resources/)

- Reviewing conference papers – by Colin Raffel (@colinraffel)
- How to write a good conference review – CVPR 2020 Tutorial

Ad hoc thoughts on reviewing

- If you're doing multiple rounds of review (e.g., the initial review, and then another review after the authors received an R&R), it's best not to raise more questions in the 2nd round that you didn't raise in the 1st round that aren't about new content from the revision (i.e., you could've raised them with the original submission but didn't – so the authors didn't get a chance to respond, and it likely wasn't so important since you missed it the first time around)
- If you're not so confident about your review, you can write a sentence about that within your review (e.g. "I'm not an expert in XX so take with a grain of salt, but…")

Is it bad if I haven't been asked to review a paper yet?

- This is extremely normal! In fact, many venues actively discourage soliciting early-year PhD students as reviewers
- Over time, as you become more experienced, you may be asked to review for relevant venues
- In the meantime, if you'd like practice, you can ask your advisor if you could serve as a "*shadow/sub-reviewer*" – the advisor is still the point person for the review, but you can take the first pass at writing the review (which your advisor can double check) & you can be credited

As an author, what do you do once you receive reviews & have the chance to rebut?

First, read the reviews

- Similar to a “first pass”: get a sense of what all the reviewers are saying
- If you read negative reviews, don’t take them to heart! These are not a reflection on you as a researcher.
- In general: sleep on it! Don’t start working on your rebuttal until the next day, so you have time to digest the reviews

Second, itemize what each reviewer is saying

- For each reviewer, tag the sentences they wrote:
  - Are some questions that you need to respond to?
  - Are some comments about things that are unclear?
  - Are some just positive comments?

Third, analyze and regroup (e.g. in Excel / Google Sheets)

- Organize your notes into 2 Excel columns, one identifying the reviewer (R1, R2, …) and one copy pasting verbatim each comment block
- Identify common themes (e.g., R1 and R2 both asked the same question about a specific method) & rearrange rows as is helpful

http://getalifephd.blogspot.com/2011/03/how-to-respond-to-revise-and-resubmit.html

Fourth, figure out how to respond!

- In your Excel sheet, add a column for “How to respond” to each row
  - These can be line edits to the paper directly, or a paragraph explaining something not previously clear in the paper
- Then, do your revisions!

http://getalifephd.blogspot.com/2011/03/how-to-respond-to-revise-and-resubmit.html

Fifth, write your rebuttal

- Remember to check if your venue has a word limit for rebuttals & if there are other constraints (e.g. sometimes you can't submit an updated paper, or attach figures)
- Write your rebuttal response by summarizing line by line what changes you made, or what responses you have, to each of the reviewer notes
  - (You don't need to respond to positive comments, but you're welcome to thank them!)
- Generally, try to thank reviewers for helpful comments!

http://getalifephd.blogspot.com/2011/03/how-to-respond-to-revise-and-resubmit.html

Golden rule(s) for rebuttals

- Never say “no” to a reviewer
  - If they suggest something that’s difficult/impossible to do, explain why that’s the case, but offer an alternative that gets at the core of what the suggestion was about (e.g., writing more in the limitations section)
- Always be nice! Reviewers have invested the time to read your paper & may have missed some details, so be understanding if you need to re-explain something!

Resources on writing rebuttals/R&Rs

1. My Rebuttal-Writing Process for HCI Venues by Merrie Morris
2. How we write rebuttals by Devi Parikh
3. How to respond to reviewer comments: The Drafts Review Matrix by Raul Pacheco-Vega
4. How to Respond to a “Revise and Resubmit” from an Academic Journal: Ten Steps to a Successful Revision by Tanya Golash-Boza

Combining these tips

1. **Summarize** the paper, including the **category** of paper
2. State what you think the **contributions** are, and how it fits in with the field's **context** (e.g. novelty)
3. Comments: technical **correctness**, written **clarity**, etc.
4. **Questions** for the authors (e.g. unaddressed gaps / assumptions, methods used, etc.)

http://ccr.sigcomm.org/online/files/p83-keshavA.pdf
https://www.cl.cam.ac.uk/teaching/1011/R01/review-writing.pdf

Sample reviews & rubric

Reviews

https://www.cs.toronto.edu/~lczhang/290/lec/tut03_review.pdf

Rubric

https://www.cs.toronto.edu/~lczhang/290/files/cr_rubric.pdf

Examples of real paper reviews

Rejected | Accepted

https://openreview.net/forum?id=Q5ZxoD2LqcI

https://openreview.net/forum?id=QLFSDNIvI

Homework

For the paper you read last week, pretend like you were the reviewer, and write a review for it.

Writing Papers

Paper-writing: high level

Different subfields have different norms, but share commonalities in how to start writing:

1. Identify your audience (both reader, and venue)
2. Identify the purpose of your writing (what are you writing about, and why is it important / novel?)
3. Identify what you want readers to take away (Call to action? High level finding?)

AK's personal preferences (not the only way to do things!)

- Start by sketching out what story you want to tell with *figures only* (or in qualitative work, *quotes/tables only*)
  - Ideally, if someone reads only figures & captions, they can understand the narrative arc of your work
- Save abstract writing for the very end: often the act of writing helps to clarify what your main points are

Know your venue constraints

- Often easiest to have a specific venue to aim for; start by identifying their templates & relevant info (especially word/page count and section order)
  - Read some related papers from that venue to get a sense of successful writing examples
    - Are there certain writing styles authors use? Do they cite work from specific domains that you should too?
- Migrate your references to this template format!

https://www.sciencedirect.com/science/article/abs/pii/S1878764915001606

General resources for writing papers – strongly encouraged reading!

- Ecarnot 2015: Writing a scientific article: A step-by-step guide for beginners
- Doumont 2009: Effective Written Documents
- Steinhardt 2017: Advice for Authors
- Parikh 2019: Shortening papers to fit page limits

How optimize communication?

First law

Adapt to your audience

Second law

Maximize the signal-to-noise ratio

Third law

Use effective redundancy

https://principiae.be/pdfs/TM&Th-2.0-summary.pdf

Scientific Writing is Different

- Throw away everything you learned about "good writing" in English class
  - Write like your readers are not paying much attention & reading quickly
  - Repetition is GOOD
  - Fewer synonyms is GOOD
- True for papers, grant-writing, fellowship applications, etc.

https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Writing an Argument*

- An argument is intended to persuade a reader to believe in something
- It is a coherent series of statements in which you lead the reader from certain premises to a particular conclusion
- If you cannot say that you agree or disagree with an argument, then it is not an argument
- Is this an argument?
  "This article explores the relationship between privacy concerns and privacy decision making"

Slides courtesy Cristobal Cheyre

*Belcher, 2009. Writing Your Journal Article in Twelve Weeks

Writing an Argument

- Is this an argument?

"In this paper we explore how by understanding users' privacy concerns, social networks can increase the types and amount of information shared by its users. By understanding the most salient concerns of users, social networks can avoid ticking these concerns, or frame privacy preferences in a favorable light."

- Having an argument written like makes your work easier
- Formulaic argument

  Although_____ (general statement)

  Nevertheless _____ (your idea)

  Because _____ (examples and evidence)

6 tips for scientific writing from Michaela Kiernan, Stanford Med

1. Signal the research question
2. Keep a consistent order
3. Repeat key terms
4. Keep a consistent point of view
5. Put parallel ideas in parallel form
6. Use topic sentences w/ transition words & key terms

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Signal the research question

Which is more obviously the research question?

A. “We were interested in the relationship between age and technology use.”
B. “In this study, we asked whether older adults spent fewer minutes online than younger adults.”

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Signal the research question

- Uses explicit phrases like "asked" and questions like *whether* or *which*
- Implies hypothesis direction & identifies variables (age, online minutes) & study design (probably survey)

B. "In this study, we asked *whether* older adults spent fewer minutes online than younger adults."

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Keep a consistent order

- Paper needs to tell a story at a high level, from abstract to discussion
  - This story needs to be consistent within every section, too!
    - E.g., don't switch units (sometimes measuring in minutes, sometimes in hours)

Keep a consistent order

- Lead with most important point within each section, and keep the story of the most important point consistent across sections
  - If focus is on “low # minutes online for older individuals”, do not lead with observations on young individuals

Keep a consistent order

Which caption is more consistent with the table layout?

Variable: Daily Time Spent Reading News	Older Adults	Younger Adults
Online (minutes)	10	40
Offline (minutes)	30	30

A. Younger adults and older adults spend similar amounts of time reading news offline and online.

B. Older Adults spend less time reading news daily online relative to younger adults.

Adapted from Michaela Kiernan, PhD
* numbers are made up

https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Keep a consistent order

Which caption is more consistent with the table layout?

Tables are usually read left-to-right, top-down!

Variable: Daily Time Spent Reading News	Older Adults	Younger Adults
Online (minutes)	10	40
Offline (minutes)	30	30

A. Younger adults and older adults spend similar amounts of time reading news offline and online.

B. **Older Adults spend less time reading news daily online relative to younger adults.**

Adapted from Michaela Kiernan, PhD
* numbers are made up

https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Keep a consistent order

Which caption is more consistent with the table layout?

Variable: Daily Time Spent Reading News	Younger Adults	Older Adults
Offline (minutes)	30	30
Online (minutes)	40	10

A. **Younger adults and older adults spend similar amounts of time reading news offline and online.**

B. Older Adults spend less time reading news daily online relative to younger adults.

If you want option A to be the takeaway, you can reorder the table rows to tell this story instead!

Adapted from Michaela Kiernan, PhD
* numbers are made up

https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Repeat Key Terms

- Reduce confusion and increase consistency by repeating terms instead of using synonyms
  - Imagine you are a slightly-out-of-domain reviewer: maybe you don't know if there is a difference between terms!

Repeat Key Terms

Which sentence is less confusing?

A. People who are older spend less time on the internet to read news than youthful individuals. But, the elderly spend the same number of minutes offline to read news.

B. Relative to younger adults, older adults spent fewer minutes reading news online, and comparable minutes reading news offline.

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Repeat Key Terms

Which sentence is less confusing?

A. People who are older spend less time on the internet to read news than youthful individuals. But, the elderly spend the same number of minutes offline to read news.

B. Relative to younger adults, older adults spent fewer minutes reading news online, and comparable minutes reading news offline.

Keeping terms consistent can also help shorten your text! When possible, write less to convey the same ideas.

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Repeat Key Terms

These terms are confusing – are they identical? Or different definitions?

Which sentence is less confusing?

A. **People who are older** spend less **time** *on the internet* to read news than youthful individuals. But, **the elderly** spend the same number of **minutes** *offline* to read news.

B. Relative to younger adults, older adults spent fewer minutes reading news online, and comparable minutes reading news offline.

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Keep a consistent point of view

- Don’t switch between “we studied…” and “I studied…”
- Don’t switch between “we study” and “we studied”
- Remember grammar! Sentences contain: Subject, Verb, Object, Prepositional Phrase
  - **If sentences are about the same thing, keep the subject consistent**

Keep a consistent point of view

Which sentences are easier to follow?

A. Older adults spent less time online than younger adults. The amount of time spent offline was the same for older adults as younger adults.

B. Older adults spent less time online than younger adults. Older adults spent similar time offline as younger adults.

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Keep a consistent point of view

Which sentences are easier to follow?

A. Older adults spent less time online than younger adults. The amount of time spent offline was the same for older adults as younger adults.

B. **Older adults spent less time online than younger adults. Older adults spent similar time offline as younger adults.**

Easier for the reader to make the critical comparison (first sentence "less", second sentence "similar")

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Keep a consistent point of view

Which sentences are easier to follow?

A. Older adults spent less time online than younger adults. The amount of time spent offline was the same for older adults as younger adults.

B. **Older adults spent less time online, but similar time offline, relative to younger adults.**

Also helps you see where you can condense repetition & cut word count!

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Put parallel ideas in parallel form

- Similar to grammatical consistency, helps with continuity and highlighting key similarities/contrasts
- Remember to use key term repetition here!
- This will also help you see where to condense phrasing (like the previous slide)

Put parallel ideas in parallel form

- Which is more consistent?

A. An increase in time spent online was observed both in older and younger adults after being participants in Workshop X. There was no increase in time spent online after participation in Workshop Y by either older or younger adults.

B. An increase in time spent online was observed both in older and younger adults after participation in Workshop X. No increase in time spent online was observed in older and younger adults after participation in Workshop Y.

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Put parallel ideas in parallel form

- Which is more consistent?

A. An increase in time spent online was observed both in older and younger adults after being participants in Workshop X. There was no increase in time spent online after participation in Workshop Y by either older or younger adults.

B. **An increase in time spent online was observed both in older and younger adults after participation in Workshop X. No increase in time spent online was observed in older and younger adults after participation in Workshop Y.**

Parallel structure easier to read!

Adapted from Michaela Kiernan, PhD

https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Put parallel ideas in parallel form

- Which is more consistent?

Need to hunt for relevant comparisons here

A. An increase in time spent online was observed both in older and younger adults after *being participants* in Workshop X. There was no increase in time spent online after *participation in* Workshop Y by either older or younger adults.

B. An increase in time spent online was observed both in older and younger adults after participation in Workshop X. No increase in time spent online was observed in older and younger adults after participation in Workshop Y.

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Use topic sentences with transition words & key terms

- Write a “topic sentence” at the beginning of each section
  - Helps the reviewer to roadmap where they are in the paper, and transition clearly between sections
- Lead with the most important thing (in each section, and even in each paragraph!)

