Ph.D. Applications: FAQ

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Here are a few words of advice that, in retrospect, I was really glad were shared with me (in some form, by various people) when I was trying to decide where to go to grad school. I've repeated them so often that I decided to memoize. The first question's answer was written in 2007; the rest are additions in 2020 and are original, though I've been influenced by countless people over the years in arriving at this advice. This is all written from a US, computer science perspective and likely doesn't generalize further; some questions have very NLP-specific answers. (See also advice for undergraduates.)

- Where should I go to graduate school?

  [Answer from 2007.]

  As an undergraduate, taking classes, you function mostly individually, especially in Computer Science. In grad school, this is rarely the case. Grad school is primarily about research, and while research is sometimes done individually, it usually involves lots of interaction and very direct mentoring. (Not always, of course, but for most people.)

  The most important part of the decision, in my opinion, is: who will be your advisor? Your advisor is the person who will guide your research and give you career advice. Your advisor will help you get your first job after grad school. If you don't know how to do research or read technical literature or write papers, your advisor will probably be the one teaching you. For you to be happy in grad school (and many people aren't!), you have to have an advisor you trust, and whose research vision you find exciting, and who cares about your success.

  Note that you may not be able to choose your advisor when you choose the school. Some departments don't "match" students to advisors until after they've started in the program. So there's a bit of gambling; if you have to gamble, talk with the prospective advisor and find out whether they plan to take students at the time you'll want to be taken. Are there alternatives at that school if it doesn't work out with that person?

  Second to the advisor question is, what kind of research community is there? Ideally, you will go to a place where a lot is happening in your area and outside of it. How many professors are there whose work you find interesting (even if you don't plan to be advised by them), and what do you think about the other students? This is often overlooked. You will interact more frequently and (in many cases) more technically with your student colleagues than with the faculty. The senior grad students you meet in a given department are your best approximation to what you're going to be like in 4-5 years - do you like what you see? Will these people help you succeed? Will you learn from them?

  Also, be sure to talk with your prospective advisor's current (and even former) students. Grill them about their research advice, their expectations, their strengths, their flaws. Do they have their students' best interests at heart? Does everyone get the attention and face time they need from them? How much freedom is granted to students to follow their own paths? What's their

funding situation - are things going well? How much these answers matter will depend on what (you think) you want.

My opinion is not held universally. You may hear an argument along the following lines: "If you're brilliant [and you are], you will do well no matter where you go. So go to the best place you can get into." This has three flaws. First, none of us is so brilliant they can't still learn a thing or two from a good teacher. Second, no matter how brilliant you are, you'll be better off and more productive (and more brilliant) if you are happy. Third, graduate institutions (schools, departments, labs) sit in such a high-dimensional space that there isn't usually a clear way to choose which is "best." There's a small industry in defining rankings for academic groups, and if you read the fine print you'll realize that it's based largely on arbitrary factors and aggregations of opinions. I'm not saying there aren't different tiers or that all CS departments are the same. I'm saying not to trust the rankings too much or for fine-grained distinctions.

This isn't to say that there aren't other considerations. Obviously, family and social considerations, geographical preferences, and institutional preferences (e.g., not wanting to stay in the same place you did your undergraduate degree, or even choosing a prestigious department) can play in. But my advice is to use these as tie-breakers (except, obviously when you have hard constraints!) and focus on the **people** who will become your mentors and collaborators. It's the people that make or break a place, and it's the people you'll be around day to day that will make graduate school fun, challenging, and productive (or not).

- I have not published a paper. Should I still apply?

  I have taken Ph.D. students who had not previously published papers, and I know others who have done so as well. If your application can demonstrate in other ways that you are likely to be a successful researcher at the institution you're applying to, then you still have a chance. Personally, I am not blown away by an applicant who has a long list of publications but no narrative. Conversely, a narrative that shows high potential and deep critical thinking can get me excited about your application, even if you haven't published yet.

- Should I apply right after undergraduate or work for a few years?

  There are pros and cons, and it's a personal choice.

  I went straight through, because I was extremely excited about research and saw time spent on anything else as "wasted." It probably would have been healthy for me to spend a year in industry, mainly to stabilize myself as a functioning adult. It's helpful as a Ph.D. student to know that you can survive out in the world as a member of the workforce; it will make the prospect of leaving the program without a Ph.D. less terrifying. In my experience, Ph.D. students who have worked in a job for a while are a bit more balanced and confident about what they want and why they are in a Ph.D. program; they will have left behind better pay and easier work-life balance to pursue the Ph.D.

On the other hand, for some people, working in industry is a drag. If your job doesn't relate to the things you are excited about and doesn't give you new ideas, you likely won't find it fulfilling.

One of the main reasons I see people waiting to apply is that they want to get more research experience, both to strengthen their application and to get a clearer sense of what they want to do. There are dedicated programs at some companies that serve this purpose (e.g., the Predoctoral Young Investigator program at AI2), though they are competitive. Some people find roles as research programmers in academic groups. Another option is to do a masters degree in a program that is research focused (e.g., the masters of language technologies at CMU) or that has a research option (e.g., the computational linguistics masters degree at UW). Even in a more conventional software engineering job, you may be able to spend some time learning more about the field you want to study more deeply and get a clearer understanding of the major problems you want to work toward solving as a Ph.D. student.

