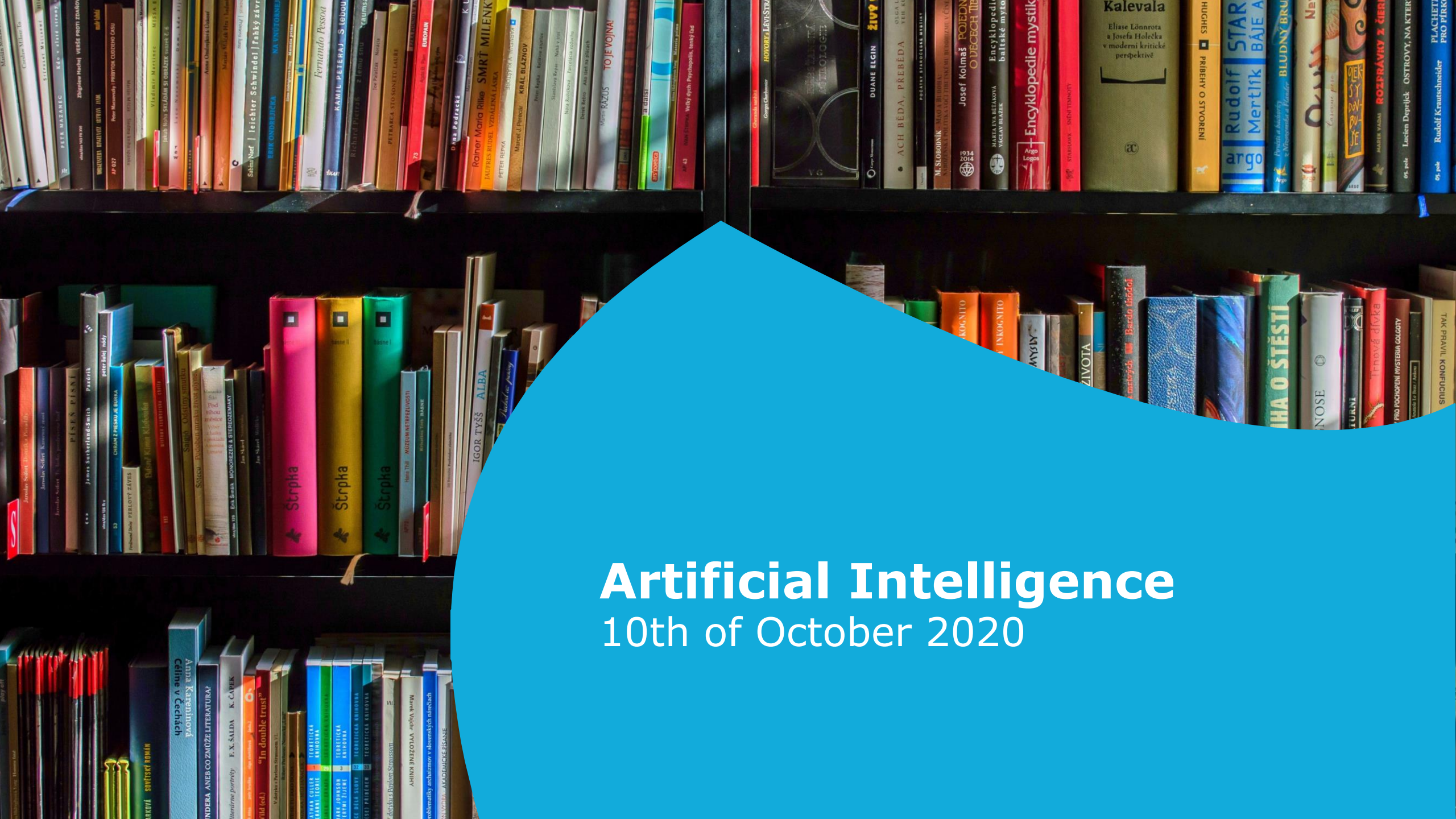
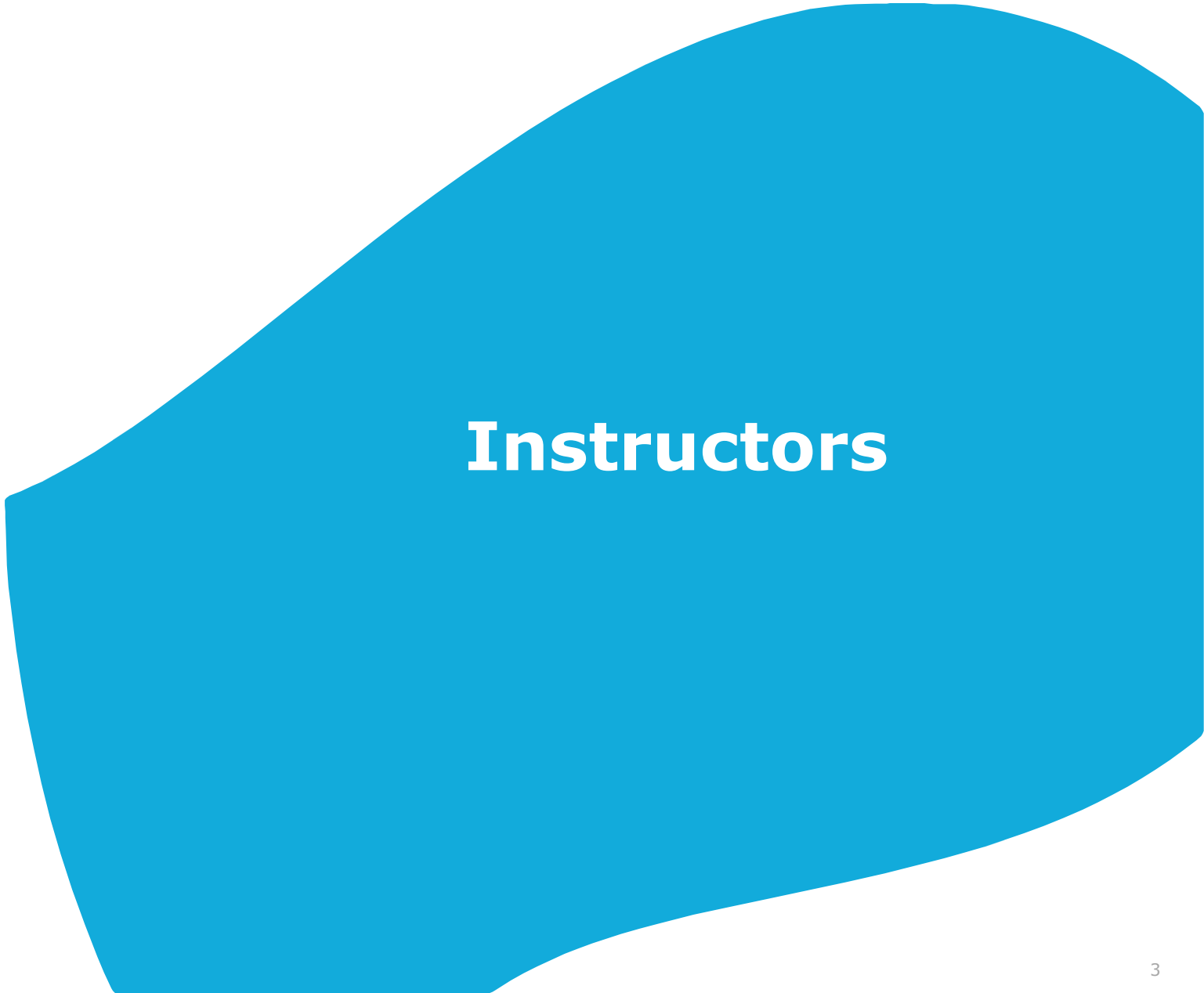




