Preface / Disclaimer

- I am not representing anyone but myself
- All the advice herein is based on a sample size of $N \approx 1$
- This advice is (probably) not the silver bullet for getting a job
- Geared toward private sector
Outline

• My background

• Current job and company
  • Engineering (gross!)
  • FTL Program
  • Northrop Grumman and the defense sector

• My job search and other job hunt advice
  • Use your resources
  • Transferrable skills
  • Learn to communicate
My Background

• BS in physics and BA in mathematics in 2011 (University of Virginia)

• Ph.D. in 2017 (Raffi Budakian’s group)

• Thesis topic: Low-temperature magnetic force microscopy, multiferroics, quantitative modeling

• PGSA Co-President and GPS mentor

• Summer internship and follow-on 1+ day/week at Inprentus starting in 2016
My Background

Real-space magnetic imaging of the multiferroic spinels $\text{MnV}_2\text{O}_4$ and $\text{Mn}_3\text{O}_4$

Phys. Rev. Materials 2, 064407 – Published 22 June 2018

[1] [2]
Why my current job?

• No interest in academia/post-doc/finance

• Wanted to move back to East coast

• Get to pursue leadership while staying technical and working on interesting problems

• Hiring process was finished ~5 months before I defended

• Good salary and work-life balance
Transition from “physics” to “engineering”

• Day to day activities of physics and engineering aren’t necessarily that different

• More emphasis on reliability, interoperability; more acceptance of uncertainty, imperfection

• There are still tons of interesting, hard, low-TRL problems to solve

TRL = technology readiness level
Project example: neuromorphic imaging

- Optical sensor built on the same principles as the human visual system
  - Asynchronous pixel (photoreceptor) reporting
  - Parallel processing paths for different tasks
  - Event-based reporting

- Advantages in data throughput, temporal resolution, power requirements…
Project example: neuromorphic imaging

Fig. 2: Lab setup for collecting test data and performing real time processing experiments.

Flickering LED for high temporal resolution testing

Grayscale image reconstruction

Motion control of sensor pointing
Project example: mission engineering for business development

- Goals of mission engineering and mission MS&A
  - Understand current capabilities and gaps
  - Explore wide trade space of solutions
  - Analyze threats
  - Aid planning
  - Guide future research and development

- My role:
  - Create models for relevant systems and behaviors
  - Develop scenarios and simulations
  - Analyze results to produce customer-relevant metrics and visualizations
Working in the defense industry

- Lots of jargon, acronyms, and history
- People care deeply about the work and mission
- Well behind commercial realm in some ways, well ahead in other ways
- Work with people from diverse backgrounds, including military
- Ph.D. confers a lot of respect (especially physics)
My job search timeline

• Overall about ~9 months, but varying levels of intensity
• 3-5 on-campus or phone interviews
• 2 on-site interviews
• 1 offer – accepted (obviously)
Starting early: Spring 2016

- Went to career fair with a plan and an OK resume
- Responded to email from Lance about NG recruiter on campus and met with the recruiter (stealth interview)
- Put together profile on UIUC online career search tools
- Attended several seminar events by Grad college career development office
Searching in earnest: Fall 2016

- Resume review and edit with career development office (and more seminar events)
- Another meeting with NG recruiter
  - Assembled application package (recommendations, transcripts, “cover letter”, etc.)
  - Informational interview with UIUC grad current employee
- Went to career fair with a plan and a polished resume
- Several on-campus interviews
  - Trading firm
  - Large materials/products manufacturer
- Phone screen and on-site interview with semiconductor company
Sealing the deal with NG: Fall 2016+

• Late October: 2-day on-site interviews and activities

• Early November: Offer extended

• Late December: Accepted offer (no negotiation)

• July 2017: First day in Baltimore
Use your UIUC resources!

- Grad College Career Development Office
  - Career development workshops
  - 1-on-1 resume review and advising
  - Mock interviews
  - Etc.

- Career Services Platform (Handshake)

- Career fairs

- Department-level events

- Lynda courses or similar
Transferrable Skills

• Unless you are going into your exact research field, you need to think about transferrable skills

• BUT you already have lots of transferrable skills, you just need to articulate them
  • Breaking down complex problems into solvable elements
  • Working in a team; collaborating between teams
  • Research and analytical skills
  • Self-motivation and time management
  • Joining and working on an in-progress project
  • Etc. etc. etc.
Learn and practice communication skills

- You will likely be going into a very technical job, but you will need to interface with non-technical people

- Take the Communicating Physics Research course

- “Soft skills” like communication are routinely listed by managers and executives as more important than hard technical skills

- Career fairs and other hiring/networking events are great places to practice
Random other thoughts…

• Career fairs: don’t put yourself in a box, I talked to companies that didn’t list PhD or physics in their profile
• Companies sometimes cannot get out of their own way trying to hire
• Luck is a significant factor in finding a job
• Other career seminars to check out:
  • Xu Wang (Intel)
  • Richard Aburano (Hiring Manager)
What We Look for (Review)

- Engineering/science master’s degrees and doctorates with high GPAs and faculty recommendations
- U.S. citizens able to obtain a security clearance
- Demonstrated drive and aptitude for leadership
- Eager to broaden their perspective
  - Explore different technical domains
  - Experience leadership of small teams and beyond
  - Develop business and management competencies
- Willing to relocate for rotation assignments
- FTLs must maintain exceptional performance in their rotation assignments to remain in the program

Interested?

*Talk to your alumni recruiter*
*Visit [www.northropgrumman.com/ftl]*
Questions?

Knowing how it could change the lives of canines everywhere, the dog scientists struggled diligently to understand the Doorknob Principle.