

COLT 2021

Applying for grad schools and fellowships

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Overview of talk

- General advice (**when**, **where**, **how**, **who**)
- Letters of recommendation
- Building your CV
- Nailing the phone interview
- You're admitted, now what?
- Applying to Fellowships

PLEASE INTERRUPT, ASK QUESTIONS!

When timeline

- -6 months to graduate school application deadline
 - Last chance for research experience
 - Think about letter writers
 - Research fellowship opportunities
- -2 months
 - Ask letter writers (with reminders)
 - Start thinking about CV, research statement
 - Figure out list of schools to apply to
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- -1 weeks
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How General application advice

- Be genuine.
- *You are admitted to a PhD program based on admission's perception of your abilities and potential for great research. A great application cannot change these attributes, but it can highlight them to make them obvious to the reader.*
- If you want to do Machine Learning Theory, emphasize experience that is not necessarily machine learning theory (e.g., control theory, graph theory, information theory, optimization, etc.). This sets you apart from the crowd.
- Demonstrate depth and interest in an area, but be open to new areas

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How Last chance for research experience

- More than 6 months out you hopefully have some research experience.
- If you want one more experience, how do you go about doing that?
 - Contact faculty of relevant courses that you (recently) did well in
 - Cold email faculty at your university in relevant areas (most faculty respond to most emails from students at their own university!)
 - Cold email faculty at other universities (expect no response)
- Strategies for getting a response to a cold email
 - Attach any info you think they might need to make an assessment of you (CV, transcript, links to papers/projects)
 - Personalize the email by mentioning specific papers of that faculty you're interested in
 - Target new faculty without students
 - Don't mention money if you hope to get paid. If self-funded consider explicitly saying this ("Self-funded undergrad seeking research experience in your lab")
 - Absolutely do **not** use a read receipt.
- Two distinct research experiences is better than one for twice as long
- Successful research is vastly more important than getting perfect grades

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Who Letters of recommendation

- What are faculty reviewers looking for in a letter?
 - Trying to understand your individual contribution to a project and research. Have you demonstrated the promise of being an independent researcher. This is especially important if you're on a paper with many authors, or don't have a pre-print out at the time of applying.
 - Calibrate you versus your peers at your institution
- Good examples of letter writers
 - Your research supervisors, faculty who are closely aware of your work, industry supervisors
 - The more senior and famous they are, the more weight their letter will carry because of their experience and ability to calibrate their recommendation relative to past students
 - A letter from someone involved in your outreach/leadership experience is great
- Not so good examples of letter writers
 - You took their course and did well (this is basically worthless, regardless of who its from). An exception might be if you got so excited about the topic you started to help lecture or had some unbelievable final project
 - Post-docs or graduate students. They don't have the experience to calibrate your abilities. If they know your work best, ask them if they would be willing to provide feedback to your supervisor, and suggest to your supervisor that they be contacted. Faculty often quote this kind of feedback verbatim in their letters along with their calibration and anecdotes

How Asking for letters of recommendation

- Email faculty member with CV, transcript, and offer to meet if they want (no need to schedule a meeting to ask, writing letters is routine for faculty)
- If you want something highlighted, you can *casually* remind them
- Don't expect the professor to comment on something they had nothing to do with (i.e., a project for another course or your research paper)
- *“Would you be willing to write me a strong letter of recommendation?”* Offer them an out, you do not want weak letters.
- Some faculty are insanely busy and will even ask you to draft a letter yourself (about yourself!). Don't freak out. It's just for ideas. They will heavily edit it.
- Ask early and remind them 2-4 weeks out, then again a few days before. If you are asking them to submit to multiple schools, send them a spreadsheet listing all of them so they can check them off

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How Tuning your CV

- Purpose is a bulleted list of info about you and your research career. Also serves as a cheat sheet for a phone interview (doesn't hurt to throw in an interesting fact about yourself)
- **Include:**
 - Publications or preprints (with links). No need to summarize, we can read the paper. What is useful is for you to describe your individual contribution to the paper
 - Major software projects (with links to github repo)
 - Awards (e.g., math olympiads, fellowship you just received)
 - Outreach+leadership experience
- **Not critical:**
 - Coursework (we have your transcript).
 - High school performance (awards are exception)
- Google for example CVs

How Writing your research statement

- Whole separate tutorial on this, but a few thoughts...
- Useful for clarifying parts of your application
 - If you have some bad grades in important areas like linear algebra or probability, it is a good idea to comment on them in your research statement. We don't care about the reason--we just want to know that you actually know that content. For instance, "see theorem 2 of my paper for proof of my command of this content"
- *Be specific*
 - give examples of papers you really admire and areas you're interested in. You won't be locked in, it just shows demonstrates that you've done your homework
- When describing your previous work, include what pieces you individually contributed to
- Get someone to read it

