MPA Careers presentation
03/02/2015

Dr Kim Nilsson

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- My career journey
- Career paths for analytical scientists
- CV advice for PhDs and post-docs
- Interview tips

- What is Data Science and why should you consider it?

- Q&A

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Admin first

- Newsletter sign-up

- Like us on Facebook or Twitter (search for "pivigo") to get latest news and job role announcements

- Feel free to ask questions anytime

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One career path

- PhD Astronomy, Copenhagen, Denmark
  - Post-doc, Heidelberg, Germany
    - Hubble Astronomer, Munich, Germany
      - MBA, Cranfield, UK
        - Risk management consultant, London, UK
          - Managing Director and co-founder, London, UK

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What careers do you think PhDs from analytical sciences can have?

Financial services Ex: Me!	Risk manager Hedge fund analyst Financial modeller Quantitative analyst	Analytical skills, Statistical modelling, Strong with numbers, Some programming, Interest in finance
Data analytics Ex: Neuroscientist to data scientist	Data scientist Data analyst Social media guru Digital marketing analyst	Programming, data modelling, statistics, machine-learning
Software Ex: Ole!	Software engineer Gaming industry Insurance Any industry really	Programming, potentially some analytics/statistics, IT management skills
Other Ex: Physicist to patent officer	Patent officer, Technical writer R&D, Strategy Consultancy Project Management	Highly role specific

Communication skills,
Presentation,
Team-work,
Creativity,
Problem-solving,
Thinking outside the box,
Critical Thinking,
Commercial awareness

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CV tips 1: format

Introduction to who you are and why you are applying for the job.

Nothing junior to a BSc, no theses titles.

Includes your PhD. Discuss your achievements and transferrable skills.

List skills that are specific for the application at hand. For programming languages, state fluency.

If you speak more than one language, state it.

End with a few personal interests/hobbies.

Kim Nilsson, PhD

Personal statement

Education

Work experience

Technical skills

Languages

Personal interests

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My top 5 CV tips

1. Remove publication list

2. Keep it non-technical

3. Achievements, not tasks

4. Do not list too many roles

5. Personalise

See also www.pivigo.com/blog

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Interview tips: general

Tip: Free online video interview tools

- Do your research

- Dress smart

- Engage the interviewer (eye contact, handshake, smile, small talk)

- Listen to the interviewer and do not be afraid to ask questions

- Prepare elevator pitch and examples of your skills

"A short summary used to quickly and simply define a person in the time span of an elevator ride."

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Interview tips: STAR framework

S ituation: What was the setting of this achievement? What was your role, were you in a team or alone? Were you new to the situation or experienced?

T ask: What was the task at hand? What was the aim of the project?

A ction: What did you do in that situation? What choice of action did you take? How does this action display the skill that you wish to convey?

R esult: End the paragraph with what the outcome of the experience was. It does not necessarily have to be outstandingly positive, it can also be a learning point.

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Interview tips: STAR framework

Examples:

As project manager in charge of a team of five was tasked with organising an international conference with 100 participants. Managed and delegated tasks, resulting in a conference which sparked intense debate and activity in the science community and received excellent feed-back from the participants.

In a role of post-doctoral researcher at a large international institute performed unique research projects with the aim of publishing ground-breaking results, and liaised with senior professionals in order to negotiate an agreement on a science proposal which lead to being granted 150 hours of observing time (5% of the total allocated time budget).''

Prepare examples that showcase the skills you are expected to have for the job in question.

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Part II: Data Science

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Intro to DS: Basics

- What is "Big Data"?

  "Big Data is anything that is on the limits of possibility with the current technology"

- Structured vs Unstructured data

User ID	Name	City	...
0954_36A	Jenna Holmes	Tokyo	...
8104_5BG	Mark Sawyer	London	...
...	...	...	...

Situation on ground in #egypt very tense. Vehicle I was in attacked. My window smashed. All ok.

