Transitioning from Academia to Industry

Oct. 7, 2020
Gennady Erlikhman

Data Science Lead
Los Angeles

linkedin.com/gennaer
gennady@insightdata.com

BA Philosophy and Cognitive Science

PhD Cognitive Psych
Overview

1. What kind of careers exist in data?
2. What are the different roles and responsibilities?
3. Some Industry Examples
4. What does it take to get a job in this field?
5. Insight Data Science and Transitions
Why increase in interest in data?

● Information Explosion & Big Data
  ○ People were ready to share information
  ○ We had means of sharing the information

● Data Driven Decisions
  ○ Not taking decisions based on “gut”
  ○ Better understanding of users
  ○ Personalized services: Recommendations
  ○ Driving business through analytics

● Technology Advancements
What kinds of careers exist in data?
Generally (but far from always):

- **Data Scientists** are strongest in business knowledge, communication, machine learning and data wrangling
- **Data Engineers** are strongest in software engineering and database management
- **AI/MLE** are strongest in software engineering and building, optimizing and deploying scalable ML models
Data Engineering

- Build ETL (extract, transform, and load) pipelines to turn raw data into a database that can be queried
- Dealing with:
  - Volume
  - Velocity
  - Variety

Source: Running Apache Airflow At Lyft
Production-level issues to consider:

- **Latency**: <100 ms to be useful “Balancing model complexity and inference speed was a critical issue.
- **Scale**: +1.4B users. Need enough modeling capacity for tailored suggestions
- **Fairness and Privacy**: Make sure models don’t expose user’s private info

Model: Bag-of-word with RNN
Even within “Data Scientist” roles, there’s still significant variation

**Who you collaborate with:**
- Client-facing (e.g. Field Engineer)
- Internal-facing

**Potential skills emphasized (or not):**
- Production-level code
- Deep Learning
- Specific methods/techniques (e.g. Computer Vision, Natural Language Processing, etc)
- Specific domain knowledge (e.g. genomics)
- SQL
- Business knowledge
- Communication

**Nature of the role:**
- Research-oriented
- Analytics & Decision Science
- Product-focused
Data Science (Decision Science)

- **Dealing with:**
  - Analytics
  - Experimentation
  - Visualization
  - Data stories

- **Inform decisions** to save cost, redirect/optimize resources, test product features, etc
Data Science (Data Products)

- Data is the core of the product and the model output provides direct value to the user.

- Role often focused much more on deploying a model than Analytics roles.
Data Science

- ~50% of DS jobs are **Analytics & Decision Science**:
  - Communication & visualization
  - Business sense
  - General ML
  - Creativity
  - SQL

- ~30% of DS jobs are **Data Products**:
  - Production-level code
  - Product sense
  - Engineering skills
  - Maybe a little ML

- ~20% are **Specialized** (i.e. specific skills):
  - Deep Learning
  - Computer Vision
  - Image processing
  - Optimization
  - etc
Data careers by another name

UX Research
- Experimentation
- Surveys
- Focus groups
- Human-computer interaction
- Interviews

Human Factors
- Engineering / devices
- UX
Skills

Transferable Skills
Interacting with clients
Presenting
Collaborating with teams
Leading others
Organizing events
Written communications

Technical Skills (a sample)
**Machine Learning**: Classification, Regression, Clustering, Neural networks, NLP, Time series analysis
**Languages**: Python, Matlab, Bash, R, C, C++, Java, JavaScript, HTML, PHP, SQL
**Libraries**: Scipy, Pandas, Matplotlib, Scikit-learn, PyTorch, NumPy, TensorFlow, StatsModels, Git, AWS
**Statistical Analysis**: GLM, Bayesian modeling, multi-level modeling, A/B testing
Values

What is Important to you in work?
Work Life Balance
High Earnings
Being Challenged
Autonomy To Make Decisions
Working with Others
Working Independently
Travel
Variety of Projects
Working for Social Good
Taking Risks
Flexible Work Schedule
Office Location
Job Security
Small/Large Company (global corporation vs. startup)
Why is this important?

- No one is a perfect fit for literally every role
- Optimize how best to use your time when applying / considering different roles
Data science is everywhere

**Health**
- Memorial Sloan Kettering
- Flatiron Health, ZocDoc

**Media**
- The New York Times
- MTV, Netflix
- Nielsen

**Social**
- Facebook
- Twitter
- LinkedIn

**Finance**
- Bloomberg
- Capital One Labs
- AmEx

**Advertising**
- Sailthru
- Tapad
- Dstillery

**Energy**
- Bright Power
- EnergyHub

**Travel**
- AirBnB
- TripAdvisor

**Retail**
- Etsy
- Macy’s
- Birchbox

**Apparel**
- Rent the Runway
- StitchFix
- Bonobos

**Government/Non-Profit**
- The City of NYC, The Census Bureau
- DataKind, Murmuration
Industry example #1: News and Media