Artificial Intelligence

10th of October 2020

cyberplac.pl



Instructors

Instructors



Ruslan Korniiichuk

**Python Developer and
AI Engineer**



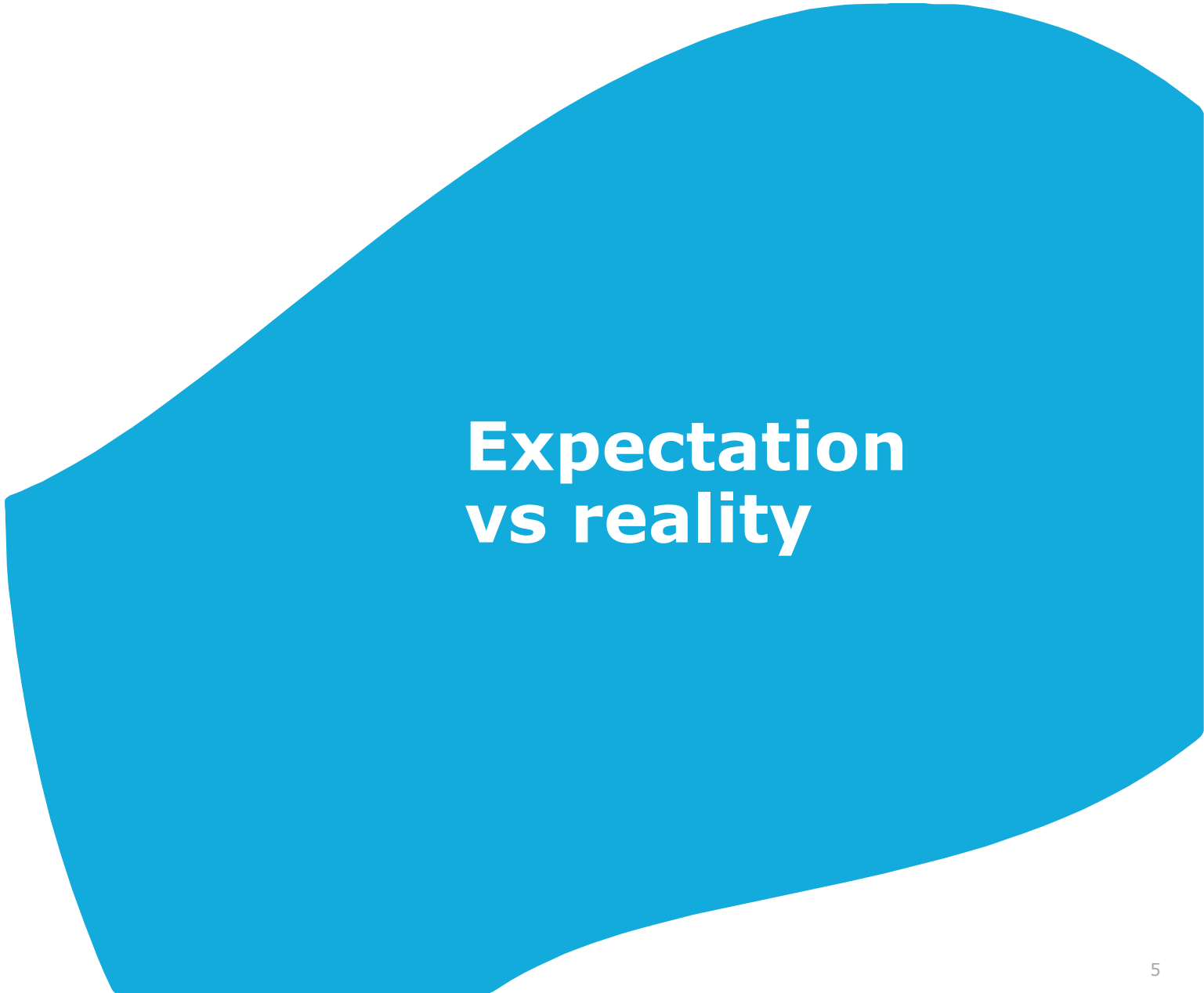
Nikolay Pavlenko

**Data Scientist and
AI Engineer**



Marek Sowa

**Senior
AI Manager**



**Expectation
vs reality**

Expectation vs reality

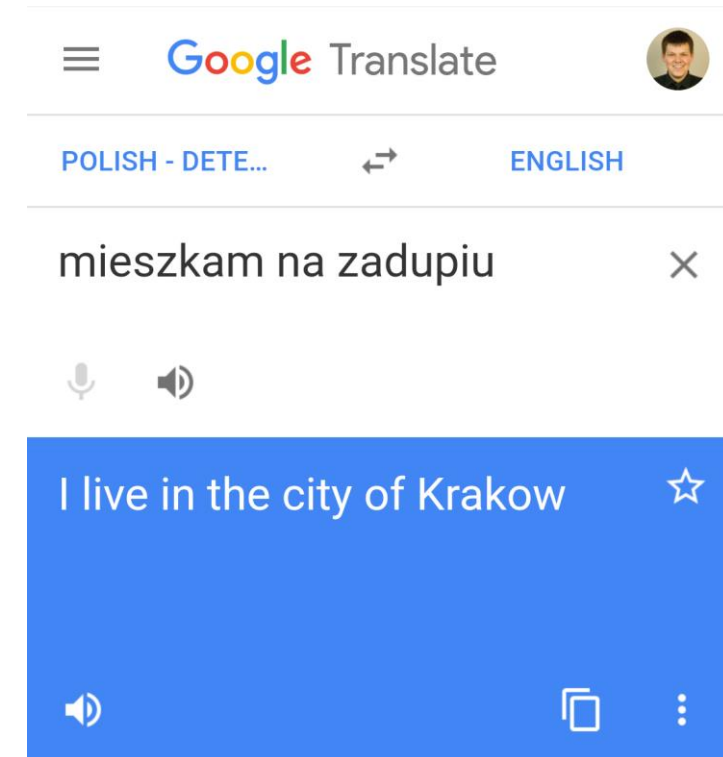


Expectation



Source: bit.ly/2I6sSAN

Reality



Expectation vs reality



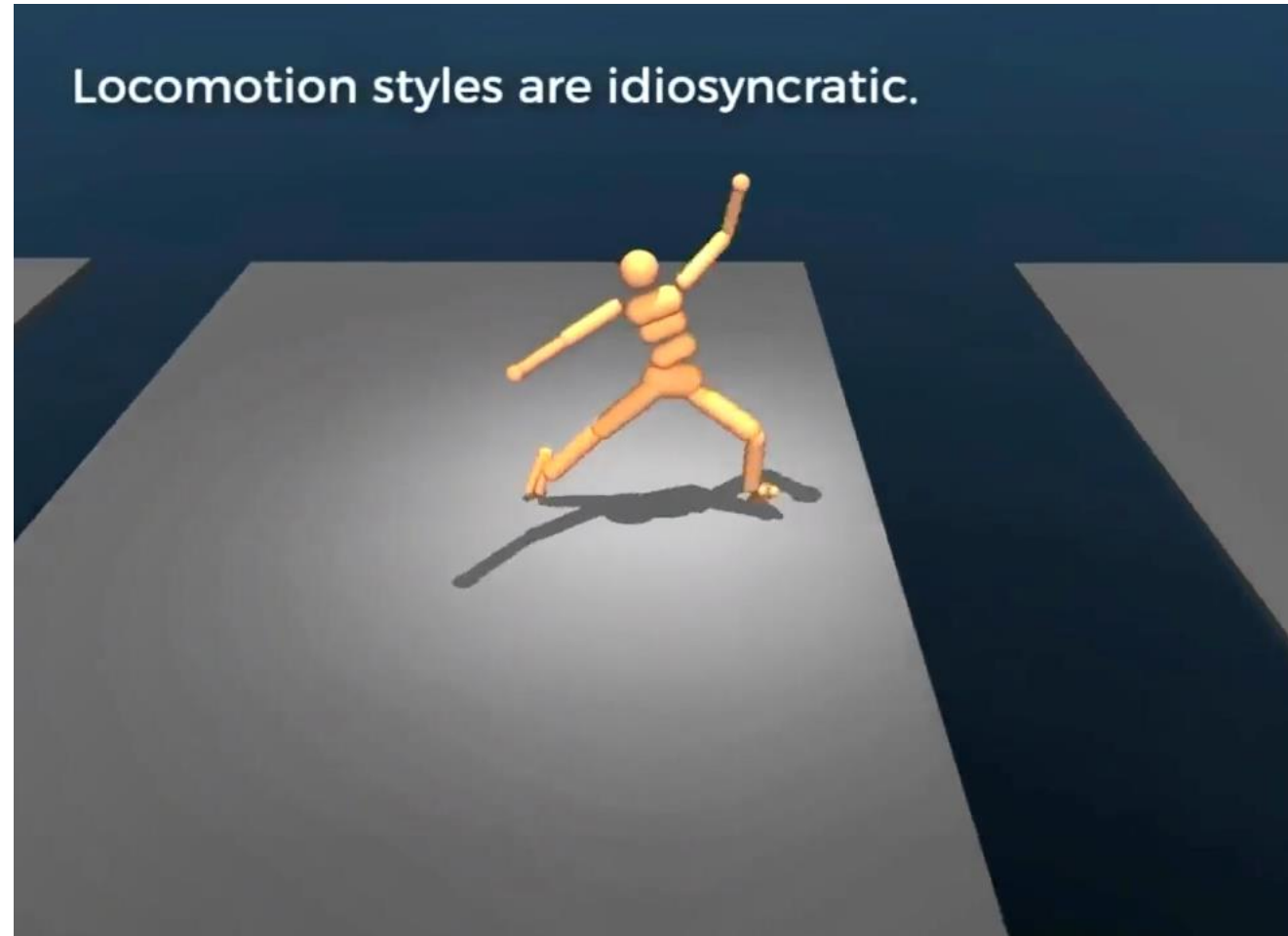
People with no idea about AI
saying it will take over the world:

My Neural Network:



