Applications of AI in business

Speaker:
Dr Michail Basios

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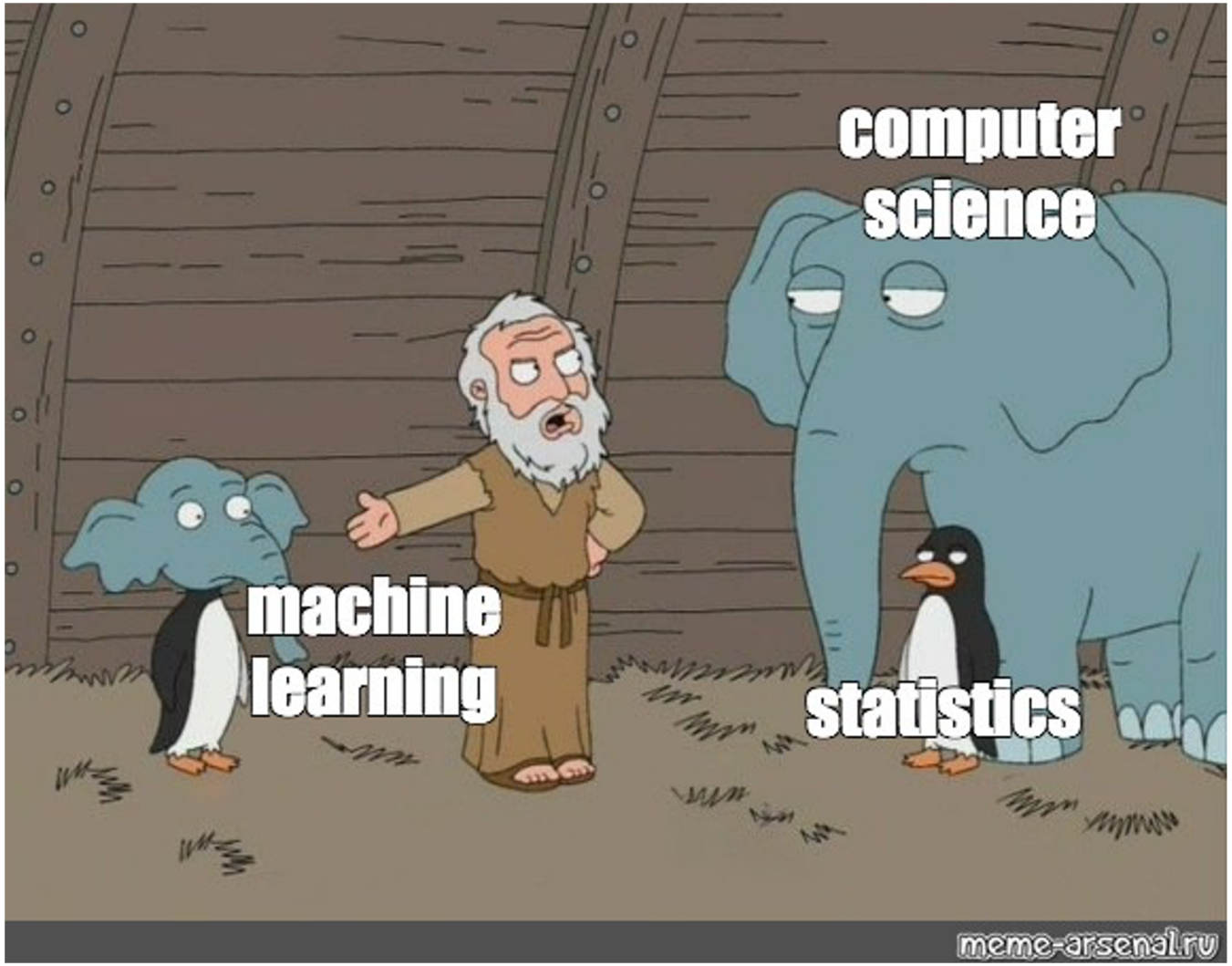
Πανεπιστήμιο Πειραιώς
University of Piraeus

What is Data Science?