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Use topic sentences with transition words & key terms

- Which limitations section start is clearer?

A. The lack of difference in offline minutes spent reading news could have arisen from several limitations of our study. One is, …. Secondly, … A final is, …

B. The lack of difference in offline minutes spent reading news could have arisen from three limitations of our study. First, …. Second, … Third, …

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

Use topic sentences with transition words & key terms

- Which limitations section start is clearer?

A. The lack of difference in offline minutes spent reading news could have arisen from several limitations of our study. One is, …. Secondly, … A final is, …

B. **The lack of difference in offline minutes spent reading news could have arisen from three limitations of our study. First, …. Second, … Third,…**

Similar to previous tips: be specific (3 limitations), be parallel

Adapted from Michaela Kiernan, PhD https://web.uri.edu/wp-content/uploads/sites/922/R01CountdownToolsforWritingConciseandCompellingGrantsv1.0.pdf

AK's personal preferences (not the only way to do things!)

- Start by sketching out what story you want to tell with *figures only* (or in qualitative work, *quotes/tables only*)
  - Ideally, if someone reads only figures & captions, they can understand the narrative arc of your work
- **Save abstract writing for the very end: often the act of writing helps to clarify what your main points are**

Writing Non-Structured Abstracts

Context		In the oceans, ubiquitous microscopic phototrophs (phytoplankton) account for approximately half the production of organic matter on Earth, thus affecting the abundance and diversity of marine organisms and strongly influencing climate processes.
Need	*what we have*	Analyses of the satellite-derived phytoplankton concentration (available since 1979) have suggested decadal fluctuations linked to climate forcing, but the length of this record is insufficient to resolve longer-term trends.
	what we want	To estimate the time dependence of phytoplankton biomass since the beginning of oceanographic measurements in 1899,
Task		we combined available ocean transparency measurements and in situ chlorophyll observations.
Object of the document		This paper presents the trends we identified at local, regional, and global scales.
Findings		We observed declines in eight out of ten ocean regions, and estimated a global rate of decline of ~1% of the global median per year. Our analyses further revealed interannual to decadal phytoplankton fluctuations superimposed on long-term trends. These fluctuations are strongly correlated with basin-scale climate indices, whereas the long-term declining trends are related to increasing sea surface temperatures.
Conclusion		In conclusion, global phytoplankton concentration has definitely declined over the past century; this decline will need to be considered
Perspectives		in future studies of marine ecosystems, geochemical cycling, ocean circulation, and fisheries.

https://www.nature.com/scitable/content/ne0000/ne0000/ne0000/ne0000/14194316/ECS-01-09-01-Abstract.pdf

Writing Non-Structured Abstracts

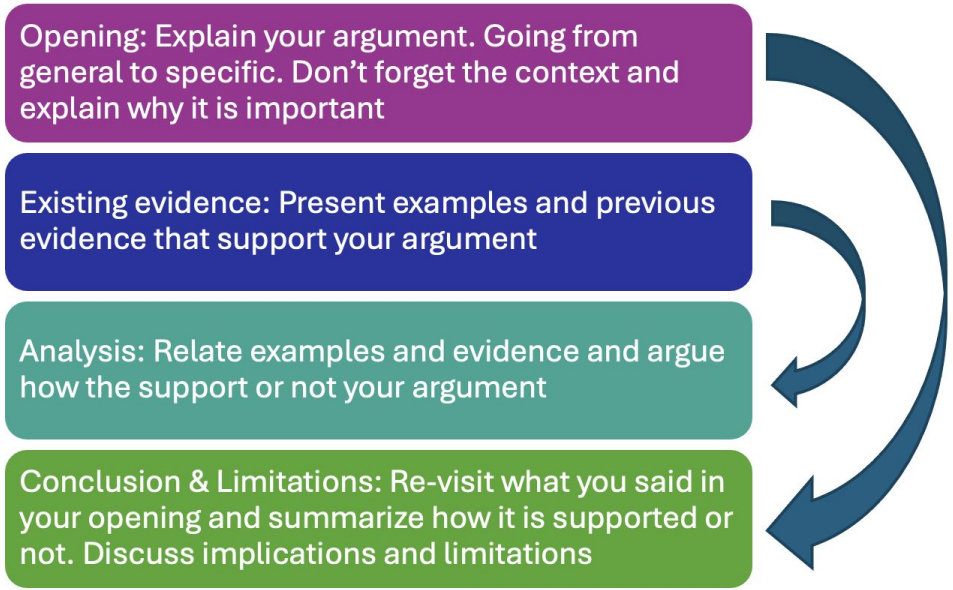
Journal editors are likely spending < 2 minutes reading this abstract to make a decision on whether to desk reject!

Using structures like this make it easy to convince them your work is good!

Context		In the oceans, ubiquitous microscopic phototrophs (phytoplankton) account for approximately half the production of organic matter on Earth, thus affecting the abundance and diversity of marine organisms and strongly influencing climate processes.
Need	*what we have*	Analyses of the satellite-derived phytoplankton concentration (available since 1979) have suggested decadal fluctuations linked to climate forcing, but the length of this record is insufficient to resolve longer-term trends.
	what we want	To estimate the time dependence of phytoplankton biomass since the beginning of oceanographic measurements in 1899,
Task		we combined available ocean transparency measurements and in situ chlorophyll observations.
Object of the document		This paper presents the trends we identified at local, regional, and global scales.
Findings		We observed declines in eight out of ten ocean regions, and estimated a global rate of decline of ~1% of the global median per year. Our analyses further revealed interannual to decadal phytoplankton fluctuations superimposed on long-term trends. These fluctuations are strongly correlated with basin-scale climate indices, whereas the long-term declining trends are related to increasing sea surface temperatures.
Conclusion		In conclusion, global phytoplankton concentration has definitely declined over the past century; this decline will need to be considered
Perspectives		in future studies of marine ecosystems, geochemical cycling, ocean circulation, and fisheries.

https://www.nature.com/scitable/content/ne0000/ne0000/ne0000/ne0000/14194316/ECS-01-09-01-Abstract.pdf

Paper Structure



Slides courtesy Cristobal Cheyre

Avoid “chronological” writing

- Easy to attempt writing from beginning of paper to end of paper, but this misses the need to connect intro to conclusion
- Easy to copy your “journaling” of what you did during the project to the methods section, but this can detract from your main argument; instead, relegate replication details to an appendix if it bogs down the main points of the paper

Finding Time to Write

- Many successful writers adhere to the idea of writing a little bit every day (schedule this in, find accountability buddies through writing groups,...)
- This is not the only way! AK personal preference (based on advice from Hal Varian): rip the bandaid
    - Block out a full day and just write the whole thing (poorly) in one go. Then, spend the next few days/weeks editing – it's much easier to edit than write from scratch.

Writing Support at Cornell

- https://gradschool.cornell.edu/policies/writing-support/ includes one-on-one feedback, multilingual writing support, writing workshops, and “write-ins” for accountability
- **“Writing from A to B”**: a Cornell book on dissertation writing is free to all students! https://gradschool.cornell.edu/academic-progress/thesis-dissertation/writing-your-thesis-dissertation/

Submitting Papers

- One person (the “corresponding author”) is generally in charge of submitting your manuscript through the relevant venue portal
  - They (along with coauthors) may need to input information like suggested reviewers for the manuscript

Accepted Papers

- If/when the paper is accepted, additional considerations must be made
  - E.g., what copyright license to choose for your paper (see Fiesler 2018 for a summary https://cfiesler.medium.com/acm-copyright-licenses-which-should-you-choose-and-how-do-you-handle-third-party-material-dbe87be8b57c)
  - Or, whether to *open-access* the paper

Publishing papers and $

- Professors use (grant) money to fund things like…
  - Your academic tuition & stipend & benefits
    - Summer salary
  - Research costs (running surveys, compute…)
  - Conference travel
  - **Publishing fees** (new as of the last few years; university libraries used to pay but no longer)
  - **…**

Publishing in venues costs money!

- Preprint servers (e.g. arXiv, medrXiv) are entirely free (but are not peer-reviewed)
- Some venues are free, but you must pay >$1k to make the paper *open access* (e.g. ACM proceedings)
    - At the free level, people with institutional access to the ACM website can read your paper, but not people without a login
- Some venues you have to pay a *publishing fee*, but once that's paid, it's immediately open access (e.g. PNAS)

A tangent: grant budget considerations

- We also pay *indirect costs* to the university (which vary by university, source of funding, etc.)
  - This usually looks like a fixed percentage of your grant that goes to paying facilities & administrative costs
  - See American Association of Universities explainer: https://www.youtube.com/watch?v=NtqK8SyxFMc

Homework

1. Identify 2-3 “key terms” in a current project to use ‘repeatedly’ in writing
2. Practice by writing an abstract for a paper you're working on (or, write an alternate abstract for an existing paper).

Public Communication

Public communication is key

- If a [paper] falls in a forest and no one hears it, does it make a sound?

Public communication is key

- If a [paper] falls in a forest and no one hears it, does it make a sound?
- If your work was accepted at a venue, you should be proud to share about it (at least 3 reviewers thought it was good work)!
  - Helps build awareness of your work, so other researchers can read / cite it
  - Helps foster conversation around your topic

How do people become aware of new work?

- Maybe people have Google Scholar notifications turned on for you (see earlier lectures)...
- Otherwise:
  - Social media (Bluesky/Mastodon/etc. threads)
  - Conference talks
  - Word of mouth
  - …

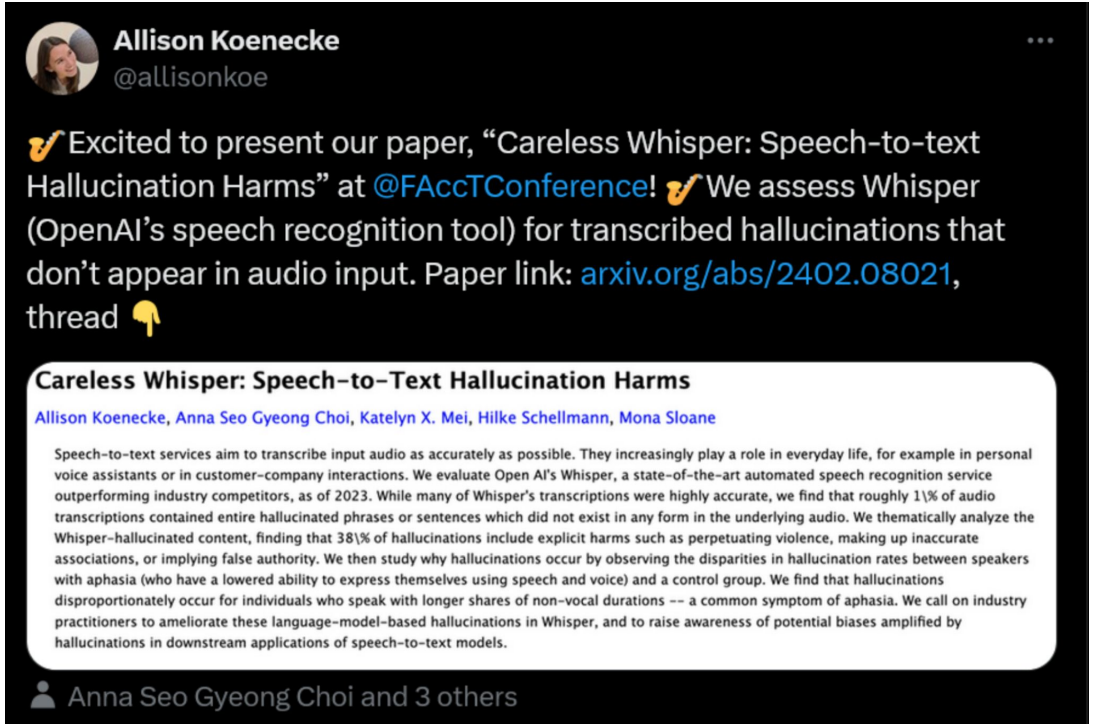
Social media: how to write a compelling thread?

- As always, prescriptive advice (everyone has different habits, including *not* posting to social media)
- Goals of a thread:
  a. Get people to click on link to paper
  b. Get people to understand the gist of paper
  c. Get people to discuss your paper

A thread formula (ymmv)

- First [post]:
  a. Include high level info about the paper (venue, title)
  b. Tag coauthors (can tag in the image if need to save character count)
  c. Include paper link

Example...

