1 INTRODUCTION

Networking is making professional connections and using them wisely. Networking makes you and your research known. It’s clearly important. Networking opens doors by connecting you to the person who controls something (resources or information) that you need. It can connect you either because you know that person already or because you both know someone in common who can introduce or recommend you. A number of panelists from the CRA-W Career Mentoring Workshops on networking gave examples:

EXAMPLE. When I was a graduate student, my brother got married in Seattle. I really like the department at the University of Washington, so I invited myself for a visit. I knew a faculty member there and I sent him e-mail saying, “I’m going to be in town. Can I come and give a talk?” While I was there, I met another faculty member who was working in an area related to mine. She listened to my talk, and unbeknownst to me, made a conscious decision to help me. She came and gave a talk at my university. She read a copy of my first grant proposal and gave me good advice. Later when she was chair of a program committee, she invited me to be a member. At that meeting, I met someone else who asked me to be on another program committee. So she helped me make contacts.

EXAMPLE. When I was an undergraduate, I did a work term in Japan. One day my boss asked me to do a demo on the spur of the moment for two visitors. I’d watched him do it before, so I said, “Sure.” One of the visitors was from the University of Toronto. I told him that I was interested in grad school and give him my business card. Some months later I got a package inviting me to do graduate work at the University of Toronto.

EXAMPLE. I was trained in architecture, but soon after graduating, I realized that there were a lot of problems that I couldn’t solve with architectural solutions alone. Their solutions required interaction between the architecture and compiler optimizations or code scheduling. So I decided to start doing research in compilers. I didn’t know anyone in the compiler area, but I went to PLDI (Programming Language Design and Implementation), which is one of the main compiler conferences. A grad school friend of mine was there. He spent the next two and a half days introducing me to everyone. When he was done, I knew all of the key players, and some of the not so key players. I knew what they were working on and, more importantly, they knew me. I got very good technical-cal advice from these people. The first time I had a compiler paper rejected, they gave me concrete advice about my style: I was writing like an architect, not like a compiler writer. They advised me about the form of the paper and the kinds of things I should talk about and the arguments I should make and where I should put emphasis. One of them later asked me to be on the program committee for PLDI.

EXAMPLE. Someone at a conference pointed out one of the ONR program managers who funds research in my area. I went up to him and said, “I’m about to send out several funding proposals, and I’d like to explain to my work to you to see if you’re interested.” He said, “Fine. Let’s talk.” He could have said, “No, I don’t really fund that area. Why don’t you talk to so-and-so.” In that case, I would have talked to so-and-so. He could have said, “I am busy now.” And then I would have said to him, “Well, why don’t we talk after this session? Or over lunch tomorrow? Or later on in the day? Or at the break?” In other words, I would have tried to pin him down to a specific time and obligate him. If he still waffled out of it, I would have thought maybe he just doesn’t want to talk to me and my time would be better spent talking to someone else. I tried to talk to him alone so that I wasn’t competing with other people for his attention. Eventually, I talked to him. I had five projects going at the time, and I explained them all to him with very succinct summaries that I had prepared ahead of time. He said, “O.K. I like that one. Send me a proposal.” And he funded it. Now that he funds me, I make a point to see him every year. I tell him what I have done over the course of the year and show him our new results.

EXAMPLE. I used to give talks in local schools about how to make mathematics and computer science fun for students in grades 4 - 8. Someone in the Education Department at my university heard about it and suggested my name as a speaker for the International Congress for Mathematics Educators, a meeting attended by three thousand people. Six months before the meeting, one of the four plenary speakers backed out and I got scheduled in his place. I had to write a paper, and while doing that, I began to realize that what I was doing in those classrooms probably wasn’t the best investment of my time. I was trying to convey mathematics to children in a way that would make it exciting but because I was only there for an hour and a half, the impact wasn’t going to last. So I started looking at electronic games. And as a result of this person who had heard about my talks and lobbied for me to speak at the conference, I’ve spent the last two years of my life in a new research area. It’s been one of the most exciting things that I’ve ever gotten involved in.

