Interviewing in a Tight Job Market

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When I was preparing to enter the academic interview circuit in Fall 2001, the process initially seemed rather daunting, especially given the poor economic conditions — but I soon found that my concerns were mostly unfounded. Fortunately, I had been given great advice throughout my graduate studies at the University of Washington by my fellow graduate students and professors, and this helped immeasurably: early preparation for your future career makes a tremendous difference. Also, you will quickly find the interview process to be fun and exciting, rather than tense and stressful.

In this article, I try to highlight some of the lessons I learned (either through others' or my own experience). My goal is not to provide a comprehensive guide to the job search process, but rather to complement the tips in articles by Ugur Cetintemel (in the December 2001 issue of SIGMOD Record) and by Qiong Luo (in this issue). I focus primarily on academic interviews, because I only interviewed at universities, but in the Appendix below I pass along some tips from my fellow graduates about the industry experience.

1 Preparation Begins Early

One of the most important things to keep in mind as a graduate student is that your number one priority should be building the skills and connections you will need for your future career — and this involves more than simply doing research or teaching. First, you should work on your presentation and communication skills. One way of developing these skills is to participate in department seminars and reading groups, both leading and participating in discussions (I probably gave at least 30 paper presentations in my time at UW). Obviously, conference presentations are one of the most important places to gain visibility and hone your presentational (and question-answering) skills.

Attaining visibility is important: the better your reputation, the better your chances of getting an interview. At minimum, you want to be visible within your department, because the faculty often promote their top graduate students to others in the community. Obviously, you want to impress your advisor with your research, but other things to do may include department service (e.g., student recruiting) or even doing an exemplary job at teaching[1]. If you can also achieve visibility in the general research community, that's even better. Naturally, research presentations are probably the best forum for letting people know about you and your work, but meeting people at conferences is also important. In my experience, there is often a natural tendency to cluster in familiar groups when visiting a conference — but it is important to expand past this comfort zone and meet new people whenever you can. It's much more fun to show up to conferences and actually know people, and it is also nice to have a few familiar faces (and inside sources!) at the places

[1] Note that having teaching experience is a plus when you apply for an academic position, but reputation, reference letters, and research track record are critical.

where you ultimately interview. A great source of further ideas for "networking" is the paper "Networking on the Network" [1] by Phil Agre.

I believe that it's extremely beneficial to do an internship at one of the major research labs. Not only does this allow you to assess how you like industrial research, but it builds many connections and exposes you to different ideas. If all goes well, your internship mentor will be a potential source of one of your recommendation letters. You will also get to know students from other universities, and find out something about other universities' environments. These connections often come in handy when you are at the next conference — you can tag along with familiar people and get introduced to an ever-expanding circle of people. I did an internship at IBM Almaden, and found that it helped broaden my research perspective *and* gave me many important contacts.

As you get closer to graduation, there are two things to do. First, make an effort to spread the word to potential employers (either personally or through your advisor) that you will be finishing soon. Second, start honing your one-on-one and group discussion skills. As people in related fields visit your university, sign up to talk with them. Go to faculty interview talks for people both inside *and* outside your field, and also to student meetings with the candidates. Learn what are good questions and good answers. Soon you will be at the other side of the table, and it helps to be comfortable in this type of discussion.

2 Applications

The application process is very time-consuming and initially quite daunting: you will be in mostly unfamiliar territory. The first question is where you should apply. You should be able to ask your advisor and perhaps your internship mentor for an honest assessment of the caliber of schools or labs to which you should apply. With that in hand, you can start looking through various sources — US News' rankings, the CRA jobs list (`www.cra.org`), the dbjobs web site (`www.dbjobs.org`), and department web sites — to see which departments are interviewing. (This year, most schools seemed to be hiring, albeit in reduced numbers due to funding cut-backs.)

Choose mostly from the schools or labs in your target range, but add a few "fliers" and a few "backups." You choice of schools should depend on your career goals, your personality, and your style of work. There are many potential trade-offs to weigh: for instance, more elite schools often have a more difficult path to tenure, but they provide more resources and get better students; it is easier to join a department that is strong in your area, but you will have to work harder to differentiate yourself from existing faculty. In general, though, at this stage it is best to not be too selective: applications are generally inexpensive and easy to send out, so you should err on the side of too many rather than too few applications. This is especially true in a "bear market," as you will be facing more competition for fewer slots. I was advised to get my applications out by early to mid-December, because interview decisions are made in several waves and slots fill up quickly.

