# Post-Ph.D. Career Advice: Risk, Communication, and You

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Outline

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- Post-Ph.D. Success - One-on-One
  - Blank Page Tests, Perceptions of Praise, Speculative Apologies
- Post-Ph.D. Success - Group Discussions
  - Input From Everyone, Allowing False Beliefs, Anxiety & Listening
- CV of Failures
- "Ask Me Anything" Q&A
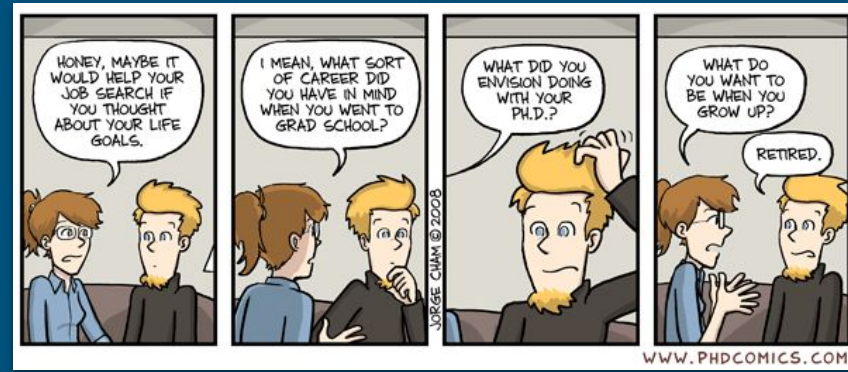
Career Options - Resources

CS Graduate Job Guide https://csguides.github.io/grad-job-guide/

Describes multiple post-Ph.D. career paths

Also includes CVs, application essays, timelines, interview descriptions, etc., from multiple CV Ph.D. students on the job market over multiple years

Industrial research, research-focused professor positions, liberal arts colleges, teaching-focused professor positions, etc.

Career Options - Self Questions

Who do you want to work with?

  Serial sets of many learners vs. a smaller set of established professionals

Who tells you what to do?

  Not having a boss vs. pressure of being responsible for ideas (and jobs of others)

Do you want to teach classes?

  1+1 as R1 research faculty vs. 2+2 (varies) as teaching faculty vs. once every few years

Do you want to write papers?

  Multiple papers per year vs. one every two years; publishing vs. scholarship

Do you want to write funding proposals?

  NSF PI style vs. federally-funded research lab (larger or SBIR) style vs. industrial research lab (internal)

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OF COMPUTER SCIENCE & ENGINEERING

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UW MSR Summer Institutes

The Paul G. Allen School of Computer Science & Engineering at the University of Wa
together a cross-section of researchers in areas of mutual interest. Each year's instit
below.

• 2023 - Rural Computing (August 20 – 23, 2023)
• 2019 - Future of Fabrication (July 22 – 25, 2019)

Planning for Resume Items

Industrial internships

Impact, success without your advisor, letters of recommendation (& lead time)

Research publications

Quantity, quality (award/impact), "three best", journal, first-author

Teaching experiences

Teaching assistant, preparation → instructor of record, summer course, CS 1 vs. upper-level elective

Service activities

Department level (admissions, hiring, DEI, etc.) vs. international level (shadow PC, real PC, workshop co-chair role, etc.)

Mentorship activities

Mentee-first-author paper, graduate school application success, etc.

Organizing Committee

Aymeric Blot
University College London

Bobby Bruce
University of California at Davis, USA

Yu Huang
University of Michigan

William Langdon
University College London

Justyna Petke
University College London
United Kingdom

Your Dissertation Document

Unlike other fields, CS dissertations rarely contain new unpublished results

You can always find an overarching theme for your three papers

> Leveraging Light-Weight Analyses to Aid Software Maintenance

> Optimizing Tradeoffs of Non-Functional Properties in Software

> Understanding User Cognition: from Spatial Ability to Code Writing and Review

ACM Dissertation Awards (etc.) exist, but most Ph.D. dissertations …

> Are read only by you and your advisor, plus ~1 chapter per committee member

> Are written "after" you already have a job lined up

Post-Ph.D. Success

Personal

Leadership

Overcorrecting to Feedback

Saying "No"

Leadership

What do you think the goal or purpose of advising (leadership) is?

To do good research?

To make a positive impact on the world?

To train the next generation of workers?

Would you rather teach {2 people 8 things each} or {8 people 2 things each}?

Personal: "The goal of *advising* is to help people understand what they want and then help expose them to training and opportunities to get it." "*Research* is the repeated generation, implementation and evaluation of creative ideas in the face of failure."

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Avoid Overcorrecting to Feedback

When uncertain (imposter syndrome, etc.) it is very tempting to over-interpret the features of high variance events

    Reviewers: the paper isn't well-motivated, students: class is too hard, etc.