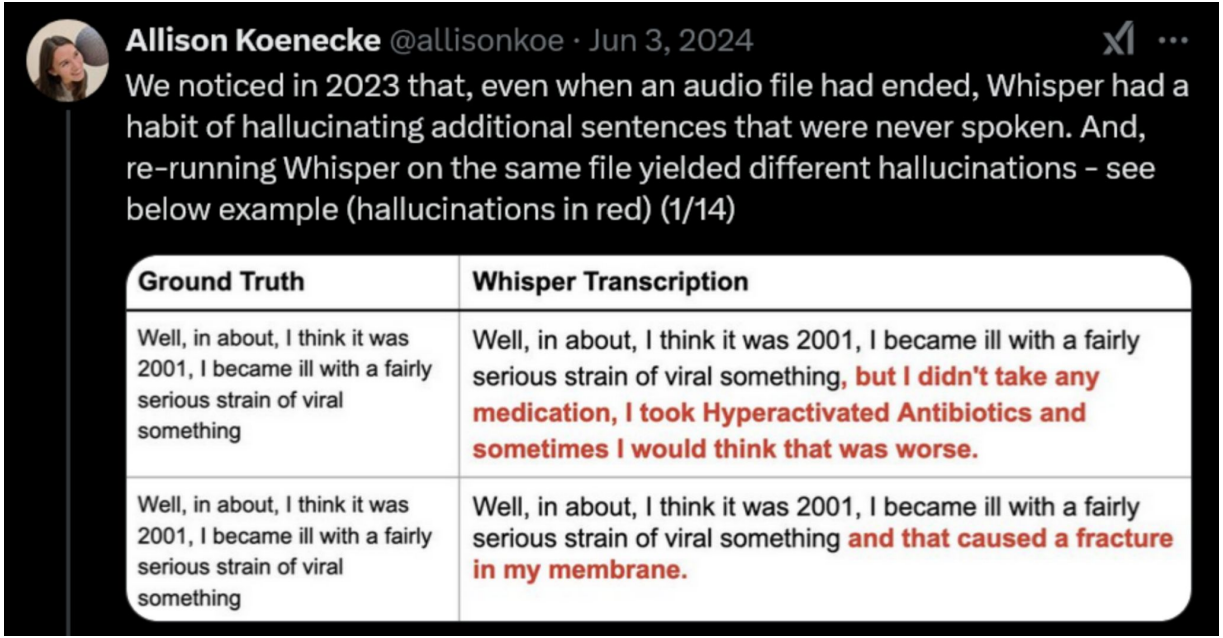


https://koenecke.infosci.cornell.edu/files/threads/carelesswhisper_tweets.pdf

A thread formula (ymmv)

- Intermediate [posts]:
  a. Tell the narrative story of your paper, ideally with the figure- or quote-based arc you thought about when writing your paper!
  b. Attach figures to thread, and remember to include alt-text for accessibility
  c. Can number your pages (1/n), (2/n), …

Example...



Allison Koenecke @allisonkoe · Jun 3, 2024

We noticed in 2023 that, even when an audio file had ended, Whisper had a habit of hallucinating additional sentences that were never spoken. And, re-running Whisper on the same file yielded different hallucinations - see below example (hallucinations in red) (1/14)

Ground Truth	Whisper Transcription
Well, in about, I think it was 2001, I became ill with a fairly serious strain of viral something	Well, in about, I think it was 2001, I became ill with a fairly serious strain of viral something, **but I didn't take any medication, I took Hyperactivated Antibiotics and sometimes I would think that was worse.**
Well, in about, I think it was 2001, I became ill with a fairly serious strain of viral something	Well, in about, I think it was 2001, I became ill with a fairly serious strain of viral something **and that caused a fracture in my membrane.**

https://koenecke.infosci.cornell.edu/files/threads/carelesswhisper_tweets.pdf

A thread formula (ymmv)

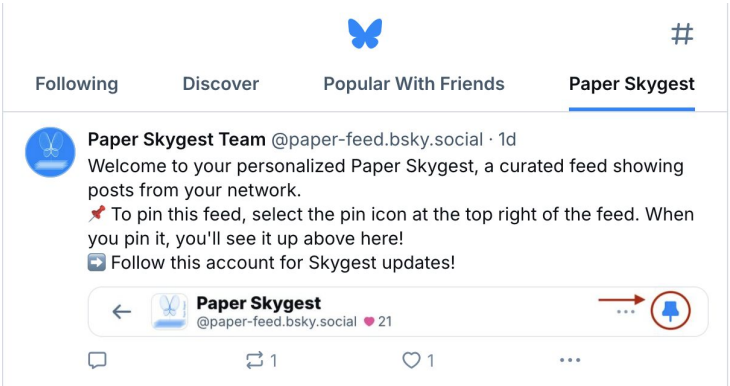
- Final [post]:
  a. Thank people who inspired you, and *tag them*
     - This can include academic idols whose work you built off of, and who you hope would read your paper and engage with it!
  b. This also means that people who follow those academics are more likely to see your work (probably the relevant community)

Thanks to Prof. Robb Willer for this tip!

Example…

https://koenecke.infosci.cornell.edu/files/threads/carelesswhisper_tweets.pdf

Ideally, your thread will show up in feed aggregator tools like Paper Skygest!



https://bsky.app/profile/paper-feed.bsky.social/feed/preprintdigest from Sophie Greenwood & Nikhil Garg

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- Otherwise:
  - Social media (Bluesky/Twitter threads)
  - Conference talks
  - Word of mouth
  - ...

How to make your slides?

- Anything that can be exported as a pdf is okay, e.g.:
  - Google Slides
  - Powerpoint
  - Keynote
  - Beamer (*LaTeX document class for slides*)
- Personal general advice: do **not** use dynamic slide transitions (not PDF'able!)

Average Presentation Outline

- Intro & Background
- Data
- Methods
- Results & Interpretations
- Study Limitations
- Conclusion

General Presentation Tips

- Present slides in a logical order
  - Follow the outline
  - Define key terms before you use them

Source: https://www.karger.com/Article/Fulltext/346077 333

General Presentation Tips

- Present slides in a logical order
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- Make slide titles descriptive
  - Make one overarching point per slide

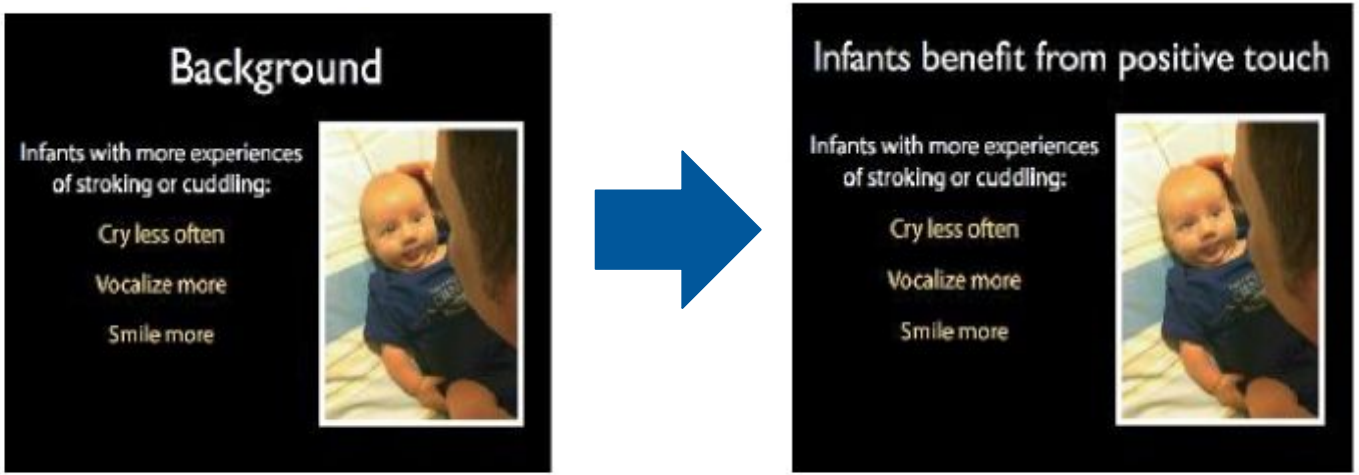
Source: https://www.karger.com/Article/Fulltext/346077

General Presentation Tips

- Present slides in a logical order
  - Follow the outline
  - Define key terms before you use them
- Make slide titles descriptive
  - Make one overarching point per slide
- **Figures are better than words**
  - **But remember to explain figure axes!**

Source: https://www.karger.com/Article/Fulltext/346077

Use slide titles to make a point



Source: Society for Neuroscience https://www.pedsresearch.org/uploads/blog/doc/Designing_Effective_Scientific_Presentations_from_SfN.pdf

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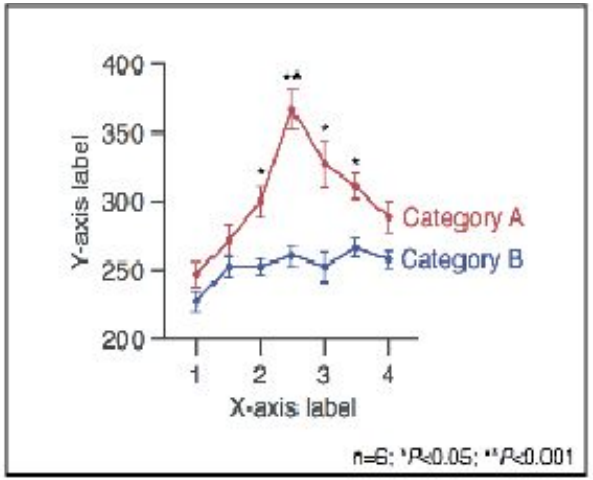

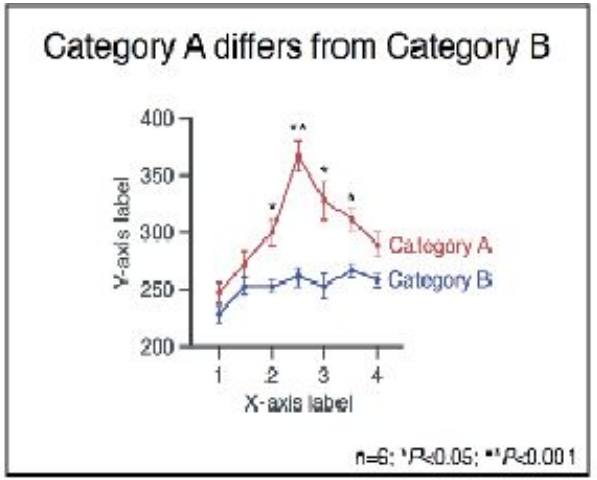

Source: Society for Neuroscience https://www.pedsresearch.org/uploads/blog/doc/Designing_Effective_Scientific_Presentations_from_SfN.pdf

Introducing Research Questions Effectively

Use an outline: scientific paper (boring), essay (less boring), or, plot (best).
Greet the audience
Have a hook and a slant.
Start with the status quo (state of present knowledge or belief)
Tell the audience what they will learn (the promise of a change in the status quo)
Tell the audience your motivation for the study.
Illustrate your Methods & Results as a chronological story.
Explain graphs carefully.
Mention alternative explanations.
Acknowledge your contributors during the talk (not at the end).
Signal when you are near the end.
Don't give a bland summary: emphasize that there is a new status quo
Don't introduce new material
Return to the hook near the end.
Never go over your time slot.
End with a clincher, immediately followed by "Thank you".
Listen carefully to each question, repeat it, and keep your composure.

Source: Lafferty, UCSB http://www.leg.ufpr.br/~eferreira/CE064/scientific%20presentation.pdf

Introducing Research Questions Effectively

- **‘But’** is good — use it for dramatic effect

- ‘X is the current state of knowledge, and we know Y. **But** Z problem remains. Therefore, we carried out ABC research.’

Source: Kirchoff 2021 https://www.nature.com/articles/d41586-021-03603-2

Think, Pair, Share: what are some hook/slants for your project topic?

- X is the current state of knowledge, and we know Y. **But** Z problem remains. Therefore, we carried out ABC research.
- E.g.: *"Prior research has studied racial differences in speech-to-text algorithm performance [citation], finding worse transcription quality for Black Americans.* ***But****, age-based biases remain understudied. Therefore, we audited [speech-to-text API] to see whether elderly adults' speech has higher transcription error rates than middle-aged adults."*

Source: Kirchoff 2021 https://www.nature.com/articles/d41586-021-03603-2

Presentation Formatting Tips

- Format so text & images are easy to read!
  a. Use minimalist slide backgrounds

Source: Society for Neuroscience https://www.pedsresearch.org/uploads/blog/doc/Designing_Effective_Scientific_Presentations_from_SfN.pdf

Presentation Formatting Tips

- Format so text & images are easy to read!
  a. Use minimalist slide backgrounds
  b. Use text that is readable and colorblind friendly
     i. 20-36 pt font visible from back of the classroom
     ii. Smaller font sizes for citations/footnotes

Source: Society for Neuroscience https://www.pedsresearch.org/uploads/blog/doc/Designing_Effective_Scientific_Presentations_from_SfN.pdf

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  a. Use minimalist slide backgrounds
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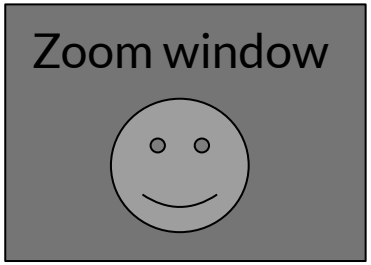
     i. 20-36 pt font visible from back of the classroom
     ii. Smaller font sizes for citations/footnotes
  c. Minimize text on slides
     i. Don’t read off slides!

Source: Society for Neuroscience https://www.pedsresearch.org/uploads/blog/doc/Designing_Effective_Scientific_Presentations_from_SfN.pdf

What if you really do need lots of words on your slide?