An experiment we tried at the University of Washington was to form a "graduating job hunters" group consisting of everyone earning a Ph.D. who was interviewing this year. We peer-reviewed research and teaching statements and CVs, shared information about interview experiences, and provided a venue for airing frustrations or questions. Most of us found this group to be valuable, and I would recommend the approach. Following an established department practice, we also held a "what's hot in CS" seminar — a day-long seminar in which students from the major CS fields gave brief presentations about the hot topics in their fields — to catch us up on the interesting research concepts outside our areas.

Your research statement and job talk are very different in nature from any technical publications or presentations you will have made to this point. Specifically, they target a general computer science audience, not specialists in your area, and their goal is not so much to convey knowledge as to establish that: (1) you

are working on interesting and relevant problems, (2) you have addressed the problems in an innovative way, (3) you are creative and intelligent, with great potential, and (4) you have a future vision that is exciting and worthwhile. Craft your research statement with that in mind.

Put significant thought into your ideas for the future: be sure you can answer the question, "Given unlimited resources and students, what would you work on?" Your research agenda should be broad and speculative enough that you don't know precisely how it'll be done, but you also should have ideas about tackling the problems, and and you must be able to justify why you are qualified to follow this line of work. Try to have both your advisor and someone outside your field comment on your research and teaching statements.

Your recommendation letters are at least as important as your statements and CV. Ideal letter writers will be established names in computer science who know you well and who are impressed with you (and most importantly, with your research skills and potential). Obviously, it is often difficult to find many people who fall into this category, so your next best option is a letter writer who knows you well enough to be able to say concrete things about you. Good candidates are people for whom you've done research, an internship, or a teaching assistantship.

Once your application is complete and you have a list of references, you're ready to begin applying. If your advisor knows someone in the department to which you are applying, you might ask him or her to send them a "heads-up" about the application and promoting you as a candidate.

Now it is time to create and refine your job talk. As with the research statement, it must justify your work and solutions, and it needs to excite the audience about your potential and your research vision. It should be well-structured with a clear roadmap and signposts (in case an audience member zones out for a few minutes). Open by targeting the general audience; towards the end, you can get more detailed (and more difficult to follow for non-specialists). Practice your talk several times before your first interview, and have people from outside your field come and give you comments. Be sure they look for annoying mannerisms in your presentation as well as the content: problems with delivery, odd mannerisms, etc. Many people find that videotaping themselves (and suffering through watching the tapes) is helpful.

3 Interviews

Scheduling interviews can be tricky — you will typically receive calls in a suboptimal order, and most places will have significant scheduling constraints. If possible, you want to avoid going much beyond a dozen interviews. It's best if you can keep the interviews relatively clustered together — if you get an offer from an early interviewer, they may not want to wait three months for a response — but you also want to avoid more than two interviews in a week.

Before you hit the road, prepare a 1 minute, 5 minute, and 15 minute summary of your work. You'll need each of these many times during your one-on-one interviews. Likewise, have a brief and slightly longer version of your future work description. Bring a bottle of water and a laser pointer to each place; most places will provide these, but occasionally they'll forget. Nowadays you shouldn't need hardcopies of slides, but I was always careful to have backup copies of my PowerPoint slides on a CD-R and the Web.

Be prepared to be surprised by places: some will be much nicer than you expect, and others somewhat disappointing. Similarly, the same job talk and interview style will go better at some places than others — don't let this get you down. A school's reputation doesn't always match its reality, and sometimes it is simply a case where personalities don't click.

Some people seem to give little regard to student meetings, but I think they are a very important aspect of the interview. First, you get to assess your potential advisees, and second, student meetings are the chance to get the inside scoop on a department. Have a general list of questions in mind for this interview, but don't

rush it. Usually these meetings begin with a round of introductions in which each student describes his or her work. Show interest in what students are doing; feel free to ask a few questions of each student.

Throughout the interviews, you'll meet many great people and learn about a lot of different and interesting things. Ask plenty of questions and show an interest in what people do. Try to build bridges and connections with other people's work. Enjoy yourself, and try to stay interested and enthusiastic. (Never be falsely enthusiastic, but don't be afraid to get coffee every so often – people understand it's a long day!)

