

DRIVING VALUE FROM DATA

AI and Big Data: What You Need to Know

Hyndland Christmas Lecture

13th Dec 2019

Our backgrounds

**Twas the night before quiz-
mas**

How does it all work?

Past/Present/Future

Questions



Lyndsey

Data Scientist
KTP Associate
Computer Science with
Business

Likes

Cake(s)
Musicals

Dislikes

Birds



Andy

Analytics Team Lead
Data Scientist
Theoretical Physics

Likes

Pizza
The Dark Knight
Books

Dislikes

The gym



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TWAS THE NIGHT BEFORE QUIZ-MAS...

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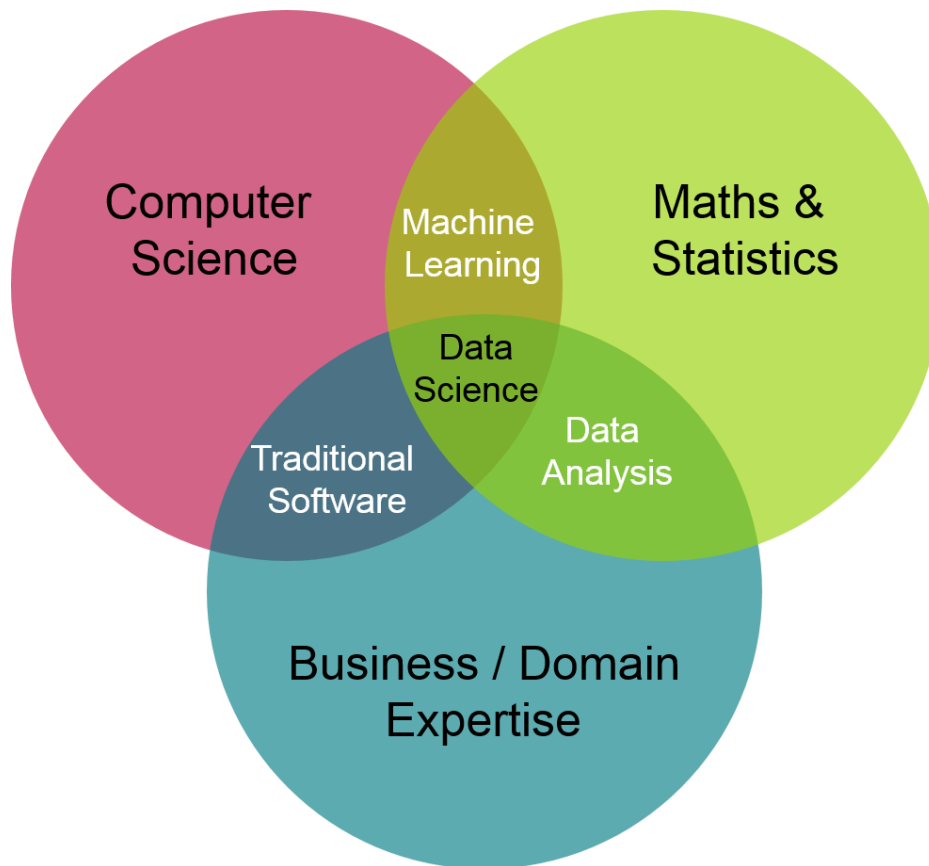


TWAS THE NIGHT BEFORE QUIZ-MAS...



WHAT IS AI AND BIG DATA (DATA SCIENCE)?

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HOW DOES IT ALL WORK?

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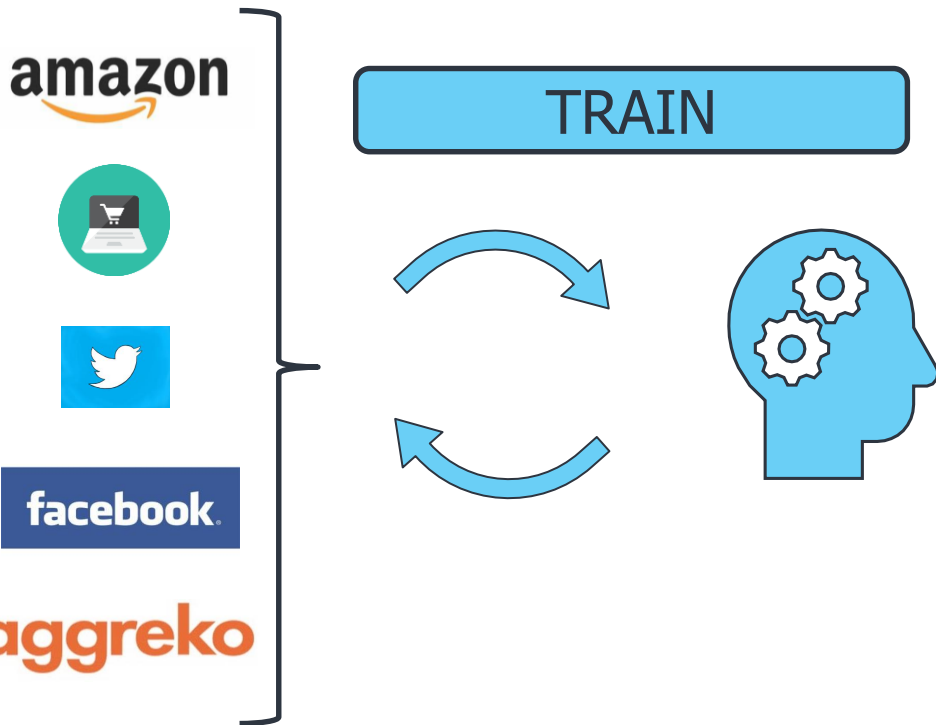
amazon