andersoncooper
Anderson Cooper

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Intro to DS: Basics

- 3 V's

Volume	Variety	Velocity
Data at scale	Data in many forms	Data in motion
Terabytes to petabytes of data	Structured, unstructured, text, multimedia	Analysis of streaming data to enable decisions within fractions of a second
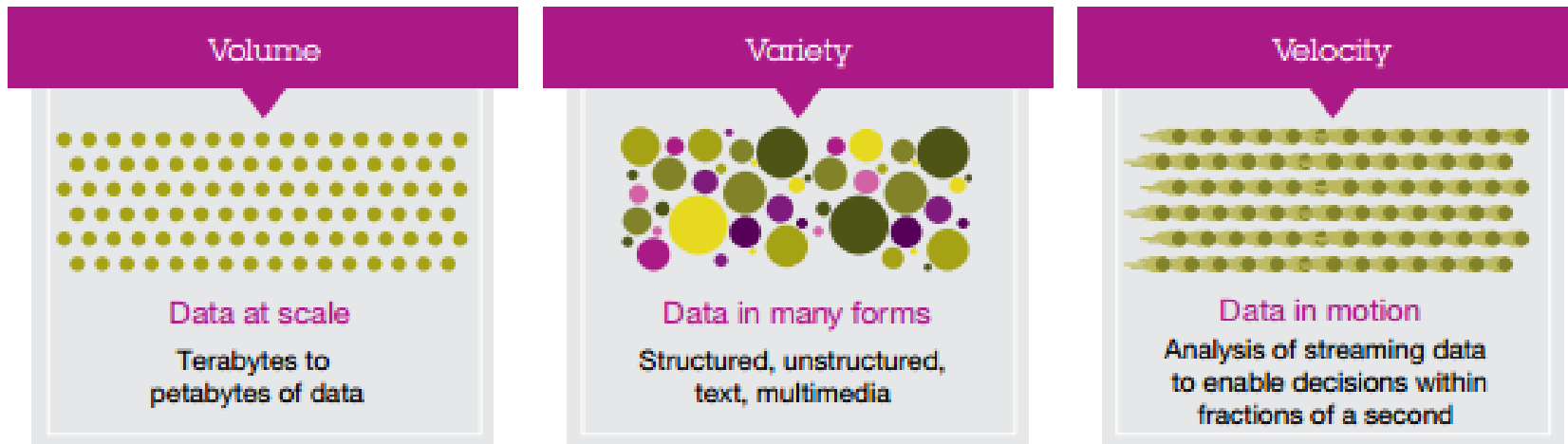
Why should you be interested in this?

- Easy career transition
- Huge demand for people over the coming decade
- Salaries will be high
- Exciting, vibrant atmosphere
- Understand how your own data is being used
- Tools and techniques can be useful in your science work etc. etc.

http://www-03.ibm.com/systems/hu/resources/the_real_word_use_of_big_data.pdf

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Intro to DS: Business aspects

- What can businesses learn from this?
    - Marketing: understand customer base better, customer lifetime value, customer feed-back
    - Operations: discover inefficiencies in the system, automate tasks, demand forecasting
    - Strategy: use data as a strategic advantage, device plans, discover trends
    - Other: recruit the best people, decrease risk in new ventures, create entirely new businesses!

- What sort of businesses work with this?
    - Tech businesses (Google, FB, LinkedIn, Twitter…)
    - Financial services (Bloomberg, all major banks, quantitative trading firms…)
    - Retailers (Tesco, Sainsbury, Walmart…)
    - Sports and betting companies
    - Media (Sky, Virgin, BT, News International…)
    - And pretty much all larger consumer goods companies

https://www.kaggle.com/wiki/DataScienceUseCases

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Examples

- ## Monsanto & Climate Corp

Announced 2 October 2013, Monsanto (chemical, agricultural business) bought a start-up DS company for nearly $1bn. Climate Corp models weather data from past 30 years for a unique location, allowing accurate weather predictions for any location.

From Forbes: Monsanto says data science could be a $20 billion revenue opportunity beyond its core business of seeds and chemicals. In the announcement the company estimated that "the majority of farmers have an untapped yield opportunity of up to 30 bushels to 50 bushels in their corn fields… advancements in data science can help further unlock that additional value for the farm."

Monsanto Buys Climate Corp For $930 Million

43 comments, 32 called-out   + Comment Now   + Follow Comments

http://www.forbes.com/sites/bruceupbin/2013/10/02/monsanto-buys-climate-corp-for-930-million/

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Examples

- Automercado Plaza

Automercados Plaza's, a family-owned chain of grocery stores in Venezuela, found itself with more than six terabytes of product and customer data spread across different systems and databases. As a result, it could not easily assess operations at each store and executives knew there were valuable insights to be found.

By integrating information across the enterprise, the grocery chain has realized a nearly 30% increase in revenue and a $7m increase in annual profitability. [The CIO] attributes these increases to better inventory management and the ability to more quickly adjust to changing market conditions.

http://www-03.ibm.com/systems/hu/resources/the_real_word_use_of_big_data.pdf

Tools and techniques: Stats/ML/Sentiment analysis

- Statistics are incredibly important – particularly probabilities and Bayes statistics

$$p(A|B) = \frac{p(B|A)p(A)}{p(B)}$$

- Machine-learning: systems that can be trained on data, e.g. to distinguish spam e-mail messages from real messages

- Sentiment analysis: aims to determine the attitude of a speaker or a writer with respect to some topic, or the overall contextual polarity of a document

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Tools and techniques: Hadoop/NoSQL/R/Python

MapReduce/Hadoop: Framework for parallel, distributed computing. Divides work into smaller chunks and controls their running on different servers. Open source.

