Acing your Data Science Interview

Emily Kearney
PhD, Environmental Science, Policy, and Management
Data Science Lead - NYC

Kyle Frankovich
PhD, Cognitive Neuroscience
Data Science Lead - Remote
Roadmap

1. What are my transferable skills?
2. The Interview
3. Common Pitfalls
4. Questions
What are my transferable skills?
Who are Academic Scientists?

Job of an academic scientist:

• Plan and execute a study ~ years
• Collect and clean data
• Use programming and statistics/ML to discriminate between signal and noise
• Convey results to the scientific community
Who are **Data Scientists**?

Job of a data scientist in industry:

- Plan and execute a study ~ week-long sprints
- Collect and clean data
- Use programming and statistics/ML to discriminate between signal and noise
- Convey results to the team/company/investors
- Make data-informed decisions that directly impact a product and a business
The Modern Data Scientist

Math and Statistics
- Machine learning
- Statistical modeling
- Experimental design
- Bayesian inference
- Supervised learning
- Unsupervised learning
- Optimization

Programming and Database
- Computer science fundamentals
- Scripting language e.g., Python
- Statistical computing packages, e.g., R
- Databases; SQL
- Parallel databases and parallel query processing
- MapReduce concepts
- Hadoop, Hive, Spark
- Experience with AWS

Domain Knowledge and Professional Skills
- Passionate about the business
- Curious about data
- Influence without authority
- Hacker mindset
- Problem solver
- Strategic, proactive, creative, innovative, and collaborative

Communication and Visualization
- Able to engage with senior management
- Storytelling skills
- Translate data driven insights into decisions and actions
- Visual art design
- Knowledge of visualization tools
The Modern Data Scientist

**Math and Statistics**
- Machine learning
- Statistical modeling
- Experimental design
- Bayesian inference
- Supervised learning
- Unsupervised learning
- Optimization

**Programming and Database**
- Computer science fundamentals
- Scripting language e.g., Python
- Statistical computing packages, e.g., R
- Databases; SQL
- Parallel databases and parallel query processing
- MapReduce concepts
- Hadoop, Hive, Spark
- Experience with AWS

**Domain Knowledge and Professional Skills**
- Passionate about the business
- Curious about data
- Influence without authority
- Hacker mindset
- Problem solver
- Strategic, proactive, creative, innovative, and collaborative

**Communication and Visualization**
- Able to engage with senior management
- Storytelling skills
- Translate data driven insights into decisions and actions
- Visual art design
- Knowledge of visualization tools

**Things to highlight**
Outline of the Insight Interview

• Tell me about your background
• The code
• Steps towards data science
Tell me about your background
Describing your background effectively

- **Listen** to directions and cues
- **Be concise** and clear
- **Start big** and become more specific when the interviewer shows interest
- **Keep it conversational**
- Anything in your background (and resume!) is fair game - know it!
Example: Tell me about...

...your research

...the machine learning tools you have used

...the team you were working with & how you communicated effectively

...this very specific thing from your resume
The Code
i.e. How do you problem solve?
Clear Communication

- What is the big-picture goal of your project?
- Explain technical tools in non-technical but also mathematical/technical terms
- Focus on the end user and how you provided data-driven answers
- Be able to articulate why you made the analytical and technical choices that you did
Collaboration

- Be willing to evaluate your code and approach
- Ask for feedback and incorporate that new perspective into your thinking
- Brainstorm trade offs, limitations, and next steps
  - Practicality? Usefulness? Validation?
  - If you took your work one step further...
Technical Proficiency

- Self-defined functions
- Good comments that communicate the why behind technical choices
- In-depth understanding of the stats/ML methods you are using

Even better:

- Self-defined classes
- Modularity
Showing your code effectively

- Start at the top (high-level)
  - Dig into most interesting aspects...
- Keep it conversational
- Mind the time
- Never go through line-by-line
Steps towards Data Science

Not just running away, but running towards
Demonstrate Your Interest

• Why DS in particular?

• Which type of data scientist do you want to be?
  • Have you evaluated the field?
  • Do you know what a data scientist does?
  • Have you looked at blogs, job postings, companies, industries...?

• What DS skills have you learned to prepare for the transition?
  • Do you know or are you learning industry standard tools? (Python/R, SQL, inferential stats, etc.)
Common Pitfalls

- Interviews as Tests
- Fixation on Novelty
- Academic Burnout
Interviews are a conversation!

- Ask questions
- Verbalize your thought process
- Check in with your interviewer
- All interviews are a culture-fit test
Most Data Science is not cutting edge

- “Interesting” is not always valuable
- Find the correct tool for the job
- All algorithms have trade-offs; be aware of them!
- Start simple, then increase in complexity as needed
Your enthusiasm is critical

- Focus on moving forward!
- Emphasize the positives, be specific
- Why data science?
Questions?

Emily Kearney
Data Science Lead - NYC
[LinkedIn](https://www.linkedin.com/in/emily-kearney-phd)

Kyle Frankovich
Data Science Lead - Remote
[LinkedIn](https://www.linkedin.com/in/kylefrankovich/)