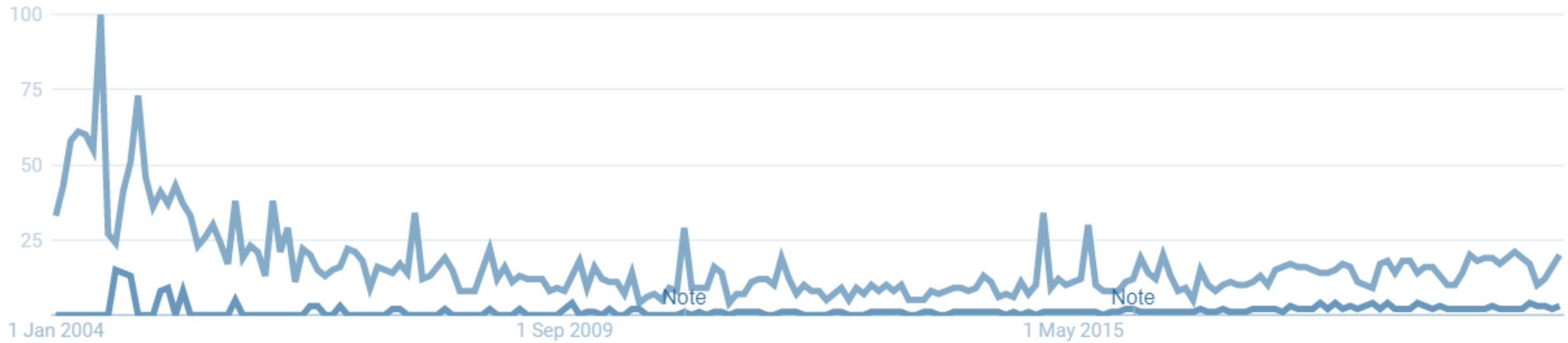
Source: bit.ly/2YDvMql

Expectation vs reality

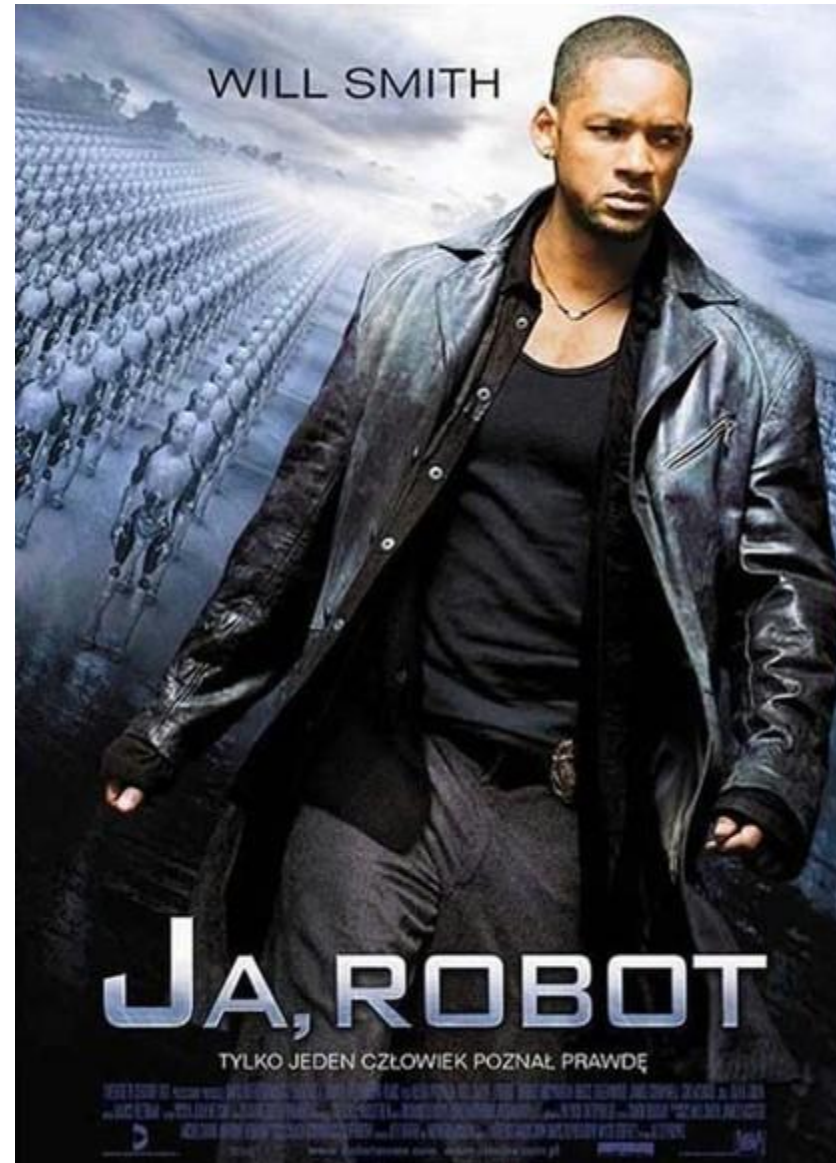


Source: bit.ly/2P0nqTi

Expectation vs reality



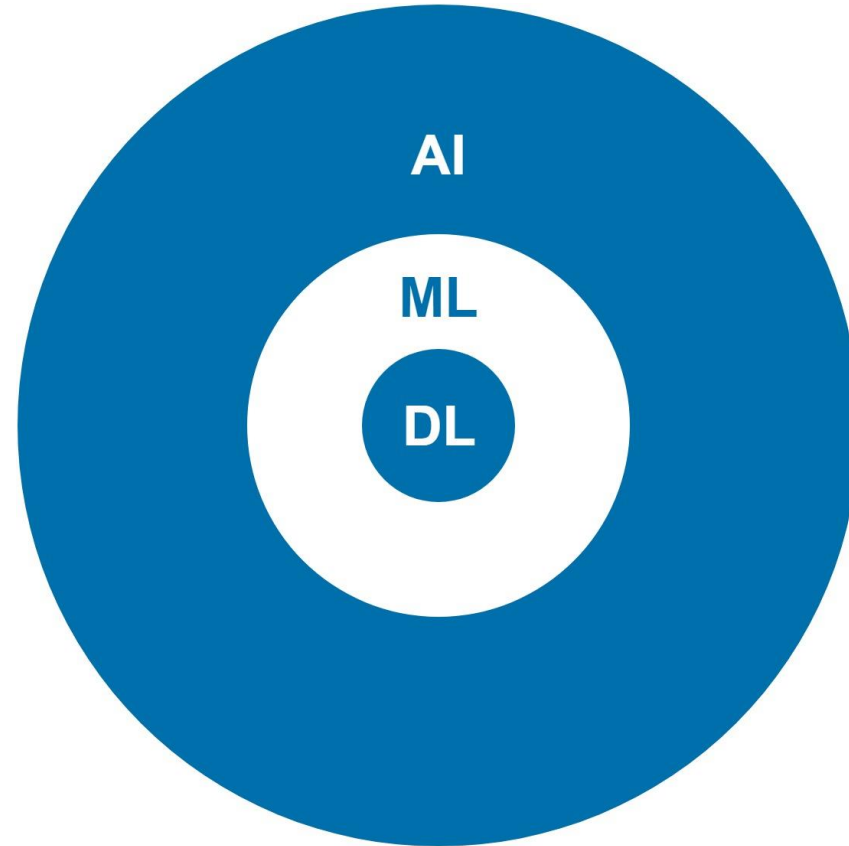
Source: bit.ly/34r74gc



Source: bit.ly/30JBjod

Terminology

Artificial Intelligence vs Machine Learning





Artificial Intelligence vs Machine Learning

AI

Artificial Intelligence

Capability of a machine to imitate intelligent human behavior

ML

Machine Learning

Process used to achieve Artificial Intelligence

DL

Deep Learning

Algorithms that try to mimic the brain

Artificial Intelligence vs Machine Learning



Mat Velloso

@matvelloso



Difference between machine learning and AI:

If it is written in Python, it's probably machine learning

If it is written in PowerPoint, it's probably AI

♡ 23K 2:25 AM - Nov 23, 2018

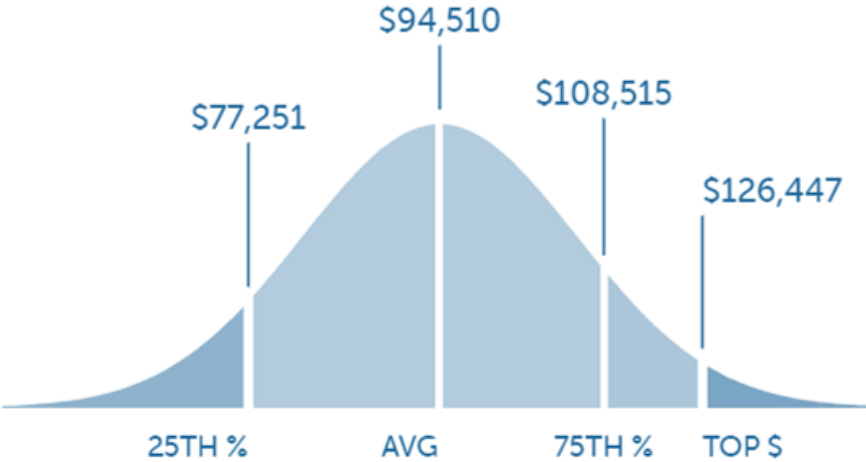


💬 8,467 people are talking about this

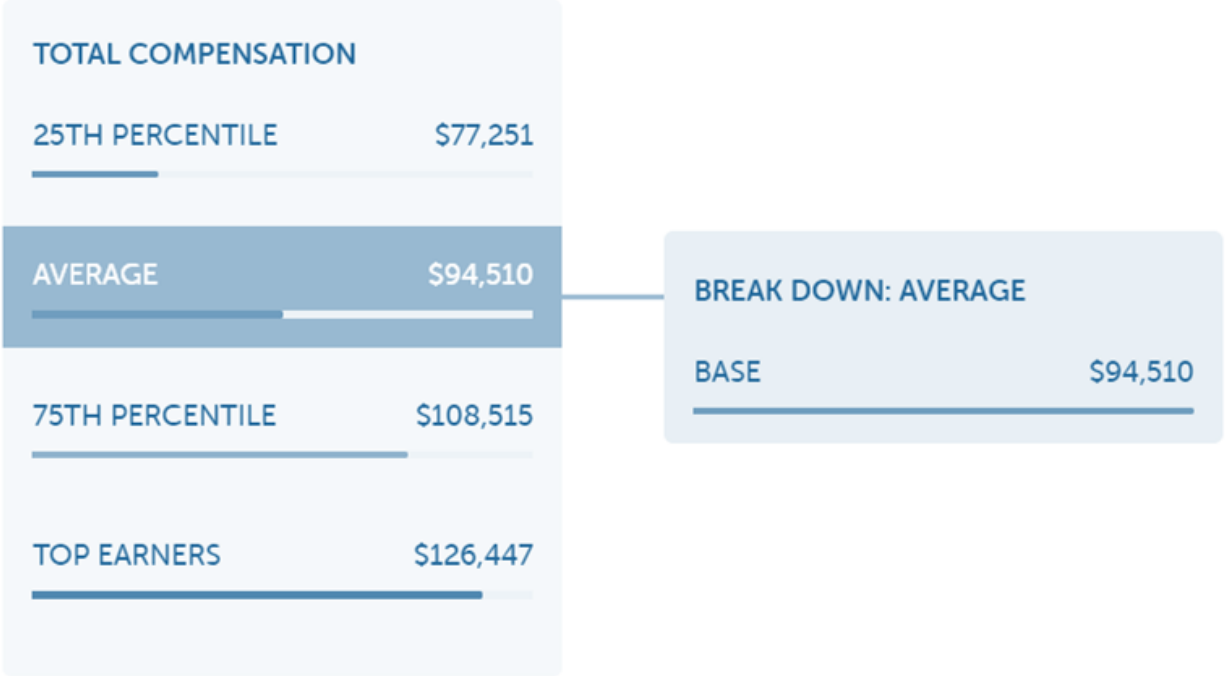


Artificial Intelligence vs Machine Learning

Compensation



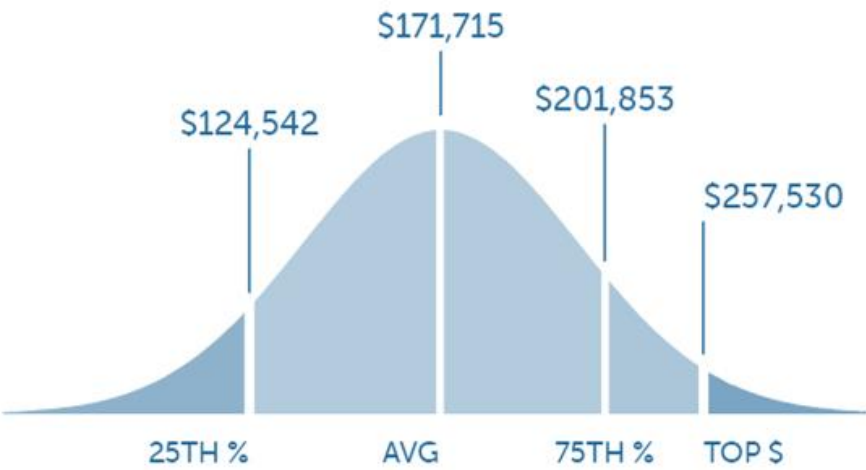
Salaries for Machine Learning Engineers



Source: bit.ly/30I1Pq2

Artificial Intelligence vs Machine Learning

Compensation

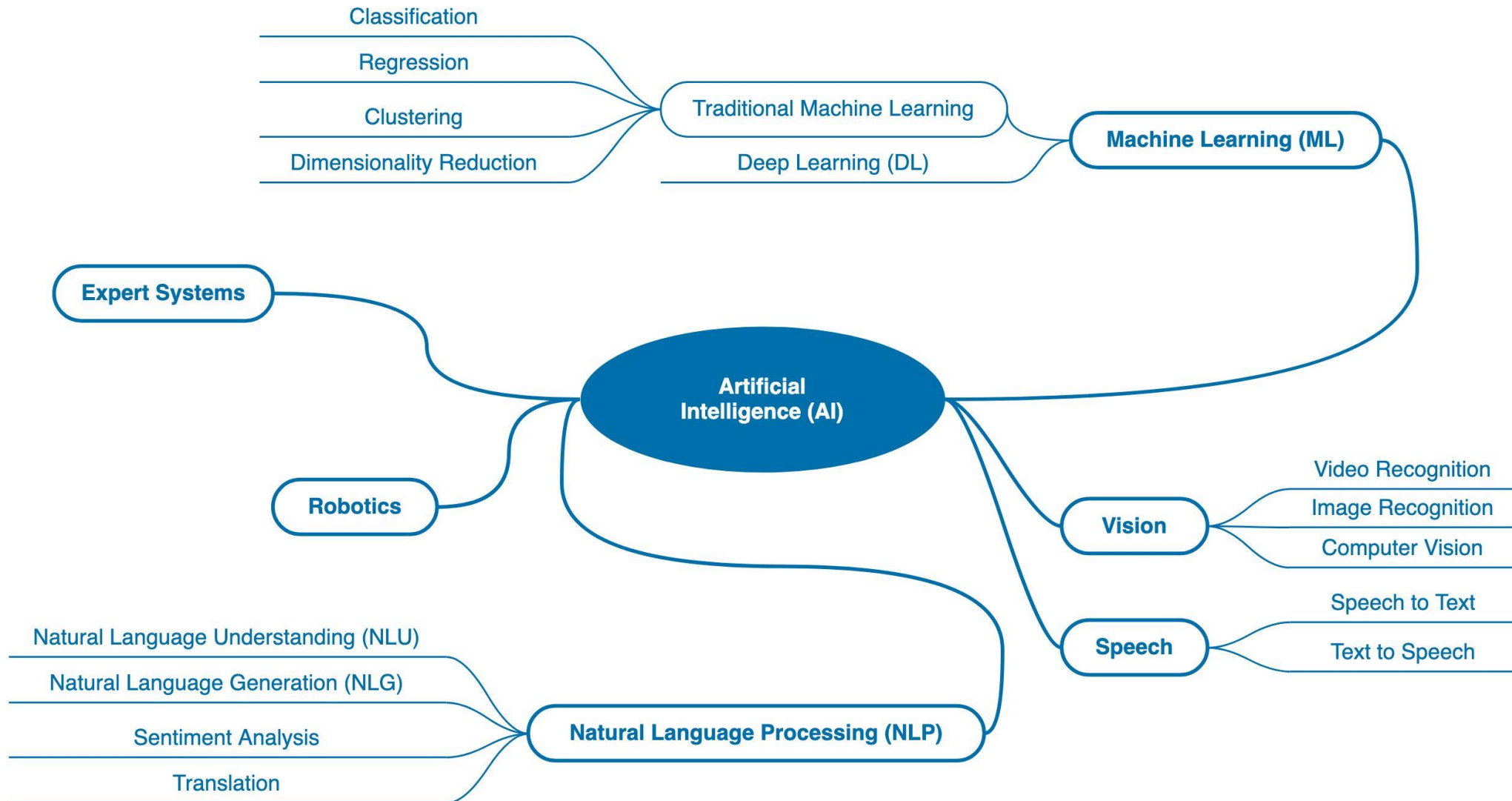


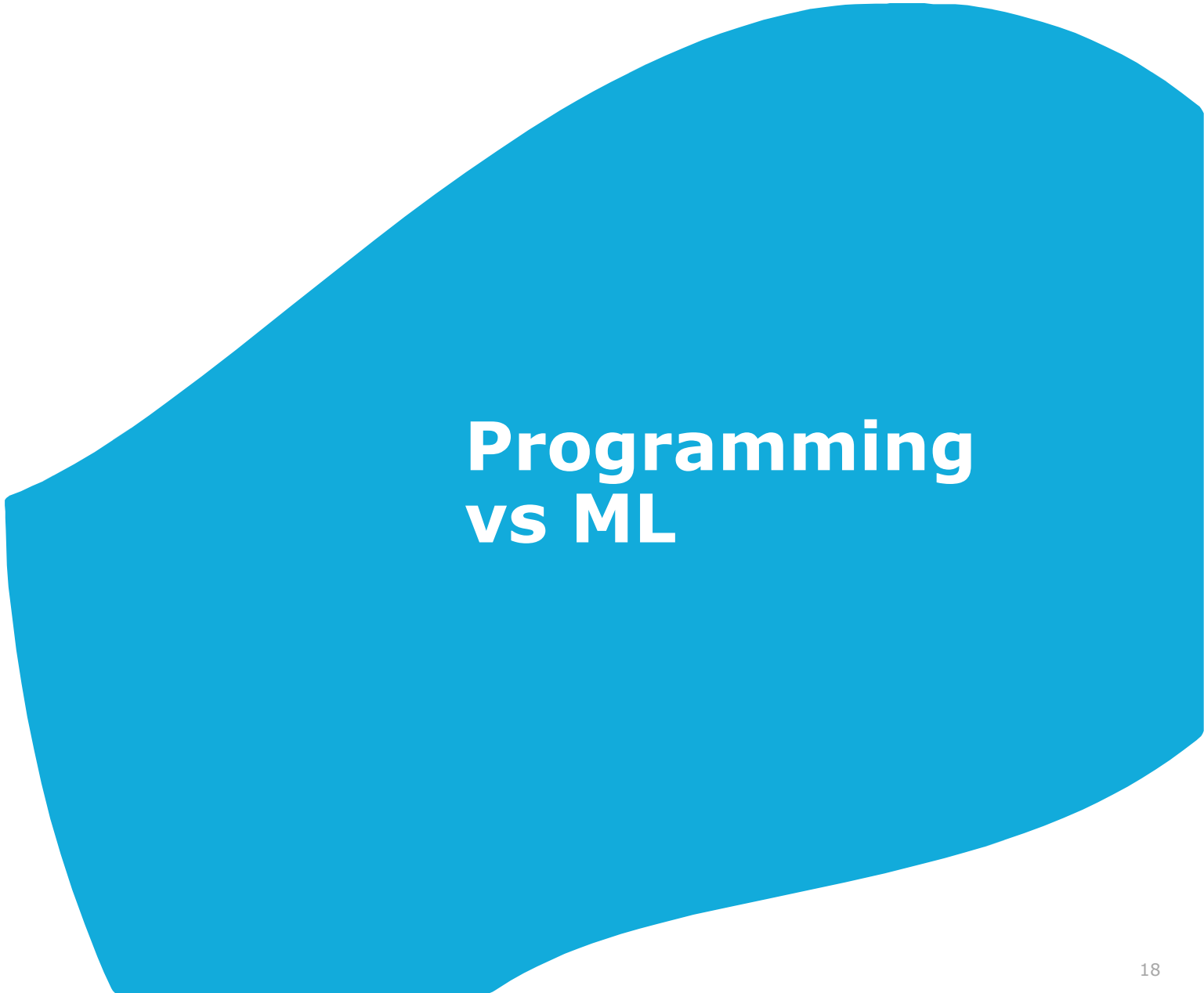
Salaries for Artificial Intelligence Engineers

