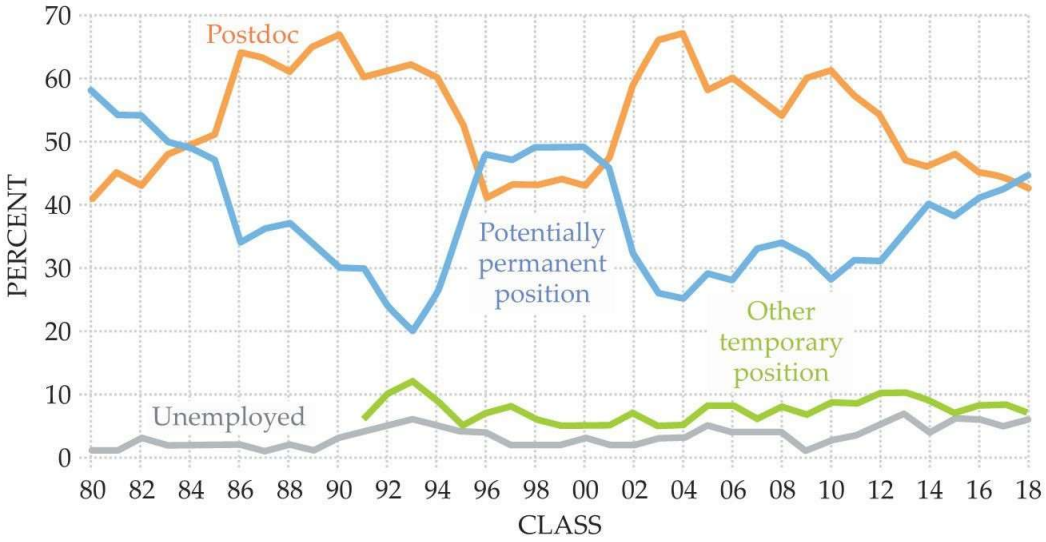
Physics Career Seminar
Oct 21, 2022

Why Tech Companies Care About Your Physics PhD

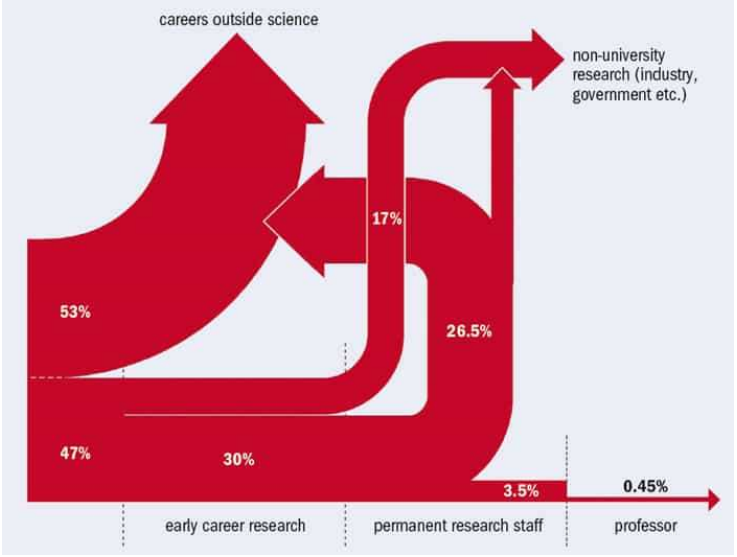
Souvik Dutta
Ph.D., UIUC 2021

Statistics



40% of Physics PhDs obtain PostDoc positions overall.

- https://physicstoday.scitation.org/doi/10.1063/PT.3.4591



The reality beyond obtaining PostDoc positions.

https://physicsworld.com/a/the-academic-pyramid/

Academia and Industry: what's the link?

Daily Life in a Tech Job	Transferable Skills from a Physics PhD
Attend team meetings, ask questions	Research group meetings
Invited to external meetings	Attended workshops and schools
Competitive Analysis	Reading papers on arXiv
Make presentations to own team	HEP/CMP journal club presentations
Make presentation to external teams	Poster PPTs, talks in conferences
Maintain code/codebase	Coding on Mathematica/MATLAB, etc.
Mentor summer interns	Mentor first/second Year grad students
Communicate with PMs, SDEs, CX, UX	Collaboration between theory/experiment
Make $$$	

OK, but…

I am giving up on my dream to be a Physics Professor, is it worth it?