- People will stop listening to what you’re saying and read the slide instead!
- Make it digestible for people by showing more text on click (e.g.: next 2 slides)



General tips on choosing formats

- You'll notice that I use a default template that has empty space on the left
  - This is useful for students who want to take notes in the margins
  - This is useful for me if I have Zoom windows

General tips on choosing formats

- You'll notice that I use a default template that has empty space on the left
  - This is useful for students who want to take notes in the margins
  - This is useful for me if I have Zoom windows
- Save time by using the same slide styles/format for all separate presentations you make (easy to mix and match when you eventually give longer talks)

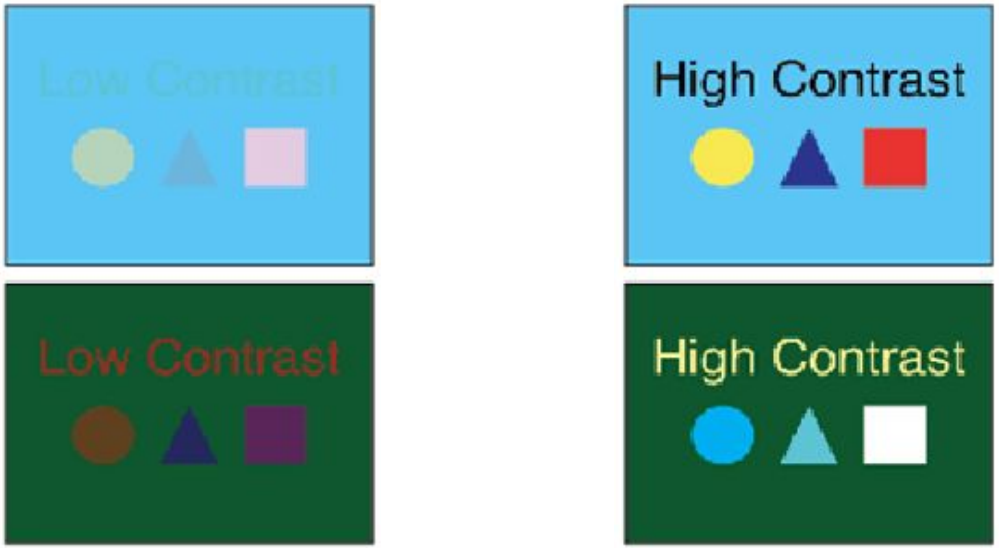
Font styling matters!

On a slide, it is harder to read underlined words or words in ALL CAPS

If you want to emphasize a word, use **bold letters** or *italics*

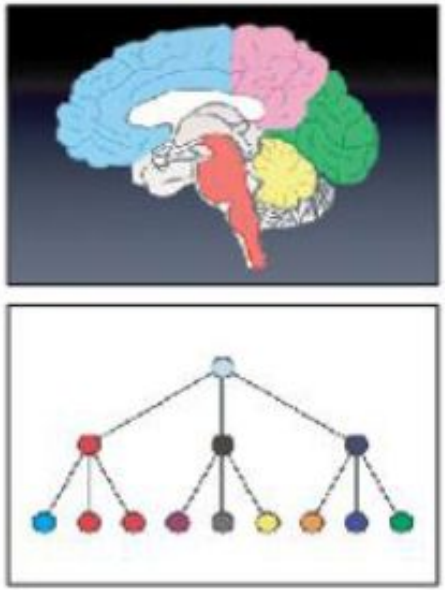
Source: Society for Neuroscience https://www.pedsresearch.org/uploads/blog/doc/Designing_Effective_Scientific_Presentations_from_SfN.pdf

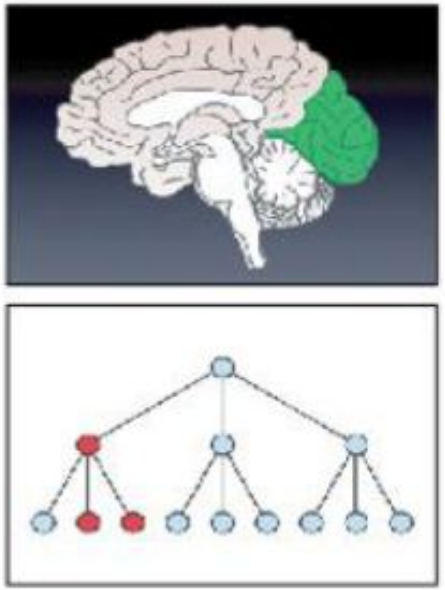
Color choices matter!



Source: Society for Neuroscience https://www.pedsresearch.org/uploads/blog/doc/Designing_Effective_Scientific_Presentations_from_SfN.pdf

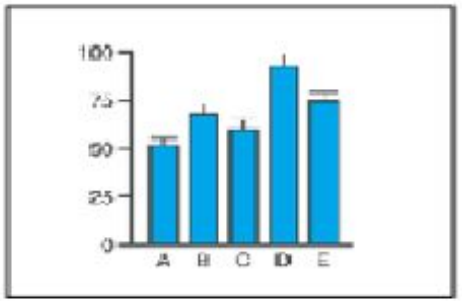
Fewer colors → Easier to interpret

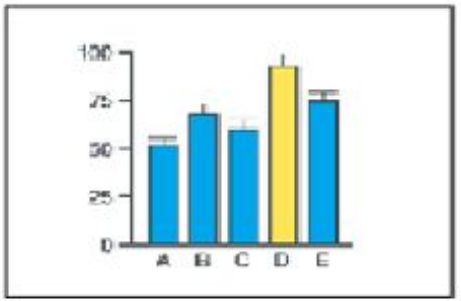




Source: Society for Neuroscience https://www.pedsresearch.org/uploads/blog/doc/Designing_Effective_Scientific_Presentations_from_SfN.pdf

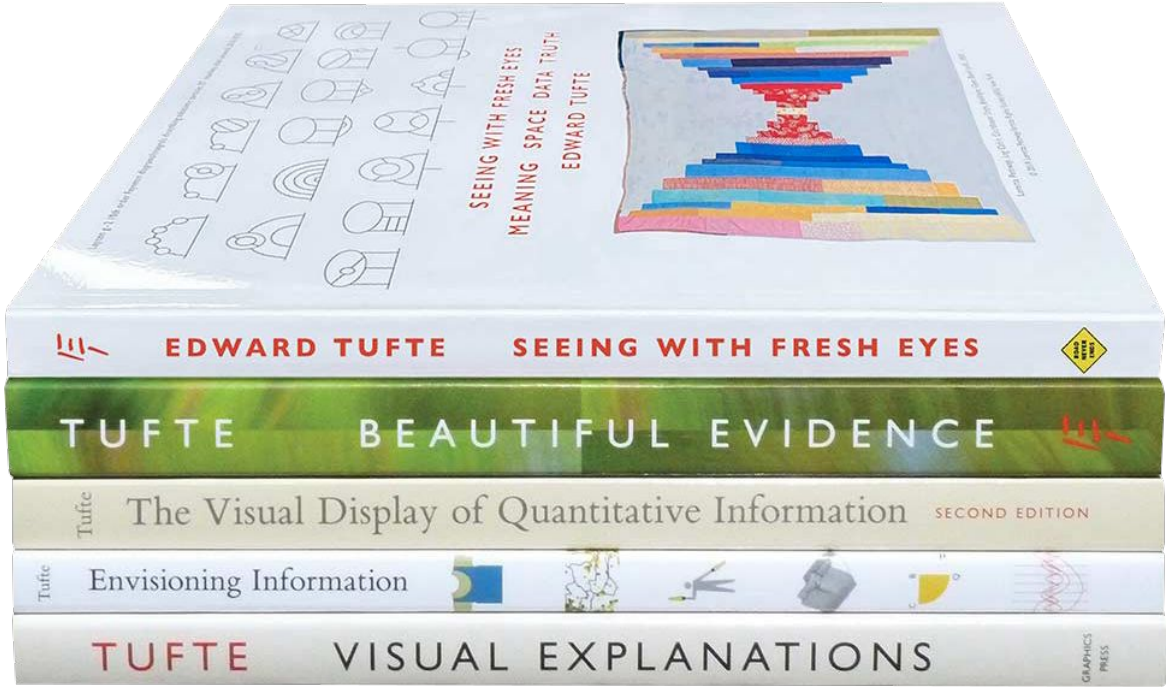
Which better emphasizes a key point?





Source: Society for Neuroscience https://www.pedsresearch.org/uploads/blog/doc/Designing_Effective_Scientific_Presentations_from_SfN.pdf

For more on viz: Ed Tufte's books



https://www.edwardtufte.com/product/online-course/

Oral Presentation Tips

- Understand your audience
  - Are your slides targeted correctly?
- Practice your presentation
- Don’t read off your notes / slides
- Prepare for discussion
  - Anticipate obvious questions
  - Repeat questions asked by the audience

https://cuwip.physics.wisc.edu/wp-content/uploads/2016/03/Good_Presentation_Guidelines_2page.pdf

Worried about hard questions?

- Practice 5x before giving a talk to different (friendly) audiences
  - The union of all the questions you get from your practice talks will cover ~ 99% of all questions you'll get from your actual audience → less fear
  - Tip: include slide numbers on practice talk slides so friends can help give comments

Poster Presentations

- We’ve talked plenty about slide-based presentations; ***posters*** follow similar rules: minimize amount of text, maximize info presented figures

Poster Presentations

- We've talked plenty about slide-based presentations; ***posters*** follow similar rules: minimize amount of text, maximize info presented figures
  - Use e.g. Powerpoint/Slides/Beamer to make 1 slide (which you can change the dimensions of) to create your poster
  - Add a QR code directing to your paper in the corner
  - Ask labmates / check university for logos to put on poster

Poster Printing

- Many universities are able to print posters in specific libraries. Otherwise, dedicated services like FedEx do poster printing.
- Check with your advisor on printing fees!
- If you can’t bring the printed poster with you to the venue for some reason, check to see if you can get it printed somewhere near the venue!

Conference Tips

- Show up to your presentation room early for set-up & to check in with the session chair
  - Always keep an HDMI adapter on you!
  - If using a mic, check to make sure folks in the back can hear you
  - Make sure you know how much time you have for presentation & questions (in practice, timing can get condensed)

Conference Etiquette

- **Do:** always be nice!
  - If you liked someone's talk, tell them so afterwards :)
- **Don't:**
  - Similar to reviewing, don't ask 'gotcha' questions of why someone didn't do X in their work, if X is impossible
  - Ask q's to advance your own agenda (stick to the presenter's agenda)!

Responding to hard questions

- You can always say something like *“that’s a great question, but out of the scope of this talk. I’d be happy to chat offline after the Q&A”*
  - Chatting 1:1 afterwards can help clarify the scope of the question, and give you more time to go in-depth in your answer

How do people become aware of new work?

- Maybe people have Google Scholar notifications turned on for you (see earlier lectures)...
- Otherwise:
  - Social media (Bluesky/Twitter threads)
  - Conference talks
  - Word of mouth
  - ...

Impact beyond papers

- Lots of other ways to share your findings!
  - Talk to people in academic working groups
  - Talk to relevant non-academic communities
  - See if Cornell News will write a piece about your work
  - Blog about it
  - Make a project website e.g. https://fairspeech.stanford.edu/
  - Record a video explainer e.g. https://www.youtube.com/watch?v=1fQ7q4_x00I
  - etc.!

Homework

Draft either a thread or slides on either a paper you've written, or a paper you've read.

PhD Milestones & Progress Reports

PhD Milestones

- In addition to course requirements and TAing, there are several important meta-deadlines to work towards
- Expectations for PhD milestones:
  - https://infosci.cornell.edu/phd/current-phds/phd-student-handbook

Forming a committee

- The first step, due end of 2nd year (but good to think about even earlier)
- Many students worry that this commits them to a research direction early on, but the intention is to encourage them to think ahead and talk to more people inside and outside of the department.

Forming a committee

- Think through potential options & reach out to potential committee members early to schedule a conversation and explore fit
    - It can help to write a one-page outline of their interests to share with the potential committee member when reaching out
- If someone says ‘no’, it doesn’t mean they don’t like you or your work – they may just be on too many committees already!

Considerations for committee members

- Committee members should be able to help provide feedback on your research (and it can be especially valuable if coming from a different academic perspective)!
- They may also be future collaborators or letter writers, and can provide useful advice on your overall PhD experience

A Exam

- Passing the A exam takes you from being a “PhD Student” to a “PhD Candidate”; usually end of 3rd year
- A Exam goal: the student moves forward on research and convinces their committee members that they are on track
- Format is up to advisor and committee members
    - Most A Exams have students present and/or write about their current research, their research plans (e.g. a dissertation pre-proposal), or review literature in their area of research

A Exam Logistics

- You will need to poll committee members to find a time and reserve a space, and notify Nicole Roy about the upcoming A Exam at least two weeks in advance.
- A Exam outcome is decided by the committee; could be:
  - Pass
  - Pass with a follow-up requirement *not* formally enforced (e.g., hand in a revised version of the writeup by next semester)
  - Conditional pass that requires another meeting of the committee (enforced by the graduate school)
  - Fail (typically leave program with master's degree)

Dissertation Proposal

- No standard length or format within IS; generally somewhere between 10-40 pages (your committee will tell you more explicit guidelines)
- Generally you will want to:
  - Motivate the dissertation research w.r.t. existing literature
  - Describe main idea of planned research
  - Provide a proposed timeline for the work

Dissertation Proposal

- Deadline / format up to the committee:
  - Sometimes handled as part of the A Exam, either as one of the A Exam "questions" the students answers or as an additional document
  - Sometimes asked for soon after the A Exam (e.g. a month or two)

B Exam (a.k.a. defense)

- Theoretically, full thesis draft is due to committee 4 weeks before B exam
  - In practice, committee may allow for ~2 weeks prior
- Exam results can be: pass, conditional pass, or fail
  - *Plus*, agreeing on necessary revisions to the dissertation
- B exam lasts ~2.5 hours and, like with the A exam, you will be in charge of coordinating timing among the committee & room booking

B Exam (a.k.a. defense)

1. First ~5 min.: Committee confers on what order the proceedings will go in / how much time will be allotted
2. “Public” portion of the defense (can invite audience):
   a. ~Hour: Student presents their work
   b. ~15 min: audience is allowed to ask questions.
3. “Private” portion of defense: committee asks questions, often starts with the most "distant" member (often the minor member) and then continues in order concluding with the chair. Each member typically gets the same amount of time to ask questions (~15-20 minutes each).