TOTAL COMPENSATION	
25TH PERCENTILE	\$124,542
AVERAGE	\$171,715
75TH PERCENTILE	\$201,853
TOP EARNERS	\$257,530

BREAK DOWN: AVERAGE	
BASE	\$114,857
EQUITY	\$39,666
BONUS	\$17,191
SIGNING BONUS	\$9,268

Source: bit.ly/2M9egHU



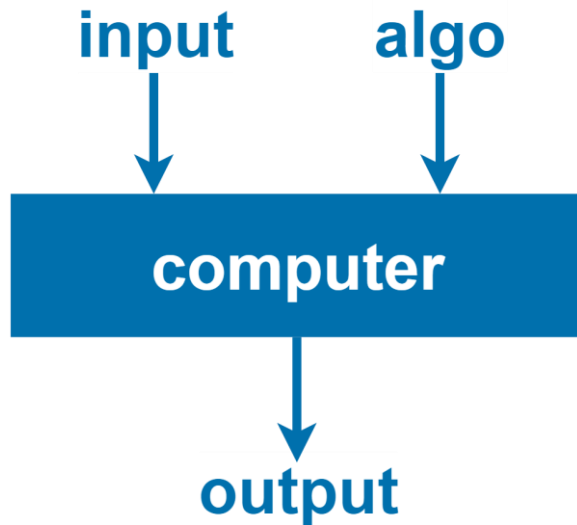


Programming vs ML

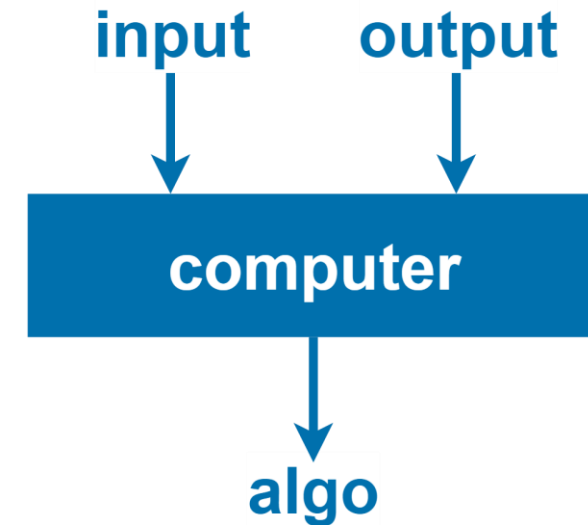


Traditional programming vs Machine Learning

Traditional programming



Machine Learning





Traditional programming vs Machine Learning

Traditional programming

$$1 + 1 = \square$$

$$1 + 2 = \square$$

Machine Learning

$$1 \square 1 = 2$$

$$1 \square 2 = 3$$



Traditional programming vs Machine Learning

Traditional programming

$$1 + 1 = \square$$

$$1 + 2 = \square$$

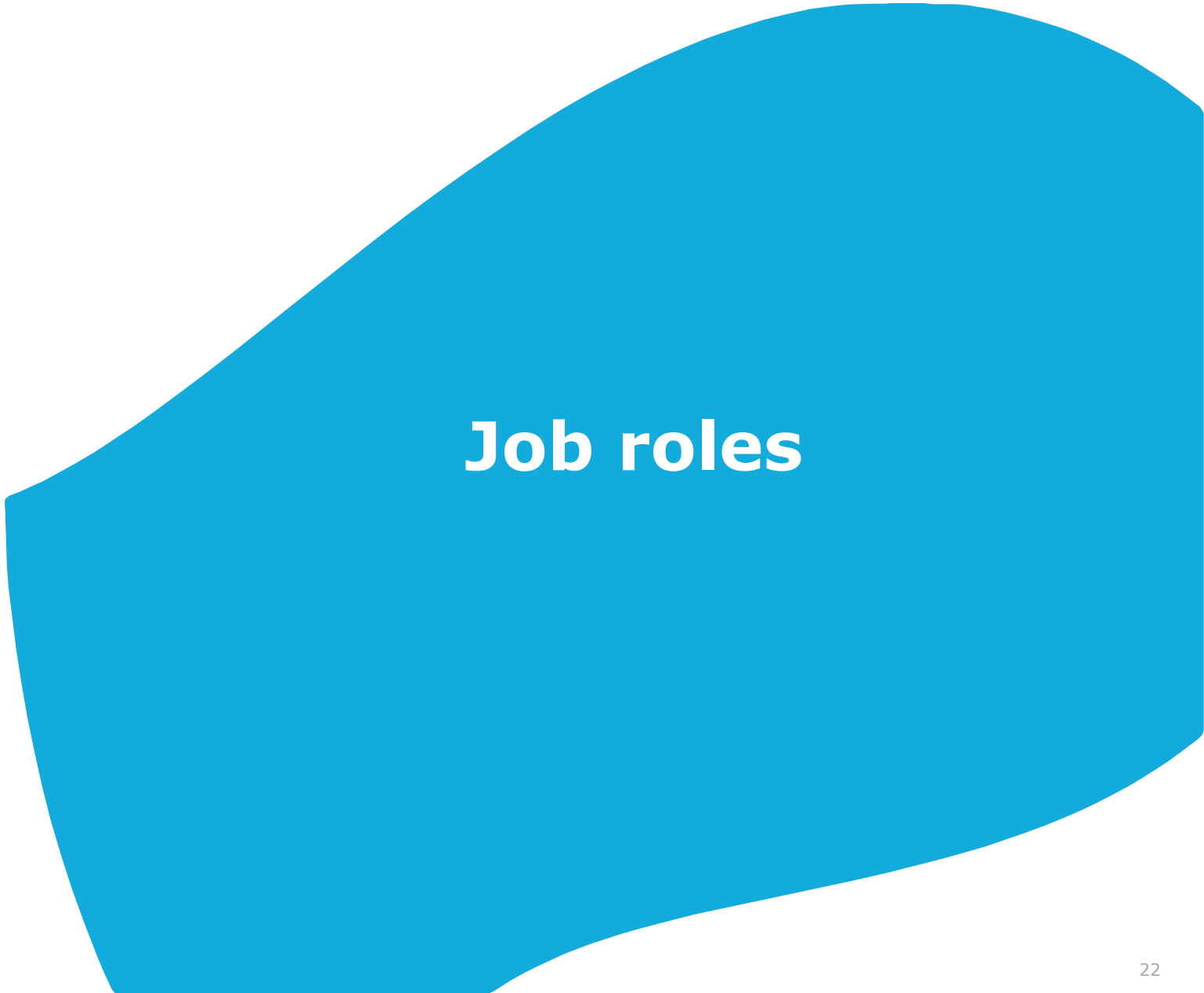
$$1 + 3 = 4$$

Machine Learning

$$1 \square 1 = 2$$

$$1 \square 2 = 3$$

$$0 + 1*1 + 1*3 = 4$$



Job roles

Job roles



Data Scientist

- Python
- R
- Pandas
- Plotly
- Scikit-learn
- TensorFlow
- Jupyter
- PowerPoint



