Academic Job Search: From Failures to Success

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First Version: April 14th, 2020, Revised: June 9, 2021

Abstract

This note records my tenure-track faculty job search experiences in electrical engineering & computer science (EECS) during the period 2017 Fall - 2020 Spring. After countless failures in the very first two cycles of my job search, I finally successfully landed on a tenure-track faculty position at the University of Michigan, EECS department in 2020 Spring, in the middle of the COVID-19 pandemic. The initial setbacks were painful, but to me they are invaluable experiences to learn and grow. To most people academic job search is a very stressful and painful process, I hope this note can encourage future academic job hunters to have the faith and confidence to pursue the dreams by sharing my own journey and experiences.

Acknowledgement. I would like to express my sincere gratitude to everyone who encouraged and helped me during those very difficult and challenging times. First of all, I am indebted to my Ph.D. advisor Prof. John Wright (Columbia U.), spending so much time and effort on my research and long-term career development, even when I struggled. I would like to deeply thank all my letter writers, Prof. Yuxin Chen (Princeton U.), Prof. Carlos Fernandez-Granda (NYU), Prof. Arian Maleki (Columbia U.), Prof. Yi Ma (UC Berkeley), Prof. Trac D. Tran (Johns Hopkins), and Prof. René Vidal (Johns Hopkins), for their strong support of my job search, even I failed so many times. I would also like to thank my all colleagues and friends, especially Prof. Yiwei Dou (NYU), Dr. Tingran Gao (U. Chicago), Prof. Yuantao Gu (Tsinghua), Cong Han (Columbia U.), Prof. Shengxi Huang (Penn State), Dr. Han-wen Kuo (Columbia U.), Prof. Rui Liu (Kent State), Prof. Shuyang Ling (NYU Shanghai), Sheng Liu (NYU), Dr. Wei Liu (Tencent), Xiao Li (CUHK), Dr. Shang Li (AT&T), Prof. Gongguo Tang (Coloradao Mines), Prof. Ju Sun (U. Minnesota), Dr. Guolong Su (Google), Prof. Gang Wang (U. Minnesota), Prof. Zhangyang Wang (TAMU), Prof. Min Wu (UMD), Dr. Chong You (Google Research), Prof. Ming Yan (MSU), Prof. Jiangfan Zhang (Missouri S&T), Dr. Le Zheng (Aptiv), Prof. Pengcheng Zhou (Columbia U.), Prof. Yuqian Zhang (Rutgers), Yuexiang Zhai (UC Berkeley), Prof. Zhizhen Zhao (UIUC), and Prof. Zhihui Zhu (Denver U.), for their advice and encouragements. My thanks to Prof. Laura Bolzano, Prof. Jeffrey Fessler, and Prof. Lei Ying at the University of Michigan, for providing me the wonderful interview opportunity that I never imagined of, and their appreciations of my work. Finally, my thanks go to my family, for their unconditional support of pursuing my intellectual freedom and academic dreams.

1 Preface

Becoming a professor is my dream since my childhood, follow the passion to impact the world and get respected, by gaining knowledge and delivering the knowledge to the next generation. I chased and protected my dream from high school, to college, to graduate school, and I started my faculty job search in my last year of Ph.D. study at Columbia University in 2017 Fall, with encouragement from my Ph.D. advisor Prof. John Wright. My research is at the intersection of signal processing, machine learning, numerical optimization, and data science, that we develop efficient, guaranteed optimization methods for exploiting and learning low-dimensional structures from high dimensional data. These are hot topics nowadays. There are *plenty of* opportunities with a trend of growing faculty members in these directions for many universities.

However, my first round of faculty job search is a *complete* failure. I submitted around 40 applications, and got onsite at 4 top universities in the US but none of them gave me an offer. Personally, I was just not well prepared in every aspect, where I can still remember several embarrassing moments when people challenged me during the interview and I fell short of an affirmative answer. Some people also questioned the breadth and applications of my mathematical theory in engineering problems that I do not know how to address. Most of the issues come from the *narrow thinking* as a fresh graduate student. It was a painful moment, but more pains come during my second round job search. I immediately restarted my job search again in the following year 2018-2019, submitting over 60 applications. I got around 12 phone interviews, and only 3 of them turned into onsites. Again, none of them gave me an offer because my research portfolio looks almost identical to my last round search. In some of the interviews, people were also questioning my research independence and my ability to develop an independent research program, given all my work is with my Ph.D. advisor. After two rounds of failed job searches in 2019 Spring, I was really depressed, where my research stagnated during the job hunting and I even questioned my ability to ever become a professor. I felt so embarrassed to meet my colleagues and friends, telling them that I failed my faculty job searches so many times.

Nonetheless, I haven't given up and things turned around in my third round of job search. I can still remember many touching conversations with my Ph.D advisor analyzing my failures and how to learn and improve from them. What I learned is that, to land on and lead a faculty job, you need to have the ability to follow your *own passion* and initiate your *own projects* rather than work on the projects that your advisor gives you, you need to think your career path in a *broader perspective* rather than *narrowly* focus on small research projects, and you need to start *thinking and acting as a faculty*, rather than still behaving like a Ph.D. student under the protection of your advisor. So after graduating from the PhD program at Columbia, I decided to step out my comfort zone with my Ph.D. advisor who really cares me and provided me too much protection, joined as an independent research assistant professor (AP) at NYU Center for Data Science (CDS). I was very grateful for such a decision and a change, that I started to work more like a faculty rather than a graduate student by working much more independently and mentoring graduate students. During the period, I was also very lucky to find several wonderful collaborators with shared interests and career goals, which not only boosted my research productivity but also my leadership as a researcher in the field. As a research AP, I also wrote grant proposals as Co-PI and started organizing workshops through

collaborations. I attended various conferences and workshops to present my work and build up my academic connections, where by chance I was fortunate to introduce my work to Prof. Jeffrey Fessler in the IMA Computational Imaging workshop in 2019 Fall, who I believe gave me the chance of interviewing at the University of Michigan.

