Resume Suggestions For Physics PhDs Looking For Industry Positions

H. Wolfmeister

UW Physics Career Seminar

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DISCLAIMER

This is personal advice from
personal experience, job searches,
from being on a hiring team,
and asking recruiters questions.
Some is inference.

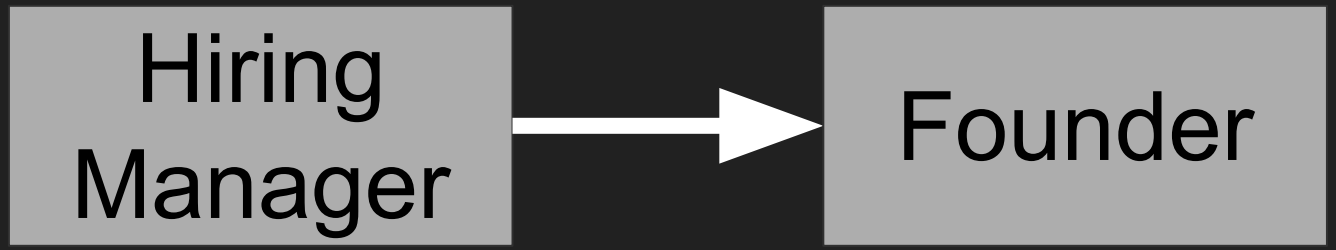
YMMV.
For Entertainment Purposes Only.

Who Will Look at Your Resume?

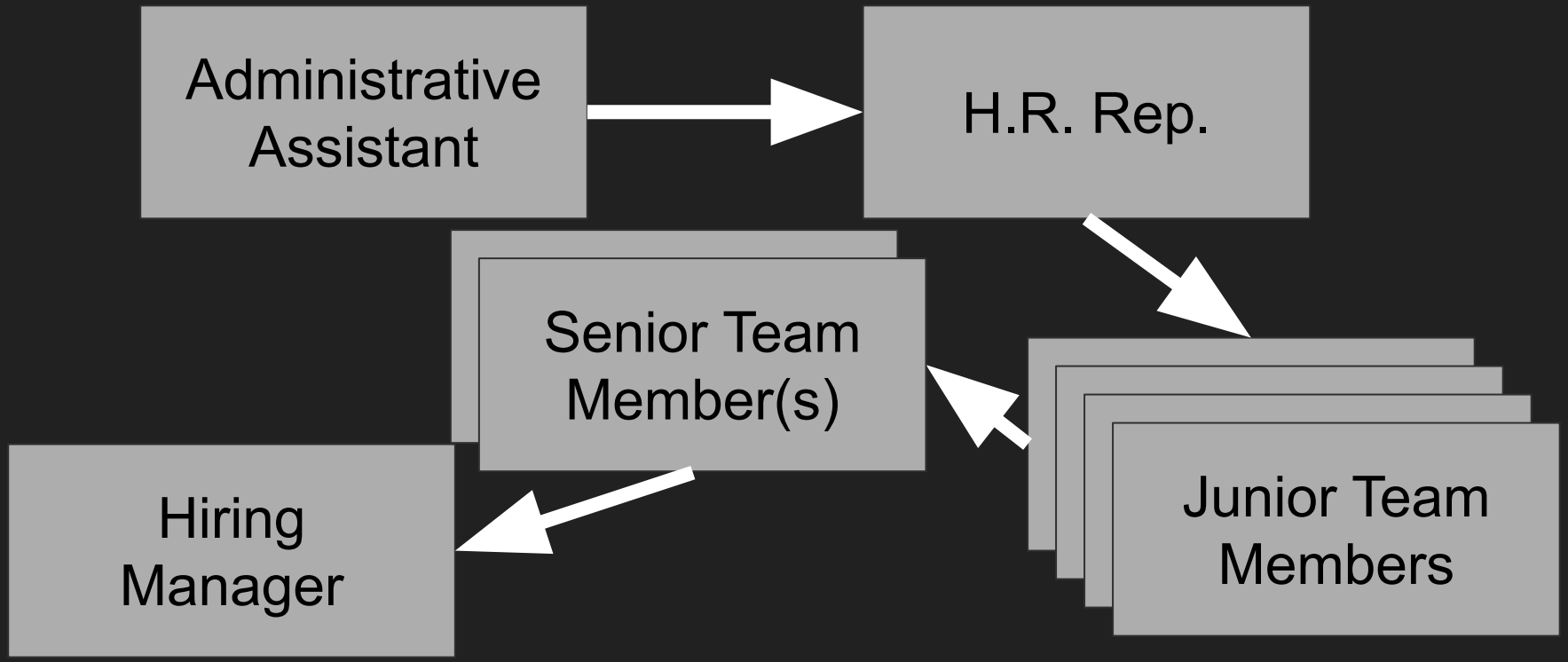
- **Your resume is a product**.
- Like any product, you should consider:
  - **who your customers are**
  - **what they expect and want** to see.
- For industry roles, expectations are *very* different from academic roles.
- Resume may be looked at by many people with different backgrounds and goals.