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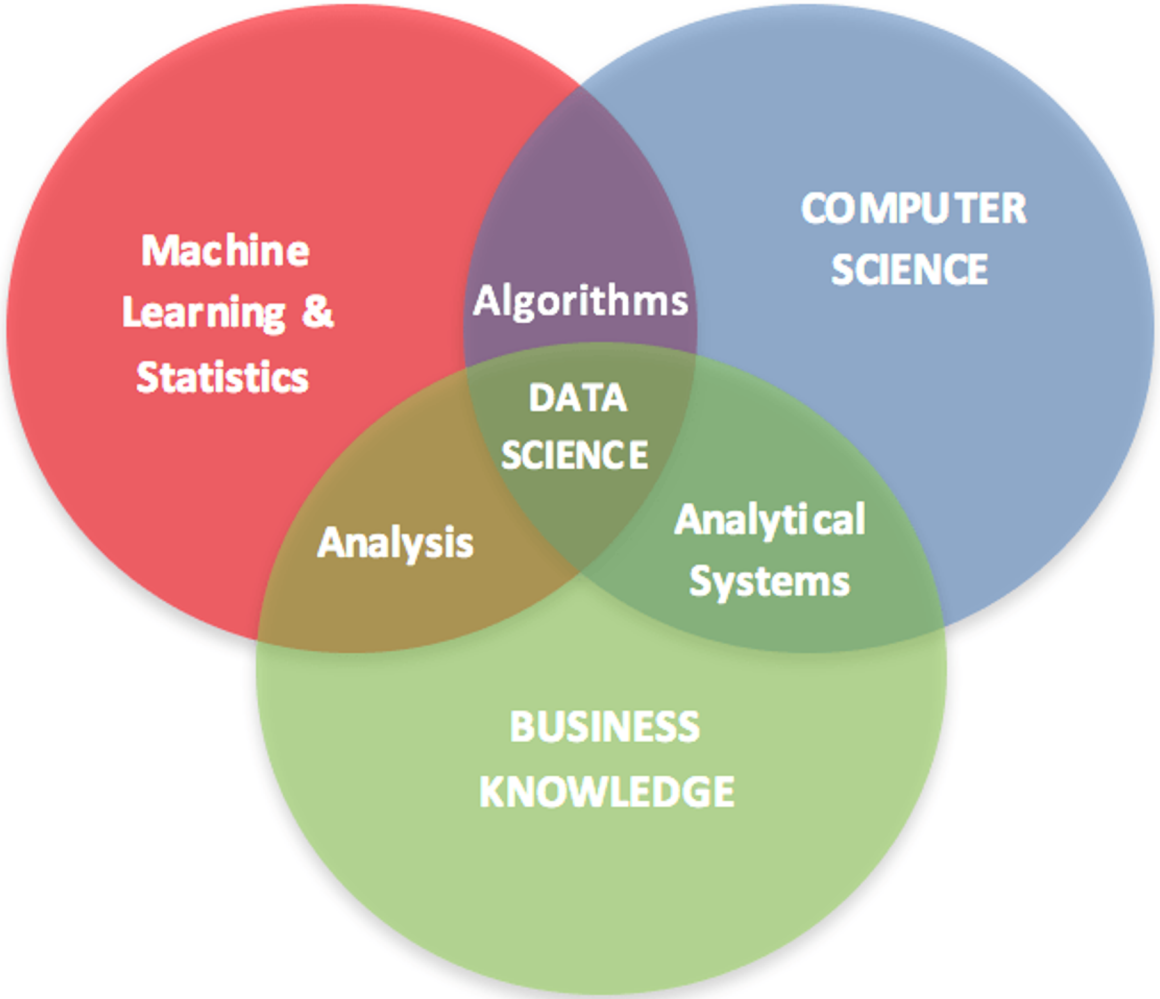
What is Data Science?



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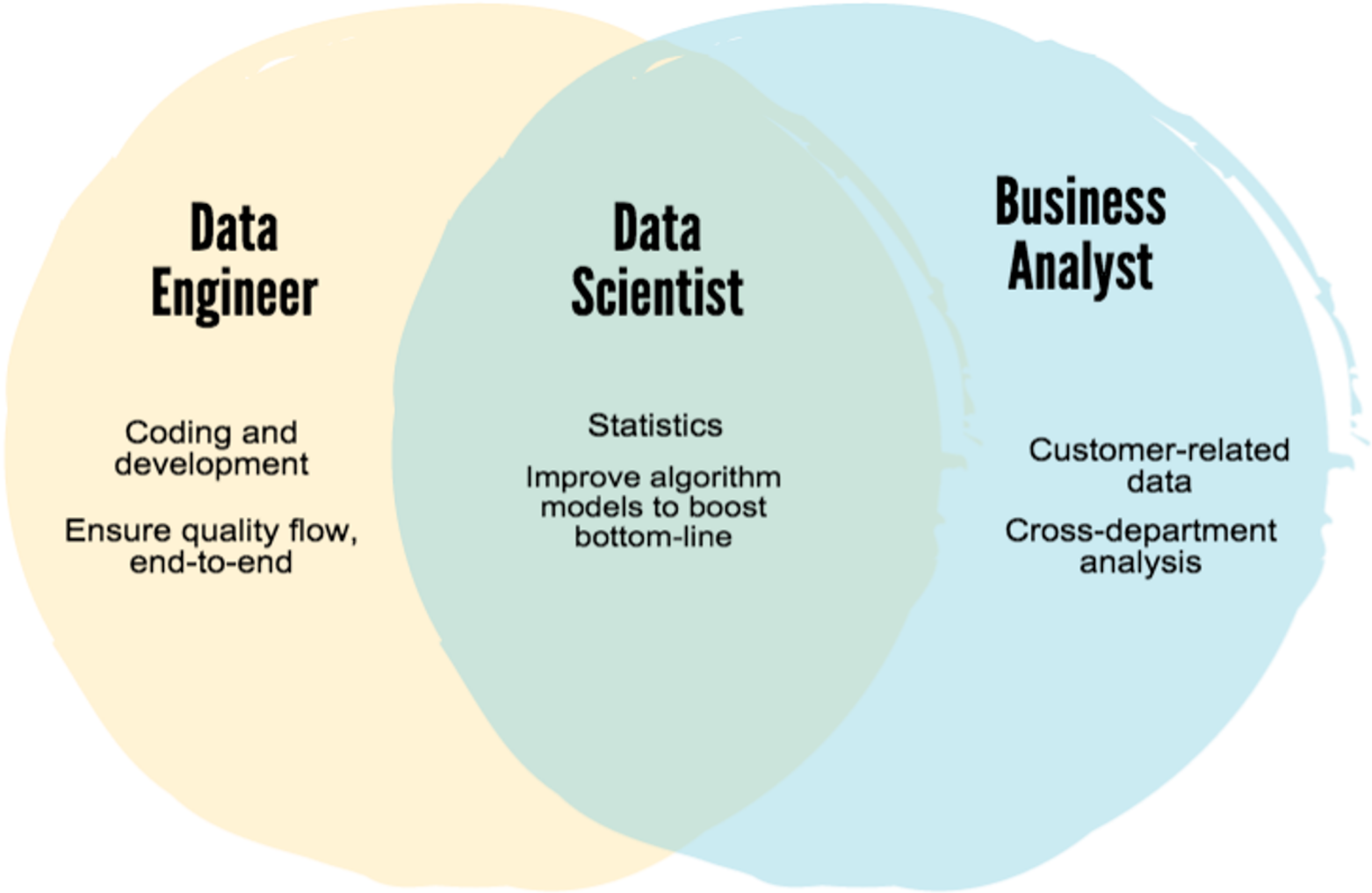
What is a Data Scientist?