After deciding to work on educational/multimedia stuff, I needed to find some video game or electronic game developers who would work with me. I wanted to develop real products that had high quality graphics and animation and storylines and characters and sound and so on. It costs a million dollars to do one. I wanted to do several. I didn’t know any game developers, so I started asking people for leads. Nothing panned out and eventually I decided to try Microsoft even though they don’t do games. I called an old academic friend who knew people at Microsoft and he set up a meeting for me. He even
drew me there. We met with guys in their edutainment section and they told me, “We don’t do games.” But they did suggest another company, and right now I’m working with that other company on our second product.

**EXAMPLE.** When I was a graduate student, I met every month with a group of women graduate students in computer science and electrical engineering. We talked about all sorts of things. Now they’ve all graduated and gone to other institutions but we still network. We’ve learned from each other’s experiences about interviews, about writing grants, about all the steps along the way. It wasn’t something that we intended, but it has grown into a valuable set of connections.

**EXAMPLE.** Networking helps with some of the more mundane aspects of our jobs, too. I had a connection with a senior woman who gave me a copy of her successful NSF proposal so that I had an example to look at the first time I wrote a proposal. Another senior woman suggested that I become an ACM lecturer. I didn’t even know what that was, but the three years that I spent as an ACM lecturer really taught me how to think on my feet, how to give a cogent talk, and how to think about how well a talk was coming over from my audience’s point of view.

**EXAMPLE.** One of my students’ research was not quite ready to submit to a conference, so she presented it at a workshop associated with the conference. These are often very good things to attend. They’re informal and there’s usually more time for your work to be discussed. My student met faculty and students from other research groups at MIT and Stanford. She got to know their work and they got to know her work. Afterwards they exchanged papers, software, etc. As a result one of her letters of recommendation came from MIT and she’s now doing a post-doc at Stanford.

**EXAMPLE.** Two years ago, I was a guide on a kayaking trip on the California coast. One of the men on trip mentioned that he worked for X (major computer company). “Oh,” I said “What do you do for X?” And the answer was, “I manage it.” He was the CEO! A year later when I was raising money for the Grace Hopper Celebration, I called him up and left a message with his secretary saying that I was an old kayaking buddy and I’d like some advice about a conference that I was running and maybe he could call me back. Sure enough, two days later, “Hi. How are you? Been kayaking lately?” And we got a significant contribution for the Celebration.

Networking opens doors for you. It can:

- Help you get letters of recommendation. When you go up for tenure, you’ll need letters from people outside your department. If the people who are asked for letters have known you and respected your work over a period of time, they’ll be able to write stronger letters.
- Make it easier to get job interviews. Much of the screening of candidates for job interviews goes on informally at conferences. Faculty from departments with openings contact potential recruits, including graduate students who are a few years from graduating.
- Get you invitations to give talks. Giving talks at other universities is also a good way to network further.
- Help you get funding. In agencies that do not use peer review, program directors make the decision themselves; it helps if they know you and respect your work before they get your proposal. In agencies that do use peer review, reviewers are often explicitly asked to comment on the proposer and their work.
- Get you invitations to join program committees. These are usually formed by the committee chair with the advice of people who he/she knows.
- Give you an edge on getting papers accepted. Reviewers evaluate papers on their content, and the process, in general, is quite fair. However, if they know the author and like her/his past work, they start off with positive expectation; it’s a small factor but it can make a difference.
- Supply you with great advice. You’ll meet people who have been in similar situations and they’ll have all sorts of helpful suggestions.
- Provide feedback on your research. Most of the time when you network, you’ll have technical discussions that can give you invaluable feedback. People will find pitfalls in what you’re doing, alerting you to potential problems sooner rather than later. They may expose you to biases in the community that you can then address when pitching your work. Technical discussions may give you new ideas or a different perspective. They can also give you encouragement.

Lots of women, however, are not comfortable with the idea of networking. Some worry that they aren’t good at it, but networking doesn’t really require much more than being prepared and being sociable. Other women are concerned that it isn’t fair: Should someone get an interview at IBM just because their advisor knew who to talk to? Regardless of whether or not it’s fair, it is how things work. People who make hiring decisions, for example, will value a recommendation from somebody they know and trust. Some women worry that networking uses people. However, most people are happy to do small professional favors for you and you’ll be able to return those favors, if not to that person directly, then to someone else.