By stepping out of my comfort zone and working hard towards my weakness, it finally paid off in my third round job search. In the final round, I tried my last strength by submitting over 150 applications all over the world, with 20 phone interviews and 12 (I canceled 3 due to lack of energy) onsite interviews. I obtained at least 6 offers (some are suspended due to a hiring freeze). After countless failures and struggles, I successfully landed on one faculty position that I never imagined and am very proud of. I never easily gave up upon failures – my take on every failure is to learn and grow from it, persist and find a new way to try harder next round. *The real failure is not you got declined or rejected, but you lose your courage to try another round.* Finding a faculty position is never an easy job, it involves many years of preparation and even luck. Many things are uncontrolled and can easily go wrong. I hope my experiences can provide inspiration for those that are still struggling with their academic job search. Dream big and pursue it with passion, keep the faith, and work hard against all obstacles. There is always light at the end of the darkest tunnel.

Organizations. For the rest of the note, I share my own tips for preparing and interviewing for faculty positions, that I learned from countless failures. In Section 2, I discuss how to prepare the materials for applying faculty positions. Section 3 focuses on the interview process. In Section 4, I share some of my thoughts on offer negotiation. Finally, in Section 5 I provide some of my reflections on the whole process and the faculty life so far.

2 Preparations

There are many materials online that I found very helpful during my job searches [1–3]. The job application material itself usually consists of five key components: *the cover letter, your resume/CV, the research statement, the teaching statement, and 3-5 letters of recommendation.* For the first time applicants, these need months of preparation. In the following, I will discuss them in more detail. In general, your goal is use the materials to convince the faculty recruiting committee that you can develop an *exciting and independent research program* in the near future. But there are no golden standard rules behind any of these materials such that you can please all the reviewers – the search committee on the other side are also humans, when selecting candidates there are luck and randomness due to bias and reviewers' personal tastes.

On the other hand, what I learned from my job search is that every school is looking for the best candidates on the job market. It is a market that the winner takes it all – if you look at the faculty candidate seminars in the spring, for the same track of faculty search, every school (ranking from top 1 to top 30) almost interviews the same set of candidates with some small variances. Thus, if you feel that your package is not around the top on the market in your field in the same year, your chance of even getting an onsite at top 30 schools is slim. Therefore, before getting on the academic job market, it is very beneficial to look at the past faculty candidate seminars in your area to get a

sense of and evaluate how competitive your overall package is. The lessons I learned from my failed job search is that your application package needs to be very competitive and you need to be mentally ready before getting on the job market. Faculty job hunting is very stressful and time-consuming, unlike me, you want to succeed once. Once you failed the onsite (even the phone) interview at one school, it is *almost impossible* that the same school will give you a second chance in the next 2-3 years.

2.1 The Keys

One may argue that graduating from a very top school/program is essential to find a decent faculty position. This is perhaps true to some extent, as top schools are usually well-recognized and have a great alumni network. However, I believe the *key factors* that determine your chance of landing a faculty position are you as a person:

- *Have you done solid work in the past that has been well-recognized in your field?*
- *Are you able to articulate the significance of you work to a broad audience concisely in an exciting way that can be easily understood?*
- *Can you clearly present you work in a 45-min talk that are exciting to a broad audience within and beyond your field?*
- *Do you have a compelling research vision into the future?*
- *Will you be a charismatic colleague that everybody enjoys to work with?*

All these abilities can be cultivated through the Ph.D. program, by taking responsibility and showing leadership in your research projects, and by attending many seminars, workshops, and conferences to present your work and interact with your colleagues in your field. It is especially important to pay attention to building these abilities in the senior years of the Ph.D. study. You need to show more independence so that you can build an independent research program after graduation. To be a faculty, what really matters eventually are your ideas, your leadership, and your contributions to the field. I learned this hard lesson from a painful process during my first round job search. No matter what the school you are from, I believe the above key factors deciding the chances of landing a satisfying faculty job and future career success.

2.2 Applications

Usually the tenure-track faculty job are posted online starting as early as mid-August, and it continues until roughly mid-November. The application deadlines vary for different departments. For example, the deadlines for applied math, statistics, and operation research are usually quite early (e.g. early November), and the searches are usually finished around February or March. For electrical engineering and computer science departments, the application deadlines are typically around mid December to early January, and the search is not finished even until the end of May.

Collecting Job Posts. For myself, the first step of the job search is collecting job posts. For machine learning faculty positions, there are major 5 sources that I rely on (most of them can be applied to other programs as well):

- **HigherEdJobs.** https://www.higheredjobs.com/
- **AcademicJobsOnline.** https://academicjobsonline.org/ajo
- **CRA job announcements.** https://cra.org/ads/
- **MathJobs.Org.** https://www.mathjobs.org/jobs
- **Websites of individual departments.**

Looking through these posts can be a tedious work. You need to pay attention to their job descriptions and requirements, and apply only to the openings that align well with your research area (otherwise my experience tells that it would be a waste of energy). For many departments, they usually have several specific search directions that they will mention concretely in the post. Usually for each direction they will invite 4-5 candidates for onsite. Some searches can be tenure-tack junior searches or open rank searches, where the latter means that the search be any rank ranging from assistant professor to full professor positions. The open rank search is usually harder than the junior faculty search as you might need to compete with senior people that are much more experienced than you. For very top schools such as MIT and Stanford, their searches can be completely open, that they just want to hire the most competitive candidates on the market without specifying any search directions.

Maintaining a Updated Personal Website. As mentioned by [1], the first *critical* component of the job application is the personal website. It is very important to maintain a up-to-date website highlighting your research interests, publication records, videos of your presentations, source code releases, and so forth. Do not assume that the faculty search committees will look into details of your "official" application materials – these days it is more convenient to Google someone's name and get a first impression of your through your website. For that matter, always post your job application materials prominently on your website. In case someone is reviewing a set of candidates and cannot find your research statement, everything should be linked to your website so that people can find it easily. For myself, I constantly updated my website https://qingqu.engin.umich.edu/, and even added a tracker to my website using https://clustrmaps.com/, so that I can see which school is reviewing my materials. My experience is that these webpage visit locations seemingly lead to quite accurate predictions for the job interviews.