- What makes a great research statement?

  A great statement is **distinctive** and shows **awareness**, **curiosity**, and **forward thinking**.

  Distinctiveness: Lots of statements talk about the "hottest" trends in the field right now. Successful Ph.D. students engage with trends but don't follow them. Extremely successful Ph.D. students start new trends.

  Awareness: A strong statement illustrates that an applicant has read widely about work in the field (and/or related fields) and has a sense of the landscape. A very strong statement shows critical thinking, maybe a bit of skepticism, and a sense that the person is developing taste in problems.

  Curiosity: A strong statement shows that the person is motivated to seek out new knowledge. Clear research questions, even bold ones, are great; even better is a clear understanding of what concrete steps will need to be taken to answer those questions. The Heilmeier Catechism is a tool I often use when planning projects.

  Forward thinking: An applicant's CV and letters help us see what they've already done. The research statement is an opportunity to get a sense of what kind of work they want to do over the next few years. Most people won't follow through exactly on the plan they describe here, but it's important to have a plan nonetheless.

- Should I name faculty in my research statement?

  I think it's generally a good idea to name faculty members you think would make great advisors for the work you want to do. But there are pros and cons to this, and to the level of detail you include.

Pro: if you name Prof. X, they are more likely to see your application, because the committee is more likely to route the application to them directly. No guarantees, of course. But committee members don't always know the landscape in your research area as well as you do, and they may not know who the best fit advisor is for you in their department.

Con: if you name Prof. X but not Prof. Y (who would be a good fit, too) then Prof. Y might not see your application. If you include a long list of faculty members, you may fall into the cracks because the committee sees you as too unfocused to route to a particular faculty member or group.

Sometimes when applicants list faculty members who are potential advisors/mentors, they give reasons. This, too, has pros and cons.

Pro: if you are particularly excited about something a faculty member has been working on but it's not obviously directly related to your interests, pointing this out may help them understand why you want to get to know them better. We can't read your mind, and you may see connections we don't.

Con: if you say you want to work with Prof. X on Y, where Y is a topic they've published on or that you associate with them, then keep in mind that (a) they might not be working on Y anymore and (b) they might not see themselves as a researcher in Y. (For example, people sometimes say they want to work with me on "sentiment analysis." While some of my papers have evaluated models on sentiment analysis datasets, and the term "sentiment" appears in the title of my most frequently cited paper, it's never been a major research goal of mine.)

The safe thing is to mention a small number of faculty and leave it to them to judge why you fit for themselves, unless it's not obvious from what you've described as your research interests.

- Should I email faculty about my application?

  No. I get tons of emails to alert me about an application. It really makes no difference in my case. I get too many to read, let alone remember when the time comes to look at applications. Emailing me will not improve your chances of acceptance.

  If you have technical questions about my work, emailing me and my coauthors is a reasonable thing to do, and it's okay to mention that you're applying. But please only do this because you have a legitimate question about our work. It's unlikely that I will remember the exchange when I'm reviewing your application.

- I want to mention my past projects in my statement. Tips?

  Your publications, if you have them, and often your past projects, are easy to see on your CV. I recommend mentioning them in the essay only in support of the primary goal of the essay (see the appropriate question, above). Past work can help illustrate distinctiveness, awareness, curiosity,

and show how you landed at the forward-thinking vision you have now. Please don't repeat details from your CV. Keep in mind that the reader of your essay will likely be more interested in *why* the project was significant, what *your* contribution was to the project, and how it informs your plans, than in the specific research findings.

- Do you care about GRE scores, TOEFL scores, GPA, number of publications, ranking of my previous institution?

  Speaking for myself alone, not really. I don't believe standardized tests measure anything useful, reliably. Grades and publication counts make it easy to rank people, but they hide important aspects of your application that are impossible to quantify. I'm extremely skeptical of university rankings and believe that strong researchers come from many backgrounds. There are many kinds of evidence for estimating someone's future success as a researcher, and they are mostly not quantitative.

  That said, I do not make decisions on my own; the committee (which in a given year I or my group members may or may not be serving on) plays a big role and so do other faculty in my research group. The quantitative indicators above will likely play a role in the process. But I generally encourage people not to assume that a weakness somewhere "in the numbers" is disqualifying.

- How should I think about reference letters?

  Reference letters are the most individual-specific part of an application. Everyone who writes them does so differently, and everyone reads them and weighs them differently. I can tell you a little bit about how I think about letters, but this shouldn't be interpreted as official or universal.