The idea of networking may make you nervous (although you’re probably already doing a lot more of it than you realize). It can be scary, but do it anyway. The better prepared you are, the easier it will be. The next three sections will help you get better prepared.

2. WI TH WHOM SHOULD YOU NETWORK?

The easy answer is everybody, but the most important groups are:

2.1 Established Researchers in Your Field

These are the people that are going to be asked to write your promotion letters. They are not going to ask your cohorts, your colleagues, or people with the same length of time in your career. They’re going to ask the big guns. It’s a good idea to make sure they know you. Not just know you because they read your paper, but also because they have met you. They know your approach to research. They have heard you dismiss your ideas. They have a general sense of your intelligence and your capability. Get to know these people and keep in touch with them throughout your career.

2.2 Funding Program Directors

As mentioned above, it helps if your program directors are pre-disposed to liking you and your work. In addition, many agencies have special, targeted programs from time to time. If your program director knows your work, he/she may point out relevant opportunities.

2.3 People Who Could Hire You

Networking may help you get your foot in the door for an interview. If you already know someone at an organization, they might be your host, for example. It can make you more relaxed.
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2.4 People Who Can Give You Good Technical Advice

Obviously this includes people in your area but it also includes people in other areas. Talking to somebody who is naive about your field and asks you questions about it can change your perspective.

2.5 Your Contemporaries

People grow up. One day your contemporaries are going to be established researchers. Keep in touch with them now. Be aware of people both above and below you: the undergraduate you were mean to today could be your program manager in ten years. There are things you can do with your contemporaries right now. You can trade software or workloads, leveraging off each other to get your research programs started more quickly. You can trade lecture note or test questions. Graduate students or new faculty will often take the time to read papers that senior researchers won’t, so you can get good technical advice from them. Include people from outside your immediate research area as well. You may be able to meet other people through them and you never know what directions your research will take in the future. Even purely social connections are good, since having a person that you like to talk with can make a conference seem more welcoming.

Networking has a snowball effect: as you get to know people, you’ll meet the people they know and your resource tree will expand.

Most networking takes place at conferences where we, the professional and technical community, meet on a yearly basis. The next section focuses on networking at conferences. Section 4 covers advice on what to do outside of conferences, and Section 5 covers negative aspects of networking (there aren’t many). To conclude, Section 6 introduces the “Young Girls’ Network.”

3. WHAT TO DO AT CONFERENCES

It’s essential to go to conferences and workshops. Make it a point to start going as soon as you have some research to talk about. Go to the best conferences in your area, even if you’re not presenting a paper. Don’t overlook small conferences and workshops either. If you’re having trouble getting your papers accepted at the large, prestigious conferences, it can help to start in the smaller, less prestigious conferences and workshops. There the talks will often be longer and there will be more time for interesting discussions. In the smaller venues, the participants may also make time for social activities—like hikes—which give you a chance to get to know others in a more relaxed, informal setting.

This section describes how to prepare to network at a conference or workshop—including tips on making contacts once you are at the event.

3.1 Know Whom You Want to Meet and What You Want to Talk to Them About

Know beforehand who you want to talk to. Write their names down. Often conferences are busy places and it is easy to get distracted. People will come up and snare you and you may lose sight of the fact that you wanted to talk to a specific person. If you miss an opportunity, you’ll have to go home and wait for another year to roll around.

Know what you want to talk to them about, as well. Read their papers and check out their Web pages so that you’ll have comments to keep the conversation moving.

3.2 Know What the People You Want to Meet Look Like

If you’re going to find people, you’ll need to know what they look like. Check their Web pages for pictures beforehand. If they’ve published in IEEE journals, you can look for their pictures at the end of their papers. Ask your friends or your advisor to point them out. You should know what all the important people in your field look like. If you don’t, you may miss an opportunity: you may, for example, idly chat with someone in an elevator only to find later that you should have been introducing yourself to them.