Your resume may travel on many different types of journeys

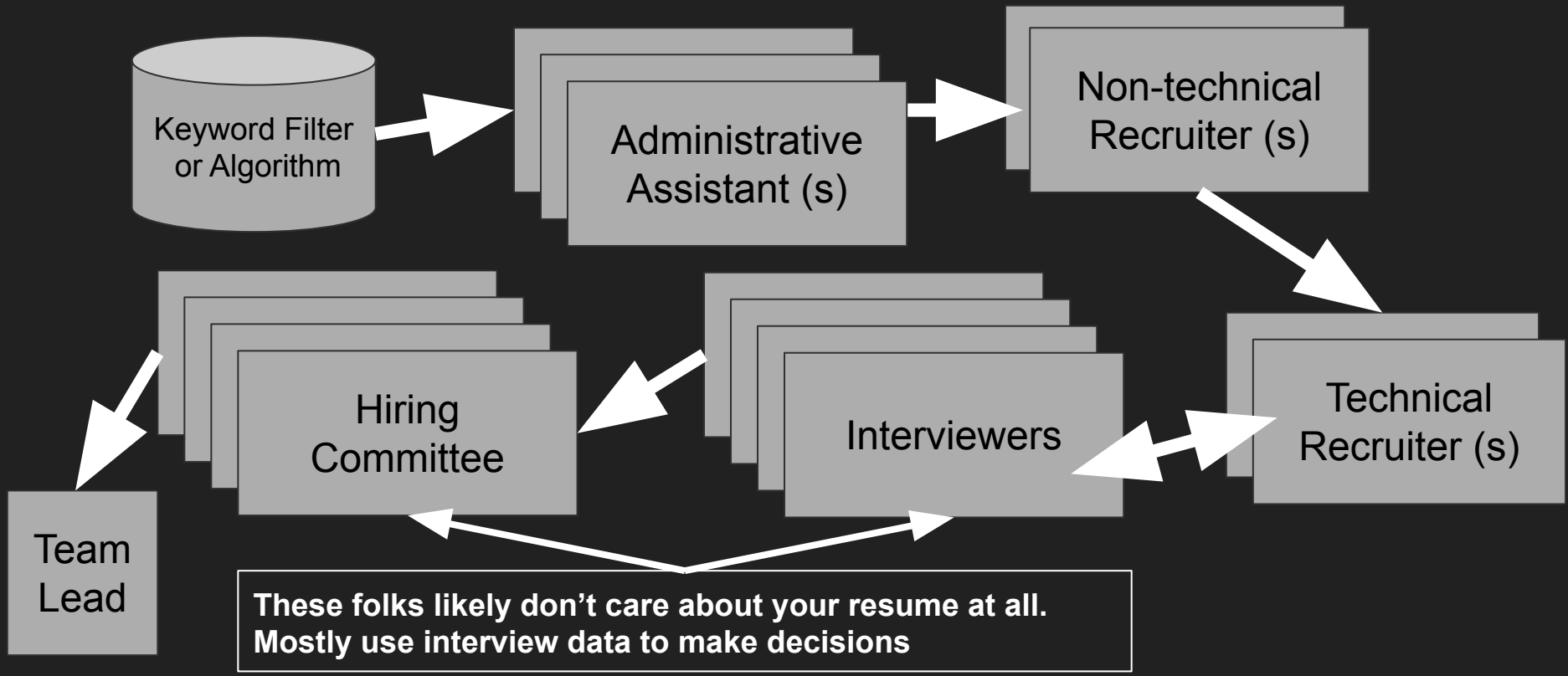
Resume Journey: Small Startup



Resume Journey: Small Company or Siloed Team

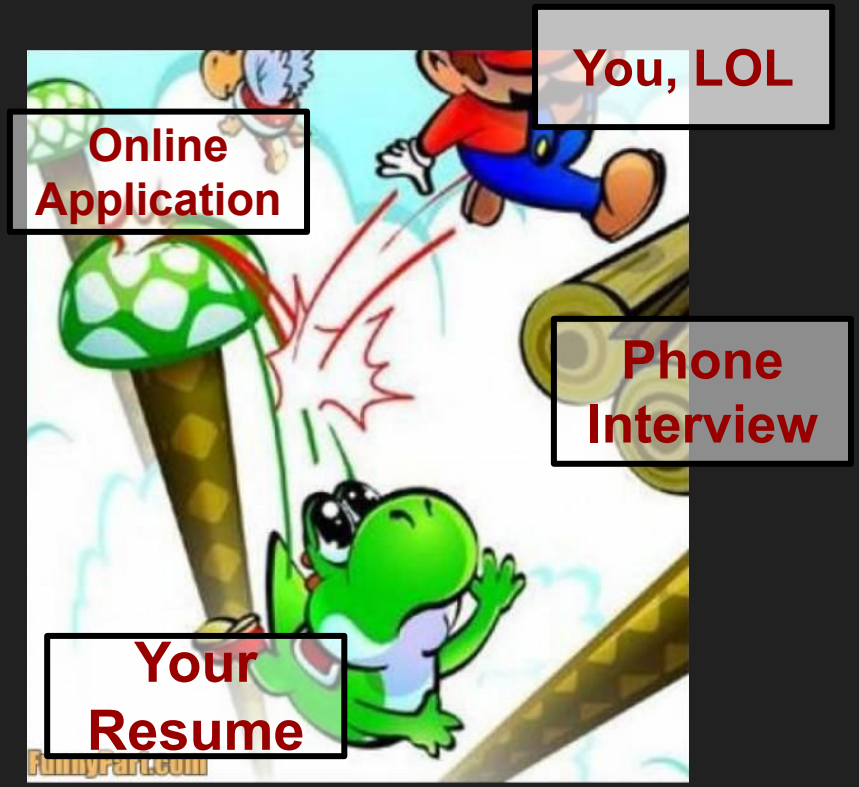


Resume Journey: Largest Tech Companies



Your Resume's Purpose Is to Get You a Phone Interview

- Resumes are unreliable evidence:
  - Hirers see lots of embellished and misleading resumes.
- Once a candidate has had a phone interview, data from that interview typically dominates decision to move forward or not.
  - Even more so for successive interviews.



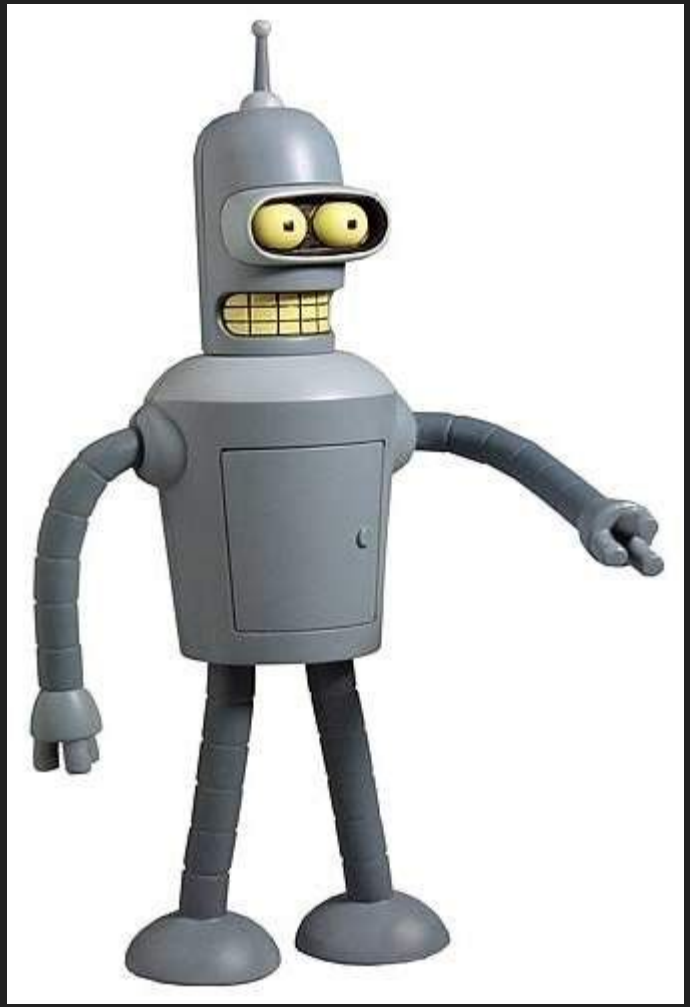
Try to Understand Your Readers

What They Do and Want

Keyword Filter or Algorithm:

- Background:

  “grep `(Ph.D.|Doctorate)` resume.pdf”
- Job: Kick out all the *totally* irrelevant resumes.
- Input: Job posting or list of keywords
- Output: yes/no or ranking.
- What can you do to help them?
  - Make the words in your resume match the word choices of job posting **exactly** (where truthful).



What They Do and Want

Administrative Assistant
or Non-Technical Recruiter

- Background: Maybe fresh out of school,
  maybe a degree from an unrelated field.
- Job: Prioritize the most relevant resumes
  For phone interviews.
- Input: job posting, lots of resumes
- What can you do to help them?
  - Make words in your resume **and order of those words** match job posting requirements as closely as possible.
  - Don’t use jargon that’s not **in the posting**.

