

Perspectives on the PhD Process

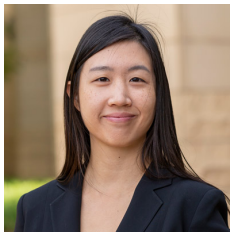
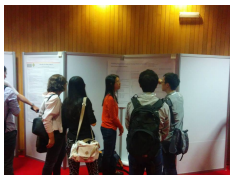
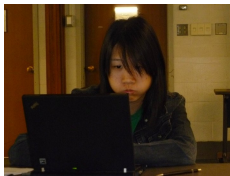
from a recent graduate

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About Me

- ▶ Undergrad degrees from the University of Pennsylvania in 2012
- ▶ PhD from Columbia University in 2019
- ▶ Assistant professor and graduate admissions committee member at UTD since Fall 2019



Should You Get a PhD?

Only if you can answer one very important question!

Why do you want a PhD?

- ✓ There is a problem I am passionate about trying to solve
- ✓ I want to work in research (either academic or industry)
- ✓ I want to teach at the university level
- ✗ It sounds prestigious
- ✗ I don't know what else to do

Should You Get a PhD?

About half of PhD students in the US end up dropping out¹

It takes 5-7 years to complete the degree

During that time you will experience

- ▶ A lot of failures and rejection
- ▶ Loneliness and self-doubt
- ▶ Long work hours, including weekends and holidays
- ▶ Being poor while your friends in industry make big bucks

If you don't have a good reason for wanting a PhD, you probably won't stick it out!

¹<https://cgsnet.org/phd-completion-project>

The PhD Process

A Rough Timeline

Years 1-2: coursework and qualifying exams

- ▶ You start doing research, but you might not get any publishable results yet
- ▶ You can explore different topics within your research area if you're not sure what you want to work on

Years 3-4: candidacy exam and research

- ▶ Some schools and/or departments (but not all) have an oral candidacy exam during Year 3
- ▶ You should be settled on a research topic, producing results, and publishing papers
- ▶ You start thinking about who you want to have on your dissertation committee

The PhD Process

A Rough Timeline

Years 5-7: proposal, dissertation, and defense

- ▶ Most schools/departments will require you to propose at least one semester (or more) before you intend to defend
- ▶ You should have already finished about half of the work for your dissertation when you propose
- ▶ You will likely be applying for jobs while writing your dissertation and preparing for defense

The PhD Process

How It Happened for Me

Year 1

- ▶ Required courses and electives relevant to my research
- ▶ Passed three qualifying exams
- ▶ Came up with some research ideas but no publishable results

Year 2

- ▶ More required coursework
- ▶ Passed fourth qualifying exam
- ▶ Failed last qualifying exam in fall semester but passed in spring
- ▶ Published first paper after two rejections

The PhD Process

How It Happened for Me

Year 3

- ▶ Done with required courses
- ▶ Changed research topics
- ▶ Published second paper after one rejection
- ▶ Won an award for that paper

Year 4

- ▶ Passed oral candidacy exam
- ▶ Follow-up to my second paper was rejected twice for being too critical of my own prior work
- ▶ Changed research topics again
- ▶ Published third paper after one rejection

The PhD Process

How It Happened for Me

Year 5

- ▶ Taught a course for the first time
- ▶ Research progress slowed to a crawl

Year 6

- ▶ Started trying to publish what eventually became my sixth paper
- ▶ Proposal two days before Christmas
- ▶ Changed research topics again due to new funding source

The PhD Process

How It Happened for Me

Year 7

- ▶ Academic job search
- ▶ Published fourth paper as part of a larger research team
- ▶ Dissertation writing
- ▶ Job interviews
- ▶ Published fifth paper after two rejections
- ▶ Finally published sixth paper after four rejections
- ▶ Dissertation defense

Lessons Learned

PhD is not like school

- ▶ It's more like an apprenticeship
- ▶ Doing well on coursework and QEs is necessary but not sufficient

You need to self-motivate

- ▶ There is no one taking “attendance” when you do research
- ▶ There are fewer deadlines, and they can be very far in the future

Lessons Learned

Writing and public speaking skills are important

- ▶ It's not enough to do good research; you need to convince people that you and your research are great
- ▶ Nothing irritates a reviewer more than a paper that's poorly and/or confusingly written

Visibility in your research community is important

- ▶ These are the people who will be on your dissertation committees, write your recommendation letters, and hire you when you graduate

Lessons Learned

Failure will happen, but it's okay

- ▶ You can bounce back from most failures
- ▶ The point of research is that we don't know if it will work