3.3 Prepare a Brief Description of Your Work

The only thing you’re sure to have control over in a technical conversation is what you say about your work. You’ll do a much better job if you’ve thought ahead of time about how you’re going to describe it. You want to deliver a crisp, intelligent, few words explaining what problem you’re solving, why that problem is important, and why your solution separates you from the rest of the pack. You’ll want a brief description because in most cases, you won’t have much time and you can’t afford to go rambling on and on. Get right to the point. The purpose is not just to get across to them what you’re doing, but also to impress them with what you’re doing and how you’re doing it. You should have three-sentence, five-minute, and 15-minute descriptions of your research ready because the person you’re talking to may or may not be in your area and you don’t know exactly how long you’re going to have his/her attention. You can go on for as long as the person is still asking questions. Most people will want one of the shorter versions, but occasionally some one really interested in your area will want the longer version.

Remember that when you’re talking, you’re acting to some extent. It’s a presentation. Practice. Close your office door and talk to yourself. Talk to your friends.

3.4 Ask a Question During a Talk

If you’re sitting at a talk and you have a question, no matter how stupid you think it is, stand up and walk to the microphone and ask it. Chances are, there are a dozen or two other people in the audience who have the same question and it’s not stupid at all. You don’t get to meet anyone this way but everyone in the room sees you and hears your name and hears your intelligent question. (If it gives you any consolation, it’s far easier to ask the question than to answer it.)

3.5 Introduce Yourself to the Speaker After the Talk

If you can’t bring yourself to ask a question during the talk, introduce yourself to the speaker afterwards. Go up and say “I liked your talk,” or “I had a question.” It might give you a chance for a more in-depth conversation. Try to clarify something that you didn’t understand, or explain a different slant that you have, or describe a related research result of yours or explain how you might be able to extend the work. This is a good time for pigeon-holing that particular individual. (Of course, there may be other people doing the same thing, but it’s still a good opportunity.)

3.6 Engage in Hall Talk

Most of the technical talk goes on at conferences while some poor soul is giving their paper. Everyone is out in the hall, jabbering away. Join them. You, too, can do that.
3.7 Follow Your Personal Style

Even without realizing it, most of you already do quite a bit of networking. Continue to be sociable and friendly to the people you meet. Talk to them in a way that is natural and comfortable for you.

3.8 Use Your Contacts to Get New Contacts

Get your friends to introduce you to people you don’t know. Get your advisor to introduce you. Your advisor is probably an established researcher who knows everyone. Have them introduce you. (Don’t assume that they’ll do it on their own.) Join your advisor if he/she’s talking to a group of people. Don’t do it so often that you’re a pest, but once or twice a conference is O.K.

Don’t forget to pass it on. Make an effort to introduce your friends to each other.

3.9 Make Lunch and Dinner Plans

Everyone at these conferences has at least two meals a day in public, and they might as well eat them with you. If you see somebody in the evening standing around the lobby of the hotel looking hungry, you can go up to them and say, “Do you have dinner plans?” If you walk into the lunch room and you haven’t made a plan ahead of time, don’t sit down at an empty table. Sit down at a half full or three quarters full table and introduce yourself to the people around. Meals can be particularly good, since you’re sitting in one spot. You don’t have to worry about people looking over their salads for somebody more important to talk to. They’re stuck with you for the duration. But be a little bit careful. If you want to go to a lunch and get involved in a technical discussion, the worst thing to do is sit next to people who are already deeply into a technical discussion, because they’re probably not going to break to talk to you. They might ignore you and continue talking to each other. That’s a wasted opportunity. So, pick a table where people are talking socially.

3.10 Talk to People You Meet by Chance

Start up a conversation with someone who happens to sit next to you. Talk to the people on either side of you or in front of you or in back of you. If you’re at a session, make a comment on the last talk or ask about something that you didn’t understand. What did you like about the talk? What you didn’t you like? It’s also O.K. to just introduce yourself. Talk to whoever you sit next to on a conference bus or stand next to in line.

3.11 Talk to People Who Happen to Come up to You

Don’t always be so on the lookout that you miss what is right in front of your face.

3.12 Talk to People About Their Lives as Well as Their Works

When you met people professionally, you should talk about their work. Generally, people enjoy that. But it’s also good to get to know them at multiple levels. Don’t ask prying questions, but, if somebody mentions their spouse or their kids or their hobby, follow-up on it. Be interested.