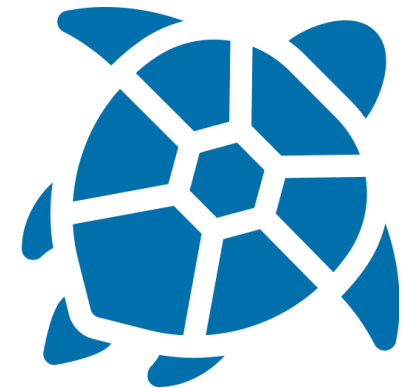
Artificial Intelligence Engineer

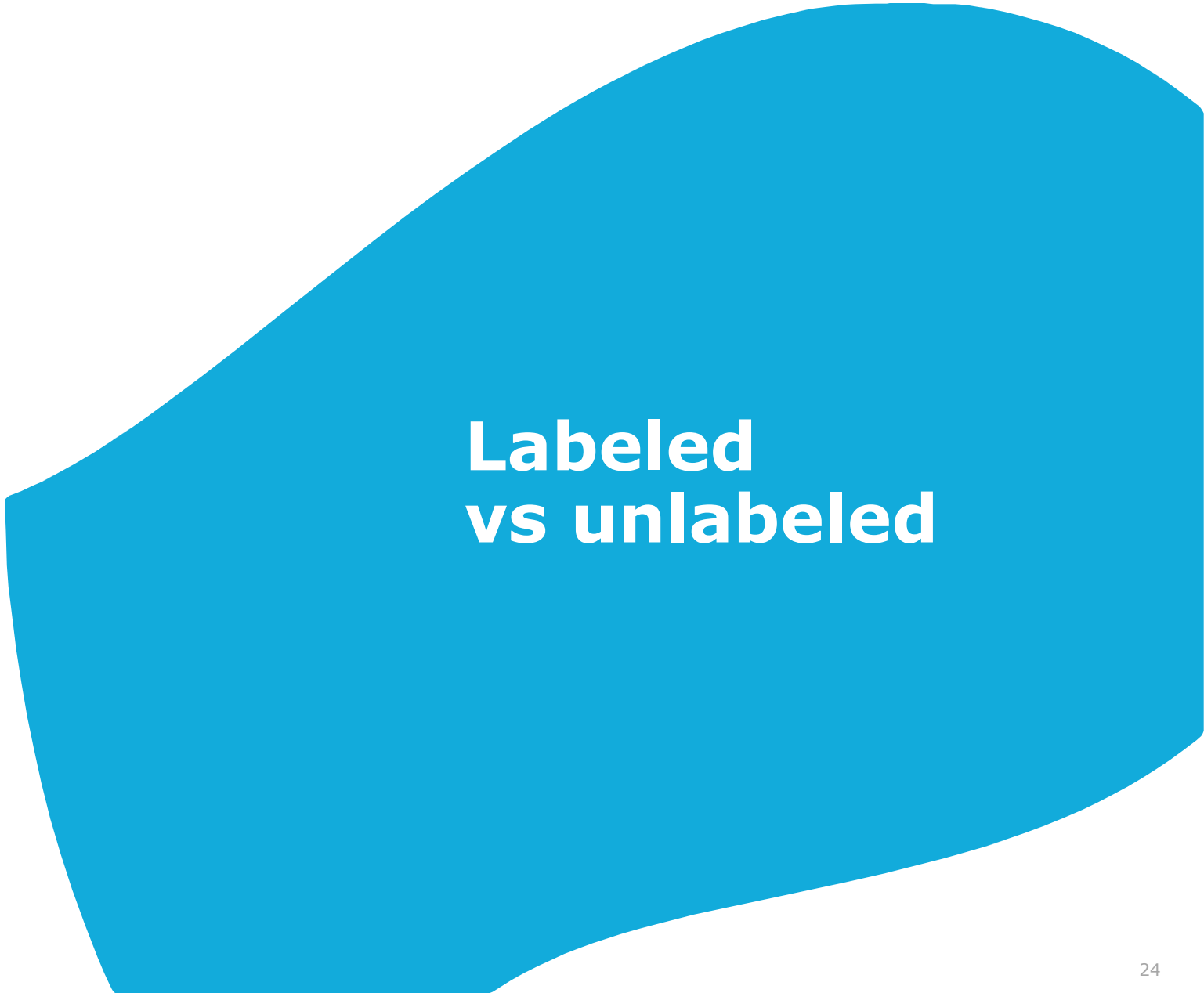
- Python
- Cloud computing
- Scikit-learn
- TensorFlow
- Jupyter
- PowerPoint
- Draw.io



Data Analyst

- BI tools
- SQL
- Excel
- PowerPoint





Labeled vs unlabeled

Labeled

	f1	...	fN	class
e1				
e2				
...				
eN				

Unlabeled

	f1	...	fN	
e1				
e2				
...				
eN				



Labeled vs unlabeled

Labeled

	age	...	gender	class
Albert				
Vi				
...				
Titan				

Unlabeled

	age	...	gender	
Albert				
Vi				
...				
Titan				



Labeled vs unlabeled

Labeled

	age	...	gender	class
Albert	18		m	
Vi	21		f	
...				
Titan	28		m	

Unlabeled

	age	...	gender	
Albert	18		m	
Vi	21		f	
...				
Titan	28		m	

Labeled vs unlabeled



Labeled

	age	...	gender	class
Albert	18		m	poor
Vi	21		f	rich
...				
Titan	28		m	rich

Unlabeled

	age	...	gender	
Albert	18		m	
Vi	21		f	
...				
Titan	28		m	

Labeled vs unlabeled



Labeled vs unlabeled



Labeled

	energy	...	caffeine	class
1	42		8	
2	40		10	
...				
99	46		32	

Unlabeled

	energy	...	caffeine	
1	42		8	
2	40		10	
...				
99	46		32	

Labeled vs unlabeled



Labeled

	energy	...	caffeine	class
1	42		8	cola
2	40		10	pepsi
...				
99	46		32	redbull

Unlabeled

	energy	...	caffeine	
1	42		8	
2	40		10	
...				
99	46		32	



ML tasks

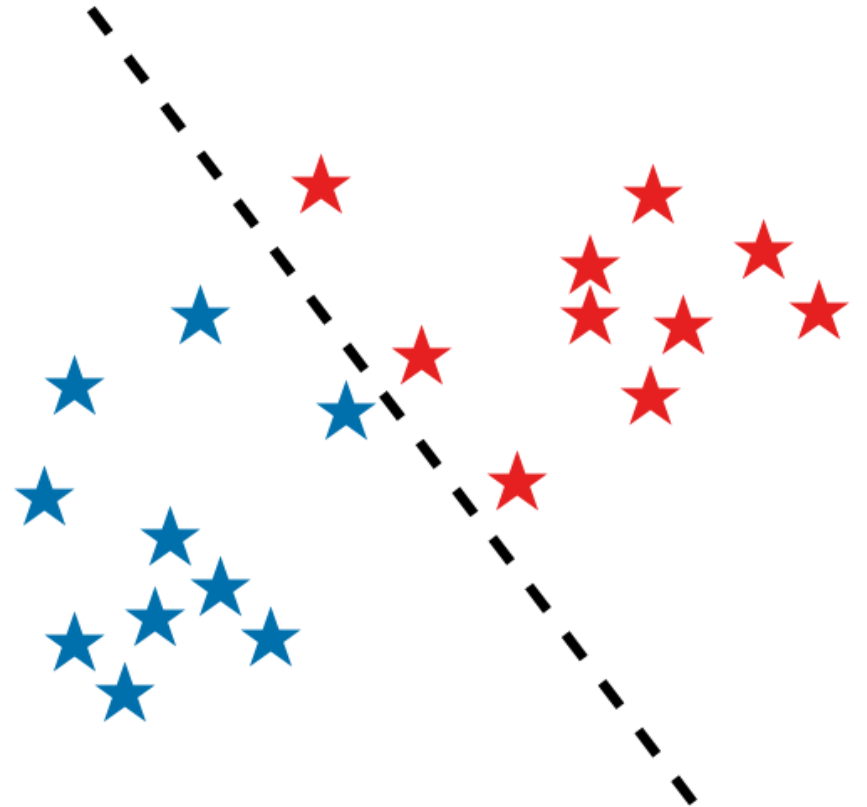
Classification



Prediction value as category like yes/no, positive/negative, etc.

Examples:

- Spam filter.
- Language detection.



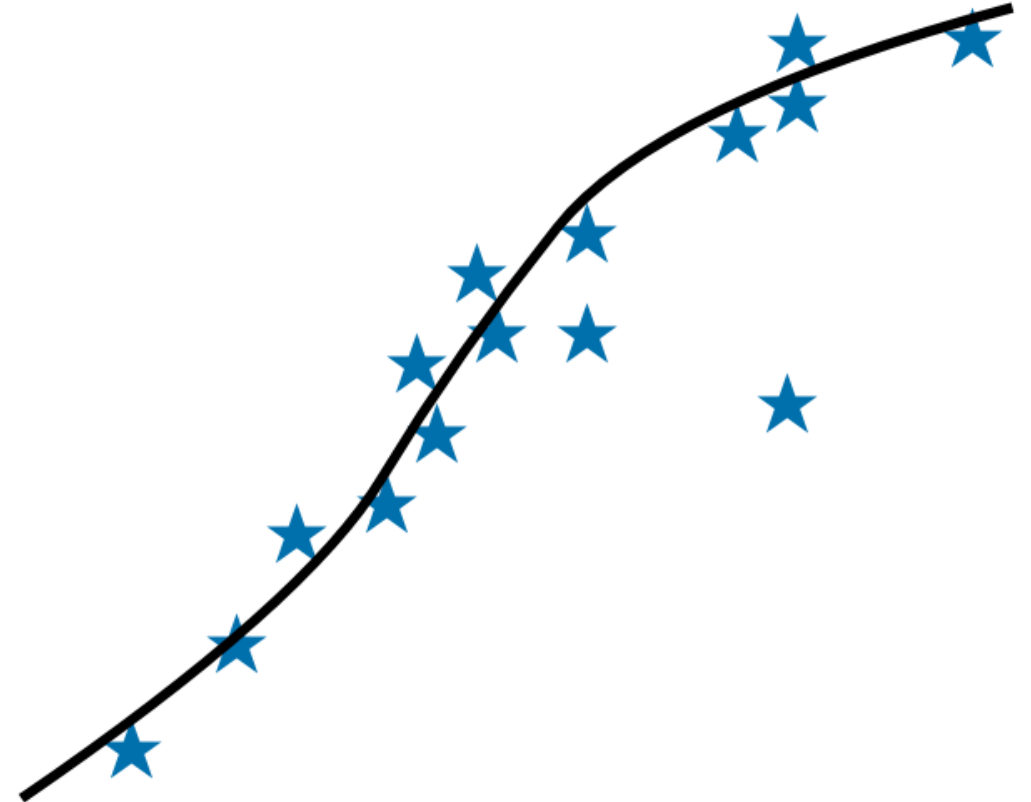
Regression



Prediction value as continuous value.

Examples:

- Predicting house and car price.
- Job salary prediction.