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SOFTWARE

Algorithms in Decision Making

FUZZY BOUNDARIES

RULE-BASED DECISION MAKING

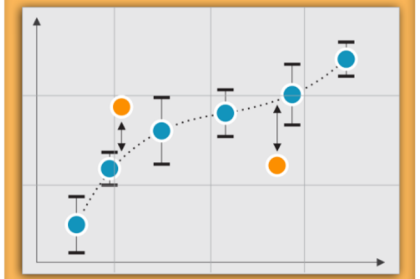
...

IF condition fulfilled ***THEN***
activity 1
ELSE
activity 2
...

Boolean data
(yes or no)

Examples:
- phone notification
- time- or threshold-based alarms
- simple pattern matching

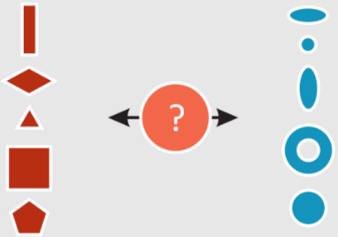
STATISTICAL REASONING



Numerical data
allowing for curve fitting

Examples:
- extra- and interpolation
- outlier detection
- predictive maintenance

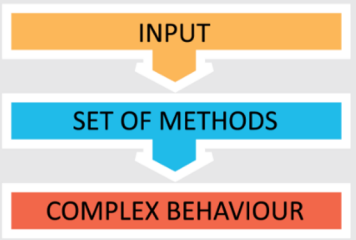
MACHINE LEARNING



Arbitrary data
that needs to be abstracted into numbers

Examples:
- identification of relevant features from large input datasets
- quality control using various metrics

ARTIFICIAL INTELLIGENCE



Autonomous selection of best methodology when presented with **arbitrary data**

Examples:
- autonomous vehicles
- human-like conversational skills
- intelligent digital assistant

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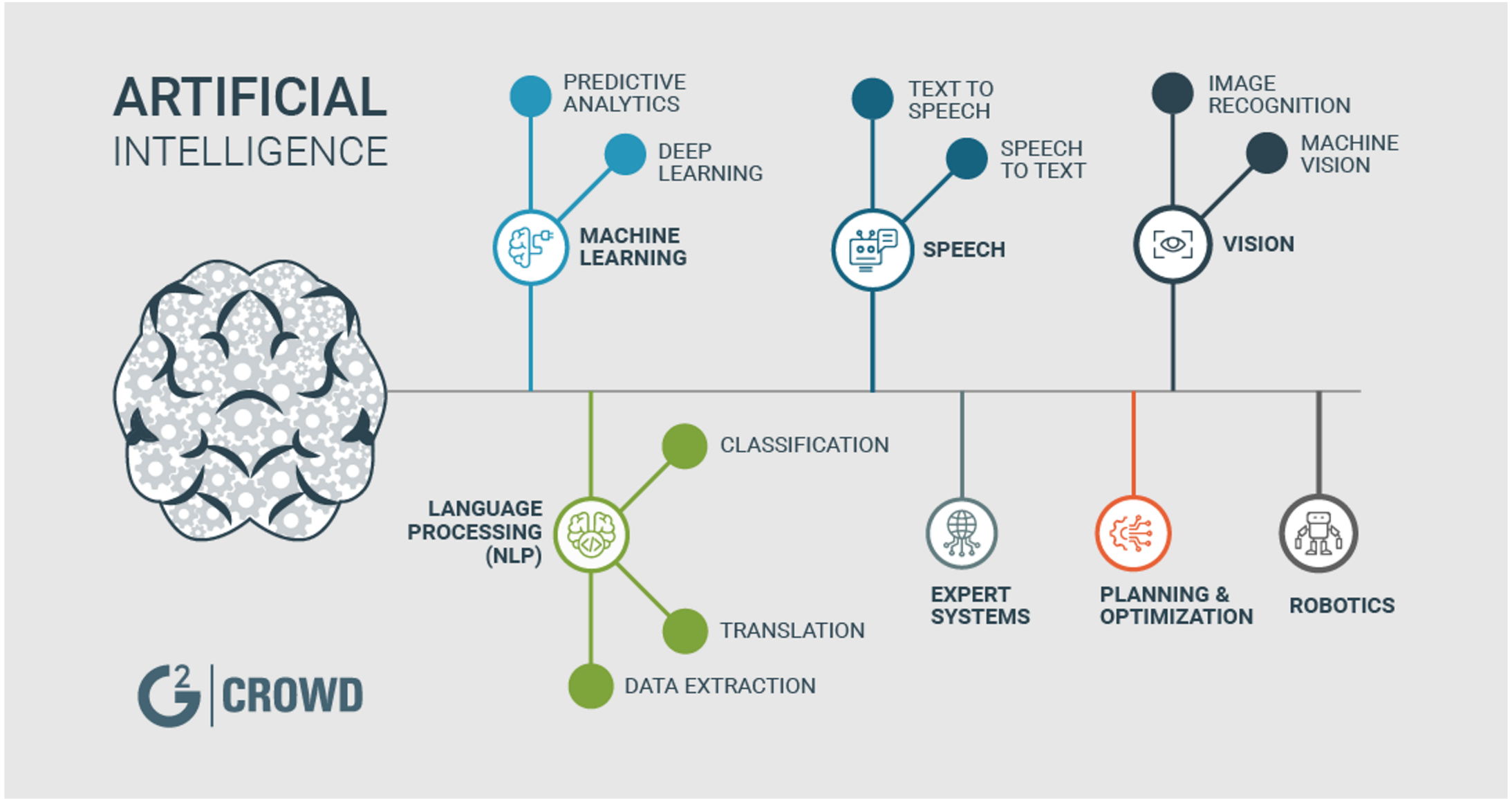
ARTIFICIAL
INTELLIGENCE
PREDICTIVE ANALYTICS
DEEP LEARNING
MACHINE LEARNING
TEXT TO SPEECH
SPEECH TO TEXT
SPEECH
IMAGE RECOGNITION
MACHINE VISION
VISION
LANGUAGE PROCESSING (NLP)
CLASSIFICATION
TRANSLATION
DATA EXTRACTION
EXPERT SYSTEMS
PLANNING & OPTIMIZATION
ROBOTICS
G2 CROWD