What They Do and Want

Technical Recruiter / Senior Recruiter (large company)

- Background: many years in field,
  often with related technical degree.
- Job: Get high-quality resumes to the hiring team.
- Incentives:
  - May be on a target/quota system of conversions, or a salary+bonus system for hires. **They are incentivized to get folks hired. Help them help you.**
- What can you do to help them?
  - They may call you and ask some basic questions like where you want to live, what you want to work on. Be transparent with them and they'll try to match you with a team that will hire you and an offer you will accept.
  - Ask them what gets candidates hired, and then apply their advice.

What They Do and Want

Hiring Team Members (small company or silo)

- Background: Varying levels of experience.
- Job: Doing actual work, not looking at resumes.
- Incentives:
  - They probably hate looking at resumes and doing interviews, but the team needs it. They want to find someone who can do the work, and be a colleague.
  - It's 3:30 on Friday, and they need to pick >=20 resumes out of 100 before they go home.
  - Finding out during an interview that a candidate isn't qualified is frustrating for everyone.
- What can you do to help them?
  - Provide **EVIDENCE** on your resume that you can meet the stated requirements.
    - Typing "Python" on your resume is not evidence that you can use Python.
    - Typing "Expert in Python" on your resume is not evidence that you can use Python.
  - Avoid unneeded details on the resume.

What They Do and Want

Hiring Manager
(small company or siloed team)

- Background:

  Can do your job better than you, but has better things to do.
- Job: Building a strong team.
- Incentives:
  - The allocated money for this job might disappear and go to another team if they don't fill it. Their team might be missing opportunities due to personpower.
- What can you do to help them?
  - Provide **EVIDENCE** on your resume that you can meet the requirements.
    - Typing "hard working" on your resume is not evidence.
  - Avoid unneeded details on the resume.

What They Do and Want

Interviewers (Large Tech Company)

- Background: Do a job similar to the one you are applying for
- Job: Actual work, plus some interviewing.
- Incentives:
  - In general want their company to hire good people,
  - They may not be on the team you'll eventually work for if you're hired.
  - They're typically given a rubric of candidate qualities, and try to make the interview reflect those qualities. The resume is often irrelevant. They do sometimes use the resume as a conversation starter, or to help interpret your responses.
- What can you do to help them?
  - We'll talk about interviewing at a later time.

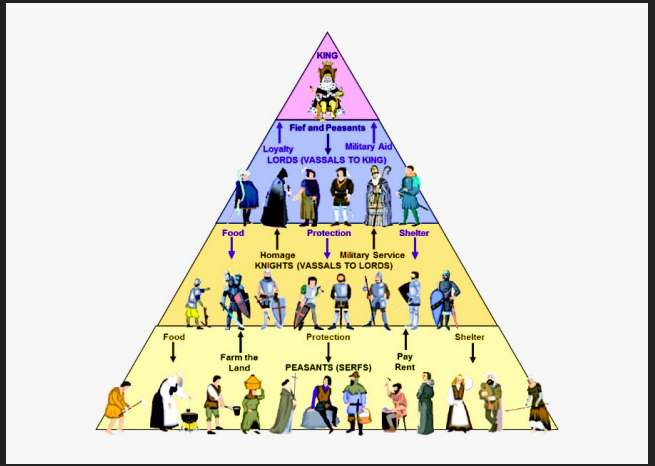
What They Do and Want

Hiring Committees, Compensation Committees, etc. (large tech company)

- Background: Technical experience and lots of experience hiring.
- Job: Mostly engineering managers.
- Input:
  - Your resume (unreliable), plus notes from all your interviews.
  - Many companies now strive to redact irrelevant details from the resume during this step, including name, gender, university, etc.
- Output:
  - Hire/No-Hire/What comp. level, etc.
- What can you do to help them?: Interview well.

The Differences Between a Resume and C.V. Reflect the Differences Between Academia and Industry.

Technology Resume v.s. C.V.



The markets are different!

Academic Physics:

- Is a small, closed system.
- Many professors at different universities know of each other, have met each other, work together.
- Professors stay with universities for >20 years, typically stay in same field all their lives.
- The career trajectory is commonly linear:
  BS/BA →PhD→Post Doc →Assist. Prof →Assoc. Prof→Prof.
    - The structure is largely unchanged since the 1970s.

Technology Resume v.s. C.V.

Compare to Industry:

- Huge, fluid system
- Too large to assume that two industry members know each other, except in very specialized sub-fields.
- Careers in many technology fields are highly non-linear
  - High-school graduate to business owner to employee to MBA student to manager ….
  - Manager to I.C. and back again not uncommon or undesirable.
- Typical hierarchy and trajectory vary by company and over time.
  - Some job *titles* are < 5 years in existence!
  - The typical bay-area job duration, or time spent on a single team is ~2 years!

Technology Resume v.s. C.V.

On an academic C.V., the reader **wants or expects**:

- Specific research topics matching their view of future.
- Coherent career trajectory.
- Recognizable, respected pedigree:
    - universities, advisers, co-authors.

