Since U Been Non (Academic)

...

Topology Students Workshop
Vanderbilt
2024 June 12

Quick Introductions

Shane Scott
Researcher
Braid Technologies

Sneha Subramanian
Director, Data Science
Salesloft
Coauthor in absentia

Your Skills Have ($) Value

You've spent years working on your:

- Technical Communication
  - Teaching individuals
  - Technical speaking to multiple levels of expertise
  - Public talks
  - Writing, editing and reading academic papers
- Information Organization
  - Abstraction
  - Pattern recognition
- Quantitative Literacy
  - Data reasoning
  - Linear algebra
- Self Direction
  - Time management
  - Project management
- High level math
  - My day to day requires: PDEs, differential geometry, functional analysis, combinatorics, machine learning

Industries Have ($) Value for Your Skills

Careers looking for mathematicians

- Data Jobs
  - Data Analytics
  - Data Science
  - Machine Learning
  - Data Engineering
- Software Development
  - Software Engineering
  - Product Management
  - UX Research
- Scientific Writing and Content Creation
- Finance
  - Quant Analytics
  - Financial Engineering
- Education
  - Public or Private Schools
  - Education Tech
- Non-Academic Research
  - Department of Defense
  - FAANG
  - Analytics, Polling, Consulting
  - Simulation & Movie Effects
  - Climate Science

... and many more!

Non-Academic Jobs

Why?

- If you like working as part of a team/organization
- If you need more flexibility in how you work
    - Especially location flexibility
- If you like having the option of multiple career tracks
- If you want better pay
- If you just don’t feel like academia is for you

Non-Academic Jobs

Why Not?

- If you like working alone or in smaller groups
- If you need more flexibility in what you work on
    - E.g. the types of research problems that interest you
- If you know for sure that an academic career is for you
- If you want a more stable job
- If you have philosophical or cultural conflicts

How to Start

Connections

Top Priority!

- Grad School Cohort
- Ask professors to put you in contact with former students
- Coffee with Friends of Friends
- LinkedIn
  - Cold call
- Jobs Fairs
- Networking Events
  - Hosted by Professional Associations (Check their sites)

How to Start

Mentorship

Finding a mentor

- 1-2 major mentors or several "mini-mentors".
- If you have someone in mind, go for it!
- Engage with people from the career community.
- Seek more advice, less information.

After you find a mentor

- Take ownership of your mentor-mentee relationship.
  - Set up regular 1on1 times.
  - Come up with specific questions, topics and agenda.
- Actively seek feedback from them.
  - E.g. share your code or resume.

How to Start

Finding Community

Looking for communities ...

- Both remote and local in-person
- Search on Meetup
- For online communities
  - Blogs, forums, chats etc.
  - Slack
  - LinkedIn
- Hackathons
- Communities affiliated to your school

Some examples ...

- HackerNews (tech; online)
- Women Who Code (tech; remote + local chapter events)
- Locally Optimistic (data; Slack)
- Data Science for Good (data; remote + local chapter events)
- Teach for America Alumni Network (education; remote + local chapter events)

How to Start

Start Now! Develop your skills!

Communication is Universal

- Write clear README's and in-code documentation.
- Be a good TA!
  - If you get the opportunity to teach your own class, do it.
- Go to conferences, give lots of talks.
  - Practice, record, watch yourself!
- Keep a journal and/or write a blog.
- Use communication tools to explain and track your projects!
  - Vidyard
  - Loom
  - Put a link in your resume and README's.

Learn Coding Skills

Build things, document, share

- Industry Language:
  - Python, Java, Javascript, C/C++/C#, Ruby, Elixir, Go etc.
  - Maple/Matlab are very rarely used
- Learn software dev skills
  - Github
  - IDEs
  - Code reviews and pull requests
    - Code with a friend
- BUILD something
  - Start a project in your field of interest
  - Contribute to an open source project
  - Project Euler!
- Document your experience
  - Make a personal website
  - Blog about progress or subproblems of projects

How to Start

Start Now! Develop your skills!