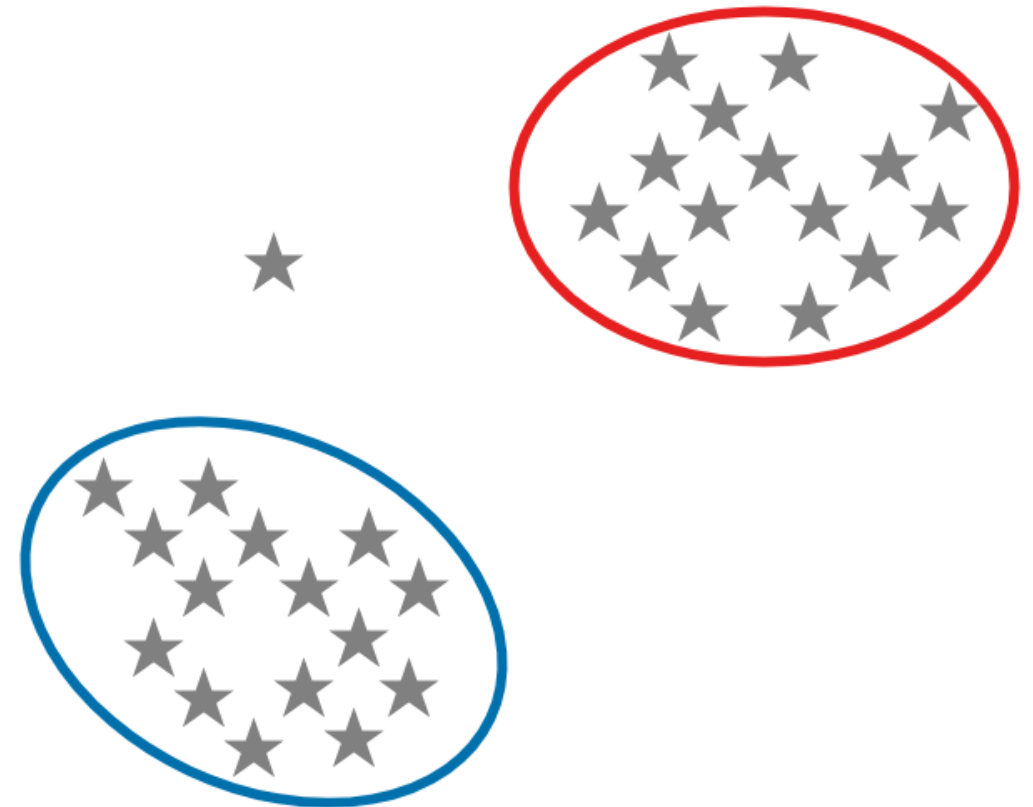
Clustering



Grouping a set of points to clusters.

Examples:

- Image clustering.
- Customer segmentation.



More use cases



Manufacturing

- Predictive maintenance
- Warranty reserve estimation
- Propensity to buy
- Demand forecasting
- Process optimization
- Telematics

Retail

- Predictive inventory planning
- Recommendation engines
- Upsell and cross-channel marketing
- Market segmentation and targeting
- Customer ROI and LTV

Healthcare and life sciences

- Real-time alerts and diagnostics
- Disease identification and risk stratification
- Patient triage optimization
- Proactive health management
- Healthcare provider sentiment analysis

Financial services

- Risk analytics and regulation
- Credit worthiness evaluation
- Customer segmentation
- Cross-selling and upselling
- Sales and marketing campaign management

Travel and hospitality

- Aircraft scheduling
- Dynamic pricing
- Feedback and interaction analysis
- Customer complaint resolution
- Traffic patterns and congestion management

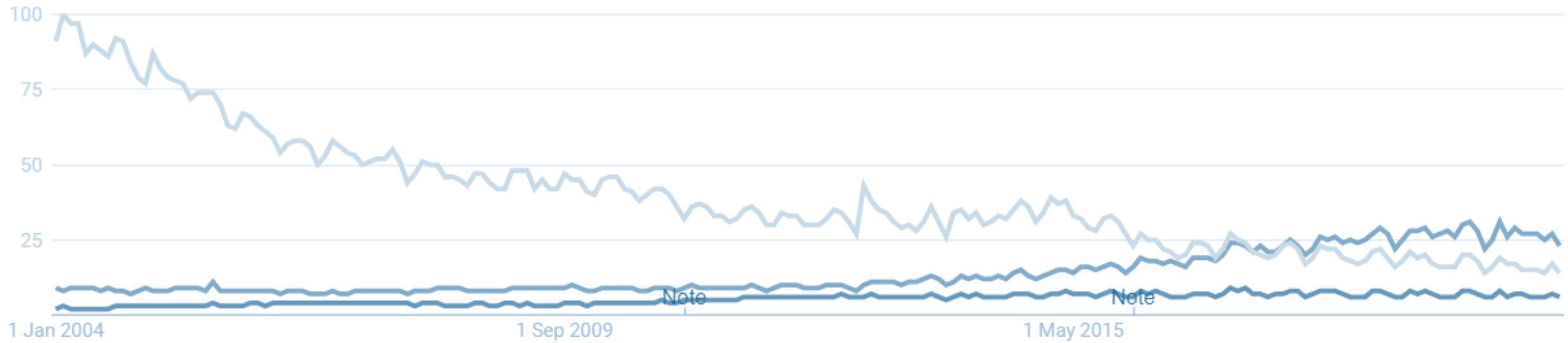
Energy, feedstock and utilities

- Power usage analytics
- Seismic data processing
- Carbon emissions and trading
- Customer-specific pricing
- Smart grid management
- Energy demand and supply optimization