Publications, Connections & Recommendations. The most important thing that you want to show in your application package is the strong publication record that can easily stand out in comparison with your peers, simply because this is the most obvious evidence for your past academic success. This does not necessarily mean that you need to publish tons of papers. Although we are in an era of publication deluge, I still believe what really matters is *the quality of your work*, and the leadership that you build through your work in the field — there are some schools asking you to submit only 3 most representative papers. It is very important that your work has great originality and

provides deep insights into the problem (a big plus if it also appears in top venues), having high impacts (e.g., highly cited), and you are the major contributor to the work (e.g. first or last authorship). For fresh Ph.D. candidates, having one good first authorship publication per year should be sufficient; for a postdoc, this might go to two per year. Moreover, you also want to show an upward trajectory of your research impacts through the publications – having several strong publications right before the job hunting season kicking off seems to be quite important. People are hiring you not for your work in the past, but for the work that you can do in the future. Therefore, showing an upward publication trajectory could provide solid evidences for projecting your future success.

The second important thing is your connections with people in the field (e.g., where your recommendation letters come from). Your visibility and recognition (e.g., the well-known people that you are collaborating with, and your family tree) demonstrate your impact in the field. As many may recommend, before the job search starts, it is a very good idea to attend many related workshops and conferences to present your work and meet with well-known people in your field. From my own experiences, this is indeed very beneficial. Some of the important visits that I made in 2019 include visits to my PhD advisor's connections, where I presented and discussed my research. I not only got their letter supports, but with common research interests I established great connections that we started to collaborate on papers and proposals. Also, I feel small workshops with focused theme could be a better place to find connections than large conferences. For me, I benefited a lot by attending the IMA computational imaging workshop at U. Minnesota in fall 2019, which I believe led to the interview opportunity for my current position.

For the recommendation letters, one of the most important (and perhaps the easiest) recommendation to obtain is obviously from your Ph.D. advisor. On the other hand, it would be a great plus if you can obtain *strong letters* from well-known people (full professors) in your field, where the search committee will weigh greatly on what these people say about you. Additionally, to demonstrate the broad impacts and recognition of your work, having letters from people outside your home institutions with no co-authorship, but can point to the significance of your work, would also be very beneficial. In general, letters from untenured faculty often weigh less than those from tenured, so do not having *all* letters from untenured faculty. As a fresh Ph.D. graduate, it would be not easy to obtain 3-5 letters if you do not plan ahead well before the job search. When I started my faculty search as a fresh Ph.D., I find some of my letter supports through attending workshops and delivering talks, and some of them from my Ph.D. thesis committee. As a postdoc, you can obviously obtain additional letters from your postdoc mentors. You also need to communicate with your letter writers at least one or two months ahead of the application deadlines such that they can arrange those letters and submit them on time. It is also a very good idea to use https://www.interfolio.com/, such that your letter writers can just send one letter to the interfolio, and then you can request the letter directly from the interfolio to whatever place you apply to by paying some fees.

It would also be very beneficial to have people who are outside your home institution who truly appreciate your work, indicating the broad impacts and recognition of your work. In general, letters from untenured faculty often weigh less than those from tenured. I would not recommend having all letters from assistant professors.

Main Materials. It is also important to understand that search committees at most top schools get at least 200-300 applications per year from all over the world, even for a single faculty job opening. The time spent on each application will be limited, so it is important to make sure that your package can easily stand out from the very large pool of applications. Your curriculum vitae, with a strong publication record, is the first thing that the search committee will have a closer look at. From my view, the cover letter, research and teaching statements matter much less, so do not stress over them too much. You cannot make up for a weak publication record with a brilliant research statement.

The *cover letter* is usually one-page description summarizing: *(i)* the specific position and the research direction that you are applying for, *(ii)* a brief introduction of your research, and *(iii)* the name of the people who is suitable for reviewing your materials. The letter needs to be very "school-specific" of why you are applying to this school in particular. Since you will be submitting many applications, make sure that you *do not* mistake the name of the school that you are applying for, otherwise it might get desk rejected without review!

Again, I believe that the *curriculum vitae* is probably the most important part of the application materials. Given the volume of the application pools, the search committee do not have time to go through every detail of each application, and the very first impression they get from you is through your resume. Make sure your resume stands out from the others. More specifically, the curriculum vitae should provide a detailed summary of your research interests, publications, talks, service work, teaching credentials, mentorship experiences, references, and any other factoids that might be of interest to the search committee. You can find my resume here as an example: https://qingqu.engin.umich.edu/wp-content/uploads/sites/42/2020/08/resume.pdf.

The *research statement* is one of the hardest components to get it right. It is intended to serve two purposes: *(i)* to provide a narrative summary of your research contributions (and especially how they all tie together) demonstrating your *strong track record* in the past, and *(ii)* provide a clear and ambitious vision on what areas you intend to work on in the future. You can treat it as a "mini" career proposal but needs to be *concise* and *coherent* – it is usually at most 3-4 pages long and needs to nail what your specific research "angle" is, why the area is important and exciting. You should also articulate a clear and ambitious vision of what kind of research direction you would take when starting a faculty job, and nobody is going to hold you from working on the specific things you say you want to do for future research directions. Again, search committees are not only hiring you based only on your track record – they are hiring you based on your potential to be a successful and independent researcher, and a life-long colleague. They want to see that you have an independent and compelling vision for at least the first few years of your faculty job. Try to think big and be ambitious. If the best you can come up with are extensions of a couple of papers to your thesis, you are in trouble not only for your application but also your faculty career. Try to think of a three-to-five-year agenda that would get people excited to have you as a part of the faculty. Moreover, having a clear thought of this can be very rewarding once your faculty life starts. As an example, my research statement can be found through the link: https://qingqu.engin.umich.edu/wp-content/uploads/sites/42/2020/08/ResearchStatement.pdf.