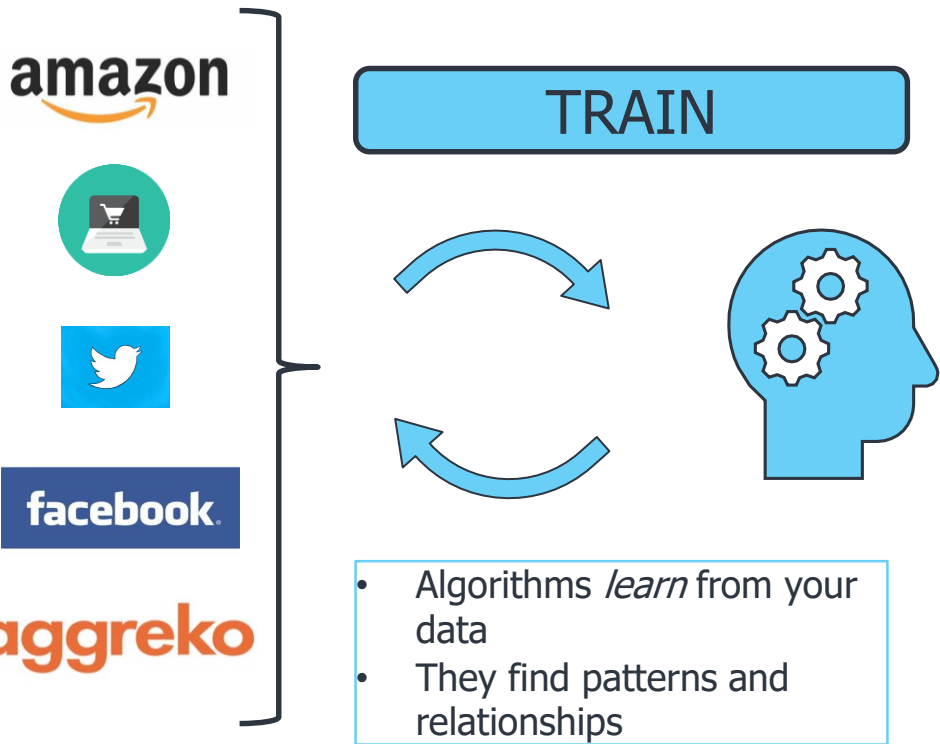


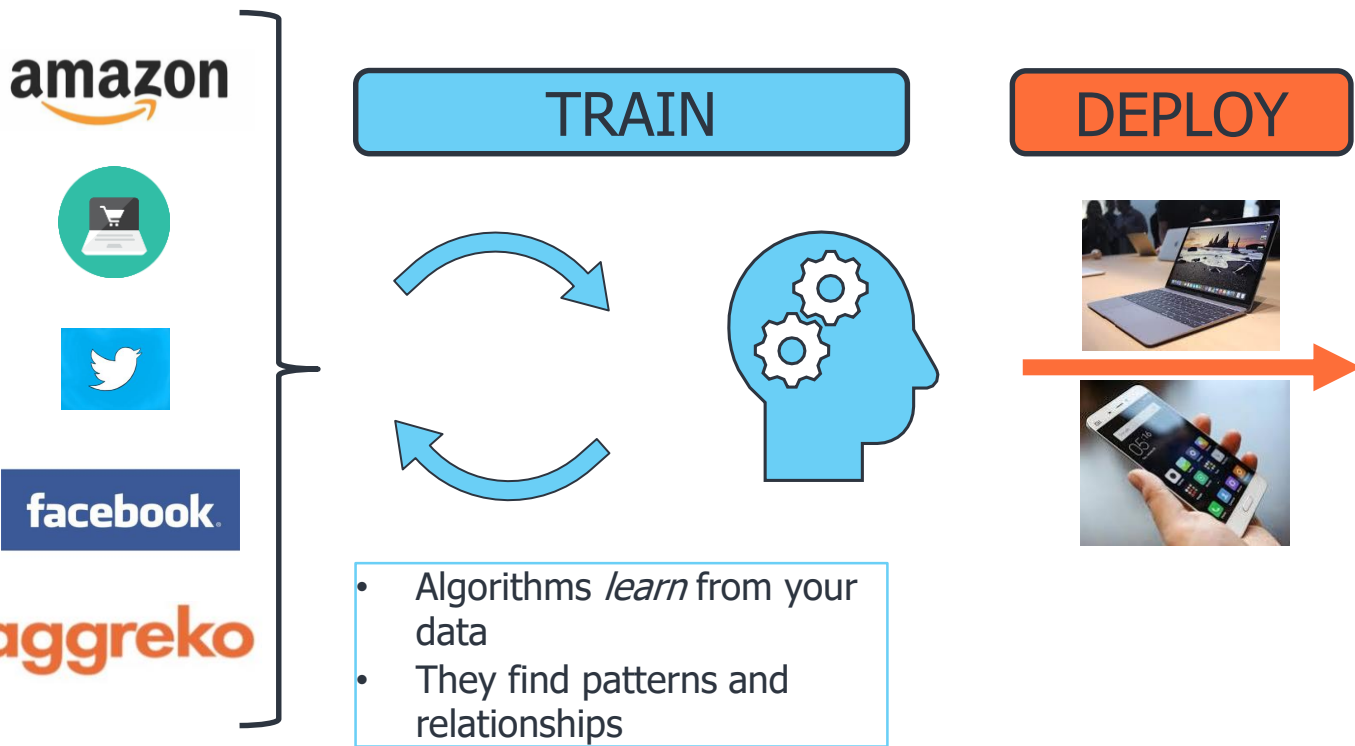
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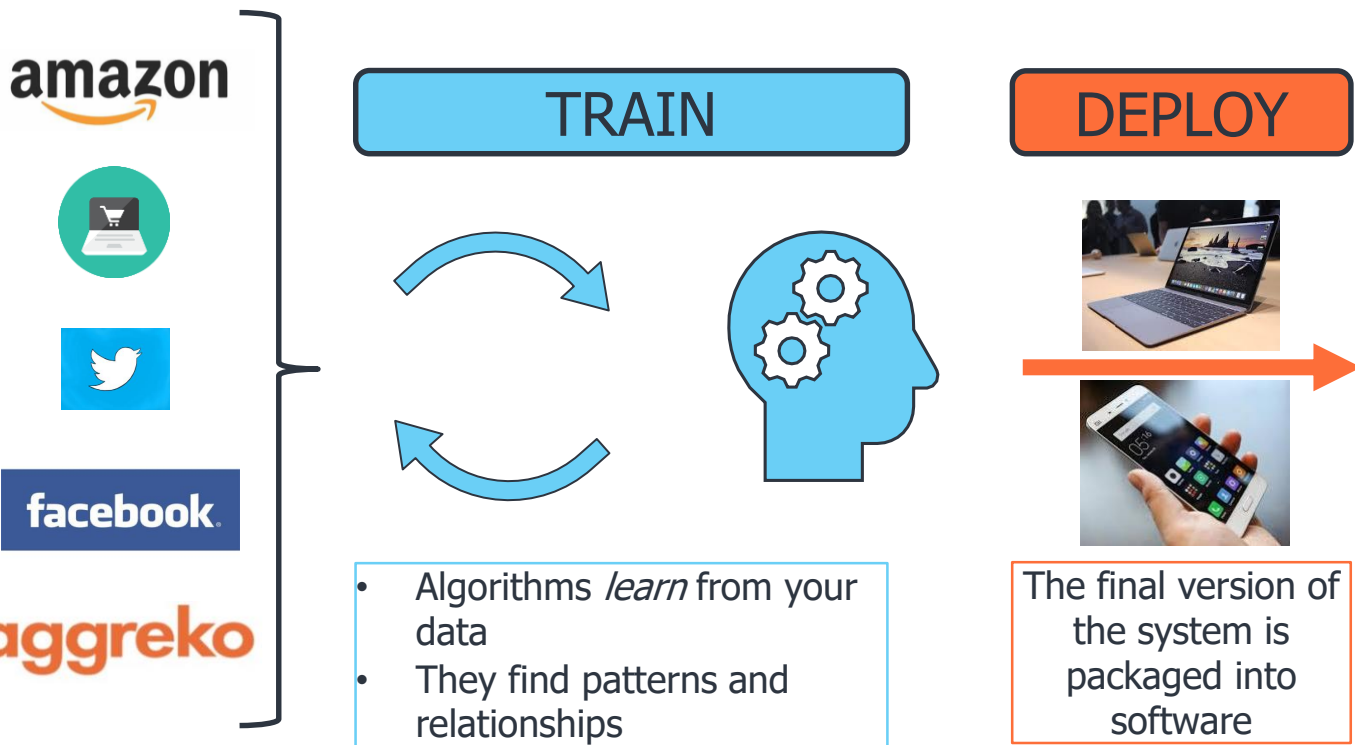
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HOW DOES IT ALL WORK?









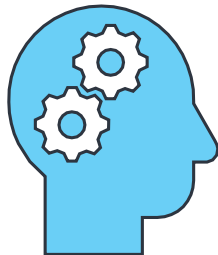
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facebook

