REFLECTIONS AFTER 10 YEARS IN THE SEMICONDUCTOR INDUSTRY

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PHYSICS DEPT CAREER SEMINAR

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DISCLAIMER

- What this talk is, and isn't
    - IS: Based on my experience and mistakes I've made. YMMV
    - IS: Containing basics of job hunting that I was either too embarrassed to ask or too dumb to follow
    - IS NOT: A philosophical treatment of academia vs. industry (see past career seminars)
    - IS: personal. I am not representing my employer (Arm Inc) in this seminar
- I do have follow-on sessions where I will represent Arm in recruiting capacity

OVERVIEW

1. What has changed in the job market since my last seminar

2. What I learned from progressing through the levels

3. What I learned from being involved in hiring

4. What I learned from being in different companies: Public vs private, large vs small, established vs start-up

5. What I learned from being laid off

MORE RECENT CHANGES IN HIRING PRACTICES

- For the most part I stand by everything I said last time

- LinkedIn became dominant. Your profile IS your resume. Start your LinkedIn profile now

- Gaming the system:

  - A different kind of keyword spam: AI does not have area-expertise and cannot read technical writing. Create LinkedIn posts to trick the recommendation algorithm. Does not need to be in-depth, just need to be appropriate for the AI audience

  - Job search: finding the right search terms

- Useful job research websites: levels.fyi, Glassdoor (use with caution)

HOW DID I END UP WHERE I AM?

- UIUC Physics, PhD, 2004-2012

My last Physics career seminar: 2013

- Intel Corp, Sr Failure Analysis Engineer, 2012-2020

- Cerebras Systems, Staff Silicon/RDL/Product Engineer, 2020-2023

- Arm Inc, Principal Quality Engineer, 2023-present

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What do these job levels mean?

HOW TO READ JOB LEVELS

Job levels in tech industry:

- For technical roles, see table

- There are also terms like Individual Contributor (IC). It's a blanket term for technical people that do not manage other people

- Some brilliant engineers are very bad at management

- Usually at Staff level, bifurcates into technical and managerial roles

- Usual managerial role progression: Manager→Director→VP, etc.

(There are also two kinds of managers: those that do technical work, and those that do not. IMO the latter should not exist in tech industry)

Job Level	Influence /Responsibility	New grad	Commonly referred to as…
Technician	No discretion	Assoc to Bachelors	"Early career" or "New/Recent Graduate"
Engineer	Makes discretion but needs direction	Bachelors to Masters	
Sr Engineer		Masters to PhD	
Staff, Sr Staff	Directs self		"Experienced"
Principal+	Directs others		
Distinguished, Fellow, etc	Influences field of expertise		Largely honorific. Hired through search, not job listing

PAY GRADE VS JOB LEVEL

- Pay grade determines exactly how much you get paid
  - In larger companies, different engineering disciplines, e.g. software vs hardware vs machine learning, have different pays for the same grade
  - Grading system is company specific
- Job level usually determines the pay grade *range*
- Job level to pay correlation is not absolute. Lower end of the higher level might overlap with higher end of the lower level
- Microsoft's pay grade chart was leaked a while ago and is an insightful document. Look it up

DO JOB LEVELS MATTER?

YES.

- Job level typically carries over when you change job

- Job Level indicates your level of responsibility and is a recognition of your expertise

- Psychological anchoring when your resume is read

- You can earn promotion by doing good work, but the faster route is often getting hired into a higher level

- There's usually at least one level difference between Master and PhD

  - For physics grads, this difference is NOT due to expertise, but because of the self-directing skills accumulated through the doctoral project

THE REST OF THE JOB TITLE

- There are often no set rules about how to write a job title. Hiring managers come up with names to fit purpose

- There are dialect differences between companies in describing job functions, leading to confusion over certain job titles, e.g. Product Engineer. Read the job descriptions carefully

- Job title is a lot less important than what the job actually involves

- When jobhunting, using the right search terms is critical

- +/- 1 flexibility in title level/grade often exists. Lower end of a higher grade/level is preferable than higher end of a lower grade/level

JOB DESCRIPTION

- Job description is often pieced together with job responsibility, requirements and qualifications specified by hiring manager and then wrapped in a template by human resources

- The job description usually describes an *ideal* candidate

- You do NOT need to be ideal to be hired. If you don't quite meet every criteria, you likely can still be hired at -1 level/grade

- Connect to the technical people ASAP: connect with the hiring manager or someone inside the business unit, introduce yourself, ask questions about your candidacy

PHYSICS VS EE/CS: WHAT EMPLOYERS LOOK FOR

Semiconductor industry is a continuum: from pure computer science (e.g. architecting) to pure physics (fabrication). Compared with an EE/CS student:

- At new/recent graduate level: you are not expected to have area-expertise. EE/CS has the leg up in knowing the subject matter background better. To make up the difference, here's what I suggest:
  - You do need to know enough subject matter background to carry an intelligent conversation, so a little bit of cramming the books on relevant topics.
  - Skills transfer: design of experiments, project management, data acquisition, simulation, data crunching, machine learning, etc
  - Demonstration of learning aptitude
  - Demonstration of problem-solving skills
  - Any way you can connect with hiring manager will help make the right impression
- At Staff and higher level, no: you should have accumulated enough expertise through career

HIRING PROCESS

- Broadly, two strategies:
    - Accumulate a pile of resumes, and pick the best
    - Review resumes as they flow in, and make a decision on "first across the line"
- The difference in strategy reflects a difference in the demand for the area expertise:
    - Early Career: little area-expertise. Accumulation strategy favors picking cream of the crop
    - Experienced: employers will typically scour LinkedIn and invite applicants, then pick first across the line
- Typically, HR/TA is the first gate keepers, however they are NOT technical people, and they are your biggest obstacle. Your chance of success skyrockets if you can make connection with hiring manager/interviewer
- It's very important to start building your LinkedIn profile early on