Rejection will happen, but it's okay

- ▶ Most published papers get at least one rejection

Everyone gets discouraged sometimes

- ▶ The infamous “PhD slump” hits many people around Year 3-4
- ▶ Take a break, work on a personal project, give yourself time to remember why you enjoy CS

Lessons Learned

Very few people are lucky enough to love their job

- ▶ If you don't like your research, you probably won't finish the degree
- ▶ But it's normal and okay to have hobbies you enjoy more than work

Make sure you have an outlet for stress

- ▶ The last couple years of PhD are one long, high stress stretch
- ▶ If you don't have some way to destress, you will go crazy and burn out

Things I Wish I'd Done Differently

Don't just work when you feel like it

- ▶ I could have been so much more productive if I didn't sit around waiting to feel motivated
- ▶ Set a schedule that works for you and stick to it

Always be doing something

- ▶ There's no such thing as "I have nothing to do right now"
- ▶ I'm not a natural multitasker, so it took me a long time to learn how to work on more than one project at a time

Things I Wish I'd Done Differently

Plan ahead for graduation

- ▶ You will need four dissertation committee members and at least two recommendation letter writers (not counting your advisor)
- ▶ I didn't go out of my way to collaborate with professors other than my advisor, so I wasn't sure who to ask

Try to finish your dissertation early

- ▶ There is a lot going on in your last year of PhD
- ▶ I was juggling job search, dissertation writing/defense, house hunting, and moving

Applying to Grad School

Does all this still sound good to you? Want to get a PhD?

- ▶ Start preparing early! As soon as you know!
- 1. Figure out what research area(s) you're interested in
- 2. Work in a professor's lab and do a research internship
- 3. Take relevant elective courses
- 4. Build and maintain good relationships with potential recommendation letter writers
- 5. Find out what schools have strong research groups in your area of interest

Applying to Grad School

There's lots of advice online for how to put together a strong application

My main thoughts:

- ▶ Apply to the right schools for your research area
- ▶ Focus your application around your research experience and ideas
- ▶ Make sure your recommendation letters are submitted!
- ▶ Apply for external funding as well (eg. NSF, NDSEG)

Applying to Grad School

How do you decide where to go once you get your acceptances?

- ▶ Your relationship with your advisor and his/her other students is the single most important thing
- ▶ It's also good for there to be multiple professors working in your area
- ▶ The prestige of the school **in your area** is more important than overall prestige
- ▶ You will be living near this school for the next seven years, so make sure you're okay with that

Academic Job Search

In the wise words of my dad, a CS professor and faculty search committee member at UMass Boston:

This will be the most stressful and rejection-filled year of your life.

Academic Job Search

What kind of job do you want?

- ▶ Liberal arts college
- ▶ Research university instructional track
- ▶ Research university tenure track

Your whole application should be tailored to that job

- ▶ Really highlight your teaching or research
- ▶ Also showing that you're good at the other thing is necessary but not sufficient

Academic Job Search

Not every department hires every year

- ▶ Sometimes there are no job openings at the school you really wanted
- ▶ Sometimes there are, but they're not looking for someone in your research area

The deadlines are all different

- ▶ Make sure both you and your recommendation letter writers know all the different deadlines for all the different schools

Speaking of recommendation letters...

- ▶ You need at least three; more is better
- ▶ Choose your letter writers based on the type of job you want

Academic Job Search

Interviewing

The phone interview

Usually they will have someone in your research area talk to you

- ▶ Impress this person!
- ▶ They already know your credentials on paper
- ▶ Now they want to know what kind of person/researcher you are

The campus visit interview

This is the final but most important hurdle

- ▶ The goal of the application and the phone interview is to get invited to campus

Academic Job Search

The Campus Interview

Your goal: impress people and make them like you

The job talk

45 minutes to present your dissertation work

- ▶ Needs to be high-level enough for a general CS audience but also have enough technical detail for someone in your research area not to be bored
- ▶ Also needs to show them that you have a plan for what new work you will do if they give you the job
- ▶ However you perform here is how they will expect you to perform in the lecture hall or representing them at conferences

Academic Job Search

The Campus Interview

One-on-one meetings

If you made it this far, they already know your credentials are good

- ▶ No one will ask nitty-gritty questions like a coding interview
- ▶ They want to know your opinions (and reasoning) on big issues in your area or CS in general
- ▶ They want to make sure you're a pleasant person to be around

Meals

These are also scheduled meetings during your visit; treat them like a slightly less formal one-on-one, but with more people

Academic Job Search

If you don't get an offer, don't take it too hard or too personally

- ▶ Maybe another candidate had more papers than you
- ▶ Maybe they needed someone in another research area more than in yours
- ▶ Maybe they didn't think you'd accept the offer

You can always do a postdoc and apply again next year!