For most research-oriented engineering schools, the *teaching statement* is usually 1-2 pages long and is weighted less than the research statement, although it might not be true for other departments such as applied math and statistics. Based on my own experiences,

most fresh Ph.D. graduates in engineering have precious little teaching experience beyond a couple of semesters of teaching assistant work, so there might not be much to say about teaching. Still, do the best you can. If you have advised any undergraduate researchers or mentored junior graduate students, include this in your teaching statement, as mentorship is important as well. Finally, think clearly about what kinds of courses you would be willing and able to teach. It's not always obvious based on your research background – make it explicit in your statements.

Finally, nowadays, there are more and more schools requesting for the *diversity and inclusion statement*. This might not be as important as your resume or research statement, but writing it wrongly can hurt you application. I feel that it is a bit similar to the broader impacts plans for career proposals. Showing your past record about promoting diversity and inclusion, and your plans on this in the future.

2.3 After the Application

Once you submitted the applications, for the next step, a good idea is to make some personal contacts with faculty in the institutions that you applied to. For each of the department that I applied to and excited about, I usually send emails to 2-3 faculty members that are close to my research field, informing them that I have applied. If they know you or appreciate your work, they will help to inform the search committee, promoting your application so that it can stand out from the large application pool. This is especially true if you have built personal contacts with them during past visits or meetings in conferences/workshops. This is why making yourself visible in workshops and conferences very important before going on the faculty job market.

3 Rocking the Interviews

If your job application stands out, it only gets you an interview but does not get you the job immediately. Keep in mind that the search committee are humans as well on, they want to find a *charming* person that is best fitting for their faculty search rather than simply counting on the cold numbers on your application materials. Therefore, the interview is far, far more important than the application materials.

3.1 Phone Interviews

Given the advances of technology, nowadays phone interviews become more and more common. In my first round of job search during 2017 Fall - 2018 Spring, I only get 1-2 phone interviews, where most schools gave out onsite invitations directly. In my last two rounds of job searches, almost every school requested phone interview before onsite invitation, where I got 10-20 phone interviews for each round.

The phone interview usually lasts around 15 - 30 mins, and most of them are conducted via Zoom (During and after the COVID, everything now (even onsite interviews) is online over Zoom). Although this is not an onsite interview yet, I still recommend to dress formally, giving people a good first impression. I find the following tips on the YouTube very useful

https://www.youtube.com/watch?v=rQwanxQmFnc.

The purpose of phone interview. Based on my own experiences, the main purpose of the phone interview is to identify candidates who are the right fit for the search and can articulate ideas clearly in a short period of time. Given the huge volume of the application pools, most committee nowadays prescreen a large set of candidates before onsite, without going into details about their research and teaching statements. They use the phone interview as a chance to learn verbally from you about your research, teaching and future research plans, to identify their best fit. On the other hand, they also use this chance to gauge your interest of joining them to reduce the chance of failing the search.

Preparing for the questions. Through the 30-min interview, the search committee will ask you a set of *standard* questions that they will ask for other candidates, so it is not difficult to predict these questions and make some preparations. A typical set of questions are:

- *Can you tell me about your research (with layman language) in a few sentences?*
- *What is the work that you are most proud of? What is the impact of your research?*
- *What is your future research agenda in the next 3-5 years?*
- *What is your future group size? Where are you looking for funding to support them? What will be your career proposal look like?*
- *Why do you think you are the right fit for our department? Who would you like to collaborate with in our department/school?*
- *What new/traditional classes can you offer to teach? What is your teaching philosophy? Do you have any teaching experiences?*
- *Why do you want to come to our university?*
- *How can you contribute to the diversity of our program?*
- *Do you have any questions for us?*

The following questions are rarely asked, but you still need to be a bit prepared:

- *Why do you want a faculty job rather than going to the industry?*
- *How can you compete with the peers in your field? How can your research be differed from your Ph.D. advisor?*
- *What is your research vision in the next 10-20 years?*

There is no standard answers to all these questions, since they can be very personal. However, the underlying principle to address these questions is to be brief and clear to everyone even not in your field, making them feel excited about you. You need to think in the chair of the other side – when telling about your research (vision), you should assume minimum domain knowledge of the search committee, and providing a clear answer that even your mother/friend can understand and feel excited. This is also important when you want to attract students to work with you when you started the position. Keep in mind that many of the search committee might not be in your field, you should not

go into every detail of your research – presenting a broad and exciting agenda to them should serve the purpose well.

In terms of funding, the search committee is not only gauging if you know where to look for the funding, but more importantly they also want to make sure that you have vision and plans to secure the funding in the future. One good way to address this is to demonstrate the importance of your research agenda within major funding agencies, and present some successful evidences that your research has been richly funded in the past.

Additionally, you should also be a little bit prepared about the potential collaborations within and outside the department. Again, the search committee are made up of persons, they want to hire people that can benefit them in the future. Going through every persons' website in the department before the interview, and think about how to connect your research to them. This also demonstrates that your interest in the position and you did in-depth research about the department.

For teaching, you should really think about what kind of new courses that you can offer to strengthen their curriculum, which will make people excited about you. In my case, I focused more on machine learning and optimization courses, which are in huge demand nowadays. I also indicate that I want to teach a maths of deep learning course which can be very popular nowadays.

For questions such as why you choose their school, the answer can actually be standardized. Usually top schools at good locations would not ask these type of questions at all, because everyone wants to join them for sure. For other schools, I usually address the question from three points: *(i)* attracting high quality students, *(ii)* potential collaborations, and *(iii)* low cost of living to focus more on research and mentorship.