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TRAIN



- Algorithms *learn* from your data
- They find patterns and relationships

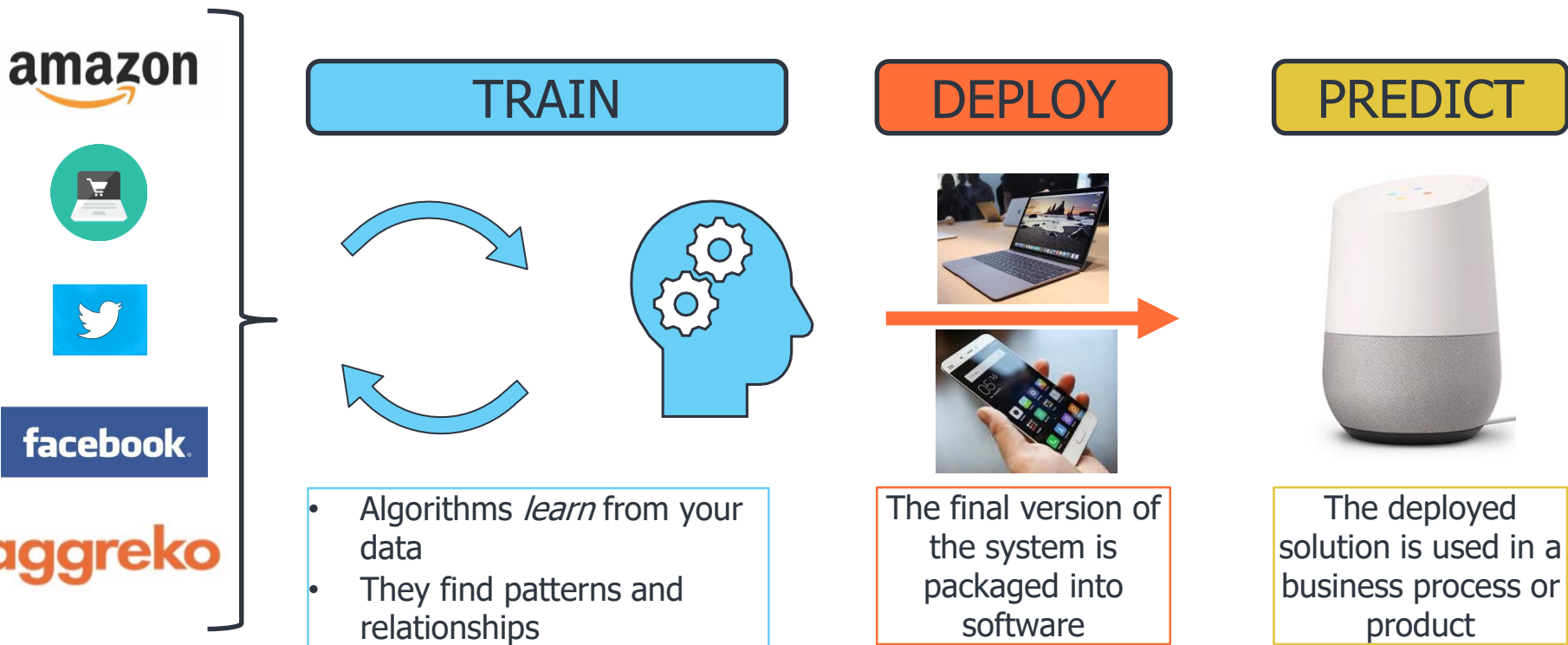
DEPLOY



The final version of the system is packaged into software

PREDICT



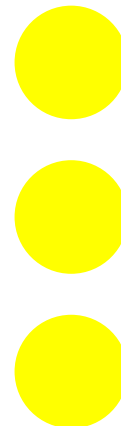
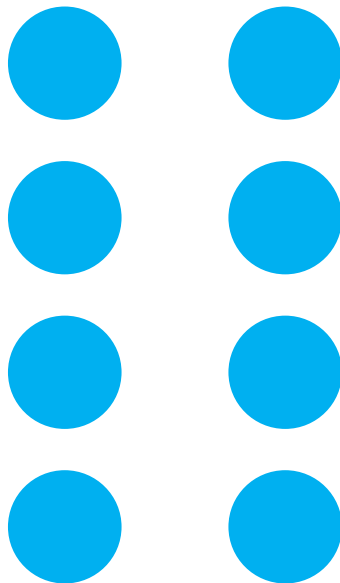
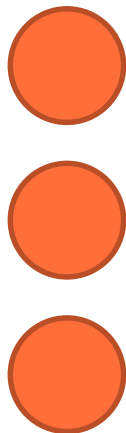




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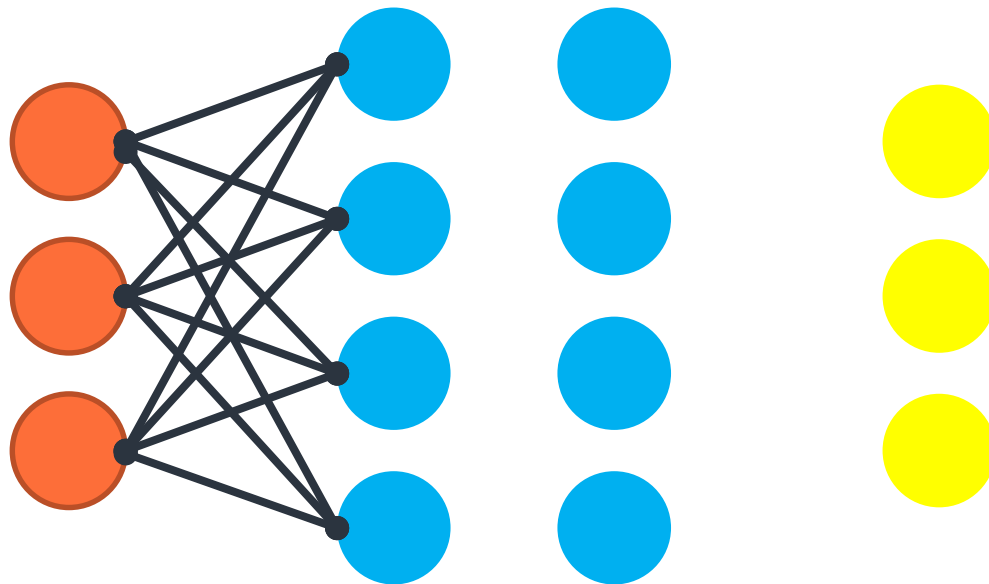


INPUT



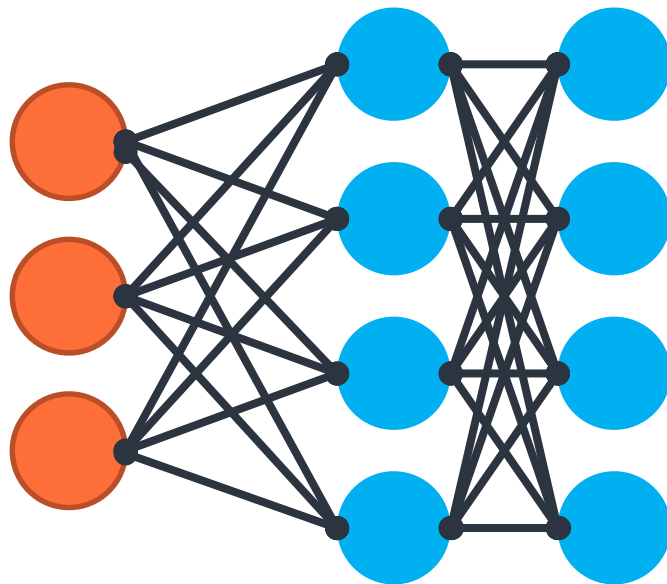


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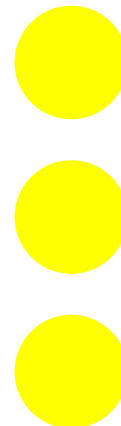