- Can still work on interesting problems

  (Think Meta VR, Tesla Autopilot, Automated trading)
- Problems you solve will help the society/humanity *right now*
- Don't have the need to publish or perish
- The guy in the next office is not your competitor

  (You're not applying for the same grant, position, etc.)
- You are driving a commonly shared goal across your company
- If you don't like your boss/team/company goals, it's easy to switch out
- Most people are extremely punctual, and they respect your time
- Your weekends are your weekends

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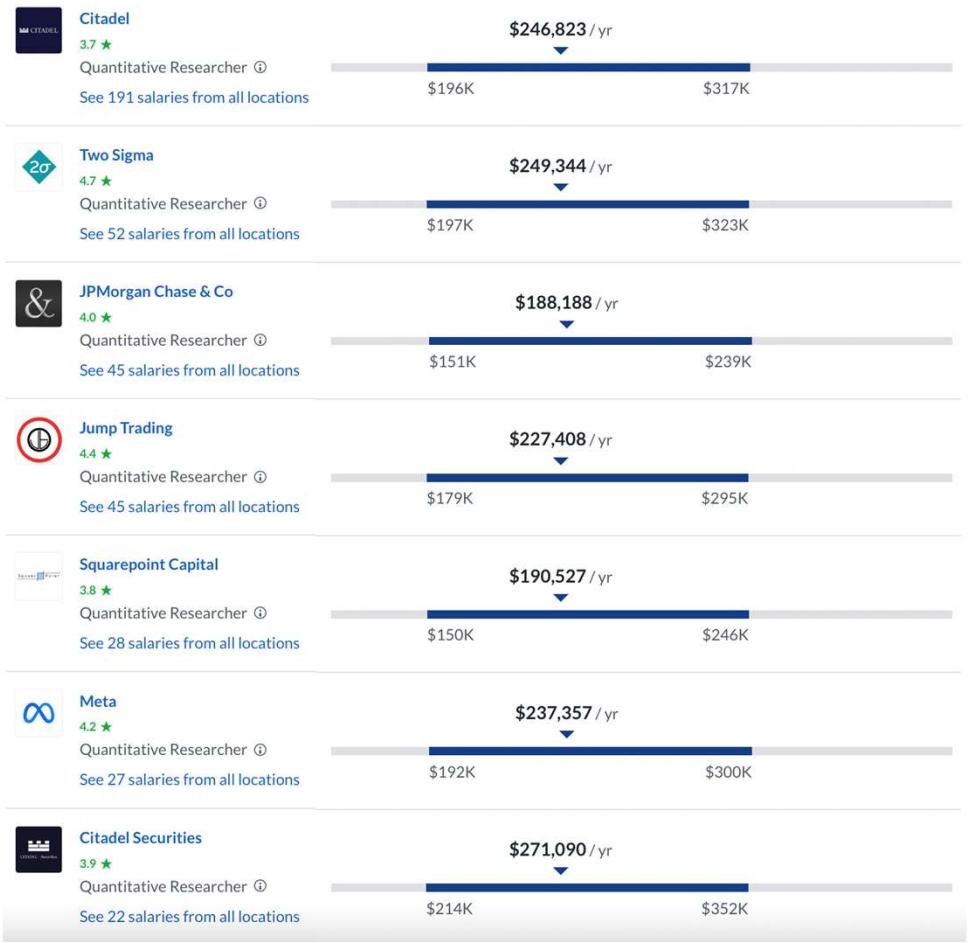
Let's talk money