In the last 3-5 min, the committee will turn the table around by letting you ask them questions. It is very important to prepare several questions in advances – asking no questions could be very embarrassing, indicating that you have little interest in the position. A typical set of questions include

- *What are the future directions of the department? How does the college support the department?*
- *How to recruit Ph.D. students? Does the department have a strong or weak search committee for Ph.D. recruiting?*
- *What is the teaching load? Is there any flexibility in creating new courses?*
- *How about the working and living environment? City culture?*
- *What is the search/decision timeline?*

You can ask this set of questions repeatedly during onsite interviews as well.

Keep in mind that an interview is actually a conversation between you and the interviewers, where you and the search committee are gauging the mutual interests towards each other. Be confident and stick to point, and make the conversation flow to your strength. If you do not get any of the questions clearly, you can rephrase their question in your own words to repeat and confirm. You could also pause your answer for a few seconds, and ask them if they follow the points that you made. Having a few pauses in your answers can be beneficial, which not only help the interviewer digesting your answers, but also give a little bit time to relax and think about your answers.

3.2 Onsite Interview

After the phone interview, usually you will be notified about onsite interviews within one or two weeks (at most a month). Faculty job interviews are generally one or two (full) days, depending on the size of the department. The main components are: *(i)* the job talk, *(ii)* meetings with faculty members within and outside your area, *(iii)* meetings with the department chair, the dean of the college, and Ph.D. students, *(iv)* chalk talk (some school), *(v)* breakfast, lunch, and dinner.

Preparing the Onsite Interview. Doing one onsite interview is a very exhausting process. Talking with all kinds of people can really wear you out, especially because you need to keep yourself in the best status all day long. Thus, if time allows, prevent doing back to back interviews to have time to recharge yourself. Before COVID when travel was allowed, I typically only do one interview per week. Book direct flights whenever possible to minimize the chance of delays, and try to get on the earliest possible flight of the day so that you can have backup plans in case that you missed it. Also, as suggested in [2], since it could be a very stressful time, do not plan on doing any other serious research work during the interview season. By no means should you be trying to meet a paper deadline while interviewing. By the time you are interviewing, it is already too late for any new publications on your resume to affect the outcome of the job search.

For the whole process of the interview, dress as formal as you can, which means you need to wear a suit and tie, with nice shoes and a belt. To make sure that the presentation goes smoothly, I usually prepare the pointer by myself with some backup batteries. I would also bring an HDMI to Type C converter such that my MacBook can be easily connected to the screen. I usually try to obtain the onsite schedule 2-3 days before the interview. I find it very beneficial to go through the website of each faculty member on the schedule list before the interview, knowing their educational background and research interests, finding common grounds and potential research connections. I usually make an excel list to mark down these points and bring it with me to the interview. Other than the slides for job talk, I also prepare a second backup slides, which concisely introduces my research and future agenda, funding plan, teaching plan, potential collaborators, etc. You need to understand that the life of faculty is very busy, there will always be faculty members that will be meeting with you, who are interested in your research but cannot make to your job talk. Bringing the second slides is easy to introduce your work to them, and give them positive feelings about you. These slides can also be used in the chalk talk with search committee members.

The Job Talk. The job talk is often at the beginning of your interview schedule, and it is the most important part of the interview that you *never* want to screw it up. The job talk serves the dual purposes of presenting your research contributions and future research vision, as well as showcasing your teaching ability. The talk needs to be extremely well-rehearsed, technically solid with certain depth, clear, entertaining, engaging, and instructive. If you give a bad talk there is literally no chance you can recover and end up with an offer, whereas few bad one-to-one interviews (with people outside your area) might not sink you. My tips of preparing a good talk are the following:

- **Attending as many seminars as you can.** One of the benefits doing a postdoc at NYU for me is that I can great talks almost every day. I usually attended 1-2

seminars per week, observing and learning how other people deliver a talk. If I attend a bad talk, I often try to analyze and discuss with others where the talk went wrong and how I can avoid them. If it is a really great talk, I often take notes and try to learn from the parts of the presentation that I most appreciate. I also download tons of talks/tutorials on the YouTube and watch them when I commute to work everyday (I got this advice from my previous advisor Prof. Trac Tran), through this way I find it a lot fun not only learning some new knowledge but also learn how the famous researchers present their work such that everyone can understand.

- **Breaking the talk into "thirds".** In the first third of the talk (e.g. 10 min), you should lay out the problem space and focus on motivations why the problems are important, where this part of talk should be easy to follow for everyone even outside your field. In the main body of the talk (20-30 mins), you can provide a lot of technical details with high-level intuitions to demonstrate that you are the expert in the field. It is okay to lose some people outside your field here, but try not to lose the experts in your field. In the final third (e.g. 10-15 min), you should bring all the audience back, explaining the implications of the work and pointing out a compelling future direction. You should be able to make the audience even outside the field excited about the work you have done. For me, in the final third I demonstrate several interesting applications derived from our theory using some exciting experimental results, projecting to a board class of engineering problems that our theory can be very useful.

- **Asking for advice from the people in your area who give good talks.** Another great tip that I learned is to ask advice from people who give great talks that you are familiar with. When I was preparing my job talk, I got great advice from my advisors, collaborators, and colleagues, who I enjoyed all their talks in the past. I iterated my talk with most of them, and got quite a lot of great feedback on how to make improvements. I significantly reduced technical details by replacing them with pictures illustrating the high-level intuitions and demonstrating my contributions in a boarder context.

- **Practice your talk with audience NOT in your field.** It is important to remember that the job talk is not only a talk to people in your area. The people in your area might already know your work well – which is why you are interviewing there in the first place. The talk needs to appeal broadly to the rest of the department – to explain why your work is important, what the key contributions are, and to give them intuitions for how to solve hard problems in an area other than their own. To achieve this, I find it very useful to practice the talk with people with minimum knowledge in your specific field. I got a lot of the most helpful feedback from my roommate, who has a Ph.D. degree in a related field but knows little about my work. He provided me many great feedbacks that I never realized. One surprising thing that I learned is that people outside your small field often tend to put the wrong emphasis on your presentations, where I made a lot of effort to adjust organization so that they can stick to the key points that I want to deliver.