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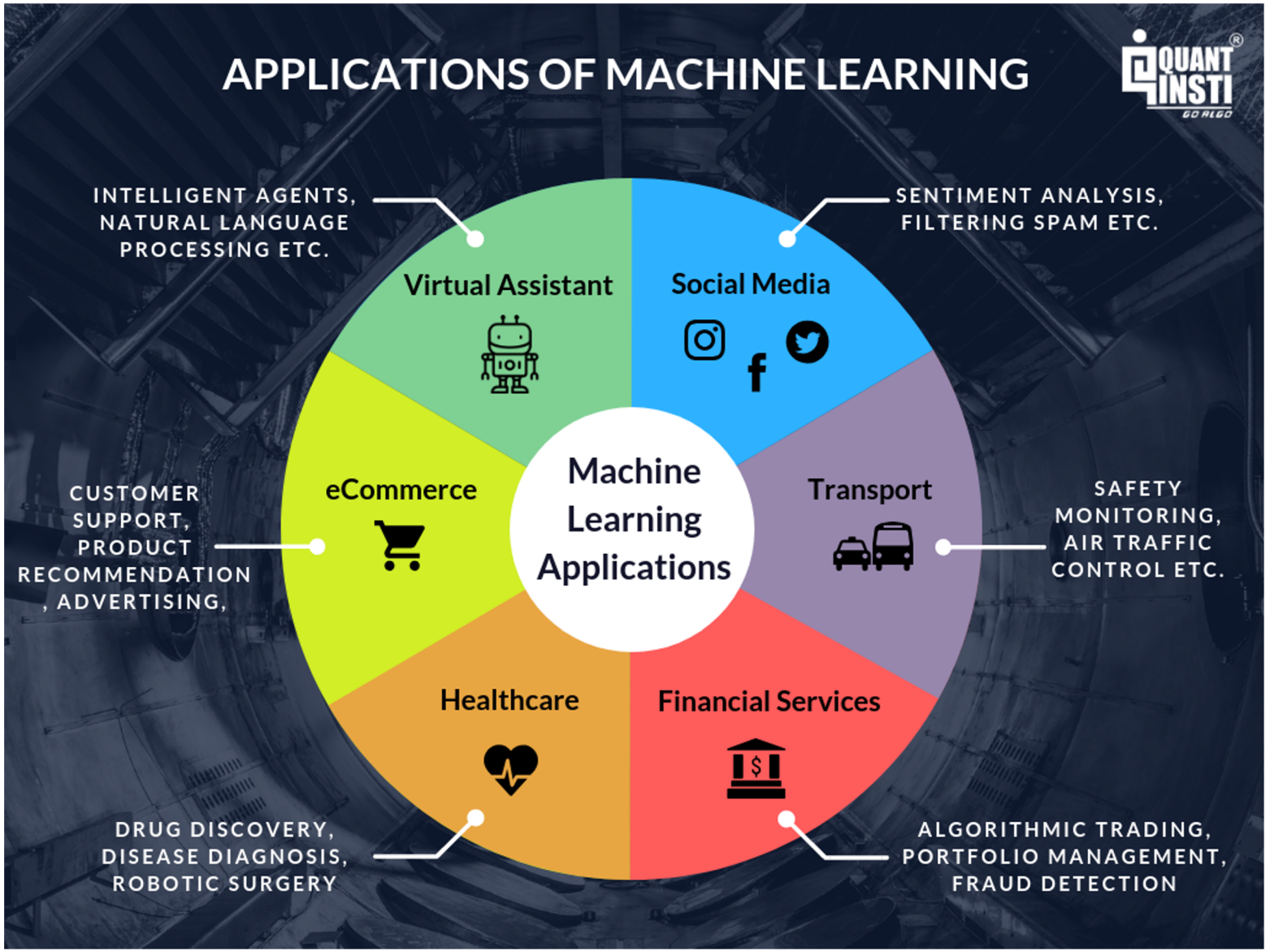
Where is Data Science used?