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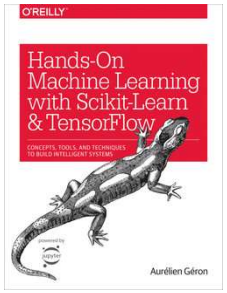
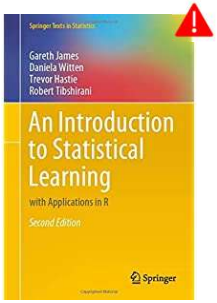
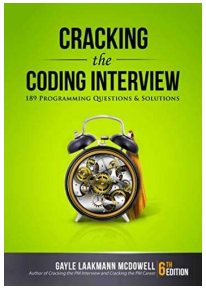
Preparing for a Machine Learning Interview

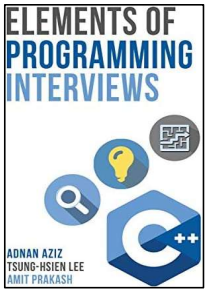




- Some coding skills are essential: R, C++, Java, Python

LeetCode HackerRank GeeksforGeeks





- Machine Learning skillset

coursera DeepLearning.AI datacamp

- ML Tech Blogs

towards data science

Machine Learning Mastery
Making Developers Awesome at Machine Learning

- Industry Blogs

amazon | science Google AI DeepMind

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Preparing for a Machine Learning Interview*

* as a Physicist

- The most difficult equation in machine learning is

$$\frac{\partial h}{\partial x_1} = \frac{\partial h}{\partial u_1} \cdot \frac{\partial u_1}{\partial x_1} + \frac{\partial h}{\partial u_2} \cdot \frac{\partial u_2}{\partial x_1}$$

- The most complex function used in machine learning is

$$p(x) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x)}}$$

- The hard bit is to develop an intuition for these algorithms, which model to use, what happens when we tweak parameters, etc.