- Types of problems you might need to solve if you worked in the news and journalism space
  - What headlines do we show each user?
  - What pictures associated with stories should we show?
  - At what time of the day should new content be released?
  - What advertisements should be with which articles?
Industry example #2: E-commerce and Retail

- Types of problems you might need to solve if you worked in e-commerce
Industry example #3: Health

- Types of problems you might need to solve if you worked in health data
Job of a scientist

- Collect and clean data
- Use programming and statistics knowledge to discriminate between signal and noise
- Convey results to the scientific community
Job of a data scientist

- Collect and clean data
- Use programming and statistics knowledge to discriminate between signal and noise
- Convey results to the team/company/investors
- Make data-informed decisions that directly impact the product and ultimately the business
How do you get these jobs?
What evidence are companies looking for?

**Product**
- Identify and translate high value problems into a data problem

**Execution**
- Solve and validate their solution against problem-specific metrics.

**Communication**
- Communicate their results back to stakeholders.
Product/Business Skills

● Do you know the problems that the industry is tackling?
  ○ Applying the relevant tools / techniques to relevant problems

● Understand how to apply the knowledge to industry problems
  ○ Reading industry / company blogs
  ○ Attending meetups
  ○ Knowing to ask the right questions / knowing the lingo
Technical Skills

- Experimentation / experimental design
- Statistics
- Programming (+ computer science + SQL)
- Machine learning

Knowing trade-offs of various approaches and being able to articulate them
Behavioral Skills

- Are you a strong communicator?
- How do you work with other people?
- Can you complete work on a tight deadline?
- How do you take the technical details and explain it to someone that doesn’t work in your field?
Networking

● Know the right people to talk to
  ○ Hiring Managers
  ○ Technical Recruiters

● Know how to pitch yourself
  ○ Tailor a pitch for each role you apply to.
  ○ Use career fairs effectively, don’t just drop in your resume.

● Meet the right people
  ○ Meetups
  ○ Hackathons
  ○ Fellowships/ Internships/ Bootcamps

● Know to have technical conversations (knowledge about the field will help here)
How can you showcase evidence of these skills?

● Technical
  ○ Work on side projects!
    ■ Solve a data problem that you or others are having
    ■ Use this solution to make an actionable difference
    ■ Put the code on github

● Communication
  ○ Write up your results and process (medium or other blog post)
Industry Resumes

- Use 1 full page and *no more*
- Minimum .5” margins on all sides
- Start with a blank page -- only include what’s relevant to your next role
- Include a Header, Skills, Experience, and Education sections
- Start each bullet with a past-tense action verb
- Use consistent font style and size, indent, bullet size, date format, etc.

Writing Strong Bullets

Situation: Describe what you did (context, overview)

Action: Explain how you did it (the skills you used)

Result: Describe why you did it / why it mattered
What to consider when looking at companies

● Size of the company
  ○ From large corporation to startup
● What type of role are you interested in?
  ○ E.g. Where in the analytics < - - - - > engineering spectrum do you want to be?
    ○ Domain / area of interest
● Culture fit
● Mentorship
Interview Process

- Preparing a good resume to get a foot in the door
- A quick phone screen to get you started (behavioral or technical)
- Coding assignment
  - Timed Coding assignment (HackerRank, Leetcode)
  - Over the phone coding
  - Take home Data Challenges
- Onsite
  - 4-6 hours
  - Mix of Behavioural, Technical and data-oriented
  - Speak to multiple team members
  - Topics: Designing data platforms, Whiteboarding coding questions, Technical conversations
Most importantly, be open to rejection and learn from your mistakes.
Insight Data Science
Transition to Careers in Data
Insight Programs

- Full-Time Programs
- Fully Remote Sessions
- Applicant Mentorship Available
- Scholarships Available
- No educational requirements for 5 of the 7 programs
- Fellows come from academia AND industry

Fellows come from a range of backgrounds:

- Physics
- Software Eng. & CS
- Biological Sciences & Eng.
- Mathematics
- Neuroscience & CogSci
- Chemical Sciences & Eng.
- Mech, Env, & Civil Eng.
- Social Sciences
- Hardware & Systems Eng.
- Geology & Earth Sciences
Insight is committed to improving access to opportunities for traditionally underrepresented groups in tech. In addition to interventions to improve access to the Fellows Program, we’re also working to provide an equitable experience where all Fellows feel a sense of belonging in the Insight Community. Here are a few ways we’re making it happen:

**Admissions**
- Insight candidate mentorship program for underrepresented groups
- Insight & partner company sponsored scholarships available
- Learn more at: [insightfellows.com/scholarships](http://insightfellows.com/scholarships)

**Fellows Program**
- DEI Summit, with lightning talks, panel discussions, and keynote speaker
- Data ethics & bias training
- Team dedicated to initiatives that improve the Fellow experience

**...And Beyond**
- Insight alumni provide mentorship to incoming Fellows
- Affinity groups to continue supporting the alumni community
In addition to an average base salary of $127,363, Fellows receive an average bonus of $11,200.