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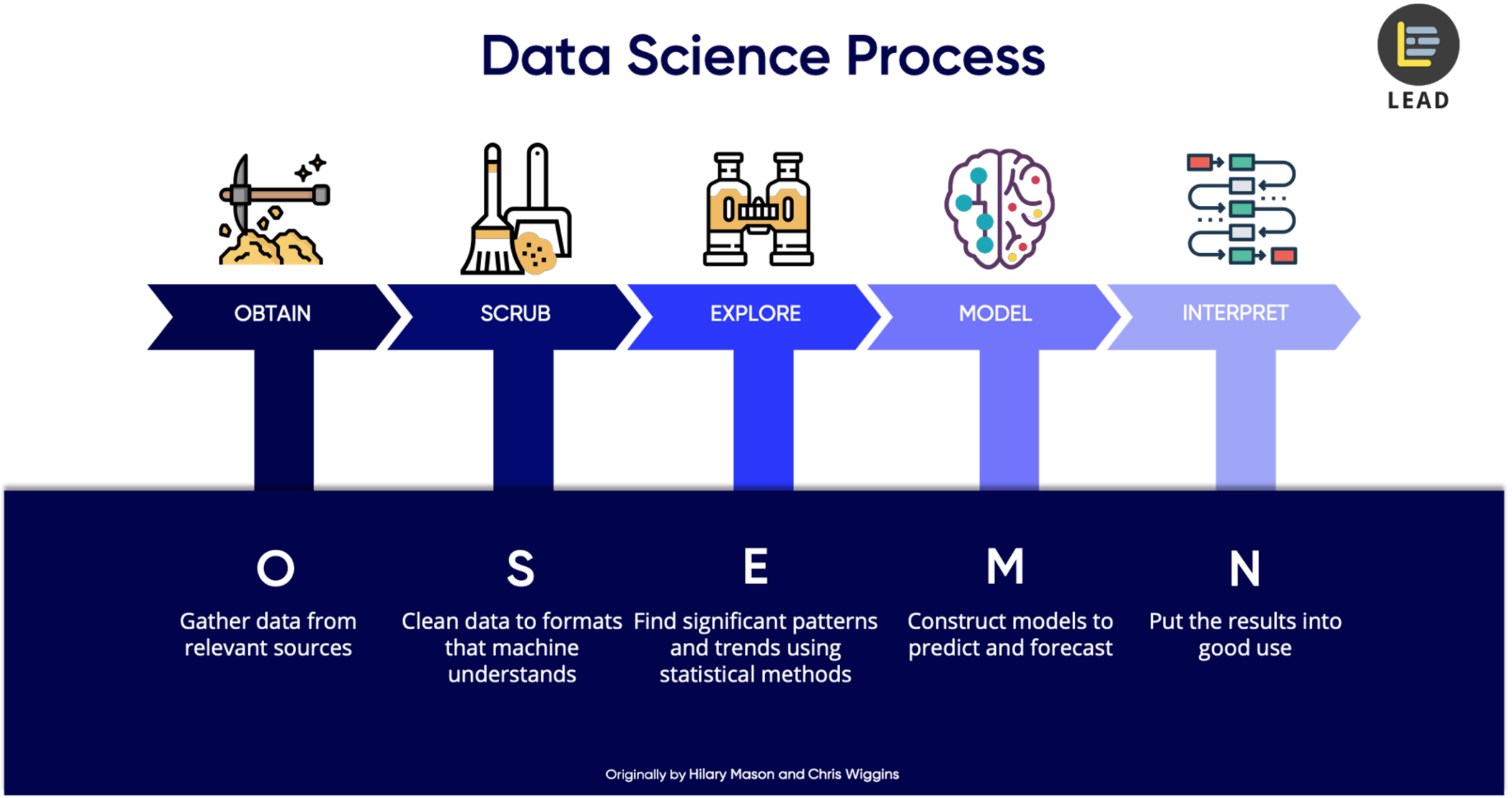
Understanding AI is complex