https://scikit-learn.org/stable/

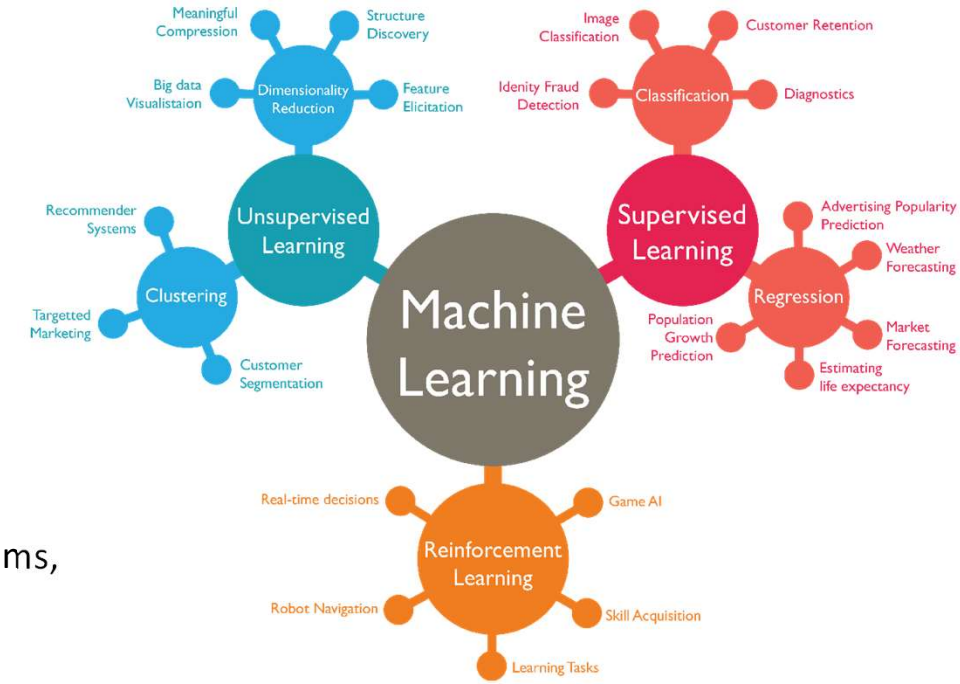


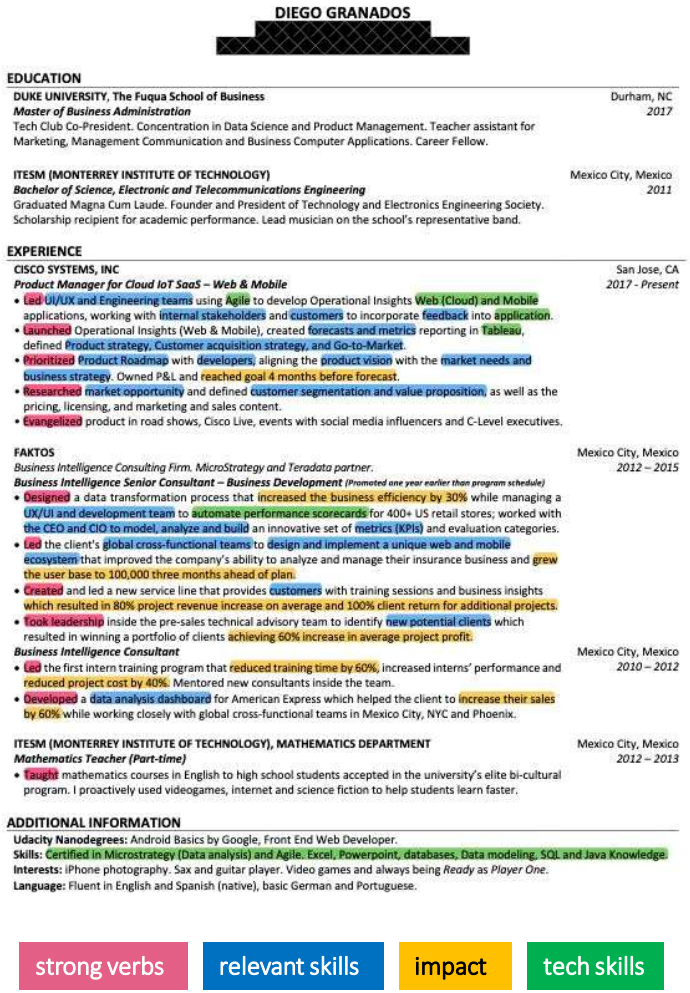
Image courtesy: Audrey Lorberfeld

model.fit( ) model.predict( )

Curriculum Vitae

- Format: Don't worry about searching for fancy, colorful, complex templates.
  A plain old boring B/W template works.
- Write accomplishments with X-Y-Z
  "Accomplished [X], as measured by [Y], by doing [Z]"
- Start every accomplishment with a verb in past tense.
  Strong Verbs (Led) >>>> Soft Verbs (Assisted)
  Led, Designed, Researched, Prioritized, etc.
- Might want to skip the "skills" section entirely by embedding skillset inside of accomplishments – helps bring out the context in which the skills were applied
- Not every accomplishment has to have impact but try to add as many as you can. Impact shows that you can do the job - well and make a difference.
  (What is it that without YOU it wouldn't have been possible? What did it cause? How did you measure what happened?)
- Length? 1, 2, 3 pages are ALL ok. You may have a lot of experience. Make it RELEVANT, that's what matters.
  Tailoring your resume to the job >>>> almost everything else.
  Don't submit the same resume to every job.
  Triple-check for grammar/spelling mistakes.

Courtesy: Diego Granados, Product Manager at Microsoft



DIEGO GRANADOS

EDUCATION

DUKE UNIVERSITY, The Fuqua School of Business — Durham, NC
Master of Business Administration — *2017*
Tech Club Co-President. Concentration in Data Science and Product Management. Teacher assistant for Marketing, Management Communication and Business Computer Applications. Career Fellow.

ITESM (MONTERREY INSTITUTE OF TECHNOLOGY) — Mexico City, Mexico
Bachelor of Science, Electronic and Telecommunications Engineering — *2011*
Graduated Magna Cum Laude. Founder and President of Technology and Electronics Engineering Society. Scholarship recipient for academic performance. Lead musician on the school's representative band.