Book recommendations

- Programming:
  - Cracking the Coding Interview, by Gayle McDowell
  - Clean Code, by Robert Martin
- Data Science / Machine Learning:
  - Modern Multivariate Statistical Techniques, by Alan Izenman
  - Python Data Science Handbook, by Jake VanderPlas
  - Hands-On Machine Learning, by Aurélien Géron
  - Deep Learning, by Ian Goodfellow, Yoshua Bengio and Aaron Courville (free online copy)
- Read in the problem area you want to work in.

How to Start

Start Now! Develop your skills!

Other Resources

- Coursera / Udemy / Udacity etc.
- Online degrees (e.g. Georgia Tech's Computer Science Master's degree)
- Bootcamps
- MIT open courses

How to Start

Internships

- Check big math organizations for applied math positions
  - NSF
    - Mathematical Sciences Graduate Internship
  - AMS
    - ASA Internships
- National Labs
- Nearly any tech company
- Apprenticeships
- See Next Slide! Looking for Jobs
  - Ask what's available

Looking for Job Listings

Ask Ask Ask Ask

- Lean on your network
- Job aggregation sites
  - LinkedIn
  - Glassdoor & Monster
- Cold call
  - Esp. small firms or startups
  - Find people with similar backgrounds
- Check career sites of interesting companies
- Get on talent lists of your favorite companies
- Apply frequently and broadly
  - Consider 1-2 year plans
  - Be curious
- Prioritize recent or advertised postings
- Timelines are informal and varied

Hiring Process

Creating Awesome Applications

Resume

- Easy to read
- Easy to edit
- Applicant Tracking System
  - JobScan
  - SkillSyncer
- Tailor to the Job
- *Make* experience relevant
  - Teaching is communication
  - Problem solving
  - Math intuition
- Avoid the overtechnical & irrelevant
  - Not your CV
  - Banish jargon

Hiring Process

Creating Awesome Applications

Cover Letter

- Make it friendly yet specific
  - Try “Dear hiring manager” instead of “To whom it may concern”.
  - Avoid general filler phrases.
  - Sound confident, not arrogant.

- Personalize it!
  - Tell them why you want to work for them.
  - Tell them why you are the best choice for the role.
  - Connect with the company’s mission and/or values.

Hiring Process

Interviews

TECHNICAL

- Mind your jargon
- Prepare for:
  - Live coding
  - Take home problems
  - In person code review
  - Invited talk

NON-TECHNICAL

- Math PhDs may face special scrutiny:
  - Flight risk?
  - Pragmatism
- Answer honestly, humbly, curiously
- Don't get discouraged!
  - Not a meritocracy
  - Timing, personality, practicalities all at play

Hiring Process

What the hiring manager wants

Hiring is ...

- A huge time investment.
- An act of trust.
- Frequently about forming a team or organization - and not about you!

Hiring Process

What the hiring manager wants

Conforming qualities ...

- Curiosity
- Introspection
- Learner
- Sharer
- Collaboration
- Communication
- Organization or team values

Differentiating qualities ...

- Specific skill
- Process/team role
- Leadership

You got the job!

Should you take it?

Evaluate the offer

- Run it by a mentor
- Weigh all the factors
  - Salary
  - Time Off
  - Location and Travel
  - Benefits
    - Healthcare
    - Career Growth
  - Lifestyle

Negotiating

- Not optional
- Do your homework
  - Find salary stats
  - Quantify your worth
  - Research the firm
  - Ask somebody in industry
  - Don’t commit on any unconsidered detail
- Negotiate job description & details
- Mind the gap!
- Mention upcoming leave
- Nibble

Resources

1. Tips on Ph.D. job search
2. How to Stand Out as a Non Traditional Applicant
3. Hacker News
4. The Professor is In
5. How to Convert an Academic CV for Industry Positions
6. JobScanner