On an Technology Resume, reader **wants and expects**:

- **Evidence** of **demonstrated, generalizable** skills.
- **Evidence** of the candidate's desire to grow/adapt.
- In some cases, specialized skills or certification are expected. This is specified on the job posting, if needed.

Coursera Firefighter Certificate

There are Many Fish,
But You Must Cast a Wide Net

Low Cross-Section, but High Luminosity!

Any one, *single,* industry position can be as competitive as an academic position.

The difference is:

- There's typically only 1-2 years in your career where you may get a tenure-track job, and then typically only in prep for coming fall.
  - Most tech industry companies are *always* hiring.
- **There are 1,000 times more industry jobs than academic jobs which you are probably perfectly qualified for.**
- Academic job application success is highly correlated. Departments often end up fighting over a small subset of applicants who get offers from all their applications.
  - Industry companies don't talk to each other about hiring, and often will hire folks who were previously rejected, but later show growth.

The Most Important Slide

- **APPLY TO AS MANY JOBS AS YOU CAN**
  - Especially jobs you *think* you don't want.
- **ASK RECRUITERS AND INTERVIEWERS:**
  - **"I'm trying to improve my resume. What's one way I could make my resume more clearly-suited to this position?"**
- **APPLY THEIR ADVICE AND REPEAT.**

ANTIPATTERNS

Academic Anti-patterns

- **DON'T** List your PhD advisor's name unless the hiring company has worked directly with them and someone at the company says it's a good idea.
  - Might look like name-dropping.
  - Probably is name-dropping, really.
- **DON'T** Give your full thesis title unless it's a topic directly relevant to the job.
- **DON'T** List your publication titles, again unless it's relevant to the specific job.
  - I always offer a list "upon request." No one has ever asked.
- **DON'T** use jargon unless it's in the job-posting.
- **DON'T** List dozens of technology buzzwords without context.

Format Antipatterns

- **DON'T** Use anything but PDF for your resume, unless otherwise requested. MS Word formats can get mangled.
- **DON'T** Name your file "resume.pdf." It's annoying to have 50 resumes in a folder all named "resume.pdf"
    - Something like [company]_resume_[family name]_[given name]_YYYYMMDD.pdf
- **DON'T** Make it longer than 1 page for your first job, 2 ever. No one has the time to look past the first half-page unless they have already mostly decided.
    - 4 pages is insulting to the reader.

Contact Info

- **DON'T** Use a juvenile email address.
- **DON'T** Use an email address that you may lose access to, like your university or lab address if you're graduating, for example.
- **DON'T** List your physical address.
  - No one is going to *mail* you anything at the resume stage. It's not useful.
  - Unless it's in the same town as the job you want, it's only a liability.
    - This was true Pre-COVID, who knows now?

U.S.-Specific Advice: Protected Statuses:

- **DON'T:** Include a photo.
- **DON'T:** Include protected-status information on your resume unless it's directly relevant to the job (almost never):
    - Age, gender, sex, race, sexual preference, health status, citizenship, marriage status, parental status.
    - Counter-examples:
        - military contractor or high-travel jobs may require specific passports or citizenship.
        - Commercial passenger pilot positions may require specific age ranges or health status.

ADVICE

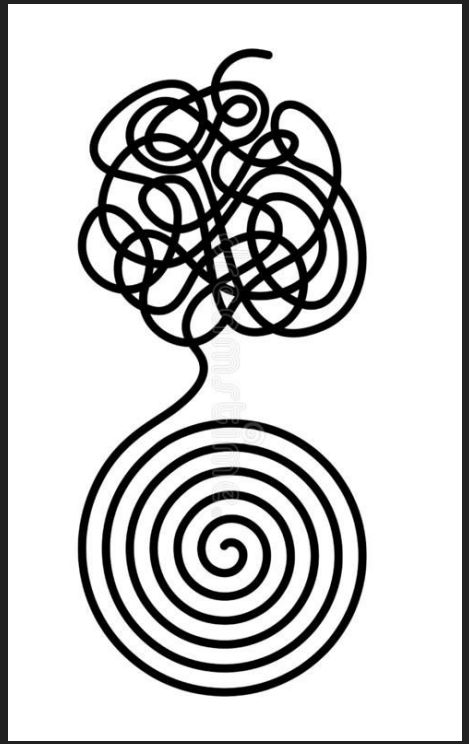
The Functional Resume

A chronological resume is structured by themes, like employment and education, then by date.

- Great if your life is one coherent story, and it's obvious why you're applying for a certain job.