3.13 Offer to Help Out When You Can

Don’t look just for connections that can help you, but also for connections that would enable you to help somebody else. Try to bring people together who could help each other or tell somebody about a paper they might be interested in. This builds ties with people.

Volunteer. You might want to introduce yourself to a well-known editor in your field, for example, by volunteering to be a referee. A current editor reported:

If you introduce yourself to me and tell me that you are willing to referee papers for my journal, I am much more likely to remember you than if you tell me, “That’s a nice dress.”

You don’t want to spend too much time on business, but a limited amount can be to your advantage. Making a good impression on a senior editor in your field can be a significant reward. The same editor said:

One of the reasons that I am an editor now is that the people who appointed me knew that I had done a responsible job on various reviewing I’d done for them in the past.

3.14 Don’t Hang Around with Your Graduate Student Friends

You already know them. Wean yourself away from them. Meet other people. That is, after all, why you’re there.

3.15 Don’t Interrupt Heavy or Private Conversations

You can tell by someone’s body language whether or not you should interrupt their conversation. If you get a sense that it’s a private conversation—if, for example, they’re whispering or if they’re huddled—don’t interrupt. You’ll get much better receptions if you’re sensitive to the situation.

3.16 Get Involved in Activities Targeted for Women

Often conferences have some activity targeted at women: a lunch, a birds-of-the-feather session, a panel, etc. Attend these events. Many women take mentoring seriously, and you can get to know them. Get on the “Systers-Academia” mailing list (see the CRA-W Web pages at www.cra.org/Activities/craw/projects/communityBuilding/sys-aca.html.)

3.17 Don’t Just Stand There—Speak!

You may feel uncomfortable initiating a conversation. The easiest way—assuming you’ve read the person’s papers or gone to their talk—is to compliment their work and talk technical. “I just read your paper and I enjoyed it and I was wondering if you could tell me a little bit more?” Or “Have you done anything further on it?” Have specific questions ready. There’s not a researcher alive that doesn’t want to talk about his or her research ad nauseam. It’s a safe, guaranteed topic. You can also ask people if they know of anyone else who’s working in on your topic. That way, when you run into them, you can say “So-and-so told me that you’re working on this.” That’s a natural way to start up a conversation. Use your ready-to-go descriptions of your work.

3.18 Write it Down

Once you’ve talked to someone, you’ll want to follow up on your conversation, but don’t assume that you’ll remember what it was that you were supposed to do. Write it down. Many conferences publish the names and e-mail addresses of attendees. When you meet somebody, make a note next to their name on your address list so as to what the follow up should be. If they’ve promised to get back to you with something, write that down too: write it on your list and write it on the back of one of your business cards to give to them. If a technical idea comes up in a conversation, write that down as well because it is freshest in your mind when you have just talked about it. If someone
4. WHAT TO DO WHEN YOU’RE NOT AT A CONFERENCE

3.20 Invite Them to Give a Talk at Your University

A good way to get to know people better is to invite them to give a talk at your institution. That way you’ll have lots of time to talk to them. As a graduate student, you probably can’t do this but you can get your advisor to do it for you. If you invite your peers to talk at your university, they might well return the invitation.

3.21 Ask to Give a Talk at Their University

You can ask people if you can come and give a talk at their university when you’re in the area. This is especially useful if it’s a place where there are senior researchers in your area. You’ll know that they’ve heard your talk and you’ll spend a whole day getting to know them and their students.

3.22 See The Same People Again

There are lots of new people to meet at every conference, but it also helps to follow up with the same people, building longer term, stronger relationships.

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There are some things that you can do without leaving home.

4.1 Talk to People in Your Own Organization

Get to know people around your university. Get to know researchers in other departments as well as nonresearchers around campus. There are lots of ways that people in your own organization can help you and you can help them. It’s good to get to know them.

4.2 Send Preprints

Circulate preprints of your papers to people that you think would be interested, including well-known people in your field. If someone is working on a related problem and you cited their work, send them a copy of the paper. You should realize that some people will ignore your preprints, but you won’t make any enemies by circulating them, and you might create a community of interest for your work.