LEAD

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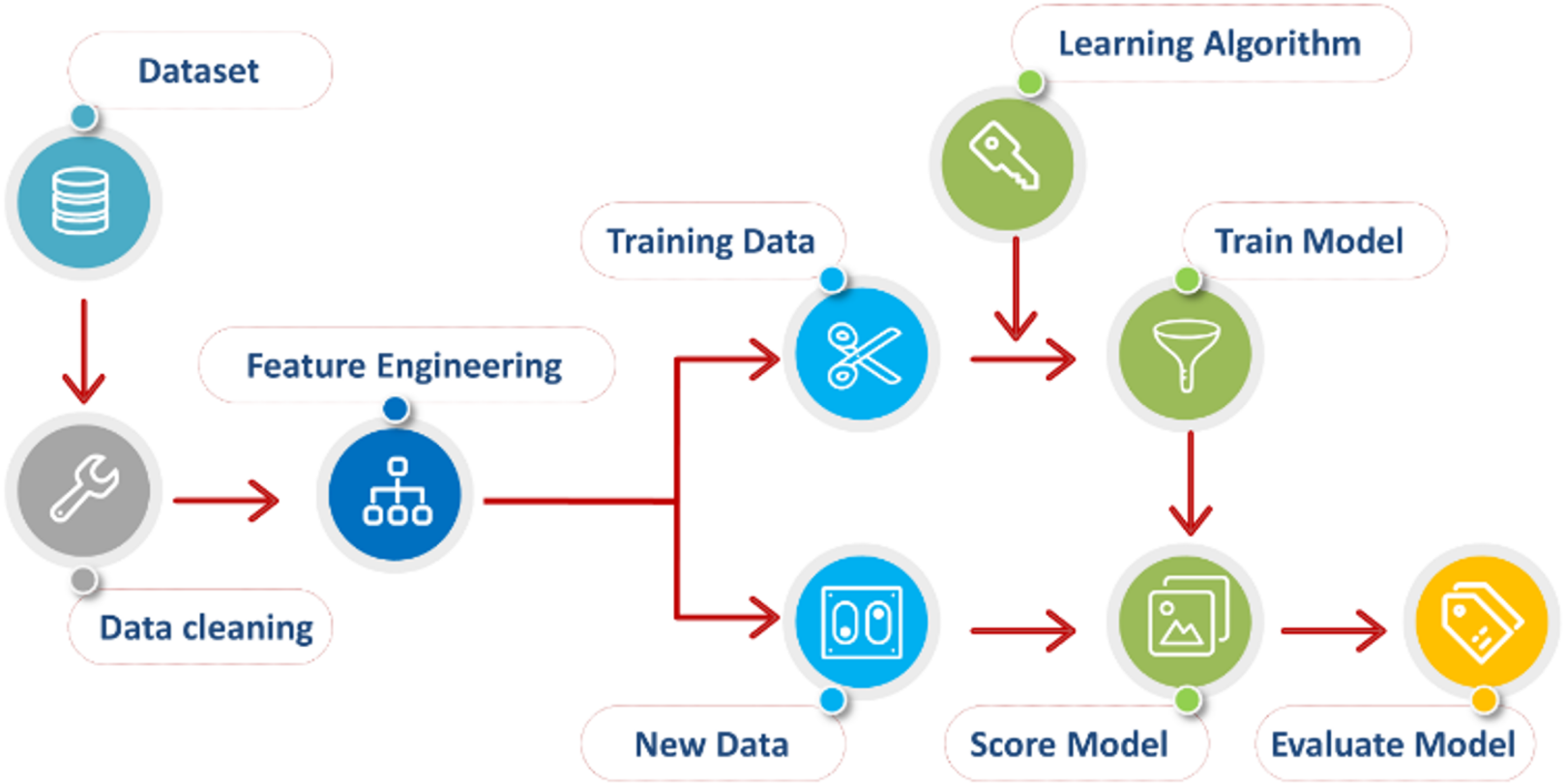
End to end process of building a model



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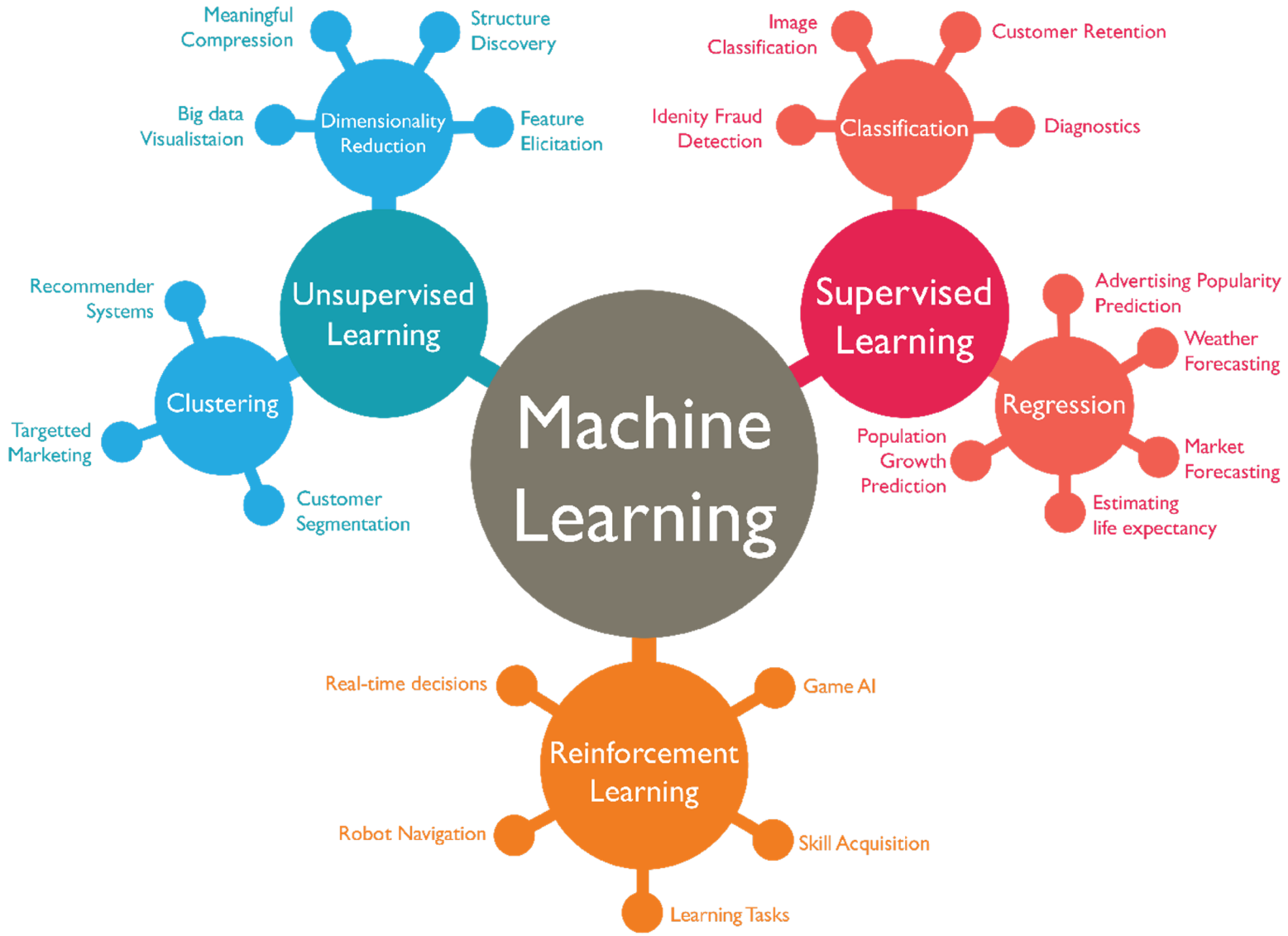
Types of Machine Learning