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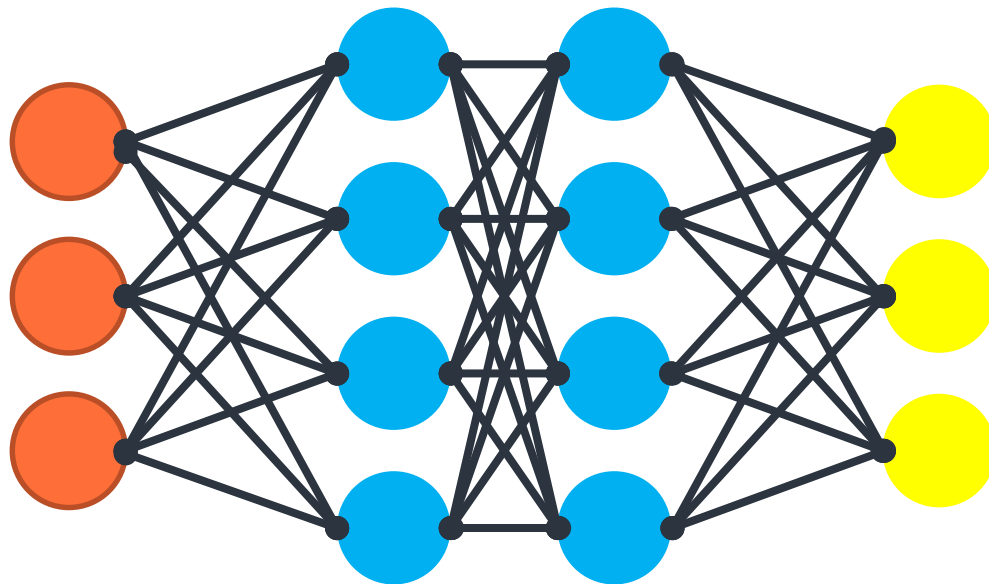


HIDDEN





INPUT



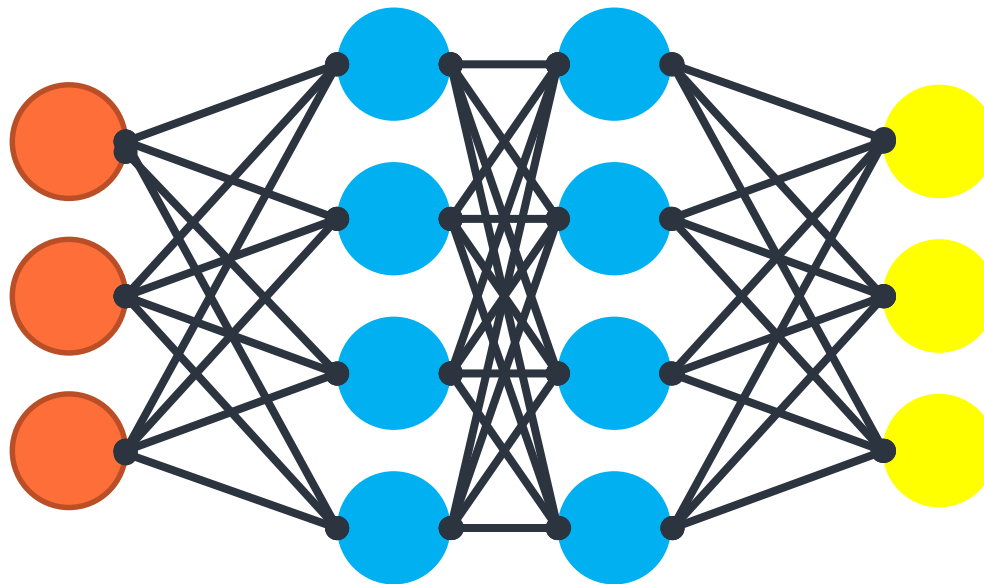
HIDDEN

"letter X"

OUTPUT



INPUT



HIDDEN

"letter X"