B Exam (a.k.a. defense)

4. Student is kicked out of the room so committee can discuss results (~30 min)

5. Student gets called back into the room to hear the outcome of exam & necessary revisions to dissertation.

- This is a good time to ask the committee if they want to read the dissertation again after it is revised, or whether they are willing to delegate vetting to the advisor

6. Hopefully, celebrate!

Student Progress Review (SPR)

- Due **April 1**! Think of this like a performance review.
- General info: https://gradschool.cornell.edu/academic-progress/requirements/student-progress-review/
- Sample form: https://gradschool.cornell.edu/wp-content/uploads/2020/01/SPR-2019-2020-Blank-Standard-Form-v2020-01-14-JBedits.pdf

SPR Sections

1. Student and Program Information
2. Student Reflections on Academic and Professional Development
3. Student Academic Planning
4. Student Career Planning and Professional Development

Sample SPR questions

Briefly summarize activity and progress on your *research/scholarship* in the past year, describing the status of your prospectus/proposal and/or dissertation chapters/manuscripts as appropriate to your field of study. If you have a working title for your dissertation, please include it.

Sample SPR questions

List *activities* in which you participated to develop your teaching, writing, speaking, analytic skills, creative abilities, leadership abilities, or other professional competencies (e.g., outreach, professional experiences, academic/professional associations, internships, workshops, mentorships, study groups, etc.)

Sample SPR questions

List coursework that you plan to complete in the coming year.

Briefly summarize your plans and goals for research/scholarship in the coming year.

The Student Side

- [*Career questions, description of your academic activities, etc…*]
- Describe any obstacles that **affected or impeded your academic progress** or professional development. What actions have you taken to **overcome these obstacles**?
- Please provide any additional observations or information that you would like to share regarding your academic progress this past year.

The Faculty Side

- Comments regarding the student's **demonstrated strengths** and **areas for development** (in relation to the student's career interests)
- Comments regarding the student's overall progress

[All will be visible to you!]

End-of-AY performance

- The end of the semester is a good time to take a step back and take stock of what you've been working on, what's worked well, and what hasn't worked well
    - *Research output, time management skills, professionalism, networking, finding a research community, etc.…*

End-of-AY performance

- The SPR is a good jumping off point for chats with your advisor about your progress
- It's especially good to come up with a list of items to improve upon now, because if we work on them during the summer / fall, then we can explicitly show that your *strength* is the ability to improve and overcome hurdles for next year's SPR!

Student Progress Report (SPR)

- **Do:** actually take this seriously & write thorough responses reflecting on your year
- **Do not:**
    - Write one-word responses for plans/goals
    - Feel bad if you don’t have honors or papers to list! It is totally normal for these to be blank early on in your career!

Homework

Write your SPR!

Applications: CVs, Resumes, Letters of Rec, Research Proposals

What things might you apply for?

- **Fellowships**
  - Things that make you look fancy (e.g. “named awards”) and potentially fund your tuition
- **Grants**
  - E.g., internal Cornell seed funding competitions for ~$5k for research expenses
- **Internships / jobs / programs / RAships / etc.**
  - Other research opportunities

When should you apply for them?

- Good idea to discuss with your advisor!
  - Some fellowships only open for 1-2nd year PhDs, some only for upper-year PhDs
  - Oftentimes useful to ensure you're doing research your first summer to make sure you have some "substance" (e.g. a paper) on your CV for future applications
  - Oftentimes useful to do an internship the summer before you graduate for the chance of a return offer

What are the requirements?

- **It depends!**
  - Sometimes just a CV
    - Sometimes a resume, or a 3-page CV
  - Sometimes a research proposal
    - Sometimes 1 page, sometimes 15 pages
  - Sometimes rec letters, transcripts, etc.

- Look it up and stay organized!

When applying for something...

- Take a pass through the application portal well ahead of submission!

- Sometimes there are additional questions that aren't explicitly indicated in the original call for applications, and you'll want to draft out answers to them earlier rather than at the last minute

What makes for a good CV?

- **DO NOT** base your CV template off a professor's CV
  - We have a very different job than PhD students; you'll see list-like sections devoted to where we've given talks & how much grant funding we've received (these are likely significantly less prominent for PhD students)

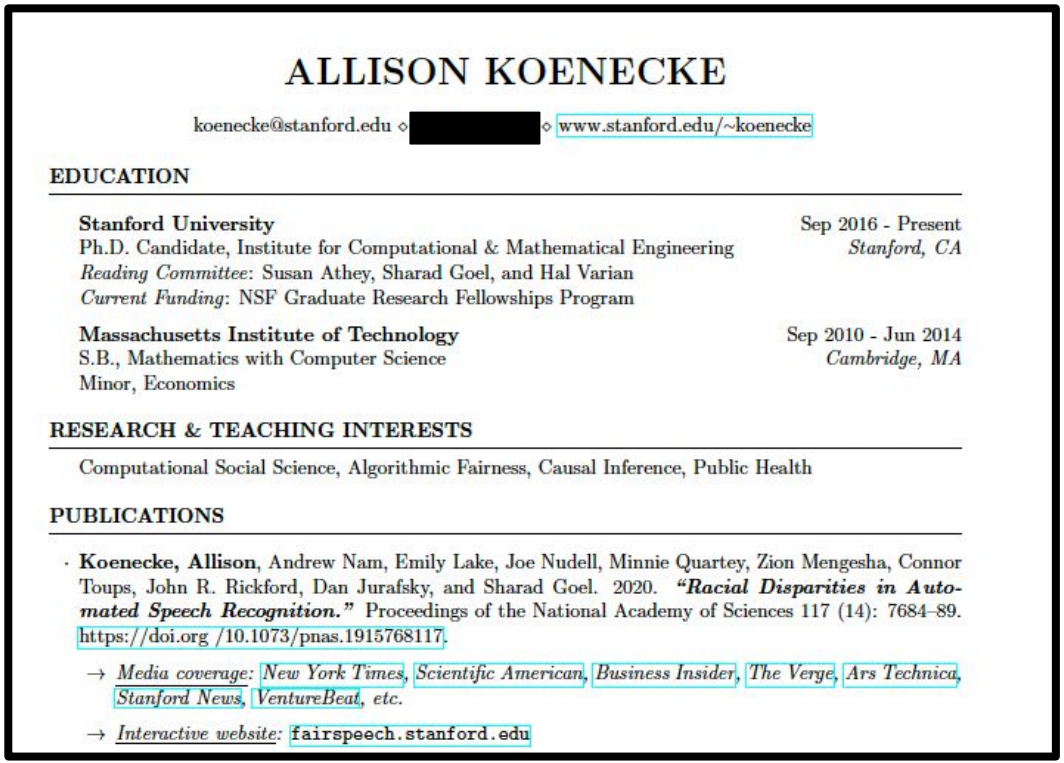
What makes for a good CV?

- **Do:** check out older PhD student CVs for templates
- What is the goal of a CV? Similar to your self-introductions
  - Tell people what research community you're in, as clearly as possible
  - Allow for redirecting people to your online presence

CV Sections

- At the top
  - Personal contact info (email) & website
  - Education (schools in reverse chronological order)
  - Advisor/committee members
  - Keywords (about research interests)
- Then, research / publications
- Then, other activities

Example from 2020



ALLISON KOENECKE

koenecke@stanford.edu ◇ [redacted] ◇ www.stanford.edu/~koenecke

EDUCATION

Stanford University — Sep 2016 - Present
Ph.D. Candidate, Institute for Computational & Mathematical Engineering — *Stanford, CA*
Reading Committee: Susan Athey, Sharad Goel, and Hal Varian
Current Funding: NSF Graduate Research Fellowships Program

Massachusetts Institute of Technology — Sep 2010 - Jun 2014
S.B., Mathematics with Computer Science — *Cambridge, MA*
Minor, Economics

RESEARCH & TEACHING INTERESTS

Computational Social Science, Algorithmic Fairness, Causal Inference, Public Health

PUBLICATIONS

- **Koenecke, Allison**, Andrew Nam, Emily Lake, Joe Nudell, Minnie Quartey, Zion Mengesha, Connor Toups, John R. Rickford, Dan Jurafsky, and Sharad Goel. 2020. ***"Racial Disparities in Automated Speech Recognition."*** Proceedings of the National Academy of Sciences 117 (14): 7684–89. https://doi.org /10.1073/pnas.1915768117.
  - → *Media coverage:* *New York Times*, *Scientific American*, *Business Insider*, *The Verge*, *Ars Technica*, *Stanford News*, *VentureBeat*, *etc.*
  - → *Interactive website:* `fairspeech.stanford.edu`

CV: Research

- Usually, subsections include e.g. “Selected Publications” (link to your papers) and “Invited Presentations” (list your conference / talk experience)

CV: Research

- Usually, subsections include e.g. “Selected Publications” (link to your papers) and “Invited Presentations” (list your conference / talk experience)
- If you don’t have published work yet, that’s okay! You can make a “Working Papers” section that lists your projects & coauthors
- If you don’t have presentations yet, that’s fine! Can include posters; or ask to give talks at other faculty’s lab groups (and list those for now)

CV: Research

- It is easy and common to feel weird about "bragging" on your CV
  - If it helps: "everyone else" is doing it!
  - You should list anything you can that is true
    - E.g., if you applied for and received a $1k travel grant from your department, that can be listed as a grant you received

CV: Everything after ‘Publications’

- This can include…
  - Industry / internship / work experience
  - Other research experience (e.g. more in-depth descriptions of RAships, as opposed to just listed papers)
  - Teaching (e.g. as a TA or instructor of record)
  - Service (e.g. **volunteering** for conferences, **reviewing** for journals/conferences, **leadership** in student groups, etc.)

CV: Everything after ‘Publications’

- This can include…
  - …
  - Skills (technical, languages)
  - Relevant coursework (list out the classes, no need for GPA)
  - Personal projects (e.g. other writing)
  - Fellowships & Honors
  - Extracurriculars

CVs vs. Resumes

- **CVs**: slightly more detailed than your Google Scholar page (in that it contains more education info etc.), can be many pages long and more list-like regarding research
- **Resumes**: more “storytelling” about your “job” (PhD research), emphasis on workplace skills, **NO MORE THAN 1 PAGE**
    - Almost no research-specific jobs will ask for a resume

2020 Resume Example (top)

Education

Stanford University — **Stanford, CA**
Ph.D. Candidate in Computational & Mathematical Engineering — Sep 2016 – (Expected) Jun 2021
- *Fellowships:* NSF Graduate Fellowship, Gene Golub Fellowship, EDGE Doctoral Fellowship
- *Relevant Coursework:* Machine Learning, Causal Inference, Stochastic Methods, NLP, Distributed Algorithms, Optimization, Game Theory, Social Data, Numerical Linear Algebra, Numerical Partial Differential Equations

Massachusetts Institute of Technology — **Cambridge, MA**
S.B. in Mathematics with Computer Science, Minor in Economics — Sep 2010 – Jun 2014
- *Relevant Coursework:* Statistics, Econometrics, Information Theory, Systems Engineering, Complex Analysis

Work Experience

Google — **San Francisco, CA**
Quantitative Analyst Intern — Jun – Sep 2017, Jun – Sep 2019

2020 Resume Example (middle)

Research & Teaching Experience

Stanford University — **Stanford, CA**
Research Assistant — Sep 2017 – Present

- *Fairness:* quantified racial disparities in Automated Speech Recognition systems built by Amazon, Apple, Google, IBM, and Microsoft. First-authored PNAS paper was covered by the New York Times; see fairspeech.stanford.edu for details
- *Health Research and Policy:* evaluated treatment effect of alpha blockers on mechanical ventilation (covered in Forbes); other research includes simulating prematurely stopped clinical trials, estimating game-theoretic switching costs of fee-for-service vs. capitation healthcare payments, and evaluating online climate change sentiment post-disaster

The Challenges of Global Poverty (MIT edX Economics Course 14.73x) — **Cambridge, MA**
MIT Teaching Assistant — Jan – Jun 2014

- Worked under Nobel laureate Profs. Esther Duflo and Abhijit Banerjee to develop an online curriculum by running office hours, moderating the discussion forum, and ensuring overall MOOC quality

CV/Resume for specific applications

- It is okay (and even sometimes, advised) to make versions of your CV specific to certain applications
  - E.g. a research position on a specific topic maybe warrants a re-ordering of your research interests, or highlighting different relevant coursework

CV/Resume Resources

- Additional tips:
  - **CV:** Jia-Bin Huang, University of Maryland https://x.com/jbhuang0604/status/1433651068282540033
  - **Resume:** Alison Green, AskAManager https://www.askamanager.org/2018/06/how-to-write-a-resume-that-doesnt-suck.html

What do applications ask for?

- Potential funders/employers want to know:
  - **Who** you are
    - from your CV/resume

What do applications ask for?