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Where General advice

- Everywhere
 - You don't know which new exciting faculty will join school
 - There is a ton of noise in the admissions process. You can be rejected for many reasons that have nothing to do with your abilities
- *Who* is more important than *where*
 - Having a tuned-in, available, and well-matched advisor is far more important than the university you attend
 - However, a caveat to this is that you will learn a lot from your graduate student peers. Higher ranked universities correlate with higher caliber peers.
 - Consequently, there are trade-offs of smaller versus larger schools
- Location matters: Consider your mental health and work-life balance before choosing your next location for 5+ years
 - Also consider school's local community

Who Advisors and community

- Who to list/choose as an advisor?
 - Young faculty are hungry, have more time, and first students are often prolific.
 - Established faculty have more contacts and their letters of recommendation carry more weight. They have far less time and you may see them much less (many exceptions!)
 - Read papers to see what you're most excited about, but also have an open mind
 - Once you've identified an area, figure out who the experts are (by talking to experts), then read their papers
- Information not listed on a website
 - Jerks don't advertise that they're jerks. If you have friends at universities you should absolutely reach out to them before applying
- Listing faculty
 - List at least 3 faculty in a rank-order list that make sense based on your research statement and CV. Listing a specific paper or topic by these faculty and explicitly linking it to a part of your research statement is good
- Contacting faculty
 - Some do this. It has no impact on whether you get accepted or not. But it may provide you with information such as if the faculty is accepting students or if they're enthusiastic about your work. Do not expect a response.

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How Phone interviews

- Purpose of phone interview
 - Can you effectively communicate technical content and your ideas?
 - What is your grasp of the area? What are the big problems? What are the relevant papers to your work?
 - What is your level of technical ability? What tools are you using? Can you boil down a proof to the core pieces, or does it just seem like a sequence of unmotivated steps to you?
 - How did you personally contribute to your paper?
- Having slides prepared is fantastic. But walking through a paper over zoom is also totally fine.
- Yes, you may be grilled.
 - Screening quality people is hard. Many faculty rely on giving you a problem and seeing how you work through it. *Keep talking*. It is okay to get stuck, your advisor's job is to get you unstuck. Think of this as practice.
- You will be asked if you have any questions. Keep it to research--this faculty may just be screening you for someone else.
- Be aware of the time and wrap up on time.

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CONGRATULATIONS! YOU'RE ACCEPTED! ...NOW WHAT?

How Visit days

- You are being recruited. Ask several graduate students the same questions about the faculty, work-life-balance, community. Everyone wants you to be happy with your decision and students are more willing to talk dirt
- See the city, can you see yourself living there?
- Questions you should consider asking your potential advisor:
 - Are students admitted as a pool or to a specific faculty member? If the latter, is that set in stone or can I potentially switch later if it's not working out?
 - I am also very interested in Professor X. Are you interested in co-advising?
 - Do your students work on projects together or individually?
 - How do you come up with research problems? Do you expect me to come in with a research problem or will you give me one?
 - What do you do if a student is having trouble making progress?
 - What is the work-life balance like in your lab? (Important: cross-reference this answer with their students' answers!)
 - Do you encourage your students to do internships or not?
 - How frequently will I have to TA? Is that typical for the department?
 - What are your favorite things to do in your University's hometown?
 - Why did you choose to live here? Why your university? You can also share the other places you're considering. The advisor may have important information, but this is a highly biased source so get it confirmed.

How Fellowships

- What is a fellowship, exactly?
 - It is external money used to pay your tuition, stipend, etc. at your chosen university. It is not a blank check, but your salary may be directly paid and you might get a bit more than the standard rate. You may also get funds specifically for travel and supplies.
- Why get a fellowship?
 - Prestige: it is an award that distinguishes you
 - Freedom: some faculty don't have funding for an RA so this would allow you to avoid TAing. It may also allow you to stay an extra year in your PhD.
 - Pay bump: minor perks and some petty cash
 - If received before admission, looks very attractive to faculty (you're free to them for X years)
- Two major sources of fellowships
 - National US programs (US citizens only): NSF, NDSEG, SMART, Hertz, etc.
 - Private companies (fewer restrictions): most major tech companies have prestigious awards, and many have awards specifically targeting women and underrepresented minorities. Check out this list for more info: <https://www.cs.cmu.edu/~gradfellowships/>

End

- Other great info
 - <https://www.cs.cmu.edu/~harchol/gradschooltalk.pdf>
 - <https://www.stat.cmu.edu/~aramdas/checklists.html>

QUESTIONS?