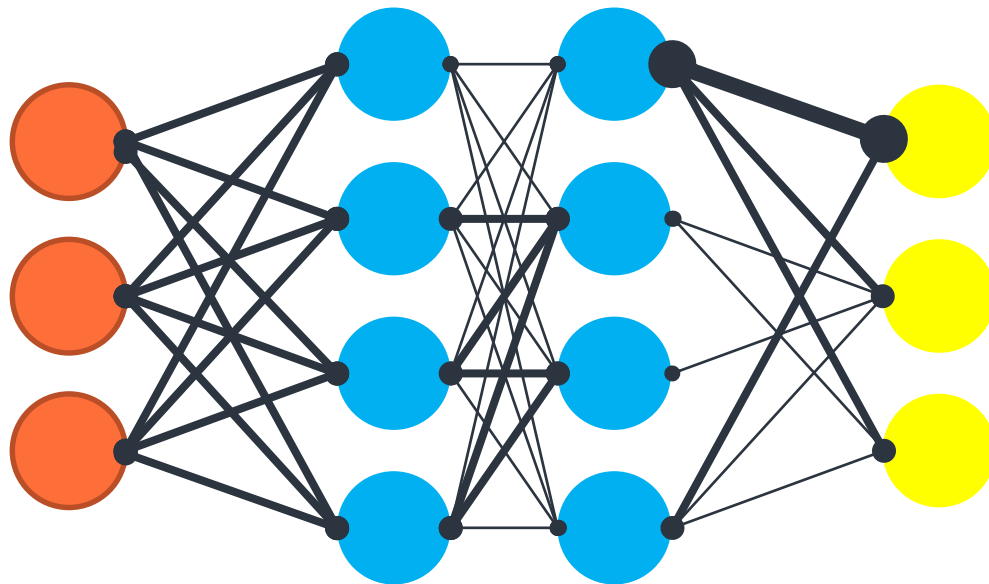
OUTPUT

Not good,
adjust weights.





INPUT



HIDDEN

"letter X"

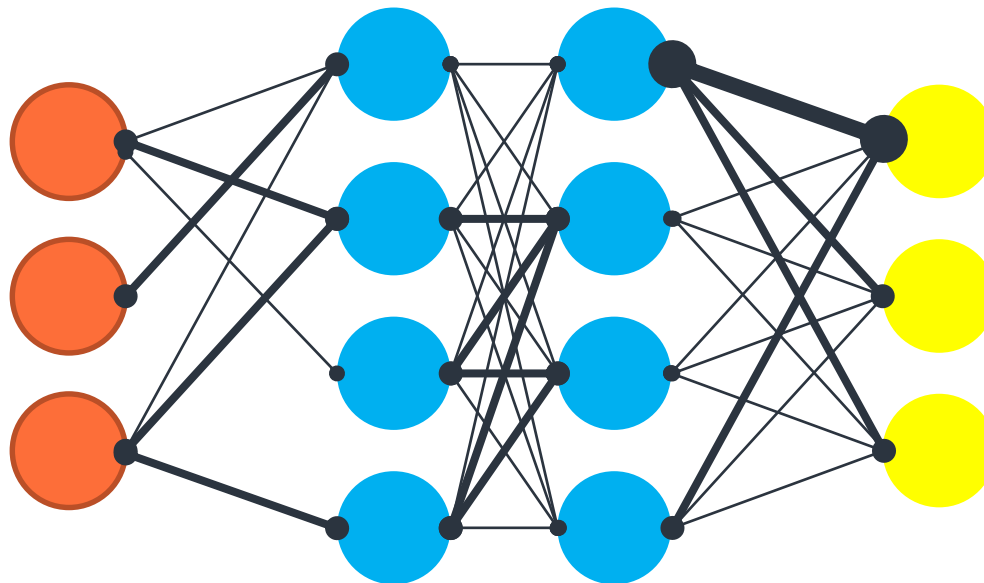
OUTPUT

Not good,
adjust weights.





INPUT



HIDDEN

"letter X"

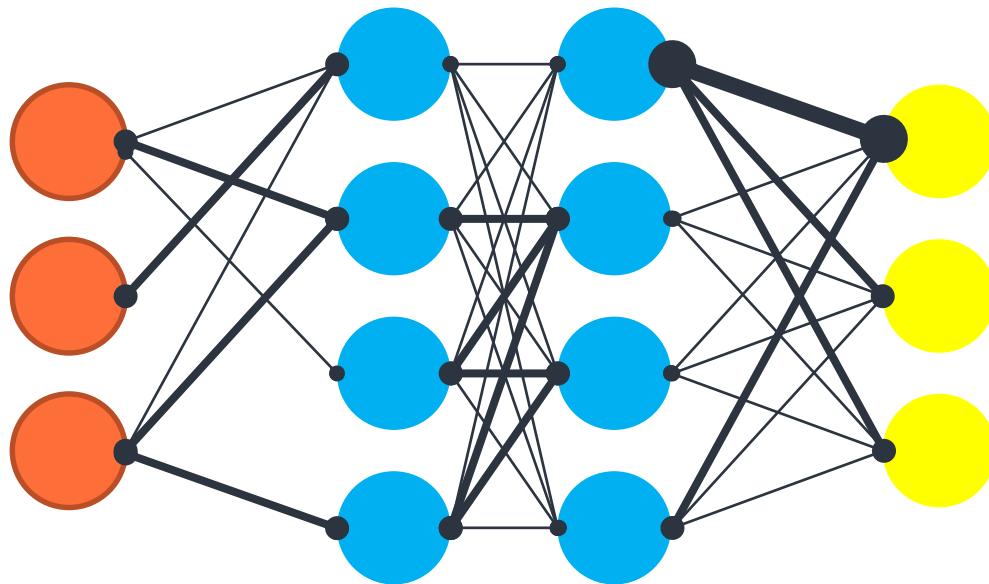
OUTPUT

Not good,
adjust weights.