- Potential funders/employers want to know:
  - **Who** you are
    - from your CV/resume
  - **Whether** they should hire/fund you
    - from rec letters
  - **What** you would achieve if they hire/fund you
    - from research proposals

Letters of Recommendation

- First step: who will write your letters?
  - Check application to see how many letter-writers you need / if there are constraints (e.g. they must be at academic institutions)
  - Figure out what set of people could give you nice coverage of the aspects you want to be written about. Think about this similarly to who you would ask to be on your committee

Letters of Recommendation

- Ask your rec letters well in advance (at least **weeks**)
- Make sure they received **links** to the relevant application call (which ideally describes what they should include in a rec letter) & submission portal link
- Make sure they know the rec letter **deadline** (and email them a few days before the deadline with a reminder if they haven't submitted yet!)

Letters of Recommendation

- Don’t be shy to ask someone for a LoR! The worst they can say is no, and if they say no, it will most likely be because they’re too busy (nothing about you)!
- The first time someone writes a rec letter for you will take a long time. Future iterations of sending a rec letter for you are much faster/easier (since they can include smaller piecemeal updates)

Letters of Recommendation

- Provide rec letter writers with:
  - A **bulletpoint list** of things they can write about regarding your interactions / why they might think you're exceptional
  - **Your CV** / other helpful background on yourself (e.g., research proposal if required)
  - **Additional details** about your application (e.g., why you'd like to apply / how it aligns with long-term goals, etc.)

Letters of Recommendation

- A U.S.-specific note: US LoR are known for being uniformly glowing (e.g. “I strongly and enthusiastically recommend this student…”), to the point where letters that don’t adhere to this norm are read as “definitely don’t accept this candidate”
- Useful to flag this to any letter writers who aren’t familiar with the US norm (e.g. European LoR are often known to be much more muted)

Letters of Recommendation

- Additional resources on how to ask for LoR:
  - Michael Ernst, UW https://homes.cs.washington.edu/~mernst/advice/request-recommendation.html
  - Matt Might, University of Alabama Birmingham https://matt.might.net/articles/how-to-recommendation-letter/

What do applications ask for?

- Potential funders/employers want to know:
  - **Who** you are
    - from your CV/resume
  - **Whether** they should hire/fund you
    - from rec letters
  - **What** you would achieve if they hire/fund you
    - from research proposals

Research proposal?

- Some applications require this!
- General scope:
  - Sell the reviewers on your big research idea

Research proposal?

- Some applications require this!
- General scope:
  - Sell the reviewers on your big research idea
  - Specific enough [data, methods, etc.] such that the work is *definitely doable*
    - Preliminary results a bonus (proof of concept)
  - Broad enough that, even if you get null results, the work is still interesting

Research proposal considerations

- If proposal is for a fellowship that funds you for N years, don’t propose a project that’s so easy it can be done in N/2 years, and don’t propose a project so difficult it would take 2*N years to complete

Research proposal considerations

- If proposal is for a fellowship that funds you for N years, don't propose a project that's so easy it can be done in N/2 years, and don't propose a project so difficult it would take 2*N years to complete
- Remember to use your scientific writing tips (reviewers are only skimming your proposal!): open with the clear research question, succinctly describe methods, don't use synonyms

Research proposal components (historically)

- Proposals for many research fellowships have often consisted of the following two key areas that you need to write about:
  - **Intellectual Merit:** why is this work novel?
  - **Broader Impact:** why does this work matter?
- Reviewers will be looking for answers to these questions, so write them in directly!

Broader Impacts matter

- ***"Sell your problem first, then sell your solution"*** – Cheng Zhang, Cornell IS
  - If the reviewers don't care about the research problem, why would they care about the novelty of your method?
- Imagine explaining your research idea to non-academic family/friends. How would you explain it to them? Use that as your intro.

Research proposal examples

- Many floating around on the internet (e.g., Google for NSF GRFP examples)
  - https://docs.google.com/spreadsheets/d/1xoezGhbtcpg3BvNdag2F5dTQM-Xl2EELUgAfG1eUg0s/edit?gid=0#gid=0
- You can also ask people you know who've been successful at these opportunities whether they're comfortable sharing their materials (or just talking about their application)

Research proposal help

- Always start by reading the rules / constraints of the research proposal (How many pages? What sections? etc.)
- Google to see if people on the internet have advice / successful examples
- Ask the Cornell Writing Centers for help!
- Ask your advisor, labmates, cohort, etc. for feedback (even multiple rounds of feedback)!

Add'l research proposal tips

- MIT Broad Research Communication Lab https://mitcommlab.mit.edu/broad/commkit/nsf-research-proposal/
- Sanya Jain https://x.com/yourgradcoach/status/1900960356010483757
- Alex Lang https://www.alexhunterlang.com/nsf-fellowship
- Yale Undergraduate Research https://science.yalecollege.yale.edu/stem-fellowships/how-write-proposal

HW

Update your CV / resume as needed.
Happy spring break!

The Academic Job Market

What does an academic job entail?

- Postdocs
- Non-academic research roles
- Faculty positions
  - Tenure-track
  - Teaching track
  - Research track
- …

Postdocs

- Can be in academia (university) or [some] industry (MSR)
- Can be 1–3 years depending on offer

Postdocs

- Can be in academia (university) or [some] industry (MSR)
- Can be 1–3 years depending on offer
- Can be “named” (e.g. Assistant Research Professorship through Cornell CDSES) or not
- Can be paid by the institution (e.g. CDSES) or by a faculty member directly
- Can be “naked” (accepted without a guaranteed faculty job afterwards) or not

Postdoc vs. Faculty market?

- Postdocs are useful to learn how to do the faculty job better!
  - More experience mentoring students, writing grants, establishing your own collaborations, etc.

Postdoc vs. Faculty market?

- Postdocs are useful to learn how to do the faculty job better!
  - More experience mentoring students, writing grants, establishing your own collaborations, etc.
- If going directly on the faculty market from a PhD, you can apply for postdocs at the same time and defer your faculty job by 1 year to do a postdoc (this is a good outcome for your faculty institution, since you get additional training before starting!)

Non-Academic research roles

- Generally, less focus on *teaching*, and mentorship is more in the form of management. E.g.:
- **Industry** (e.g. researcher at MSR, Google Research, etc.)
  - More emphasis on publishing papers & work that directly impacts products
- **Think tanks**, **non-profits, government**, other policy orgs
  - More emphasis on writing “white papers” and informing policy

Non-Academic ~~research~~ roles

- You may also be interested in non-research roles (these exist!)
  - E.g., working on product teams directly in tech companies
  - Working as a “data scientist” rather than an “ML researcher”
  - etc.

Faculty positions: different types!

- If you want to dedicate your career to teaching, there are *teaching track* positions (e.g., non-tenured lecturers) where your promotion is based on your teaching, not research
- If you want to dedicate your career to *not teaching*, there are *research professor* (non-tenured) positions with no teaching requirement & may focus on specific domains (e.g. types of collaborations or research)

Faculty positions: different types!

- Adjunct faculty: similar to teaching faculty, but often shorter contracts, fewer benefits, etc.
  - Depending on school/department, can be seen as exploitative

Faculty Positions: different types!

- Interested in teaching/research-track professorships but not finding much information about them online?
  - Cold email some profs with the career you're interested in pursuing!
  - They will often be very happy to talk to you about the more niche track they've chosen :)

What are tenure-track positions?

- Most IS students who have gone on the faculty market have applied for tenure-track positions (requires both teaching and research)

What are tenure-track positions?

- Most IS students who have gone on the faculty market have applied for tenure-track positions (requires both teaching and research)
  - After 6 years in the position as an ***Assistant*** Professor, you submit a package of research/teaching/service materials and the department votes on whether you get tenure → "***Associate***" Professor, a 1 year sabbatical, and a permanent position in that department!

Faculty titles / roles (in Info Sci*)

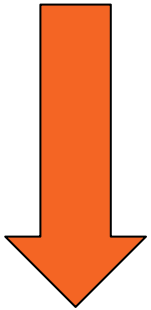
- Assistant Professor
- Associate Professor
- Full Professor
- Professor Emeritus

- Chair
- Dean
- Provost
- President

some places, like journalism schools or business schools, might be structured differently (e.g. tenuring directly into full professor)

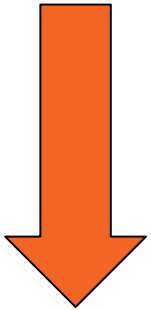
Faculty titles / roles

- Assistant Professor
- Associate Professor
- Full Professor
- Professor Emeritus



increasing seniority

- Chair
- Dean
- Provost
- President

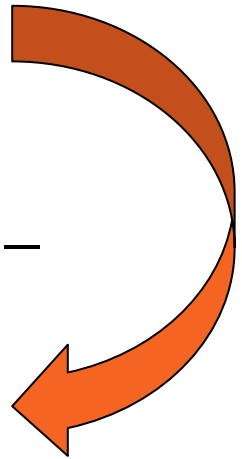


increasing responsibility

Faculty titles / roles

- Assistant Professor
- Associate Professor
- **Full Professor**
- Professor Emeritus

- **Chair**
- **Dean**
- **Provost**
- **President**



“Senior faculty” do these jobs (“junior faculty”, i.e. pre-tenure, do not)

Faculty titles / roles

- Assistant Professor **(pre-tenure, ~6 years)**
- Associate Professor **(“national” expert, ~5 years)**
- Full Professor **(“world-renowned” expert)**
- Professor Emeritus **(~ retired)**

- Chair
- Dean
- Provost
- President

Faculty titles / roles

- Assistant Professor (pre-tenure, ~6 years)
- Associate Professor (“national” expert, ~5 years)
- Full Professor (“world-renowned” expert)
- Professor Emeritus (~ retired)

- Chair **(“boss” of department)**
- Dean **(“boss” of school, e.g. CIS – three departments)**
- Provost **(more internal-facing admin role)**
- President **(more external-facing admin role)**

Today's slides...

- Focus on IS departments, and junior-level postdoc/tenure-track applications (though many similarities across jobs)
- The usual caveat: different markets work differently, different years have different quirks, etc.

A commonality for all of them

- Applicants should have at least something to say about experience with:
  - **Research** (for non-research roles, you still need to have a research-based PhD!)
  - **Teaching** (for non-teaching roles, this could be more about student mentorship through e.g. internships)
  - **Service**

Goals for today

- Understand how your job applications would be processed “under the hood”
  - Both with Cornell, and other universities / departments with similar processes

- Provide a general timeline for the IS / IS-adjacent market

Finding job ads

- Most ads are on AJO (academicjobsonline.org)

Finding job ads

- Most ads are on AJO (academicjobsonline.org)
  - **Why AJO? Because you can *submit* your applications through AJO as well (including eliciting rec letters)**

Finding job ads

- Most ads are on AJO (academicjobsonline.org)
- For IS, also check out:
  - academickeys.com (for all domains)
  - ischools.org (for ischools)
  - cra.org/ads (for computing)
- You are interdisciplinary, so don't forget to ask around if there are other department-specific lists of jobs being posted (these are often informally collated in, e.g., CS or Econ communities)

Reading a job ad

This is long!

How do we tell what's important?

AcademicJobsOnline.org

View Jobs | Registered Employers | Contact Us | Login

Cornell University, Information Science

Position ID: Cornell-IS-TTITH [#25656, WDR-00039919]
Position Title: 2023-2024 CORNELL INFORMATION SCIENCE TENURE-TRACK FACULTY SEARCH, ITHACA CAMPUS
Position Type: Tenured/Tenure-track faculty
Position Location: Ithaca, New York 14850-4623, United States [map]
Subject Area: Information Science / Human-AI interaction
Appl Deadline: 2023/12/01 11:59PM (posted 2023/09/12, listed until 2024/03/12)
Position Description: Apply

2023-2024 CORNELL INFORMATION SCIENCE TENURE-TRACK FACULTY SEARCH, ITHACA CAMPUS The Cornell University Department of Information Science (IS) in the Ann S. Bowers College of Computing and Information Science (Bowers CIS) has tenure-track and tenured faculty positions available. The IS Department spans Cornell's Ithaca and New York City campuses where nearly 40 faculty members are leaders in their respective fields within Information Science's interdisciplinary structure. We are interested in applications from researchers in any of the broad research areas of the department (see **https://infosci.cornell.edu/research**) and applicants who can contribute to advancing the department's commitment to diversity and inclusion. This year we will focus on hiring candidates whose research engages with Human-AI interaction by building or designing artifacts. Approaches that center on research through design, social computing, visualization, HCI, and technical methods are especially welcome. Faculty hired for this Ithaca campus search will have their teaching and research based in Ithaca. The IS faculty are located in Cornell's Gates Hall and the department has strong connections with several other units on campus, including Computer Science (also in Gates Hall), Communication, Economics, Sociology, Science and Technology Studies, Operations Research and Information Engineering, Cognitive Science, and the Law School. These connections support the IS department's mission to advance its understanding of how people and society interact with computing and information. The department also strives to offer a high quality of life, providing a collegial and supportive atmosphere on campus. Beyond campus, Ithaca is in the heart of the Finger Lakes region, and both Cornell and Ithaca offer a vibrant cultural life and a wide range of sporting and outdoor activities close at hand. Cornell also seeks to meet the needs of dual career couples, with both its own Dual Career program and membership in the Upstate New York Higher Education Recruitment Consortium to assist in dual career searches. Candidates must hold a Ph.D. or equivalent degree by August 2024. Candidates should submit a cover letter, a curriculum vitae (CV), a research statement, and a teaching statement. The cover letter and research statement should highlight up to three of their most significant pieces of work for consideration. We also ask applicants for all faculty positions to share their experiences and/or approaches (past, current, or future) to fostering learning, research, service, and/or outreach in a diverse community. Applicants may choose to submit a stand-alone statement or embed the information in other parts of their application materials. Diversity and inclusion are a part of Cornell University's heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities. We also recognize a lawful preference in employment practices for Native Americans living on or near Indian reservations. Fostering an inclusive environment is also a core value of the Ann S. Bowers College of Computing and Information Science. In line with Cornell's historical commitment to be "an institution where any person can find instruction in any study," we seek candidates who will create a climate that attracts and is inclusive of all students, including students from historically underrepresented groups and students who have overcome personal challenges. See **https://prod.cis.cornell.edu/diversity**, as well as **https://cis.cornell.edu/diversity** for information about related Bowers CIS activities and resources. There is a salary range of $76,200 – $309,900 for positions like this one at Cornell; this range reflects an aggregate of qualifications and disciplines across Cornell University. Actual salary offers in Bowers CIS will be based on education, experience, discipline, and relevant skills.

