

UCSD VLSI CAD Laboratory

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Becoming Part of the Research Community

One of the most important things a graduate students should do is to become established as part of the research community. Your advisor can help with this process by funding conference travel, encouraging you to publish research results early, collaborating on joint publications, introducing you to colleagues, and promoting your work.

In turn, you can **make yourself more visible** by participating in conferences and workshops, publishing papers on your work, and meeting and maintaining contact with colleagues.

Attending Conferences

Attending conferences and workshops is valuable whether you present a paper or not. Some of the reasons to do so are:

1. You'll meet people and have a chance to discuss your ideas and to hear theirs.
2. You'll get a good sense of what the current state of research is, and will learn more about how to write conference papers and give talks (sometimes by counterexample).
3. You'll probably realize that your ideas are more significant, relatively speaking, than you thought. A common reaction is "I could write a better paper than this!"

If you're giving a talk you'll gain even more visibility, and will have an opportunity to make an impression on other researchers. Some tips for preparing your talk to make this impression as positive as possible:

1. Give a practice talk, especially if you tend to get **stage fright**. Be sure to invite people who will give you constructive, but useful, feedback.
2. Make sure your talk fits in the time slot allocated. There's nothing worse than a speaker who rushes through the last ten slides, or skips from the middle of the talk to the conclusion. **A good rough rule is to allocate 2-3 minutes per slide, on average.**
3. It's better to be somewhat abstract than to get bogged down in technical details -- but be sure you give enough detail to make a convincing case. Your paper should fill in the missing details, so that people can read it to get a more in-depth understanding. Know your audience: you'll have to give more background to a general audience, and more technical detail to audiences that are very familiar with the field of research you're discussing.
4. **Use examples and pictures to illustrate and clarify your ideas.**
5. **Learn by observation:** try to **imitate** qualities of talks that you like, and avoid things that other speakers do that bother you.
6. Talk about your ideas **informally** whenever you get the chance, so that the talk will come more naturally and, hopefully, you'll have a chance to respond to and think about questions that might get asked at the talk.

7. Make sure your slides are readable and as simple as possible. Never put up a slide with tiny text and say "I know you can't read this, but..."
8. Try to relax. Don't read from a script or word-for-word from your slides, and don't talk too fast. Be confident: **you know more about your work (flaws and all) than anyone else.**

Publishing Papers

Publishing your ideas is important for several reasons: it gives you a source of feedback from people who read your papers; it establishes you as a member of the research community (useful for getting a job down the line); and it forces you to clarify your ideas and to fit them in the context of the current state of research in your field.

There are two key properties of a good paper: **significant content** -- original, important ideas that are well developed and tested -- and **good writing style**. The degree to which the paper's content has to be "significant" depends on where you're submitting it. **Preliminary ideas and work in progress are more suitable for a workshop or symposium; well developed, extensively tested ideas are more appropriate for a journal.** One way to decide where your paper should be submitted is to read papers in potentially appropriate publications (last year's conference proceedings; current journal issues). Another method to show a draft or outline of the paper to your advisor or other colleagues and ask their advice.

if you have a great idea, but present it poorly, your paper probably won't be accepted. Be sure you **know what the point of the paper is, and state it clearly and repeatedly.** The same goes for the key technical ideas. Don't make the reader work to figure out what's important -- tell them explicitly. Otherwise, they might get it wrong, if they bother to finish reading the paper at all. State the problem you're addressing, why it's important, how you're solving it, what results you have, how other researchers have addressed the same or similar problems, and why your method is different or better.

Write for the audience that you expect to read the paper, just as you would plan a talk. Give more background for general audiences, less background and more technical detail for specialized audiences. Use a running example if possible, especially if your paper is dense with equations and algorithms.

Don't try to put every idea in your thesis into one conference paper. Break it down into pieces, or write one or two longer journal articles.