EXPERIENCE

CISCO SYSTEMS, INC — San Jose, CA
Product Manager for Cloud IoT SaaS – Web & Mobile — *2017 - Present*
- Led UI/UX and Engineering teams using Agile to develop Operational Insights Web (Cloud) and Mobile applications, working with internal stakeholders and customers to incorporate feedback into application.
- Launched Operational Insights (Web & Mobile), created forecasts and metrics reporting in Tableau, defined Product strategy, Customer acquisition strategy, and Go-to-Market.
- Prioritized Product Roadmap with developers, aligning the product vision with the market needs and business strategy. Owned P&L and reached goal 4 months before forecast.
- Researched market opportunity and defined customer segmentation and value proposition, as well as the pricing, licensing, and marketing and sales content.
- Evangelized product in road shows, Cisco Live, events with social media influencers and C-Level executives.

FAKTOS — Mexico City, Mexico
Business Intelligence Consulting Firm. MicroStrategy and Teradata partner. — *2012 – 2015*
Business Intelligence Senior Consultant – Business Development *(Promoted one year earlier than program schedule)*
- Designed a data transformation process that increased the business efficiency by 30% while managing a UX/UI and development team to automate performance scorecards for 400+ US retail stores; worked with the CEO and CIO to model, analyze and build an innovative set of metrics (KPIs) and evaluation categories.
- Led the client's global cross-functional teams to design and implement a unique web and mobile ecosystem that improved the company's ability to analyze and manage their insurance business and grew the user base to 100,000 three months ahead of plan.
- Created and led a new service line that provides customers with training sessions and business insights which resulted in 80% project revenue increase on average and 100% client return for additional projects.
- Took leadership inside the pre-sales technical advisory team to identify new potential clients which resulted in winning a portfolio of clients achieving 60% increase in average project profit.

Business Intelligence Consultant — Mexico City, Mexico — *2010 – 2012*
- Led the first intern training program that reduced training time by 60%, increased interns' performance and reduced project cost by 40%. Mentored new consultants inside the team.
- Developed a data analysis dashboard for American Express which helped the client to increase their sales by 60% while working closely with global cross-functional teams in Mexico City, NYC and Phoenix.

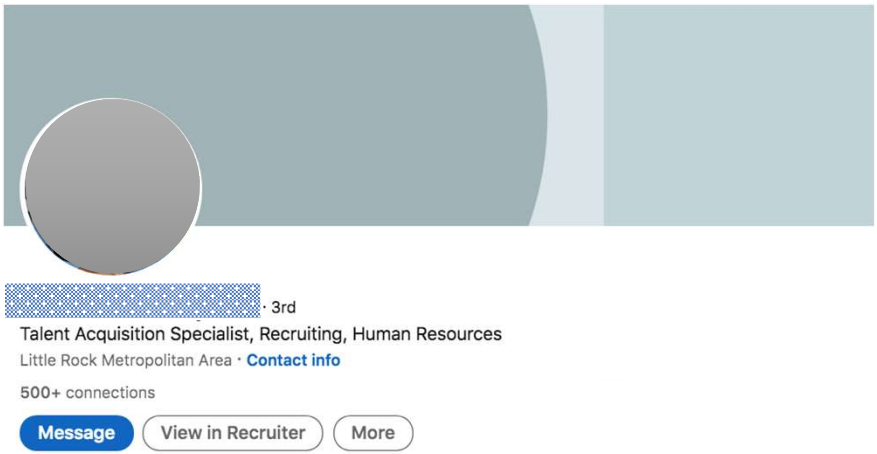
ITESM (MONTERREY INSTITUTE OF TECHNOLOGY), MATHEMATICS DEPARTMENT — Mexico City, Mexico
Mathematics Teacher (Part-time) — *2012 – 2013*
- Taught mathematics courses in English to high school students accepted in the university's elite bi-cultural program. I proactively used videogames, internet and science fiction to help students learn faster.

ADDITIONAL INFORMATION

Udacity Nanodegrees: Android Basics by Google, Front End Web Developer.
Skills: Certified in Microstrategy (Data analysis) and Agile. Excel, Powerpoint, databases, Data modeling, SQL and Java Knowledge.
Interests: iPhone photography. Sax and guitar player. Video games and always being *Ready* as *Player One*.
Language: Fluent in English and Spanish (native), basic German and Portuguese.