The above application materials should be submitted online at **https://academicjobsonline.org/ajo/jobs/25656**, along with the names of at least three people who will provide reference letters. To ensure full consideration, complete applications (including reference letters) should be received by December 1, 2023, but applications will be accepted until the search has concluded. Inquiries about your application may be directed to fac_recruit@infosci.cornell.edu.

Familiarize yourself with Cornell's **COVID-19 workplace guidance** as well as the university's **COVID-19 services and information**

Employment Assistance:

For specific questions about the position or application process, please contact the Recruiter listed in the job posting or for general questions email **mycareer@cornell.edu**.

If you require an accommodation for a disability in order to complete an employment application or to participate in the recruiting process, you are encouraged to contact Cornell University's Office of Institutional Equity and Title IX at voice (607) 255-2242, or email at **equity@cornell.edu**.

Applicants that do not have internet access are encouraged to visit your local library, or local Department of Labor. You may also request an appointment to use a dedicated workstation in the Office of Talent Attraction and Recruitment, at the Ithaca campus, by emailing **mycareer@cornell.edu**.

Please read the required Notice to Applicants statement by **clicking here**. This notice contains important information about applying for a position at Cornell as well as some of your rights and responsibilities as an applicant.

https://academicjobsonline.org/ajo/jobs/25656

Reading a job ad

Check the top for info on department, location, and whether it's tenured, and the application deadline


AcademicJobsOnline.org View Jobs | Regi

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https://academicjobsonline.org/ajo/jobs/25656

Reading a job ad

* How hard is this deadline? You could probably submit a few days later, but run the risk of decisions being made already (especially if apps are read on a rolling basis – in which case submitting earlier has a slight benefit)

AcademicJobsOnline.org View Jobs | Regi

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Reading a job ad

Check to see if there are specific search targets

2023-2024 CORNELL INFORMATION SCIENCE TENURE-TRACK FACULTY SEARCH, ITHACA CAMPUS The Cornell University Department of Information Science (IS) in the Ann S. Bowers College of Computing and Information Science (Bowers CIS) has tenure-track and tenured faculty positions available. The IS Department spans Cornell's Ithaca and New York City campuses where nearly 40 faculty members are leaders in their respective fields within Information Science's interdisciplinary structure. We are interested in applications from researchers in any of the broad research areas of the department (see **https://infosci.cornell.edu/research**) and applicants who can contribute to advancing the department's commitment to diversity and inclusion. This year we will focus on hiring candidates whose research engages with Human-AI interaction by building or designing artifacts. Approaches that center on research through design, social computing, visualization, HCI, and technical methods are especially welcome. Faculty hired for this Ithaca campus search will have their teaching and research based in Ithaca. The IS faculty are located in Cornell's Gates Hall and the department has strong connections with several other units on campus, including Computer Science (also in Gates Hall), Communication, Economics, Sociology, Science and Technology Studies, Operations Research and Information Engineering, Cognitive Science, and the Law School. These connections support the IS department's mission to advance its understanding of how people and society interact with computing and information. The department also strives to offer a high quality of life, providing a collegial and supportive atmosphere on campus. Beyond campus, Ithaca is in the heart of the Finger Lakes region, and both Cornell and Ithaca offer a vibrant cultural life and a wide range of sporting and outdoor activities close at hand. Cornell also seeks to meet the needs of dual career couples, with both its own Dual Career program and membership in the Upstate New York Higher Education Recruitment Consortium to assist in dual career searches. Candidates must hold a Ph.D. or equivalent degree by August 2024. Candidates should submit a cover letter, a curriculum vitae (CV), a research statement, and a teaching statement. The cover letter and research statement should highlight up to three of their most significant pieces of work for consideration. We also ask applicants for all faculty positions to share their experiences and/or approaches (past, current, or future) to fostering learning, research, service, and/or outreach in a diverse community. Applicants may choose to submit a stand-alone statement or embed the information in other parts of their application materials. Diversity and inclusion are a part of Cornell University's heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities. We also recognize a lawful preference in employment practices for Native Americans living on or near Indian reservations. Fostering an inclusive environment is also a core value of the Ann S. Bowers College of Computing and Information Science. In line with Cornell's historical commitment to be "an institution where any person can find instruction in any study," we seek candidates who will create a climate that attracts and is inclusive of all students, including students from historically underrepresented groups and students who have overcome personal challenges. See **https://prod.cis.cornell.edu/diversity**, as well as **https://cis.cornell.edu/diversity** for information about related Bowers CIS activities and resources. There is a salary range of $76,200 – $309,900 for positions like this one at Cornell; this range reflects an aggregate of qualifications and disciplines across Cornell University. Actual salary offers in Bowers CIS will be based on education, experience, discipline, and relevant skills.

https://academicjobsonline.org/ajo/jobs/25656

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Even if this doesn't describe you, it is *always* still worthwhile to apply: departments are sometimes willing to consider exceptional applicants even if they're outside of the hiring scope *(we do this!)*

https://academicjobsonline.org/ajo/jobs/25656

Reading a job ad

Application Materials Required:

Submit the following items online at this website to complete your application:

- Cover letter
- Curriculum Vitae
- Research statement
- Teaching statement
- Diverse Community Commitment Statement (optional)
- Three reference letters (to be submitted online by the reference writers at this site)

And anything else requested in the position description.

Make sure you know what's required (different applications often have different max # rec letters, different diversity statement formatting, etc.)

https://academicjobsonline.org/ajo/jobs/25656

Sorting out timing

- Since you'll be looking at many different ads, it's helpful to assemble a spreadsheet with department names, job ad links, and due dates
- This will also help you keep track of which rec letters have gone in already, so you can send reminder emails to your writers

The Hiring Committee

- The hiring committee usually consists of a range of faculty across the department (junior / senior, different domains), but always includes experts in the specific domain for which we are specifically trying to hire (per the job ad)
    - This is helpful in spreading the word about the job ad to that academic community (e.g. your advisors)
    - And, critical in evaluating the quality of applications

The Hiring Committee Reviews...

- Your application package!
  - Cover Letter
  - CV
  - 3+ letters of recommendation
  - Research statement
  - Teaching statement
  - Optional diversity statement
  - Optional writing sample(s)

What goes in a cover letter?

- Give us your 1-paragraph elevator pitch for why you're a fantastic hire
- Elsewhere in your cover letter, help us understand why you care about our department specifically
    - Show you've done your research: specify working groups, course numbers, or seminar series that you're interested in

How to write your statements?

- **Research**: talk both about your previous research, and also what your future research agenda is!
- **Teaching**: talk about your personal teaching philosophy / experience, and also what type of classes you envision teaching in the future (**useful to check what courses already exist in that department to avoid proposing something 'new' that already exists*)
- **Diversity**: talk about how your experiences can help you / your department foster an inclusive community

Is my CV enough?

- We don’t have a specific minimum number of papers that we look for
  - Some academic communities write fewer long papers, others write more short papers
  - Just make sure that it’s easy to figure out which papers are “most important” (e.g., you took the leading role or played a prominent role in its success, and can speak intelligently about it)

What to look for in rec writers?

- Make sure they can discuss *specifics* of why you'd be a great addition to a department
    - You can (should) provide your letter writers bulletpoints that you want them to emphasize
    - You can ask different letter writers to focus on different things (e.g., one more about research creativity, another one more about leadership, etc.)
    - If you have 5 writers but a submission site only accepts 3 letters, you can ask one of your writers to append the other letters to their letter (with attribution)

What's happening on our end?

Hiring committee

A subset of the faculty write the job ad, read all of the applications, and narrow down the applicants to a subset of candidates

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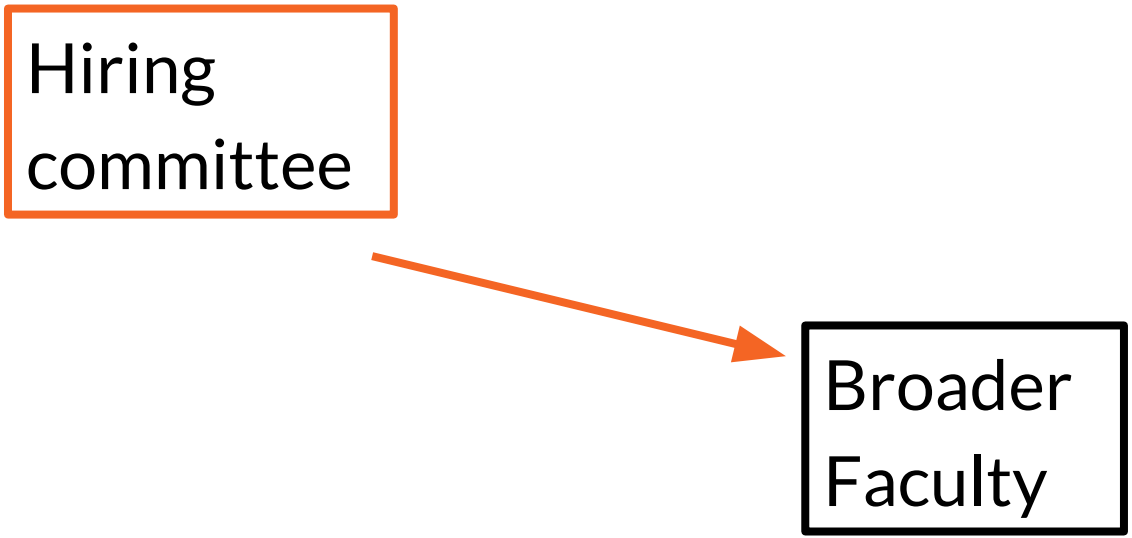
**Some departments (not us) do phone screens as first round interviews, which are usually conducted by the hiring committee only*

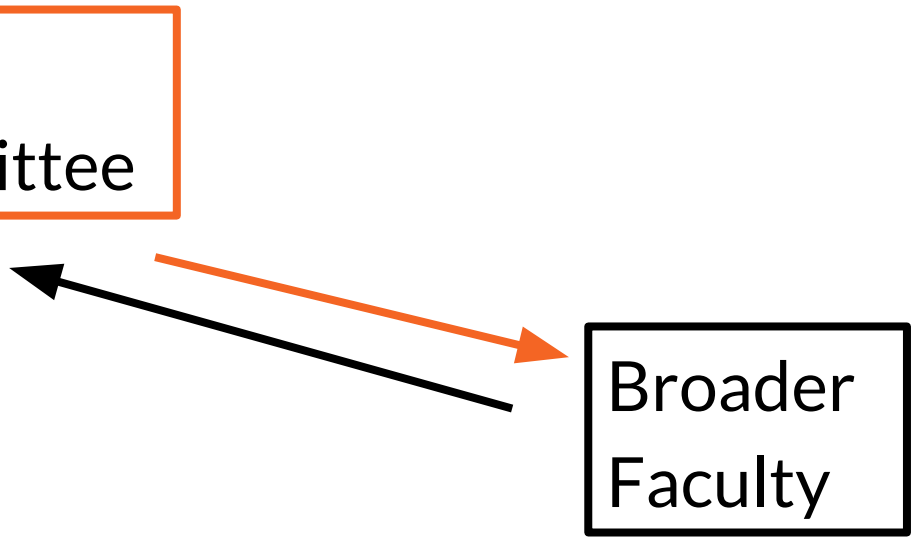
What's happening on our end?



The whole department then votes on which candidates to fly out for an interview

What's happening on our end?