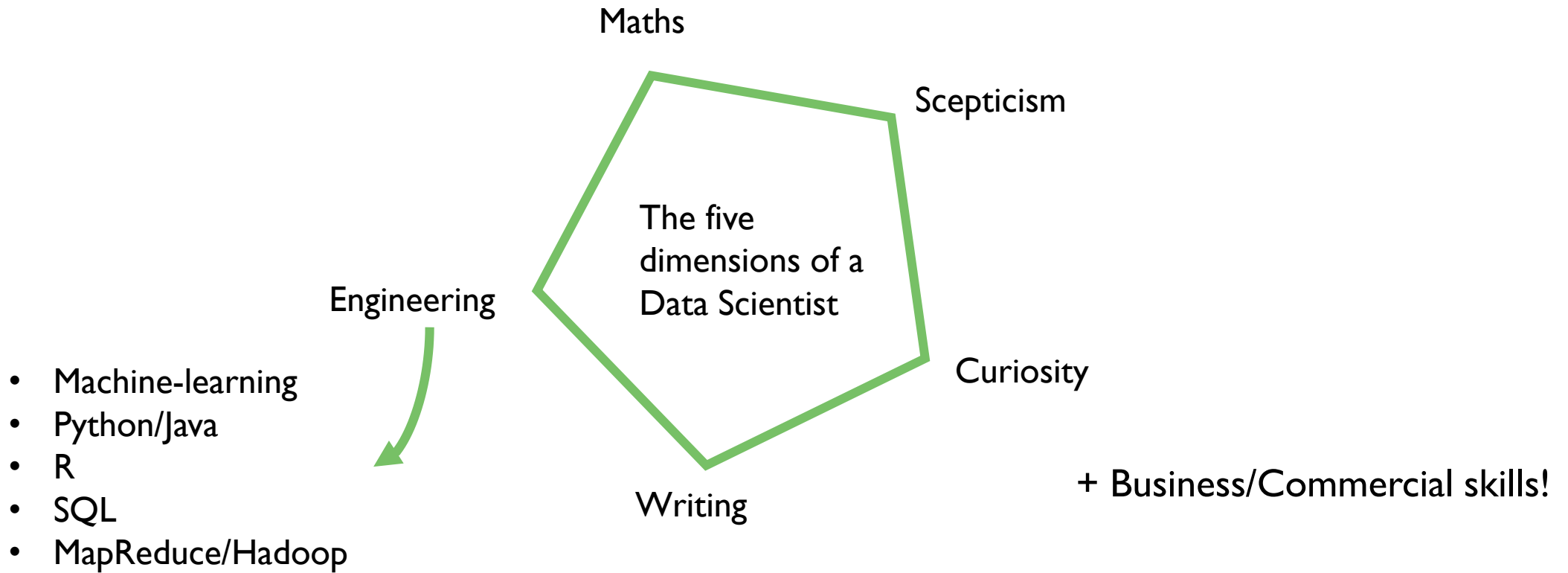**NoSQL:** "Not only SQL". A form of database storage optimised for unstructured data and large datasets.

R: Programming language, similar to IDL. Very common in use of higher level data analysis and visualisation. Open source.

Python: Extremely versatile language with lots of packages suitable for DS, including machine-learning. Highly recommended to learn.

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What skills are needed?

Maths

Scepticism

The five
dimensions of a
Data Scientist

Engineering

Curiosity

- Machine-learning
- Python/Java
- R
- SQL
- MapReduce/Hadoop

Writing

+ Business/Commercial skills!

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Work as a DS?

- ## What is it like working as a Data Scientist?
  - Boundary between tech and analysis
  - Likely to be innovative and creative, less hierarchical
  - Lots of start-ups, but also established companies
  - Similar to analytical science work!

- ## How does it pay?
  - Starting salaries £35 – 55k for junior positions in London
  - Rising to potentially £100k+ for senior positions
  - Quick promotion to be expected
  - (Only likely to increase as demand increases)

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Further resources

- The web is your friend!

- Coursera (https://www.coursera.org/)

- Data Science Central (http://www.datasciencecentral.com/)

- Kaggle (https://www.kaggle.com/)

- Data Science 101 blog (http://datascience101.wordpress.com/)

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S2DS – Science to Data Science

- Initial programme launched August 2014 in London

- 83 participants, 23 commercial partners, 23 projects

- Lectures, exercises and project work with real companies

- Main benefits commercial experience and networking

www.s2ds.org

Opening for applications for S2DS 2015 tomorrow! Deadline 6 April.

pivigo recruitment

- pivigo is a specialist data science recruitment firm (focusing on PhDs and post-docs)

- We are looking for people with strong analytical skills and some programming experience for data science jobs (mainly) in the UK

- We help you target your CV, introduce you to the company, prepare for the interviews and negotiate offers

- It is for free for candidates, sign up by uploading your CV on our webpages

www.pivigo.com

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