INPUT



"letter F"

OUTPUT

New weights,
try again

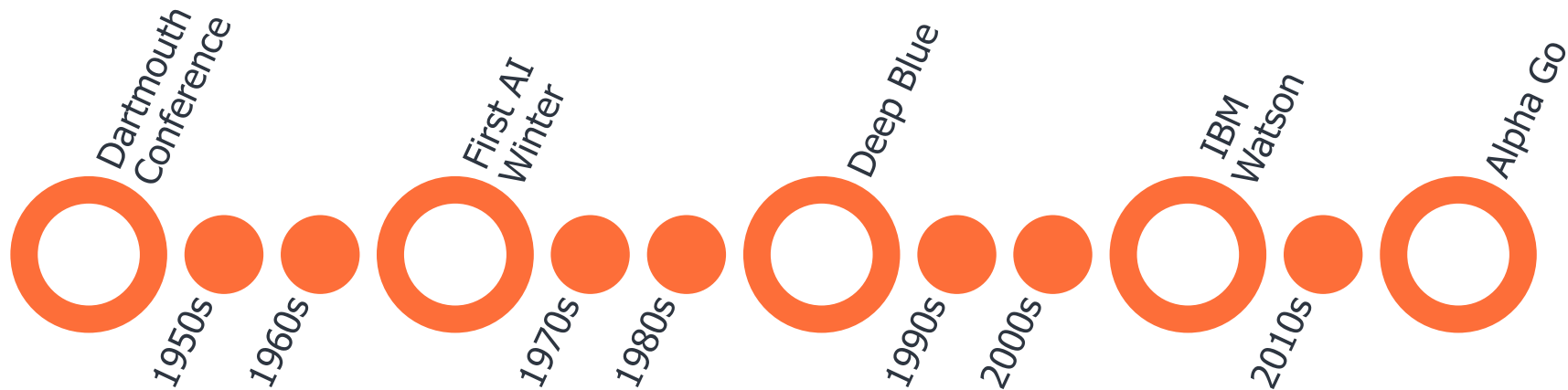


HIDDEN

SUCCESS!

THIS STUFF ISN'T THAT NEW

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... BUT RECENTLY THINGS HAVE BECOME
INTERESTING

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Lee Se-Dol says DeepMind's AlphaGo means he will never truly be the best

BUT WE STILL HAS A LONG WAY TO GO...

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THINGS WILL KEEP CHANGING ...

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IN FUTURE ALL COMPANIES WILL BE DATA COMPANIES



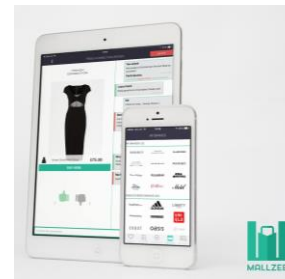
IN FUTURE ALL COMPANIES WILL BE DATA COMPANIES

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IN FUTURE ALL COMPANIES WILL BE DATA COMPANIES

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Google



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BUT THERE ARE A LOT OF OPPORTUNITIES ...

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BUT THERE ARE A LOT OF OPPORTUNITIES ...

aggreko

1893



BUT THERE ARE A LOT OF OPPORTUNITIES ...

aggreko

1893



How many car mechanics are there in this city?

BUT THERE ARE A LOT OF OPPORTUNITIES ...

aggreko

1893



1920



How many car mechanics are there in this city?

BUT THERE ARE A LOT OF OPPORTUNITIES ...

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1893



How many car mechanics are there in this city?

1920



How about now?

THE FUTURE OF EMPLOYMENT: HOW SUSCEPTIBLE ARE JOBS TO COMPUTERISATION?*

Carl Benedikt Frey[†] and Michael A. Osborne[‡]

September 17, 2013

Abstract

We examine how susceptible jobs are to computerisation. To assess this, we begin by implementing a novel methodology to estimate the probability of computerisation for 702 detailed occupations, using a Gaussian process classifier. Based on these estimates, we examine expected impacts of future computerisation on US labour market outcomes.

DATA

Data Scientist: The Sexiest Job of the 21st Century

by **Thomas H. Davenport** and **D.J. Patil**

FROM THE OCTOBER 2012 ISSUE

 SUMMARY

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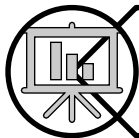
When Jonathan Goldman arrived for work in June 2006 at LinkedIn, the business networking site, the place still felt like a start-up. The company had just under 8 million accounts, and the number was growing quickly as existing members invited their friends and colleagues to join. But users weren't seeking out connections with the people who were already on the site at



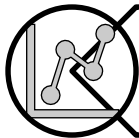
Data Scientist



Data Engineer



Data Visualisation Expert

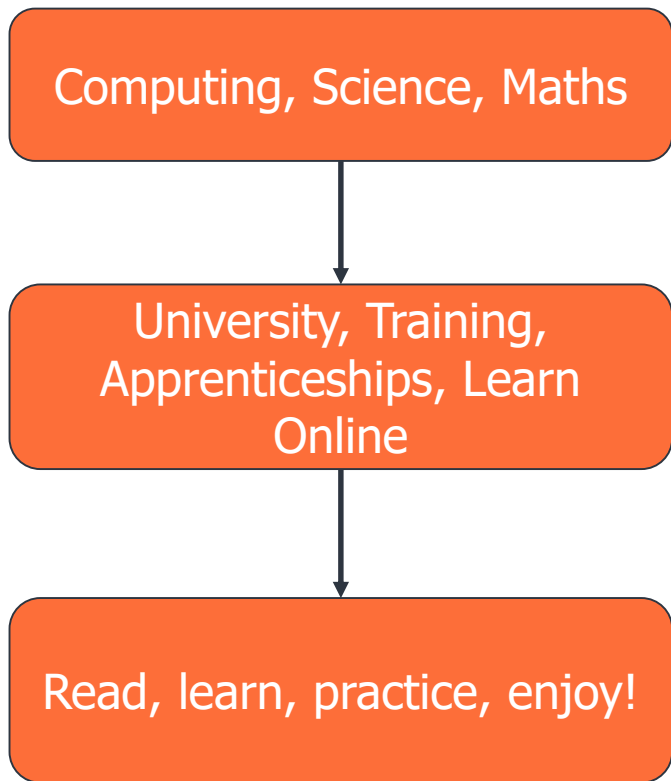


Machine Learning Engineer



Big Data Architect

- None of these jobs existed 10 years ago.
- They are not only new, they are also sought after and well paid.
- They are also super fun – you work with smart people, cool technology and you often get to work on interesting problems.