The hiring committee coordinates interviews & briefs job talk candidates on the department



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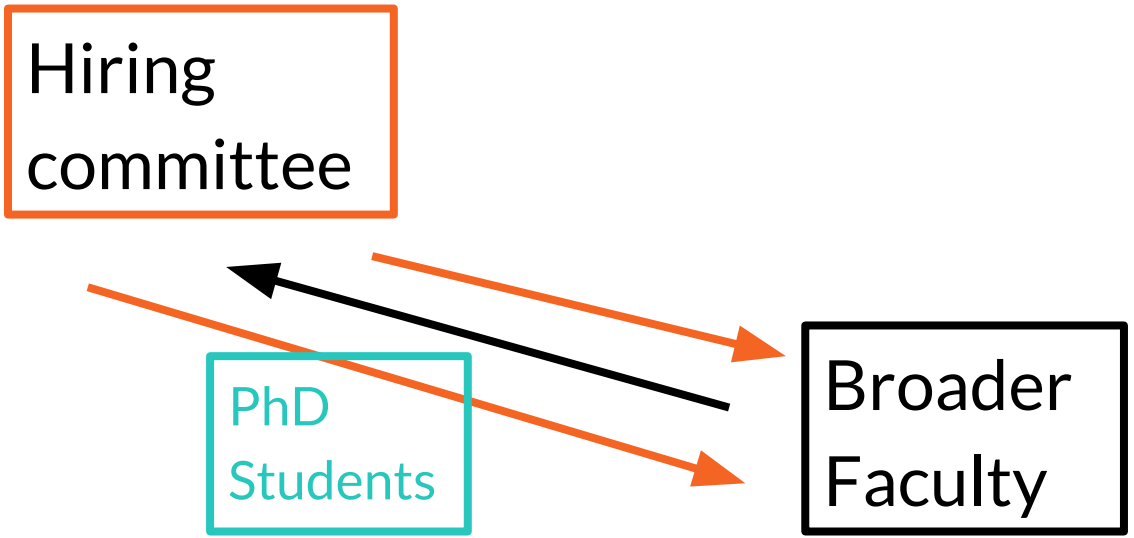


After interviews, the whole faculty votes on who to extend offers to (taking into account student feedback)

Timelines

- Hiring committee reads applications (on a rolling basis, usually) from November through December
- We make an “interview shortlist” in Dec / Jan for faculty review, and try to send out interview requests ASAP
- IS interviews happen late Jan - early March
- Hiring decisions are made after the interviews, usually mid-late March

How do schools narrow down applications?

- Either being in a field relevant to the specific call, OR being an exceptional candidate in any field
- Showing research independence in their prior research & writing (will they succeed without an advisor?)
- Having a thoughtful 5-year research plan of interest to the department (do they have a “research vision”?)
- Caring about teaching and service

What happens in an interview?

- Job talk: 1 hour (+ questions) to given an overview of your research agenda, and specifically talk about 1-2 projects in depth
- Lunch with PhD students: ask about student life
- 1-on-1 meetings: meet a range of faculty. You're evaluating the school as much as they're evaluating you; feel free to ask questions about the department or their research!
- Dinner on the town: get a feel for the surrounding area

Markers of a successful interview

- Your job talk is appealing across the breadth of the department (and doesn't get too stuck in the weeds), but is detailed enough to satisfy the in-field faculty
- Your research fosters interesting discussion / questions
- You can find research overlap with several different faculty members
- You have answers for questions like: how big will your lab be, what research communities / venues will you primarily belong to, and where will you apply for funding?

Timelines (again)

- As interdisciplinary folks, be careful with timing!
- IS interviews happen late Jan - early March
- Econ / business schools have already made hiring decisions by then
- CS departments start their interviews after us
- If you have any worries about timing, make sure to communicate that to the hiring committee so the department can adjust timelines for your case!

Requirements vary!

- The market might look very different internationally!
  - E.g., “panel interviews”, a short 20 minute talk in the first round interview (before the usual job talk), expectation to report h-index in a CV, etc.
  - Make sure to talk to people with experience interviewing at those schools!

The Job Market

- In the end, much of the job market is “random”: we always have far more qualified applicants than we can hire

- Do not ever feel like a rejection of your application is a rejection of you or your research! Odds of landing a job in academia are always very low
    - You can always go back on the job market after gaining more experience with a postdoc

Assorted Glossary

- "**Tenure clock**" – how long you have until you go up for tenure (you can "extend your clock" if you take time off for e.g. medical leave, parental leave, etc.)
- "**1:1**", "**2:1**", "**2:2**" – a faculty member's teaching load for a school on the semester system (e.g. 1:1 = teaching 1 class in fall, 1 class in spring)
    - "**Teaching relief / course relief / course buy-down**" – a (usually one-off) reduction to your teaching load, via negotiation or payment
- "**x9**", "**x12**" – prof salary is usually on a 9 month basis ($ x9)
- "**Startup funds**" – a pot of money provided by the department to the new faculty member in order to "start up" their lab (i.e., fund new PhD students, pay for compute, etc.)

HW

Update your personal website / online footprint!

Applying for summer internships / jobs in industry

Why would a PhD student do an industry internship?

- To explore more potential options for long-term career paths
- To work & network with other strong researchers in industry research teams
  - Diversify who you learn from
  - Gain a rec letter writer
- To earn more money (even doubling annual $)

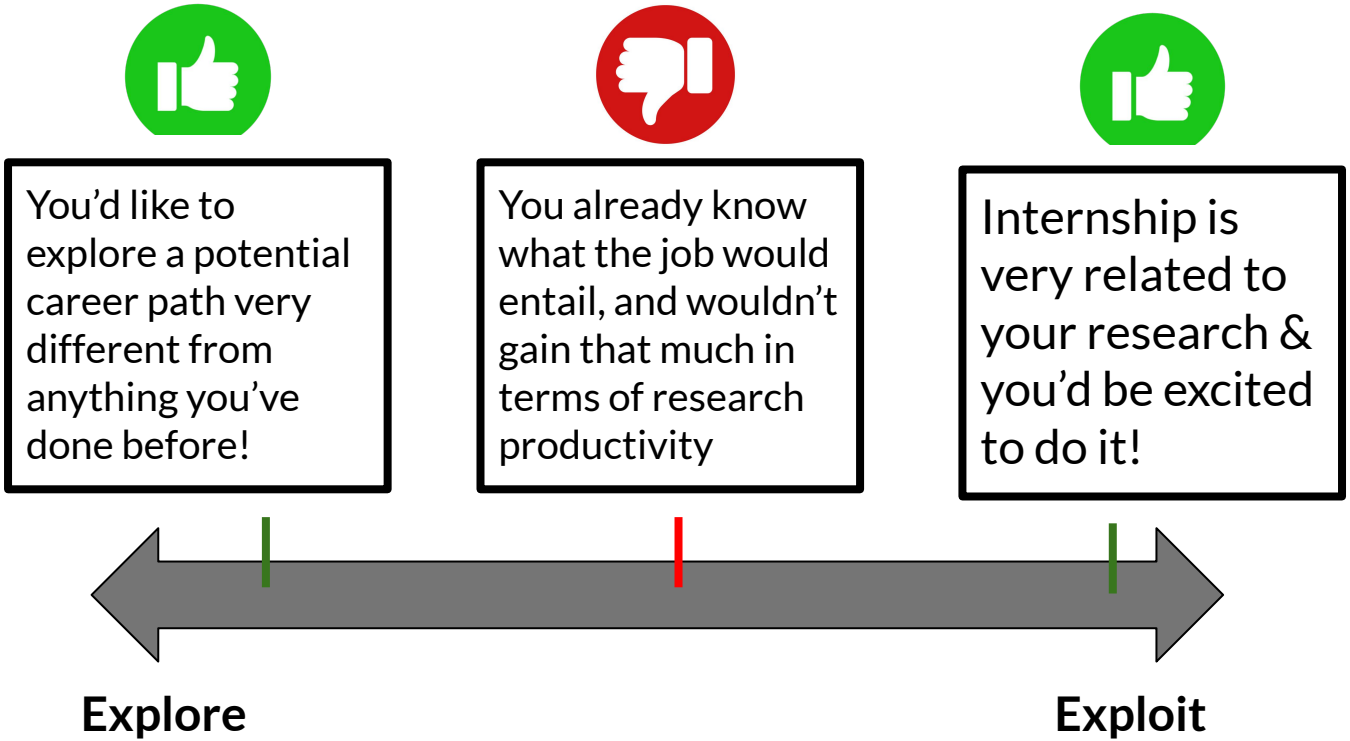
Internships in Industry

- Some are more research-related (e.g. the goal is to publish a paper, usually with research-specific teams), some are less (e.g. with product teams)
- If you plan to produce a paper from your internship, be cognizant of timing (and coordinate both with your internship mentor & your advisor)
    - It often takes an ***extra 6 months*** post-internship to have a paper submission underway; you may want to explore the possibility of part-time work with the company for that additional time

Internships in Industry

- Often, these internships are for a specific research project that's pre-defined in the job posting
- Do not expect for that project to be exactly aligned with the specific research projects that you plan to do for your dissertation – it is rare for such overlap to happen!
    - Internships can be a nice way to branch out from what you "normally" would work on

Should you consider the internship?



When is best to do an industry internship?

- Commonly best to do these at the end of your PhD (e.g. your final summer pre-defense), with the possibility of a full-time return offer if you're interested in working in industry
- But, if you're interested in exploring different career paths earlier in your PhD, it may be a good idea to try one in e.g. 2nd year to see if it changes the direction of your research agenda
- In general, get advice from your advisor on timing!

Industry vs. Academia long-term

- Getting a taste of industry earlier on in your career can be helpful as you think about longer-term career differences
  - **Academia**: longer-term mentorship of students (5+ years), teaching, lower pay
  - **Industry**: shorter-term mentorship of students (summer internships), no teaching, higher pay

Tips on getting internships

- Network with people!
  - Have informal conversations (e.g. at conferences) before you apply
- Get leads on internship openings from LinkedIn, Bluesky, etc.
- Tailor your resume/CV to the job (look for specific keywords in the postings)
- Talk to people in that department & learn more about their experiences (e.g. do they tend to use specific language to describe their research, and can you emulate that language in your app?)
- Be collegial in interviews!

HW

Make a spreadsheet for the relevant applications you might be interested in over the next year (internships, organizations, fellowships, programs, grants, etc.), with timelines & relevant notes

Some ad hoc closing thoughts

Sticking with projects

- Projects may seem exciting at the beginning but feel boring towards the end
- You will need to learn how to stick around for the ‘boring’ part of the work, otherwise you’ll end up with a bunch of half-baked projects with nothing to show for your work!
- One way to motivate yourself is to present your work: often research seems boring to you because you’ve been thinking about it for so long, but will sound really exciting to other people – and that excitement is infectious!

Progression through the PhD

- You may feel some tension between the need to master the “academic game” vs. doing what you want for yourself
  - Sometimes the former is just “eating your vegetables” – you need to learn how to write a paper (by working on research that isn’t your ‘dream project’) before you actually do your ‘dream project’
  - But, it is important to advocate for yourself and work on exciting projects – work on communicating ideas and timelines to your advisor to help you with this!

Making the most of your PhD

- You should aim to finish your PhD by showing that you are able to…
  - Have full ownership of projects
  - Upskill on your own (and figure out what resources you need to upskill – which can include when to ask advisors for help)
  - Contribute to your academic communities and keep a pulse on how those communities are changing over time

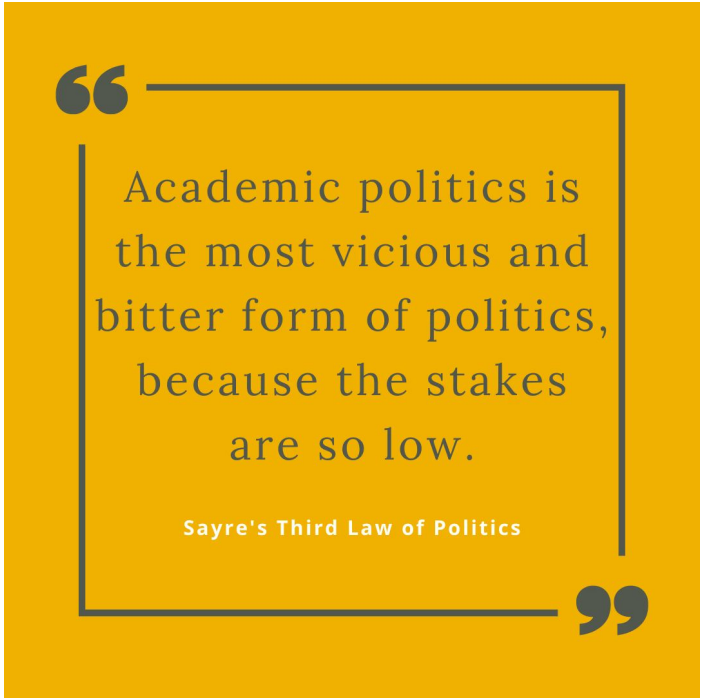
Your surroundings are important!

- Universities are a special place to be; you have the opportunity to hear from & interact with many different incredible researchers, and have many university resources available to you (e.g. classes, seminars, tutors) – so take advantage of them!

People are important!

- Be present with your peers and colleagues!
  - Go to each other's talks, be engaged with their research, and provide feedback on each other's work!
  - Your colleagues are in it "for the long haul," as are you – you'll be making some of your longest-lasting connections in grad school!

Above all, be kind (and avoid this)



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Here's everything we covered!

Professionalization & self-introductions	Giving presentations, conference etiquette, public communication (e.g., Bluesky threads) & impact beyond papers
Finding your "intellectual community" & spaces online/offline for staying up to date with research	Performance reviews & student progress review; Forming a committee and expectations from PhD milestones
Communication, Meetings, Email etiquette, Timeliness	
Time & stress management, organization, project workflows	Writing CVs and resumes; applying for fellowships & grants, asking for rec letters
Reading papers	What does the academic job market entail?
Reviewing papers; R&Rs	Applying for summer internships / jobs in industry
Writing papers	

Best of luck with your PhD journey!

Feel free to drop me a line (koenecke@cornell.edu) if there are topics you think should be included in future iterations of these slides!