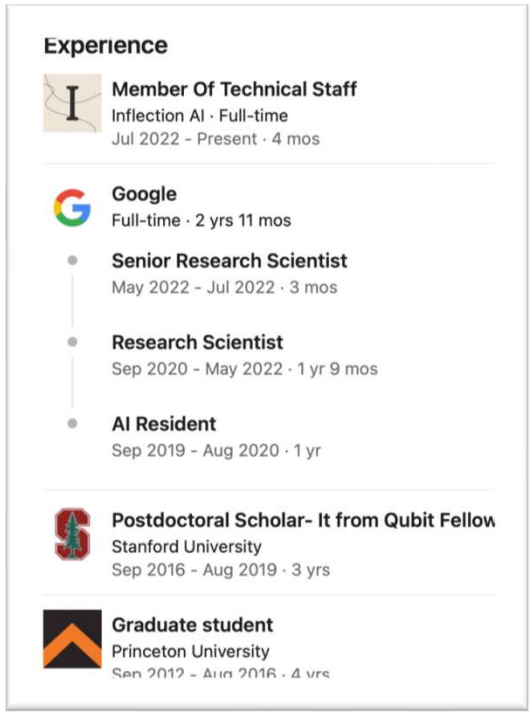
strong verbs | relevant skills | impact | tech skills

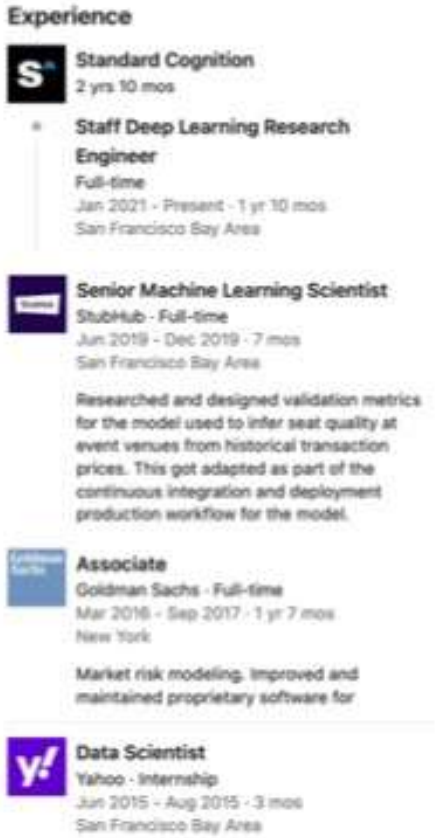
LinkedIn



About

- About yourself, that is not evident/obvious/included elsewhere
- List any personality traits that makes you well-suited to the job you seek/do
- How has your past career shaped you for the future you
- Any overarching goals in life that you like to see fulfilled through your present/future corporate positions?
- DO NOT list down your tech skills; DO NOT brag





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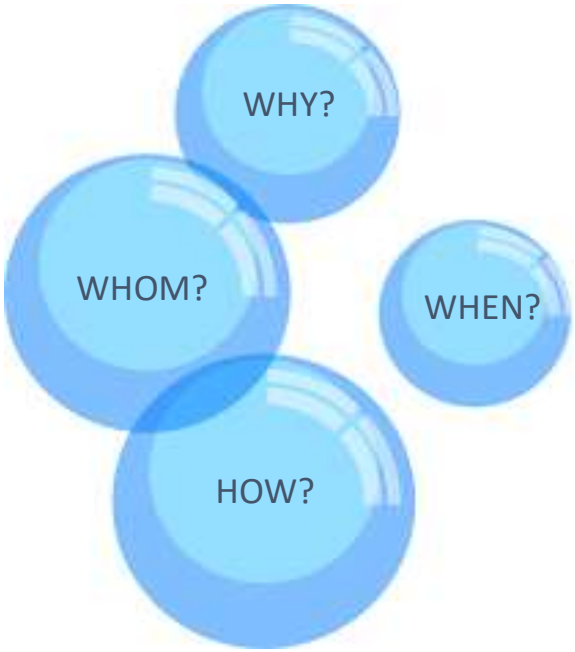
Network, Network, Network