4 The End-Game

Hopefully, at some point while you are still interviewing, you will get your first offer. This comes as a great relief and alleviates some pressure, because you know you will be employed. However, you'll soon find that in getting an offer, you will also get a deadline for your response. Such deadlines are usually relatively soft, assuming you give a reasonable and honest answer for why you need a bit more time. Also, some places will call you and try to get a feel for whether you'll likely accept before they give you an offer. It is my belief that the best policy is to be honest: if they're in the running for consideration, tell them this, but if not, let them know at the earliest opportunity.

Schools will have priorities in hiring, especially if they have few hiring slots available; sometimes those will override their sense of how good you are. Don't be discouraged if you had a good interview but don't get an offer. Eventually, you will hopefully have a set of choices, and most likely they will all have strong selling points. Now it comes down to weighing the different offers and situations. Salary is typically relatively consistent across universities, but start-up packages and department cultures are likely to differ substantially. Be aware that the actual dollar amounts of startup packages are often not directly comparable: at some places the funding is discretionary, and in other places it is be dedicated to something particular such as equipment. Sometimes RA funding is included in the amount; other times, it is provided additionally. Most top-tier research universities tend to offer two years of summer salary and two RAs for two years. If you are trying to assess how reasonable your offers are, last year's offers are a good baseline, as salaries seldom decrease from year to year, even under different economic conditions.

Choosing among your options can be very challenging. I had comparable offers from several universities that I liked, and each of which had people who would be fun collaborators. Eventually, I made my decision on the basis of how I felt I would fit into the department and its culture. My ultimate choice, the University of Pennsylvania, impressed me as being the most enthusiastic about how my future work might be at the heart of many collaborative projects. Of course, the other schools had their advantages as well, so it ultimately came down to a matter of which good alternative seemed most comfortable.

Obviously, the task of declining an offer is also a difficult one. Typically you build a personal connection with your host, and you know that they will be disappointed with the outcome. However, they will understand your decision, and I think it is always worth pointing out the things you liked about them (after all, most likely you're choosing from good alternatives, rather than bad ones!). Of course, this is not the end, either: your hosts will also be colleagues in the research community for years to come, and perhaps even potential employers of *your* future students!

Appendix: Industry Interviews

My personal experience was strictly with interviewing in academia, but I have several colleagues who interviewed solely for industry jobs. Hence I include a few tips about this process, courtesy of Corin Anderson and Matthai Philipose. In general, nearly all of the tips mentioned above still hold for industry positions.

One obvious difference is, of course, that teaching experience is somewhat less relevant in this context, though it still is good as a way of demonstrating that you communicate well. Less obvious is the fact that research labs tend to have highly specialized missions. Be sure to know the focus of each research lab, and be able to tailor your presentation and interviews to explain how your work relates to their mission. Emphasize how your skill set complements but does not duplicate existing talent. Be careful to stay consistent with your message to different interviewers at the same place, though, since they will compare notes at the end!

Your track record and your ideas for future work are as critical in a research lab context as they are in academia. Research labs look at publications, vision, and enthusiasm as a way of assessing your future potential. Especially in a bear market, it is important to do well in this regard.

Finally, doing an internship is a fantastic way to get an inside track at a research lab in which you are interested. First, you become more of a "known quantity" once you've spent a summer (or a semester) at a lab, and labs often use internships as a way of assessing potential future employees. Second, you will have the inside scoop, as well as a welcoming face, at the lab. Finally, your internship contacts can be advocates on your behalf during the decision about whether to give you an offer.

The economic conditions were rather depressed this year, especially in industry, but the good news is that people *are* hiring. With good preparation and a bit of persistence, you are indeed likely to find a good job out there.

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Biography

Zachary Ives is completing his Ph.D. at the University of Washington and will be starting as Assistant Professor at the University of Pennsylvania in January, 2003. His research interests are in the area of querying and managing heterogeneous data, and his thesis focused on developing novel adaptive query processing techniques for XML-based data integration.

References

[1] Phil Agre. Networking on the network. http://dlis.gseis.ucla.edu/people/pagre/network.html, 8 June 2002.