The final *very important* part of your job talk is **Q&A**. As a teacher, you should handle interruptions and questions *gracefully*, making your questioners feel respected, important,

and connected with you, even if you are challenged. When someone asks you a question, pay close attention to the question and do not interrupt. In most cases, people ask questions because they are interested and want to learn more about your research, instead of trying to grill you. Thus, be confident and do not react defensively, otherwise the audience will subconsciously pick up on your negative body language. Below are some more detailed tips that I learned from others and my own experiences:

- In the cases that you are not sure nor clear about the question, you could rephrase the question in your own words and reconfirm with the questioner. You can also use this short period of time to come up with a good answer.
- If there are people challenging you or really want to piss you off, again, please do not act defensive. Just politely and respectively tell them that this is a very good question to think about in the future, and you are willing to interact with them offline.
- When people are asking technical questions, this shows their real interest in your work. I often first zoom out from the question, providing a boarder view and some contexts of the question that every audience can understand. Afterwards, I zoom into the specific details about the question, and address them in an intuitive and respective way. I also try to interact with the audience by a follow-up question on whether I addressed their questions or concerns properly, trying to make interactions and connections with them.

Again, all these are easier to be said than done. My suggestion is to use every chance before the job hunting season to practice your presentation skills as much as you can. During the year of 2019, I have attended many conferences and workshops to present my work, and paid several personal visits to present my work. I found these practices are really helpful, where people asked many common questions that I never expected in the beginning, and got invaluable feedback for gradually improving my presentations.

Meeting with Individual Faculty. The one-to-one meetings take a very large portion of the interview. Usually, you meet with each faculty for 30 min (in some schools, you will meet several faculties together in one meeting). You rarely get a break during the day, so if you need to use the bathroom or grab a cup of coffee, just ask (everyone is happy to accommodate). Many of the people on your schedule will be on the faculty hiring committee, and everyone (regardless of role) will be asked to provide feedback to the committee on whether they think you should be given an offer.

From my own understandings, the goal of these meetings is not to impress them – you have already given them an impression of your work through your job talk (If you have given a great talk, they will have a very positive feeling towards you) – but to show that you can be a good potential colleague that they enjoy having you for a very long time and love to collaborate with. Additionally, they are not looking to grill you about technical minutiae, when often their technical questions show genuine interest in your work. The most important things that I learned to do well in these meetings are *(i)* **making connections with people**, and *(ii)* **being a great listener**. The easiest of these meetings might be with faculty in your area, since you already have some common ground. The hardest is with people that are in completely different research areas. Below are a few detailed tips based on my own experiences:

- To **make connections**, I usually spend quite a lot of time ahead of the interview researching each faculty that I will meet with. By surfing their educational background and ongoing research projects, I often try to identify some talking points that I can leverage (e.g., my personal or research experiences) to connect with them. Most productive meetings that I had are ones that I found a lot of common/mutual interests with, and in those scenarios, they tend to provide strong support on my case. In many meetings, I intentionally identify and point out things that they are proud of, showing that I have done my research about the department – it could be impressive when a candidate comes in having done his homework, knowing a bit about the interviewer's research and background. In some cases, if there is no common talking ground, I use this chance to convey my message on why I am the best fit for this faculty search.

- To be a great colleague to collaborate with, you also need to show your genuine interest in other people's work. The most effective way is to be a **great listener**. The most effective way is to ask questions about other people's research and show your interest. When the person on the side is describing the research that he is excited about, a good way to be a great listener is to constantly ask questions and provide feedback based on your background knowledge. This is also a very good way to make connections with people that are far from your field. I found that this type of interaction often lead to positive feelings about each other, finding that our research is actually deeply connected. Conversely, it could be a red flag when you only talk about your own research throughout the whole meeting, showing that you are a self-centered person with no interest in other people's work. This could give the interviewer negative feelings that you have a narrow perspective on your research, and you might be hard to collaborate with in the future.

In most of the interviews, you will always meet with someone who will be unable to make your job talk, so be prepared to give a 5-to-10 minutes overview of your research, or a "mini" job talk. This is where I find preparing the second backup slides very helpful as I mentioned in the beginning of Section 3.2. For my second slides, I condense my research into 3-5 minutes, with another 3-5 minutes about my future research agenda.

On the other hand, you should also take the opportunity to learn as much as you can about the department. After all, this is not a one-sided process: you should be evaluating the quality of the department and its faculty as well, and it is a great way to learn what a future faculty life would be. In many cases, a one-third portion of the meetings turns into conversations that I ask questions about the department and experiences of faculty lives. For meetings with senior faculty, I usually prepare some standard questions to ask them repeatedly for each person that I meet with:

- *What is the growth trajectory of the faculty, what new areas or initiatives the department might be starting up?*

- *How does the department interact with different research clusters/institutions within the university?*

- *What is the tenure procedure and how is tenure evaluated?*

- *Is there any mentorship provided for young faculties? How are new faculty mentored during their first year?*

- *What is the teaching load? Is there any flexibility in creating new courses?*
- *What are your secret weapons for funding and recruiting good Ph.D. students?*
- *What are your hobbies? Where typically do faculty live around the campus?*

For meetings with junior faculty, I often use this opportunity to learn about the challenges they faced in their early years. After all, I will likely face those same challenges in the near future, so it is best to hear about potential pitfalls as soon as possible. To get these conversations rolling, I often ask

- *What have you done during your first year on the faculty job that you are proud of?*
- *What surprised you most about this job so far?*
- *How do you find good students to work with in the beginning?*
- *How do you like the working environment so far?*
- *Where do you get support and mentorship from?*
- *How do you handle proposal writings and teaching at the beginning?*

These are universal questions to be asked throughout the interview. Everybody has different perspectives on these questions, so that do not be afraid to repeatedly ask those questions through the course even you have got the answers from others. This also shows your interest in the department and your desire to learn from them as a potential young faculty.