Source: Data reported from Fellows that completed Insight 2017-2019, compared to corresponding market data reported on Glassdoor in May 2020.
## What Sets Insight Apart

**Fellows join top companies in advanced roles**

Number of Insight Fellows who have joined each of our top 20 hiring companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Fellows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>107</td>
</tr>
<tr>
<td>Wayfair</td>
<td>51</td>
</tr>
<tr>
<td>Apple</td>
<td>50</td>
</tr>
<tr>
<td>Amazon</td>
<td>48</td>
</tr>
<tr>
<td>Vanguard</td>
<td>38</td>
</tr>
<tr>
<td>Google</td>
<td>33</td>
</tr>
<tr>
<td>Microsoft</td>
<td>33</td>
</tr>
<tr>
<td>CVS Health</td>
<td>32</td>
</tr>
<tr>
<td>Capital One</td>
<td>30</td>
</tr>
<tr>
<td>LinkedIn</td>
<td>30</td>
</tr>
<tr>
<td>Yelp</td>
<td>30</td>
</tr>
<tr>
<td>Intuit</td>
<td>26</td>
</tr>
<tr>
<td>Nielsen</td>
<td>24</td>
</tr>
<tr>
<td>Uber</td>
<td>24</td>
</tr>
<tr>
<td>Stitch Fix</td>
<td>19</td>
</tr>
<tr>
<td>Square</td>
<td>18</td>
</tr>
<tr>
<td>Bloomberg</td>
<td>16</td>
</tr>
<tr>
<td>IBM</td>
<td>16</td>
</tr>
<tr>
<td>Netflix</td>
<td>15</td>
</tr>
<tr>
<td>Macy's</td>
<td>15</td>
</tr>
</tbody>
</table>

Over 700 Companies
What makes up the Fellows Program

Project-based Learning

**WHY**
- Show teams your full potential

**WHAT**
- Learn skills in a cutting-edge area
- Build your portfolio with highly-demanded technologies

**HOW**
- Actively learn by building
- Gain hands on experience with guidance from industry experts
What makes up the Fellows Program

Company Visits & Demos

**WHY**
- Meet the team members you'd work with
- Present to the teams that fit you

**WHAT**
- Over 38% of demos lead to an interview
- **3x higher for Fellows** than traditional applications *

**HOW**
- Get your foot in the door with the hiring manager
- Guidance on presenting to hiring managers, and prep for each company

* Source: [Jobvite 2019 Recruiting Funnel Benchmark Report](#)
What makes up the Fellows Program

Interview Preparation & Coaching

WHY
- Interviews naturally have noise
- Interviews require deliberate and customized practice

WHAT
- Insight Fellows get jobs 40% faster with personalized support, with up to 24% higher salaries than comparable professionals

HOW
- Personalized preparation for your interviews
- One-on-one mock interviews for each company to help you show the relevant skills
- Negotiation support for offers
Structure of the Program: Week 1

- Introduction to program and high-level concepts in the field
- Select a project and set up cloud computing environment
Fellows work on their projects

Hiring managers from Insight’s partner companies visit and meet with Fellows, chat about team, culture, values, open roles, desired skills and experiences
Structure of the Program: Weeks 5-7

- Present completed projects to hiring companies
- Mock interviews and help each other prepare for interviews.
Structure of the Program: Weeks 8+

- Begin interviewing with companies, with personalized preparation
- Introductions to new companies continue through demos and resumes
Percent of Fellows that receive offer in relevant field

Median time to offer: 8 weeks

88% of Fellows receive an offer within 6 months

Source: Date of accepted offer reported by Fellows that joined Insight during 2017-2019
Successful Fellows create a lifelong network

- Past Fellows mentor new Fellows, just as the previous Fellows did for them
- The Fellow community accelerates learning through participation on our exclusive knowledge platform
- Deferred membership dues enable the program for future Fellows
When you become a Fellow, Insight makes a guarantee to you with three components:

**$100K+ SALARY**
You accept an offer for a position that earns at least $100,000 USD annually.

**WITHIN 6 MONTHS**
You accept an offer dated within 6 months of the end date of the 7-week training program.

**IN A RELEVANT FIELD**
You accept an offer within a field relevant to the programs offered by Insight.

Fellows receive the full membership benefits for the remainder of their careers, even if their financial commitment is waived as a result of the guarantee not being satisfied.
Upcoming Application Deadline

To apply, visit: apply.insightfellows.com

Next application deadline: Monday, October 12

Next session begins: Tuesday, January 19, 2021
Want to learn more?
Visit: insightfellows.com

Questions?
Email us at: info@insightfellows.com
How to contact me

Gennady Erlikhman  
gennady@insightdata.com