Many faculty have stories of why this feedback is not always trustworthy

    Resubmitted proposal gets in / change the paper and they complain about X instead

People will often point out candidate solutions to be helpful, but it's misleading

    Example: students say the worksheet is too hard, but actual issue is lecture

    Recommendation: interpret negative feedback as a boolean, look for issues on your own, avoid "design by committee"

Saying No

Many feel new-career pressure to accept every opportunity

    FOMO, wanting to get along vs. splitting attention, losing time

Dr. Mary Lou Soffa (UVa) would often give a "grid of No" to new faculty

Particular pressure on women, members of less-represented groups, etc.

Dr. Stephanie Forrest (ASU) would sometimes ask for the name of another woman (etc.) on the committee before agreeing to participate; she also notes that "it is easier to get into collaborations than to get out of them"

Post-Ph.D. Success

One-on-One

Blank Page Tests

Perceptions of Praise

Speculative Apologies

Bake Offs

The Bake Off activity structures training proposal and paper idea generation

- New workers read prior work (papers, contracts, etc.) and generate 3-4 proposals (you have 1-2 in your back pocket)
- Lay them out in a tabular form
  - Name, "So what / Who cares?", What noun are we producing?, Are materials available?, Risks?, Evaluation metrics, Success criteria, Experiments/Proof, Hardest part, How much you personally like it, schedule, etc.
- Fail Early Experiment
- Goal: not to pick one, but to generate an order in which to attempt them
  - Balance risk and reward based on career stage
  - Motivation and buy-in: "Do you want the shot in your left arm or your right arm?"

Blank Page Tests

I've found that a decent predictor of how a student will fare in grad school* is how they handle a blank page in the face of a writing task. In getting to know a (potential) new student, while I don't make explicit "this is a test" kind of tasks, I do construct excuses to ask them to write in a variety of ways, e.g., to describe potential ideas in the setup to a bake off, draft "abstracts" of potential papers, describe the experimental setup they're developing, summarize some prior work they've read, or ideally draft part of what may eventually become a paper based on our work together.

The degree to which a student is willing and able to produce new text --- basically of any quality --- in response to a prompt and then share it with me is reasonably predictive of their grad school trajectories, in my *n=1* experience.

*Note: not necessarily whether they'll finish, since most of my students have historically finished, but more the degree to which they'll struggle with the slog.

- Dr. Claire Le Goues (CMU)

How Others Perceive Praise

Qualitatively. Anxious juniors will think you are "just saying that" to be nice and "don't really mean it".

Be specific. "You did well on the presentation" vs. "Your presentation did a particularly good job of setting up the motivation. I was looking around and the audience was nodding and believed it was an important problem."

Quantitatively. You should target praising more often than you think is necessary.

I ran an experiment in which I noted (wrote down) every time I praised students over the course a week and then asked them how often they were praised. They only naturally recalled about 50% of the instances.

Speculative Apologies

In one-on-one conversations, give other people "an out" and preemptively provide a reason "on your end" for their misunderstandings

- "Good point, I didn't say that very clearly earlier, it's XYZ …"

- "You're right, the presentation skipped past that very quickly, it's PQR …"

- "I didn't leave time at the end of the meeting for you to write down the action items explicitly, they were ABC …"

It can be very tempting to focus on "the truth" (e.g., you actually directly gave the answer to that on slide 13) but resist. You want to communicate, not blame.

Compassion is not a weakness. (And, rarely, you might even be wrong!)

Post-Ph.D. Success

Group Discussions

Input From Everyone

False Beliefs

Anxiety and Listening

Input From Everyone

Speaker sex and perceived apportionment of talk

ABSTRACT

It is a widely held belief that women talk more than men; but experimental evidence has suggested that this belief is mistaken. The present study investigated whether listener bias contributes to this mistake. Dialogues were recorded in mixed-sex and single-sex versions, and male and female listeners judged the proportions of talk contributed to the dialogues by each participant. Female contributions to mixed-sex dialogues were rated as greater than male contributions by both male and female listeners. Female contributions were more likely to be overestimated when they were speaking a dialogue part perceived as probably female than when they were speaking a dialogue part perceived as probably male. It is suggested that the misestimates are due to a complex of factors that may involve both perceptual effects such as misjudgment of rates of speech and sociological effects such as attitudes to social roles and perception of power relations.

Active Pausing. Many will not interrupt a conversation. Provide pauses.

Advice: Practice "10 seconds" and "60 seconds" in your head

Actively Solicit. Ask for the contributions of everyone.

Advice: Go around the table with phrases like "We haven't heard from XYZ in a bit" or "PQR may not have had a chance to chime in"

Advice: Phrasing like "But it may be that ABC has a slightly different take on things / different experience / different opinion …" can give ABC a [group] invitation without pressure ("No, I think you covered it" vs. "Yes, I've …").

Allowing False Beliefs About You

In many cases, correcting misunderstandings of your record is a net loss

> "Let me introduce XYZ, who has 2 ICSE papers" → "Actually, I have 3 …"

Consider carefully your motivation: is it a desire to be right (pride) or a desire for the other person to be right (have a more accurate model of the world)?