In the future

- Cars won't be driven
- Planes won't be flown
- Doctors won't diagnose

BUT

- Software will still be programmed
- Problems will still need solved
- Robots will still be built.

THANK YOU

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APPENDIX

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KEY FACTS

10,009 MW

Power in our fleet

£1,760m

2018 revenue

265 locations

Sales and services centres

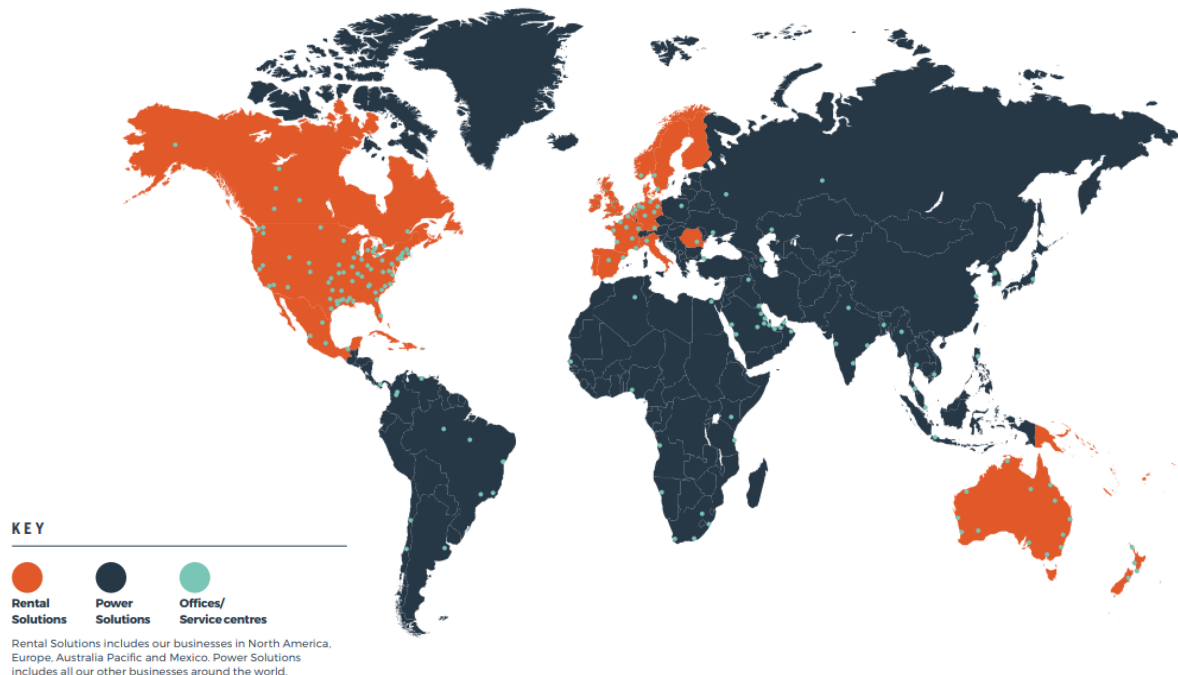
7,000 employees

Permanent and temporary

100 countries

Where we operate

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A global company, listed on the London Stock Exchange

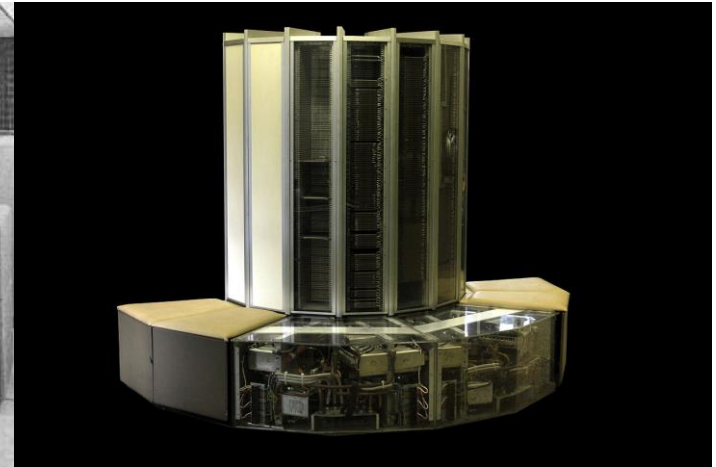
Local expertise to help our customers make their difference

Computers came along, then got faster ...

1955 – IBM 702



1975 – Cray 1



... but what about AI?

A lot of optimism:

1. 1958, [H. A. Simon](#) and [Allen Newell](#): "within ten years a digital computer will be the world's chess champion" and "within ten years a digital computer will discover and prove an important new mathematical theorem."^[58]
2. 1965, [H. A. Simon](#): "machines will be capable, within twenty years, of doing any work a man can do."^[59]
3. 1967, [Marvin Minsky](#): "Within a generation ... the problem of creating 'artificial intelligence' will substantially be solved."^[60]
4. 1970, [Marvin Minsky](#) (in [Life Magazine](#)): "In from three to eight years we will have a machine with the general intelligence of an average human being."^[61]



... But we ended up with this guy.