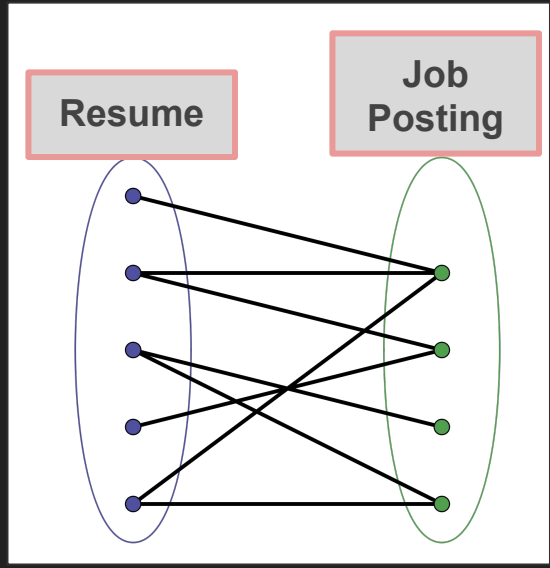
If you are changing fields, you probably want a ***functional resume***. The main sections are organized by your role, skill, or function, not your job title.

- I, for example, have had the *function* of machine learning researcher, under three different job titles. My narrative is coherent in a functional format.



General Advice: Mirror the job posting.

- Match your resume contents as closely as possible, within the bounds of accuracy, to the job posting:
  - The keyword filter doesn't know that "ML" is an acronym for "Machine Learning."
  - The non-technical recruiter might not know that "Statistical Inference" includes "A/B Testing."
  - The junior team members filtering resumes might be busy or tired. Most junior engineers hate filtering resumes, and aren't directly incentivised to do it. If you make it hard to match your resume with the job posting, they may simply reject it over other resumes that are easy to match.
    - Sections should match the job postings list of requirements.



Understand the Job and its Roles.

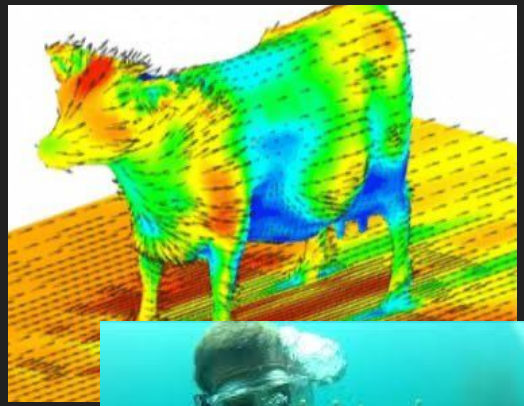
Figure out what skills and roles are important to a specific job posting.

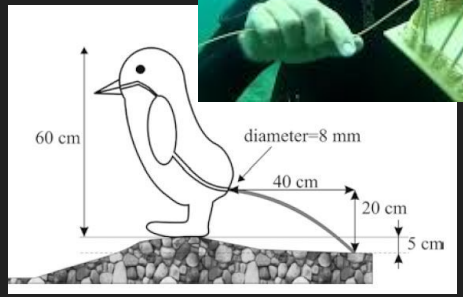
- What will the hired person do in their next role?
  - Know the difference between a **role** and a **job title**.
    - Leadership is a role, manager is a job title.
    - Designer is a role. Technical Lead is a job title.
    - Customer advocate is a role, Support Technician is a job.
    - Machine Learning Engineer is a role *and* a job title.
- **You've probably had many roles as an R.A.**
- Who are the customers of the hired person?
  - What is their current problem?
  - What value-add do they expect?

General Advice For Describing Your Research

Cast your past experience in a **goal-oriented** language that is easily understood by *all* the folks reading your resume:

- Should be mostly high-school language,
  except where it mirrors the posting.
- What were the broad goals of your work?
- What *roles* did you fill*?*
- Who did you work with? By yourself or on a team?
- Who were your “customers?” What did they want? How did you help them?
- What is different because you did your work?
  - **This need not be revolutionary to be valued.**





EXAMPLE

Hypothetical Me Who Didn’t Do a Post-Doc.