CORPORATE STRUCTURE
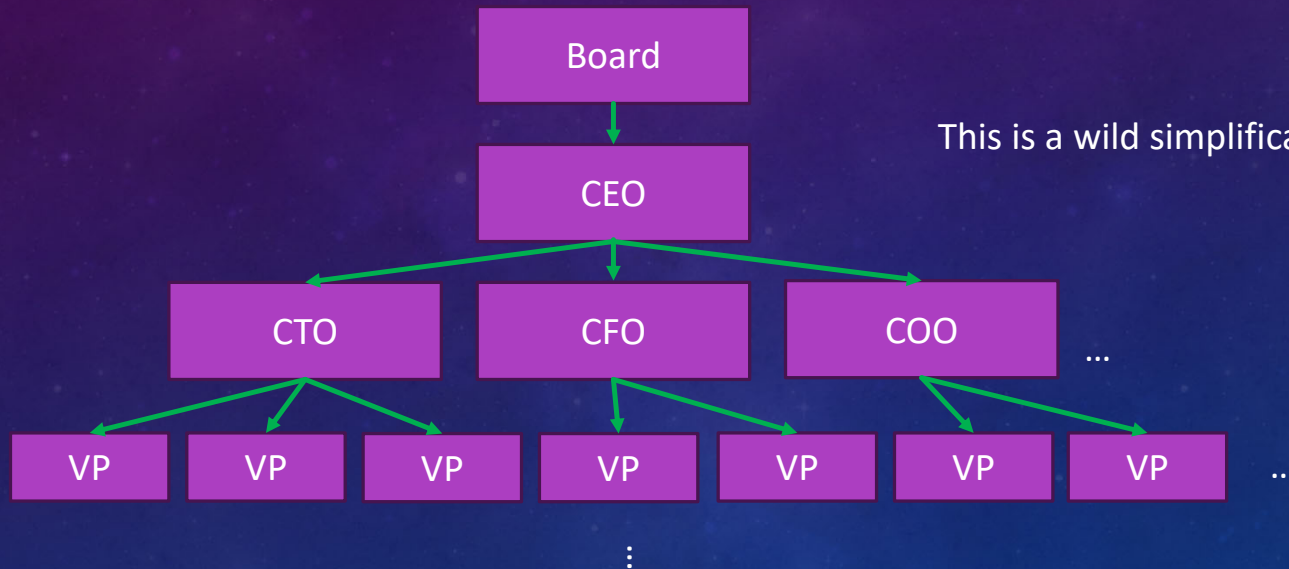
This is a wild simplification

COMPANY PHENOTYPE: PUBLIC VS. PRIVATE

- Public=publicly traded
  - Additional regulations, public disclosures
  - Pay package will include stock grants/RSUs (=restricted stock units)
  - Tends to favor short term gains due to investor interest, yet semiconductor industry has a long cycle time
- Private: governance and finance more opaque. Highly dependent on visions of board/CEO
- Cautionary tale: Intel
  - Multiple non-engineering CEOs made multiple short-sighted missteps
  - CFO becoming CEO in a tech company is a bad sign
- Personal opinion on warning signs (tech companies):
  - Non-engineering CEO, particularly in a public company
  - CEO also president of board (unless CEO is founder)

# COMPANY PHENOTYPE : LARGE VS. SMALL

	Large	Small
Job Responsibility	Well defined, favors learning area expertise	Fluid and subject to needs, favors career exploration
Corporate support, e.g. visa sponsorship, export licensing, logistics, procurement, etc	Mature support	Spotty
Benefits, e.g. health, life insurance, 401k matching, childcare, etc	Often better, due to bulk contracts	Usually worse, need higher salary to compensate
Corporate structure and career progression	mature, multi-leveled management structure and progression tends to be slower	Fewer levels, less well-defined performance review system, more mobility
Politics: overlapping responsibilities and resource needs create friction	A LOT	A bit less

COMPANY PHENOTYPE : START-UP

- A special kind of small, private company

- Somewhat of a dichotomy. Usually hires experienced to bring in specific expertise, or new grads with fresh ideas

- Stability: the motto is fast and loose
    - Check the funding rounds (round A is too risky and round G is near the end line)
    - Check who invests in the startup
    - Check if founders are still there

- Resources/corporate structure: smol

- IPO and Options: end goal for start-ups is either IPO or being bought. Stock options become valuable when either happens.

- Level of talent is typically high. Employees are a self-selected cohort. Motivation is critical.
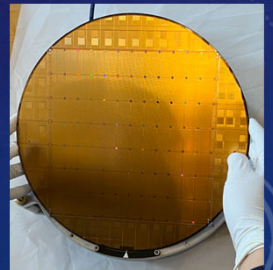
LAYOFFS

- What is a layoff: position eliminated due to lack of need (e.g. project cancellation, mergers), or, more likely, to save cost

- In semiconductor/tech industry periodic layoff is the norm

- Rumor sites: Blind.com, thelayoff.com
    - Large grain of salt advised when reading rumors

- Treatment of affected workers vastly different between companies
    - Layoff compensation
    - Some companies will hire back laid off workers after turnaround (e.g. Cerebras)
    - Some companies will blacklist laid off workers (e.g. Intel)

- Preventative measures
    - Make your work important to the central business of your employer
    - Learn. Actively advance your career
    - Keep your LinkedIn profile up to date. Make yourself marketable at all times.

THANK YOU