Meeting with the Department Chair & the Dean. Another part of the interview is to meet with the department chair and the dean of the college/school. Whenever you get the offer, it is usually the department chair initiate the phone call to deliver the good news and recommend you to the college, and the dean has the right to deny or approve the offer eventually at the college level (although he does not vote on your case at the department level).

Although these are important meetings, you usually might not get much from them. In most cases, the chair or the dean will give you abundant chances to ask them questions, gauging your interest in joining the university. If you are curious, you can ask questions about tenure criteria, fundraising expectations, or incentives for collaboration. In the meanwhile, they will use this chance to tell you how amazing the university is in various aspects. However, you should still be prepared that they will ask you some common questions (such as those in the phone interview in Section 3.1) to have a general feeling of you as a potential young faculty.

Mealtime Conversations. For all the onsite interviews, I have been taken out to breakfast, lunch, and dinner. For some large departments, I even had two breakfasts, two lunch, and two dinners in a single interview! Breakfasts and lunch are usually quick and casual, you can regard them as normal one-to-one meetings during mealtime, and prepare tons of standard questions to ask.

By the end of the interview, a couple of faculty will take you out to a local fancy restaurant for dinner. This is a time that you are most vulnerable and exhaustive after a full day of nonstop meetings. The main purpose of the dinner interview I believe is more to get to know you as a person. In other words, they want to judge whether you will be a good colleague to get along with in the future. In some cases, the faculty will chat about their personal lives and funny experiences in the past with each other, and sometimes even forget about your existence. In those cases, I often try to get involved in those conversations, sharing some of my own common experiences and being curious about their experiences by asking tons of questions. Do not be shy to get involved, act as a seasoned colleague of them instead of being a quiet interviewee. Finally, an effective way to signal your interest in a school is to ask what your dinnertime hosts love about the surrounding area. For example, ask about how the area could support your hobbies. If you are married and/or have kids, ask about things that your spouse or kids would like. If you show no interest in the area, then the faculty will suspect that you're not serious about their school. Sometimes if you are a good candidate that they love, the faculty often want to gossip about what other schools that you are interviewing at. I often try to avoid these questions in a gentle way but also tell them the truth – I will mention a few names in the same range of the school that I am interviewing with, showing that I am competitive.

Finally, I really appreciate my postdoc experience at NYU, Center for Data Science (CDS). Before COVID, CDS held a regular Math and Data (MaD) seminar every Thursday, where I had the chance to join other tenure-track faculty and the invited speaker for lunch before the talk. I did quite a lot of practice during lunchtime by participating in their conversations and by observing and learning how the invited speaker behaved during the meal.

Chalk Talk with the Search Committee. At some places, I will have a very important meeting with most faculty members in the search committee for 1 hour. The main purpose of this meeting is to discuss about your future research agenda, fundraising plans, teaching plans. In other words, this is a time to discuss how you will build an independent and successful research program into the near future. As most search committee members are involved in this meeting, it is critical to get prepared to show them a compelling research vision, and convince them that your research can be successfully funded in the future.

For myself, I usually prepare 15-20 pages of slides. In the first 2-3 pages, I recap a bit of my research in a broad sense as some committee members might not be able to attend your talk. I use 3-5 pages to describe my future research plans, going from broad pictures to concrete projects. In most of the cases, the faculty members will ask tons of questions about your future projects, so be prepared to think about some concrete projects/ideas that you really want to pursue in the near future. I also use 2-3 pages of slides to provide a compelling funding plans, telling them a story why my future research agenda can be funded, detailing the names of the funding agencies along with the projects. To make it more concrete, I highlight many faculty members within and outside the department, on specific projects that we can potentially collaborate with. Finally, for teaching I usually use 1-2 slides with focus on the development of new courses. Nowadays there is huge demand for machine learning and optimization courses, I use the chance to get them excited about the new courses that I can develop to strengthen their curriculum. For

all the places that I onsited, most feedback I got suggest that I did pretty well in this part that most of the committee members are excited about my work and my future endeavours after the meeting.

Meeting with Graduate Students. In some occasions, I am also scheduled to meet with graduate students. This is a great chance to learn about the department from the students' perspective as well as to have a sense of the quality of the graduate students. Since I just graduated very recently, I often used the time to engage the students in their research projects, career goals, and their feelings about the departments. Additionally, be prepared that there will be student representatives who will ask you some standard questions (they will report your response to the search committee)

- *What (new) courses would you like to teach and why?*
- *What is your mentorship style for engaging Ph.D. students?*
- *What attracts you to join our department?*
- *How do you guide students when they are stuck or cannot make progress?*

3.3 After the Interview

For schools that I really interested in, I spent a lot of time crafting personalized follow-up emails with each faculty member that I met with, within 1-2 days of the interview, before they submitting their feedback to the search committee. For schools that do not interest me as much, I sent follow-up emails only to a few important people such as the department chair, hiring committee chair, and my faculty host. Writing a dozen or even two dozen emails often took a whole day of my time, especially since I was so tired after each interview; but I felt like this extra effort was worthwhile. You should understand that a faculty life is very busy, and the service of the department is the last thing that one faculty wants to do. Sending follow-up emails not only shows your respect for their time, but also demonstrate your interest and gives them a positive feeling about you.

For each email I wrote, I tried to make it very personalized for each faculty member, with inputs from the conversations that we had during the one-to-one meetings. For good conversations that I found a lot of common ground, I often sent out papers pointing to some future collaboration opportunities.

For some luke-warm conversations, I used this chance to make up by providing more explanations about things that I forgot to mention during the interview. This is also a chance to get feedback for your interview. For many cases, if the department chair or the search committee chair says something like "keep in touch" or "will get back to you soon", this often suggests that they are having a warm feeling about you during the interview.