As you refine your ideas, you can re-publish in new forms, but be sure you're adding new material, not just rehashing the same ideas. **Some papers start as short workshop papers, evolve into conference papers, and eventually -- with the addition of detailed empirical results or formal proofs -- become journal articles.** **It's usually okay to publish the same or substantially similar papers in multiple workshops, but papers for conferences and journals generally have to be original, unpublished work.**

It is critical that any paper you plan to submit be read by someone else first, if only to check for typos, grammatical errors, and style. A good reviewer will give you feedback on the organization and content of the paper as well (see the section on feedback). The more tightly refereed the publication you're submitting to, the more trouble you should go to to have it pre-reviewed. For a workshop paper, having your advisor read it over is probably enough. For a refereed conference, have one or

two other graduate students read it as well. For a journal paper, you should probably find researchers who are active in the field, preferably at other institutions (to give breadth), read it over and give you comments. This is where the network of colleagues you should build (see the section on networking) comes in handy.

If your paper is rejected, keep trying! Take the reviews to heart and try to rewrite the paper, addressing the reviewer's comments. You'll get more substantial and useful reviews from journals than conferences or workshops. **Often a journal paper will be returned for revisions; usually a conference paper will just be accepted or rejected outright.** After reading the review the first time, put it aside. Come back to it later, reading the paper closely to decide whether the criticisms were valid and how you can address them. You will often find that reviewers make criticisms that are off-target because they misinterpreted some aspect of your paper. If so, don't let it get to you -- just rewrite that part of your paper more clearly so that the same misunderstanding won't happen again. It's frustrating to have a paper rejected because of a misunderstanding, but at least it's something you can fix. On the other hand, criticisms of the content of the paper may require more substantial revisions -- rethinking your ideas, running more tests, or redoing an analysis.

Networking

One of the most important skills you should be learning in graduate school is how to "network." **Breaking into the research community requires attending conferences, meeting established researchers, and making yourself known.** Networking *is* a learned skill, so you shouldn't expect to be an expert at it immediately; but it is also a skill that you can, and should, learn in order to be a successful member of the research community.

Just going to conferences and standing in the corner isn't enough. Especially if you're not normally an outgoing person, **you have to make a conscious effort to meet and build relationships with other researchers.** Presenting papers is a good way to do this, since people will often approach you to discuss your presentation. Introducing yourself to people whose presentations you found interesting, and asking a relevant question or describing related research you're doing, is also a good way to meet people.

You should talk about your research interests every chance you get. (But be sure to spend some time listening, too: you'll learn more this way, and people will feel that your conversations are a two-way street.) **Have summaries of your work of various lengths and levels of detail mentally prepared, so that you can answer the inevitable "So what are you working on?" intelligently and clearly.** If someone expresses an interest in your work, follow up! Send them e-mail talking about new ideas or asking questions; send them drafts of papers; ask them for drafts of their papers and send them comments. (If you do this, they'll be sure to remember you!) **Bring business cards with your e-mail address to conferences to help new acquaintances jog their memory.**

Maintain the relationships you form via e-mail, and by re-establishing contact at each workshop or conference you attend. If you work at it, and use your initial acquaintances to meet new people, you'll find that your "network" grows rapidly.

Sometimes these contacts will grow into opportunities to do collaborative research. Seize these opportunities: you will meet more people, often become exposed to new methods of doing research

or new subfields within your research area, and the responsibility you feel towards your collaborator may give you more of an incentive to stay motivated and keep accomplishing something.

Other professional activities can bring you into the research network as well: volunteer for program committees, send your resume to a book review editor, offer to give seminars at other universities, write conference and workshop papers and send them to people you've met or would like to meet, or organize a workshop on your subfield at a larger conference. **Mentoring junior graduate students and undergraduates is a good investment in the long run (besides providing them a valuable service and making you feel useful and knowledgeable).**

Finding specific mentors can be very useful. Especially if you feel that you are isolated at your institution, having a colleague at another institution who can give you advice, feedback on drafts of papers, and suggestions for research directions can be extremely valuable.