Advice: If *necessary*, use "yes, and" non-confrontational elaborations

> "Yes, those two studies focused on test coverage, and we recently published a third at ICSE that focuses on user interactions, similar to your PQR …"

Anxiety and Listening (1)

Junior speaker phrasing: "I just noticed XYZ. Does that impact our schedule?"

Junior self-perception: "I am anxious about this project completing on time, possibly because of concern XYZ that I didn't see until now. Let me double-check with you since you have more experience. Can you reassure me that we'll still make it?"

Senior may hear: "I am certain we won't make it on time. I think you haven't considered concern XYZ. I think you are a bad project lead because you didn't foresee XYZ and incorporate it into your schedule. Justify yourself."

Anxiety and Listening (2)

Senior speaker phrasing: "We should make the stimuli."

Senior self-perception: "We should make the stimuli together when we both have time. I will sit down with you and walk you through how to make them. I'll make a few and you'll make a few. We'll split the work and compare. We'll both feel joint ownership over this part of the project. I'll teach you how to do it."

Others may hear: "You should make all the stimuli. This is a test. You should figure it out on your own. We're still not sure if you're good at this yet. If you do make the stimuli, we will see that you are capable. If you don't, it won't get done and the project will fail. You will look more impressive if you do all of it on your own. Minimize asking for help or being a burden on other team members."

Anxiety and Listening

The people you will be working with are almost always competent

The tasks you target will involve novelty and risk

  Some anxiety from team members is natural in novel, risky situations

There is no uniform solution, but it is (now, becoming) your responsibility to proactively identify how team members (and yourself) may interpret each other

  Advice: Think of best and worst interpretations, think about (and ask about) what people are afraid of or worried about, re-state reasons and goals, etc.

  Advice: Consider showing vulnerability. A friend you can't help gets dropped.

Seeing Positives and Negatives
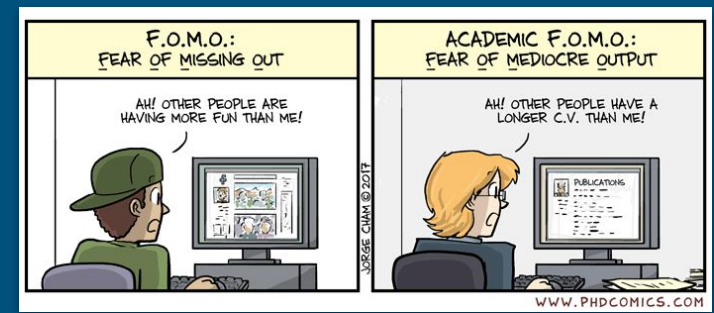
While we practice seeing weaknesses in papers, we often (unconsciously) only consider the positive accomplishments of others

In papers, authors are "*honest advocates*" and weaknesses or failures are not always listed explicitly

When looking at professional careers, CVs and awards are *"honest advocates"* and weaknesses or failures are "never" listed explicitly

Stefan, Melanie. **A CV of failures.** *Nature* 468, 467 (2010). https://doi.org/10.1038/nj7322-467a

CV #1 - Tenured full professor of CS

135+ **research** publications: 5x ten-year most influential paper awards, 4x multi-conference awards, 9x distinguished paper / featured article awards, 2x runner-up best paper awards, 5x best workshop paper or presentation awards, 18,800+ citations, h-index 54. 22x governmental + 2x industrial grants.

31 courses: 1x Engineering-wide **teaching** award, 1x engineering-wide faculty award, 3x CS-wide teaching awards, 1x MOOC to 10,000+ participants, evals above mean whenever available

9 Ph.D.s (+3 current), 2 Master's, 2 Postdocs mentored, 23 undergraduate (+5 current): 1x CRA-wide undergraduate **mentoring** award

CV #2 - That same professor

Told I was not good enough for math grad school; no pubs or letters from 1st internship; nepotism 2nd internship; wasted a year in grad school; "you can't write formal proofs"; gifted thesis topic; rejected by dozens of schools (from Cornell and CMU to UIUC and Wesleyan); botched an MSR interview so badly it was used as an example years later; new-prof papers rejected; over 100 paper submissions rejected; CAREER grant proposal rejected; 22 NSF grant proposals rejected; "program repair will never work"; accused of plagiarism; multiple prospective graduate students I recruited went elsewhere; multiple DEI transparency arguments rejected by administration; new elective course proposal rejected; "This was one of the worst classes I have taken"; ...

"Ask Me Anything" (perhaps @ break)

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Anxiety and Listening (3)

New worker self-perception: "XYZ is clearly the lead and owner on this project. She came up with the idea before I joined. Even though I had some suggestions for the hypotheses and stimuli, it's the original creative idea that counts in academia. Of course the senior members aren't going to do as much leg work: that's my job. I'm already behind: I have to make all the stimuli and run all the participants to even keep up and be a contributing member of the project and get into grad school."

New manager self-perception: "ABC is making all the stimuli, doing all of the setup, and running all of the experiments. I haven't done much of anything recently on the project and it feels like she is taking it all over. I'm supposed to be advising her, but there isn't really anything for me to help her with: she keeps turning down aid. If she could be doing this all on her own, why am I even here?"