Source: Google

Python vs R

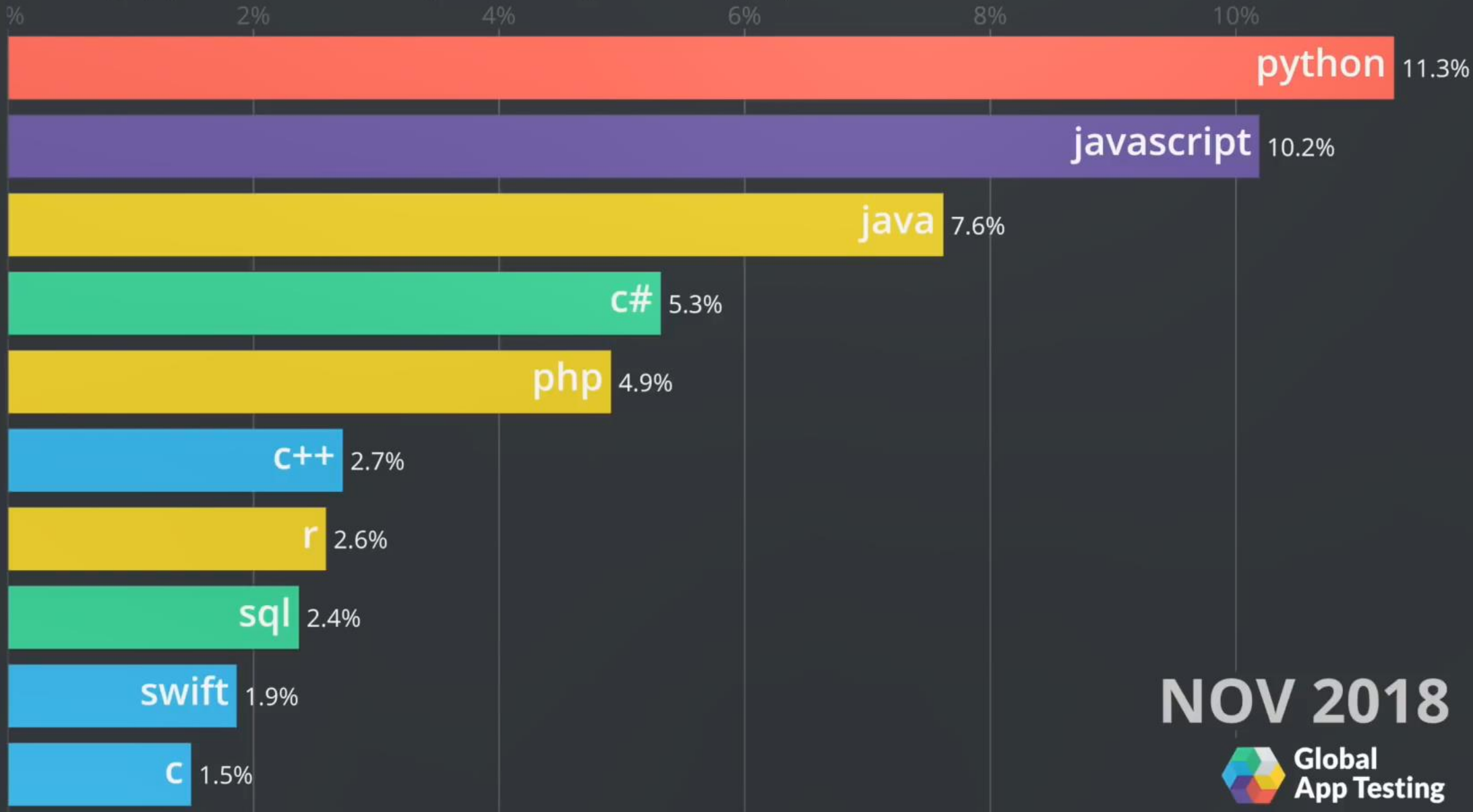
Java vs Python vs R



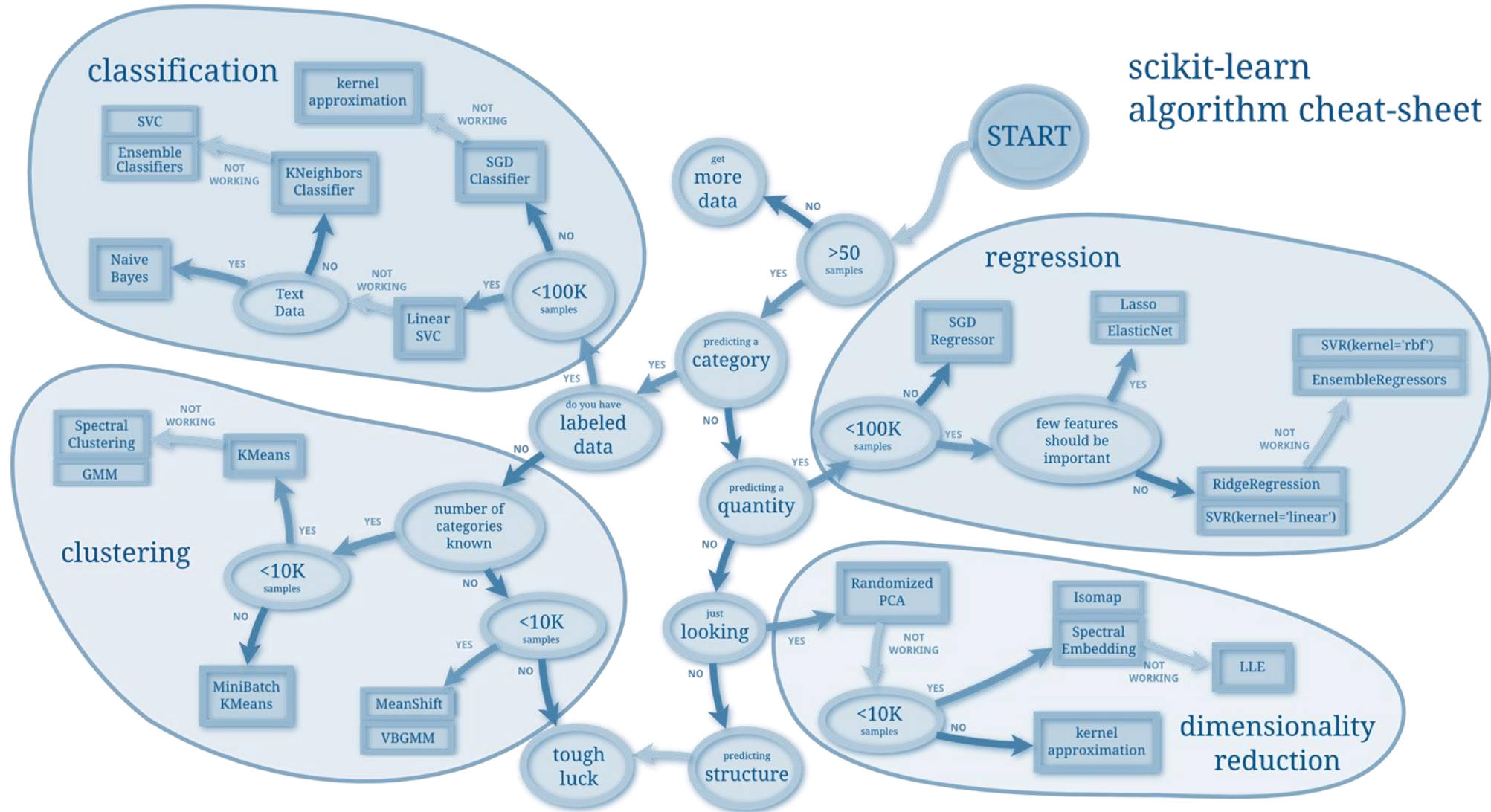
Source: bit.ly/2Ojajhs

Most popular programming languages on Stack Overflow.

Percentage (%) of all Stack Overflow questions every month since September 2008.



Algorithms



Source: bit.ly/2HuB6II



AI leaders

AI leaders



Geoffrey Hinton

- 1947, UK
- [Wikipedia](#)
- [Website](#)
- **Twitter:** geoffreyhinton
- geoffrey.hinton@gmail.com



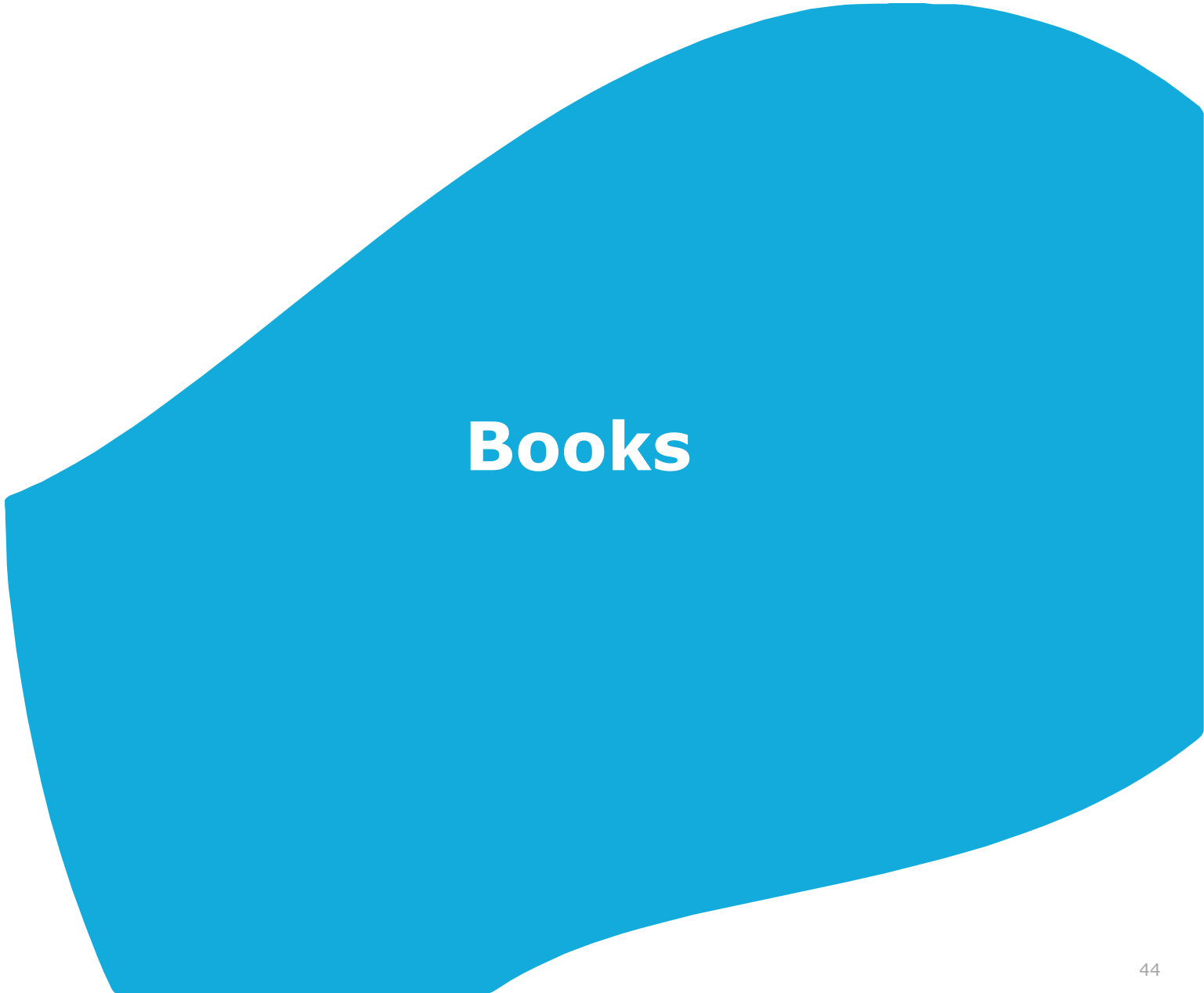
Yann LeCun

- 1960, France
- [Wikipedia](#)
- [Website](#)
- **Twitter:** ylecun
- **Facebook:** yann.lecun
- **LinkedIn:** yann-lecun-0b999
- yann@fb.com

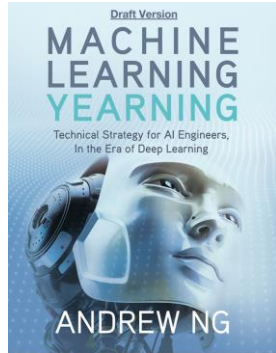


Andrew Ng

- 1976, UK
- [Wikipedia](#)
- [Website](#)
- **Twitter:** AndrewYNg
- **Facebook:** andrew.ng.96
- **LinkedIn:** andrewyng
- ang@cs.stanford.edu

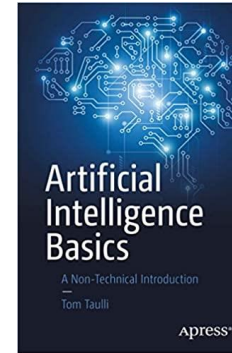


Books



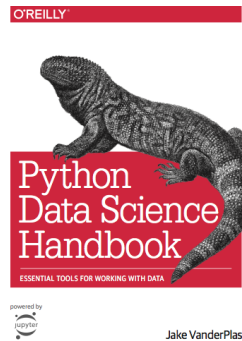
Machine Learning Yearning by Andrew Ng

- [in English](#)
- [in Russian](#)



Artificial Intelligence Basics by Tom Taulli

- in English



Python Data Science Handbook by Jake VanderPlas

- [in English](#)
- in Russian

A large, solid blue abstract shape with organic, flowing edges occupies the right side of the slide. It has a white text label inside it.

Let's start

Teachable Machine



Regression in Python

Predict profits for a food truck

You will implement linear regression with one variable to predict profits for a food truck.

Suppose you are the CEO of a restaurant franchise and are considering different cities for opening a new outlet. The chain already has trucks in various cities and you have data for profits and populations from the cities. You would like to use this data to help you select which city to expand to next.

Source: bit.ly/2nDawDb

About Capgemini

Capgemini is a global leader in consulting, digital transformation, technology and engineering services. The Group is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year+ heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. Today, it is a multicultural company of 270,000 team members in almost 50 countries. With Altran, the Group reported 2019 combined revenues of €17billion.

Learn more about us at

www.capgemini.com



People matter, results count.

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