4 Receiving and Negotiating Offers

Getting offers is always a moment of joy and excitement. Usually, the procedure is that the department chair initiates a phone call with you to gauge your interest to join them (they want to maximize the chances of getting the offer accepted). If you show your

mutual interest, you will be receiving a *verbal offer*, and the department chair will start the negotiation upon the salary, the startup package, the teaching, and start date, etc. Finally, the department will send the draft to the college for the approval from the dean, and send out the official letter offer to you to sign. Notice that a verbal offer can still be rescinded in some unexpected situations (some of my verbal offers had been suspended due to the hiring freeze caused by the pandemic and economical uncertainty), so you want to get the official written offer as soon as possible.

Delaying the offer. It is always good to receive an offer early. Receiving an offer in the middle of your interviews can significantly boost your confidence, making your rest of interview much less stressful. However, you often want to hold on a while for potentially better offers down the line. On the other hand, each department wants the chosen candidate to decide quickly (e.g., in 1 or 2 weeks), so that they have time to make an offer to their second choice if their first choice rejects them. If the first choice delays too long, then the second choice might already be scooped up by another school. One of the suggestions that I got is that, you should always holding on one offer while waiting for other better offers. In many cases, it is possible to ask politely for an extension of one or two weeks, and push the other school to make decisions sooner by notifying your offers. When asking for extensions, always show your respect and your interest, and provide some valid reasons that you want to make a small extension.

Offer negotiations. First of all, you should only negotiate in detail with schools you are really serious about. Otherwise, it would be a waste of time for others and get people annoyed. The offer usually contains three parts:

- *9-month and summer salaries.* For most of the public schools, as the information is publicly available, you usually do not have much room to negotiate the salary. But it should be noted that you salary usually goes up 2-3% every year (i.e., merit increase), a small difference in the beginning could lead to large differences after a couple of years. One strategy is that if you have multiple offers, you can use the other offers to negotiate a better salary.

- *Startup packages.* A standard package includes the funding for recruiting 2 Ph.D. students for 2 years, other discrepancies needed for your research and travel, and relocation fees. It is a good idea to make up a concrete list of how much you need for each parts before you start talking hard numbers. If you can, try to get your startup package to be all or mostly cash. By "cash", it means that the funding can be used to pay for anything ranging from students, equipment, travel, etc., so that you have more flexibility of using them. Additionally, for my field of study, asking for more support of student recruiting rather than equipment could also be more beneficial for starting a new lab.

- *Teaching relief.* You could also try to ask for teaching relief for one semester at the beginning to setup your lab. Usually I find this is quite hard to negotiate, as most places want you to start to teach early, so that you can show a upward trajectory of your teaching evaluation for your tenure case.

- *Starting dates.* Normally, the starting date of the position is in the August. In most of the cases, you can ask for delay to the spring or next year, and this part is easier to negotiate. In my case, I asked for delays to the spring due to the uncertainty caused by the pandemic. Starting in the spring has some pros and cons. In many places, the tenure clock starts in the next fall, so that you have half a year extra time to get things right before the tenure clock starts. On the other hand, however, getting students to immediately work with you in the spring could be difficult, as most graduate students have already found their advisors at that time.

Finally, do not be greedy. The goal of offer negotiation is reach a startup package that you feel confident that the resources you obtained will allow you to be successful in your early academic career. This is not about maximizing your compensation and pissing everyone off in the process – the people on the other end are your future colleagues

Making Decisions. Having multiple offers leave you happy but hard decision to make. In my case, I made quite a few phone calls with my advisor, my family and many of my close friends to seek for their advice. As mentioned in [2] as well, there are several important factors to consider when making the final decision:

- *How enthusiastic are the faculty about your offer? Was the approval vote unanimous or a bitterly-fought victory (you can often get this information from internal contacts)?*
- *How nice were the faculty to you during the interview overall? Are there any faculty that you can collaborate with?*
- *Will there be senior people in the department that will provide strong support and champion for you? Can you identify good mentors from the department?*
- *What is the quality of the graduate students? How much does it cost to support a graduate student?*
- *How close is the school to the nearest airport? As a faculty, you will be frequently traveling for conferences and funding agencies in D.C., so being close to a large airport with many direct flights makes your life much easier.*
- *What is the living cost, and how do you like the place? Does the place support the dual career for your beloved partner?*

It is good to always have at least one official offer at hand through the job hunting season that you will feel much less stressful. However, if you got better offers and are no longer interested in some places, let them as soon as possible in a respective way – they will be disappointed for sure but will be appreciative of your prompt decisions, which gives the search committee time to make the offer to their second choice candidate.

5 Final Thoughts & Reflections

In the first round of my faculty job search, I still remembered being filled with fear and self-doubt whether a faculty life is the right fit for me. The fear also comes from many

unknowns of what a faculty life look like. I am concerned about my ability to mentor students, funding raise, and eventually how to develop an independent research program on my own. This type of fear exaggerated after the first round of my failed job search.

However, by talking to so many faculty learning their experiences through the whole interview process, it gave me a chance to reflect on what a real faculty life looks like and how I can be better prepared to embrace the challenges. An effective way that I found to overcome the fear, is to stop worrying and start to think and behave like a faculty. I feel so fortunate to step out my comfort zone to be a research assistant professor at NYU CDS, where I can almost act as a tenure-track assistant professor without senior mentors. By coming up with ideas on myself and getting them recognized in top machine learning conferences, and by mentoring students with the joy of their success, it reminds me of my original passion for academic research. In my last round of job search, I am more than convinced and confident that a faculty life is something I really desired. After countless (silent and painful) declines, my confidence grows when I got quite a few offers during my last round of job search, when some faculty members told me that they are excited about my research and I am their top choice.

At present (Jun. 2021), being in the position for half a year, I still believe being a faculty is what I cherished for my life. My reflections during the whole search process have made me much better prepared for this new role. I still have so much to learn about this job and no idea if I will make it, but I am immensely grateful for the new opportunity to learn and grow.

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