4.3 Meet With Visitors to Your Department

You should meet visitors to your department—seminar speakers, postdocs, people who are on sabbatical, students of people on sabbatical, etc.—and try to keep in touch with them afterwards.

4.4 Visit Program Directors

You don’t have to wait to run into program directors from the funding agencies; you can go and visit them. Most of them are more than happy to talk to young researchers.

4.5 Use E-mail

We’ve already mentioned follow-up e-mails but you can also e-mail someone cold. You can ask for copies of papers that you can’t find. If you’ve read a paper, you can send the author questions about it (but make sure that you’ve read the whole thing). E-mail can be a good way to pave the way to meeting someone in person.

Remember, though, that senior faculty receive lots of e-mail. Don’t over do it. Realize too, that you might not get a response. If not, don’t feel bad and don’t get angry. It’s probably just that you hit them at the wrong time. Sometimes it’s better not to ask the senior researcher the question. Instead, send the e-mail to all of the authors and a student may respond. That’s fine. You get your answer and now you have a budding relationship with that student.

4.6 Ask For Help When You Can Use It

Most people are glad to have the opportunity to do something for somebody else, as long as it’s not too big of an imposition. You have to gauge this. Be clear on what the person could do for you. One panelist described an example:

At one point, when I had my master’s degree, I wanted to get a programming job. We were new to the area and I didn’t know anyone. I called organizations and found the right person to target. Then I sent them a letter with my resume and said, “I’m going to call you on Thursday, May 10th and talk to you about this.” Then I’d call them. In the letter, I’d been very explicit about what I wanted from them, which was either to find out if they had job opportunities for me or find out if they knew of somebody who did. I contacted some of the big employers, with technical slants that I thought might want to hire me directly, but I also contacted the sales organizations for computer manufacturers, because their customers might have wanted to hire me. In fact, that’s how it worked out. Someone at Burroughs said they were working on a contract with a group at the university and that group had openings. I ended up with the job and everybody benefited, and the guy at Burroughs got to do something for somebody he wanted to make a sale to.
I’ve met one or two that were inappropriate. The first time this happened to me at a conference, I was a graduate student and I was kind of flattered and kind of disgusted and I said, “You know that’s really very sweet, but...” and he kept making the same offer all weekend, all week. It was more of a problem for me early in my career. I wasn’t quite sure what was going on in a guy’s mind. Was he coming on to me or was I just imagining things? And a few times I ignored my discomfort and ended up having to be much more uncomfortable by explicitly stating, “No.” I learned to pay a lot of attention to those signals and to give off my own signals. I started mentioning my husband all the time. I’ve found that to be very effective.

Once I was at a conference and ran into a grad student who had graduated from my institution. I thought he was a friend. I invited him into my hotel room and I would suggest that you never do that.

The first thing to do when somebody makes an inappropriate suggestion is say “No.” It’s not up to you to protect his or her feelings. They are not complementing you. A sexual offer, a proposition, is simply inappropriate. Recognize that you have the right to determine what you do and you don’t have to be nice and polite at all times, especially if you’re not comfortable. Say “No” firmly and politely. If that’s not effective, say it loudly enough for others to hear.

6. EPILOGUE

We’ve all heard of the “Old Boy’s Network.” You should be part of the “Young Girls’ Network.” “Young,” in this case is intended to modify “network.” We’re not young girls, but we are part of a women’s network that is young. Our network hasn’t been around very long, but it is effective. Panelists spoke of getting jobs, grants, and invitations to speak all because of women who knew them and their work. Many women take mentoring seriously. When you need to know something, ask one of them. If you are interested in a job at some specific place, send a senior woman there e-mail and ask about it. Likewise, if you see an application at your institution from a woman, follow it up; at least make sure that people read the folder. Make sure that women whom you hear give good talks get invited for colloquia at your department. Call a woman you’ve met at an institution you’d like to visit and say, “Hi, I’m going to be in the area, I’d like to give a talk.” When you hear a woman or meet a woman who impresses you, tell other people about her. Talk her up. Help other women to get well connected, too.

Finally, don’t expect to establish connections overnight. They come slowly. Don’t give up. Keep the contacts up. Build ongoing relationships that will last your professional life.