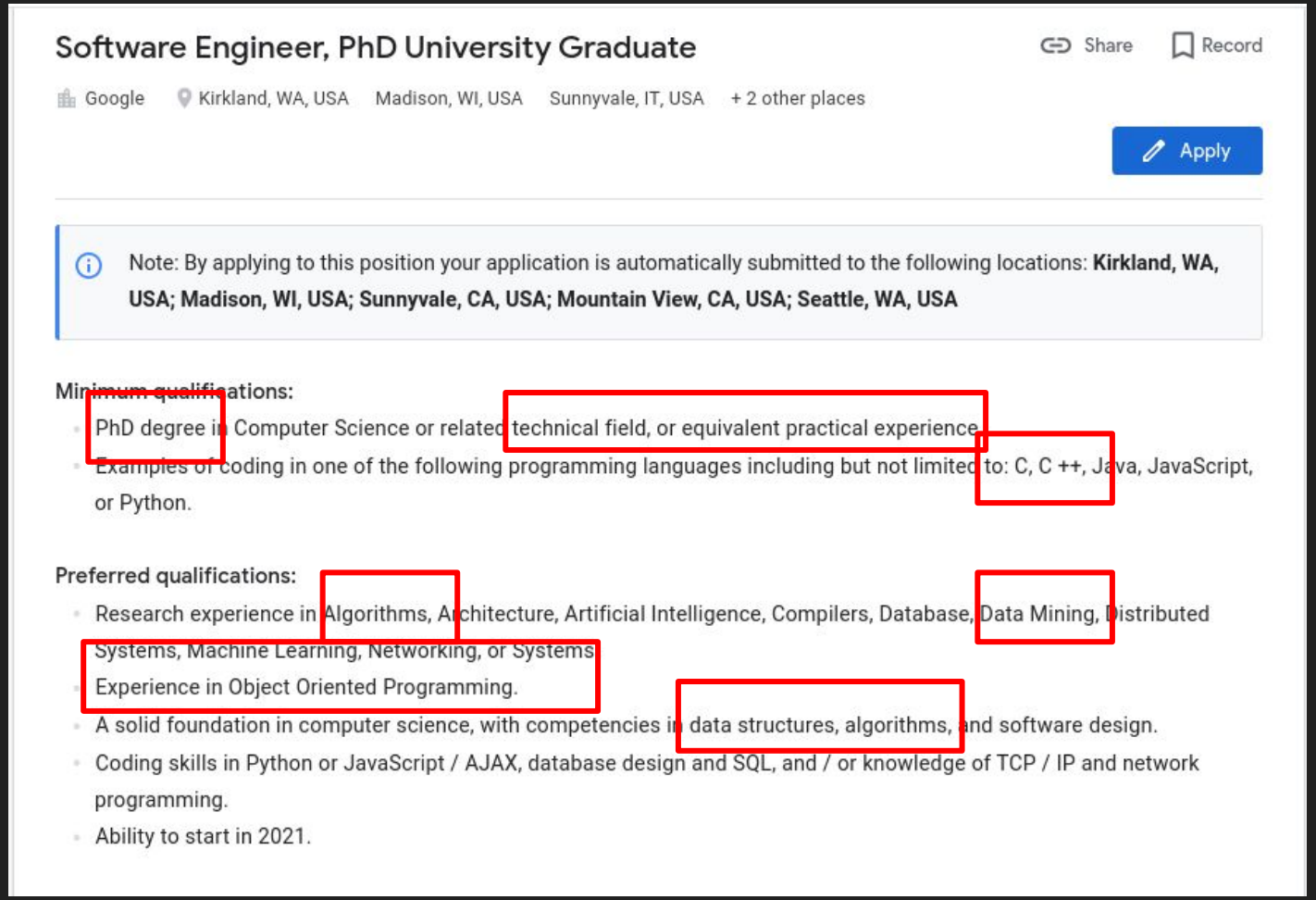
- The year was 2008, I was graduating with a Ph.D, and wanted a postdoc.

My Grad. C.V.

- I imitated my advisor's C.V. format.
- My advisor listed his citizenship, so so did I.
- Why did I list these acronyms? Who was going to read this that knew what those meant, that hadn't already made a decision about me?
  - I wasn't thinking about the reader.

Switching To Functional Format

Let's say I want this job in 2008. Is my experience relevant? You'd never know from my CV!



Software Engineer, PhD University Graduate

Share Record

Google Kirkland, WA, USA Madison, WI, USA Sunnyvale, IT, USA + 2 other places

Apply

Note: By applying to this position your application is automatically submitted to the following locations: **Kirkland, WA, USA; Madison, WI, USA; Sunnyvale, CA, USA; Mountain View, CA, USA; Seattle, WA, USA**

Minimum qualifications:

- PhD degree in Computer Science or related technical field, or equivalent practical experience.
- Examples of coding in one of the following programming languages including but not limited to: C, C ++, Java, JavaScript, or Python.

Preferred qualifications:

- Research experience in Algorithms, Architecture, Artificial Intelligence, Compilers, Database, Data Mining, Distributed Systems, Machine Learning, Networking, or Systems.
- Experience in Object Oriented Programming.
- A solid foundation in computer science, with competencies in data structures, algorithms, and software design.
- Coding skills in Python or JavaScript / AJAX, database design and SQL, and / or knowledge of TCP / IP and network programming.
- Ability to start in 2021.

Switching To a Functional Format

Major sections:

- Education ←They just want to know I have a technical Ph.D.
  - “Ability to start” ←Expected graduation date is key here. Put it bold and high. In-progress-PhDs are risky hires, because their start date is often very uncertain.
- Software Development ← Sure, let’s list all the languages I had used at the time.
- Research Experience ← Exactly the same wording
- Computer Science ←Same wording.
- Leadership ←They didn’t ask for it, so put it low.
- Professional Communication ← They didn’t ask for it, so put it low.