  - You need one letter from someone who is a researcher and knows what great research looks like and can attest to your ability to carry it out. The ideal thing here is a professor with whom you have collaborated on a meaningful research project. There are two often conflicting attributes that help but do not determine the benefit of this letter: ***senior*** faculty, who have read and written a lot of letters, tend to get attention because they have experience and ***close*** collaborators who know you well and can speak in detail about your strengths. There are no sure bets; a senior reference that is vague (because they didn't interact with you enough to form a clear opinion) or a close reference that is not well calibrated (because they haven't worked with enough other people to focus on the right attributes) is less than ideal.
  - A second one is great, but not everyone who gets accepted has a second letter like that.
  - The remaining letters play a "supporting" role. They sometimes come from a manager at an internship who can talk about your resourcefulness or creativity or problem solving or communication skills in a non-research setting, or from an instructor in a course related to your area of interest, or an instructor for whom you served as a teaching assistant, or a researcher who was involved in your project but wasn't working with you very closely or

isn't quite as experienced as that first letter writer. It's normal to have letters like these; they can't carry the case but they generally add supporting details.

- Where should I apply?

  Please read the advice I wrote many years ago about choosing a grad program, now the answer to the first question in this document. That advice was written in 2007, way before the field grew to the size it is today. As graduate admissions in our field have become more competitive, it is advisable to apply somewhat broadly (many people apply to more than ten schools), and do not exclude a school simply because its ranking isn't extremely high. Remember that rankings are an oversimplification and they were not designed with *your needs as a Ph.D. student* in mind.

  My current group encouraged me to add a concrete list of potential advisors I recommend you to consider. Because I know and respect a huge number of people in NLP, I realized that I could only make such a list if the criterion for inclusion was explainable. This is a list of people in NLP *with whom I have worked directly and productively*. A lot of these people have spent time in my group (my PhD and postdoc mentees are in bold). It is **not intended to be an exhaustive list** of people you should consider working with. It's also possible that I've forgotten someone (let me know and I'll fix it). I've left my own current institution off the list on purpose.

  USA:
  - Carnegie Mellon University: **Maarten Sap**
  - Columbia University: Dave Blei
  - Cornell University: Sasha Rush
  - Georgetown University: **Nathan Schneider**
  - Johns Hopkins University: Jason Eisner
  - Northeastern University: David Smith
  - Pennsylvania State University: Shomir Wilson
  - Stanford University: Dan Jurafsky
  - Toyota Technological Institute at Chicago: **Kevin Gimpel**
  - University of California at Berkeley: **David Bamman**
  - University of California at Irvine: Sameer Singh
  - University of California at Santa Cruz: **Jeff Flanigan**
  - University of Central Florida: **Fei Liu**
  - University of Chicago: **Chenhao Tan**
  - University of Maryland: Philip Resnik and **Rachel Rudinger**
  - University of Massachusetts at Amherst: **Brendan O'Connor**
  - University of Michigan: **Dallas Card**
  - University of Pittsburgh: Rebecca Hwa
  - University of Southern California: **Swabha Swayamdipta**
  - University of Virginia: **Yangfeng Ji**
  - Yale University: Bob Frank and John Lafferty

  Middle East:

- Bar Ilan University: Yoav Goldberg and Reut Tsarfaty
- Carnegie Mellon University Qatar: Kemal Oflazer
- Hebrew University: **Roy Schwartz** and **Gabi Stanovsky**
- Tel Aviv University: Omer Levy
- University of Haifa: Shuly Wintner

Europe/UK:

- Heidelberg University: Stefan Riezler
- Idiap Research Institute: James Henderson
- University of Edinburgh: **Shay Cohen**
- University of Lisbon (Instituto Superior Tecnico): **Andre Martins**, Mario Figueredo, and Pedro Aguiar
- Utrecht University: Dong Nguyen

Asia:

- Hong Kong University: **Lingpeng Kong**
- Singapore Management University: Swapna Gottipati and Jing Jiang

- What happens in interviews and on visit days/recruiting days?

  For most Ph.D. programs, you visit after you've been accepted. This is their chance to recruit you. Your goal is to get more refined answers to all the questions hinted at above about how good the school's fit is. Most importantly, it's a chance to meet one on one with your prospective advisor(s) and get a sense of how well you'll work together with them, and to get a read of the culture in the lab and the graduate student body as a whole. At many schools, it's also a chance for advisors to get a more detailed read on possible advisees; I've definitely had one-on-one meetings with accepted students where I realized that the fit wasn't as great as I'd thought. While it can be extremely flattering to get invitations from some of the world's great universities and be courted to take their offers, don't let it go to your head! You still need to find an advisor, and even if you end up going to another school, the people you meet on these visits will be your colleagues as long as you stay in the field. One day you might be hoping for an invitation to interview with them as a postdoc or faculty candidate, they might be writing your tenure letters, or inviting you to work together on grant proposals, or working with you to chair a conference, and so on. So even if you are pretty sure you're not going to accept a particular offer, be respectful and take the opportunity to develop relationships with the people you meet.

  This is also a chance for you to talk with current students enrolled in the program you're considering, who may be your best source on what it's like to work with a particular faculty member.

  Some programs treat the visit as an interview and make acceptance decisions afterwards, or interview you by phone or remote conference before making decisions. In this case, there's a dual evaluation happening and it will feel a bit more like a job interview. Try to think of each meeting as a conversation, not an oral exam. The goal for both people in the conversation is to

gauge how well you might work together. Be yourself and try to engage in an authentic discussion about research; your potential advisor probably doesn't expect you to know everything.

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