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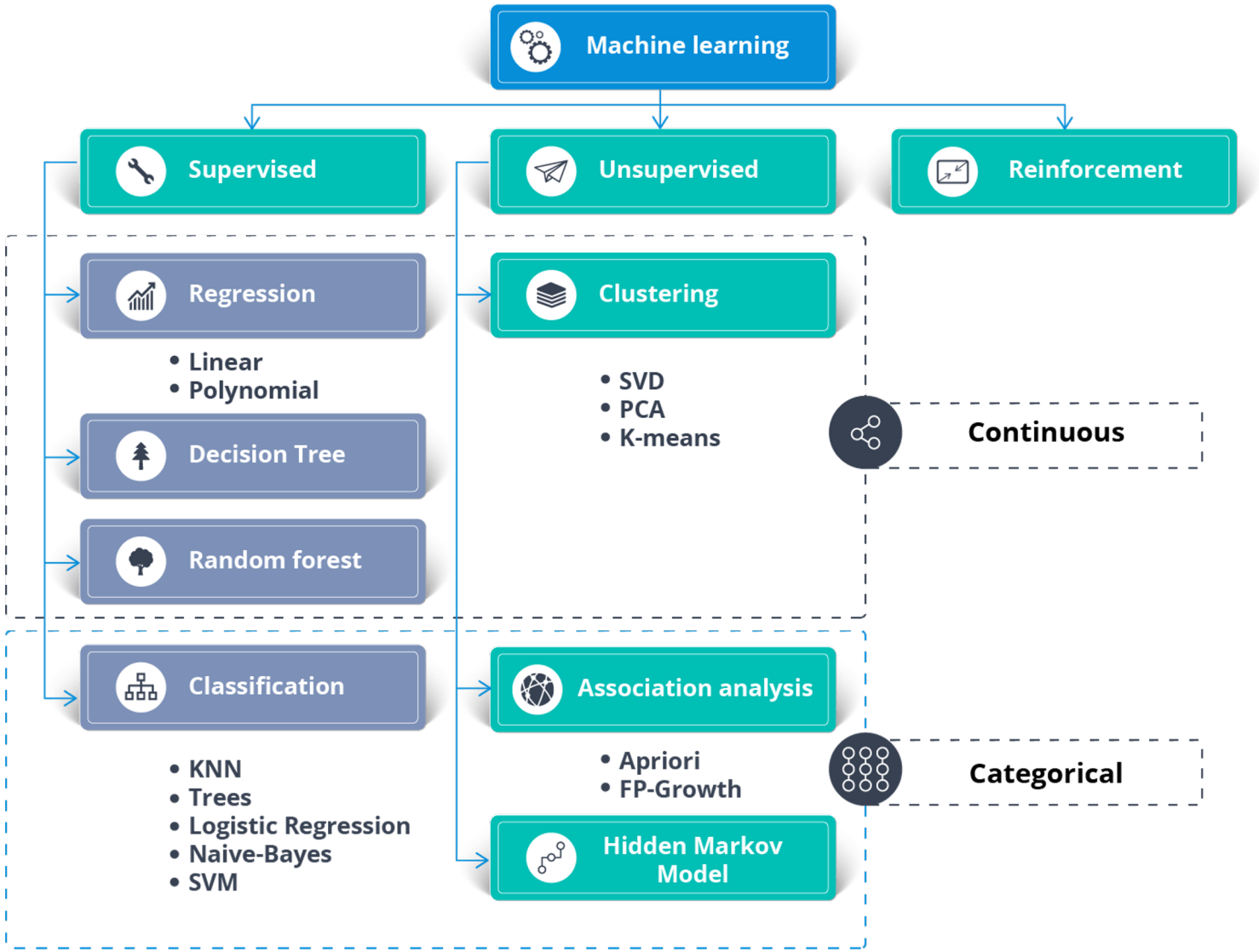
Machine Learning Models



dmlc XGBoost

kaggle

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Deep Learning the new cool thing