First Draft (the Buzzword-Salad Antipattern)

- Education: Ph.D. Experimental High Energy Physics,
  Poupon U. (Expected Grad. YYYY-MMM)
- Software Development:
  - C++, C, FORTRAN, ROOT, and Unix shell scripting tools.
- Research Experience:
  - Data Mining, Statistical Data Analysis, Image Classification, Numerical Simulation, Animal Husbandry, Literal Firefighting
- Computer Science
  - Parallel computing, Database Administration, Data Structures
- Leadership
  - Detector Group Coordinator.
  - Guidance of junior members of research team.
- Professional Communication: [Papers, talks, etc.]

Buzzword-Salad Is Unconvincing

- Lots of stuff on resume, but what did this person *actually* do with these tools?
  - Did they just take a class?
  - Did they do some passive Coursera thing?
  - Did anyone else use their code, data, or research?
  - **Should show *evidence of use and demonstrated skills.***
- Avoid “padding:” unlikely that anyone in industry will be impressed with your ROOT experience, just because you listed it as One-more-thing in a long line of things.

Anyone can wield a tool.
Hirers are looking for someone to solve problems.

Professional Experience: Soldering Iron.

Better Example

- Software Development and Computer Science:
  - As part of my Ph.D. thesis research, I co-wrote an application in C++ to analyze a physics dataset, as well as numerically simulate the physical system under study. The application consumed hundreds of terabytes from a national laboratory's distributed database, and ran in parallel in a distributed environment. The application reflected object-oriented programming and the STL data structures extensively. The results of the analysis were published in a leading peer-reviewed physics journal, and marked the completion of a specific grant objective.

Note that I state my **customers**: peer reviewers, funding agencies. I also state why I used a particular tool, for what purpose.

This candidate can probably do some reasonable level of programming in C++.

Better Example

- Research Experience:
  - My Ph.D. thesis research centered on the data-mining, statistical analysis, and numerical simulation of a dataset produced at a national accelerator laboratory. I co-acquired the the data as a member of an international collaboration. The results of the analysis included determination of aspects subatomic structure, which are needed for the next generation of accelerator experiments. The results were published in a leading peer-reviewed physics journal, completing a grant objective.

Note that stated ***why*** I did the research (better than my thesis did.)

Note that I repeated some content from before, and the sentences are a little curt. That's maybe not ideal, but I personally recommend self-contained sections over cross-linked "see above" statements. This is not universally agreed-upon advice.

Better Example: **“Production” Experience!**

- Production Environment Experience:
  - The data for my thesis were acquired in a continuous-operation environment over the span of a 15-year experiment. During my graduate studies, I directly controlled the multimillion-dollar experiment during data-acquisition operations as part of regularly-scheduled shifts. Responsibilities included data quality monitoring and failure triage. Hundreds of collaborators used the data produced in these shifts in their research.
  - During my graduate studies, I took regular on-call rotations for a physical sub-component of a multimillion-dollar experiment. Responsibilities included data quality monitoring, failure triage, and custom electronics repair. Hundreds of collaborators used the data produced in these shifts in their research.

If anyone other than you has ever used your code, your calculations, or hardware you fabricated, highlight that!

If you were ever on-call, were responsible for producing data used by others, or ever operated a continuously-running shared experiment, highlight that!

General Writing Suggestions

- Avoid is/was as a verb, which leads to adjective- and noun-focused sentences:
  - “I am a problem solver.”
  - “I was the oncall person for …”
- Prefer sentences with ***active verbs*** like “wrote,” “designed,” “built.”
  - “I overcame obstacles in the analysis.”
  - “I performed on-call duties for …”
- Avoid subjective words like “expert,” “good,” “skilled.”
- Prefer objective measures of quality, or evidence that colleagues valued your work:
  - Years of experience using a coding language or using an analysis technique.
  - Successful grant applications, peer-reviewed publications.
  - Someone else using your code, equipment, or results.

How do you stand out as an individual?

My advice: **Don't** (on a technical resume). Might help some applications, most not.

- Resume processing is commonly about high-acceptance filtering.
- Most hirers interview multiple candidates before deciding, as a policy.
- Interviews are a better time to share your individuality!

If you must:

- Stylistic aspects like font, shading, etc.
- Summary section leading the resume
  - "Quantitative scientist with experience in X,Y, Z, seeking to help W with V."
- Employment chronology at tail of resume

Closing

- There are lots of jobs. **Apply to as many as you can.**
  It's free, and they don't talk to each other!
  - Ask for "one thing" feedback, apply, **iterate**.
  - Get rejected? Apply again!
- The people reading your resume are also reading hundreds of others, sometimes thousands.
  - Respect their time:
    Make it concise
    and easy to pair with **their** requirements.
- Don't just list tools.
  - List why you used them, and for whom, and what the result was.