Artificial Intelligence

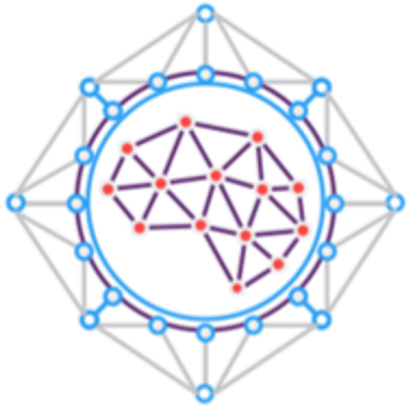
Early artificial intelligence stirs excitement

Machine Learning

Machine learning begins to flourish

Deep Learning

Deep learning breakthroughs drive AI boom



1950's 1960's 1970's 1980's 1990's 2000's 2010's 2020's 2030's

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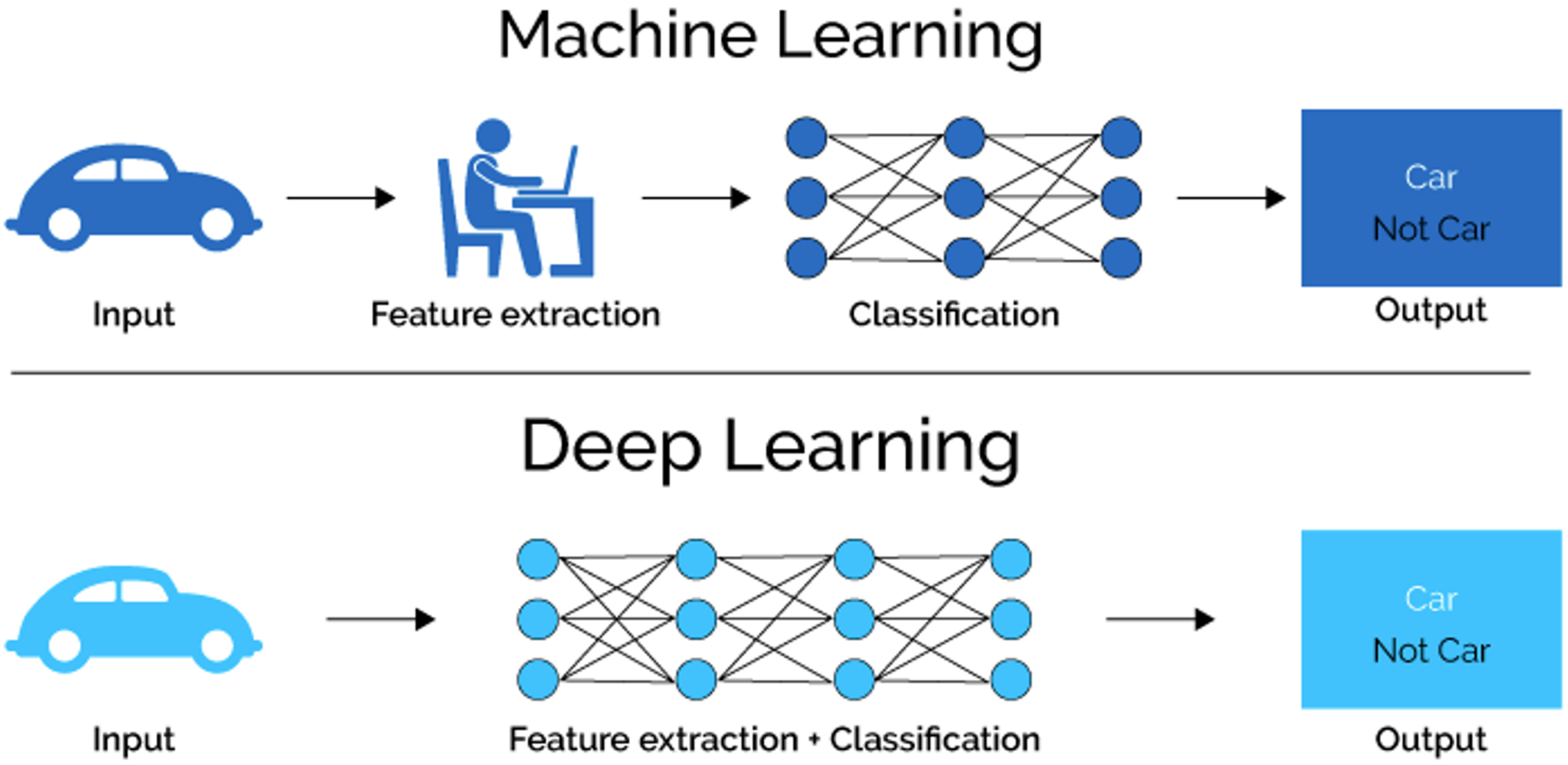
Deep Learning the new cool thing



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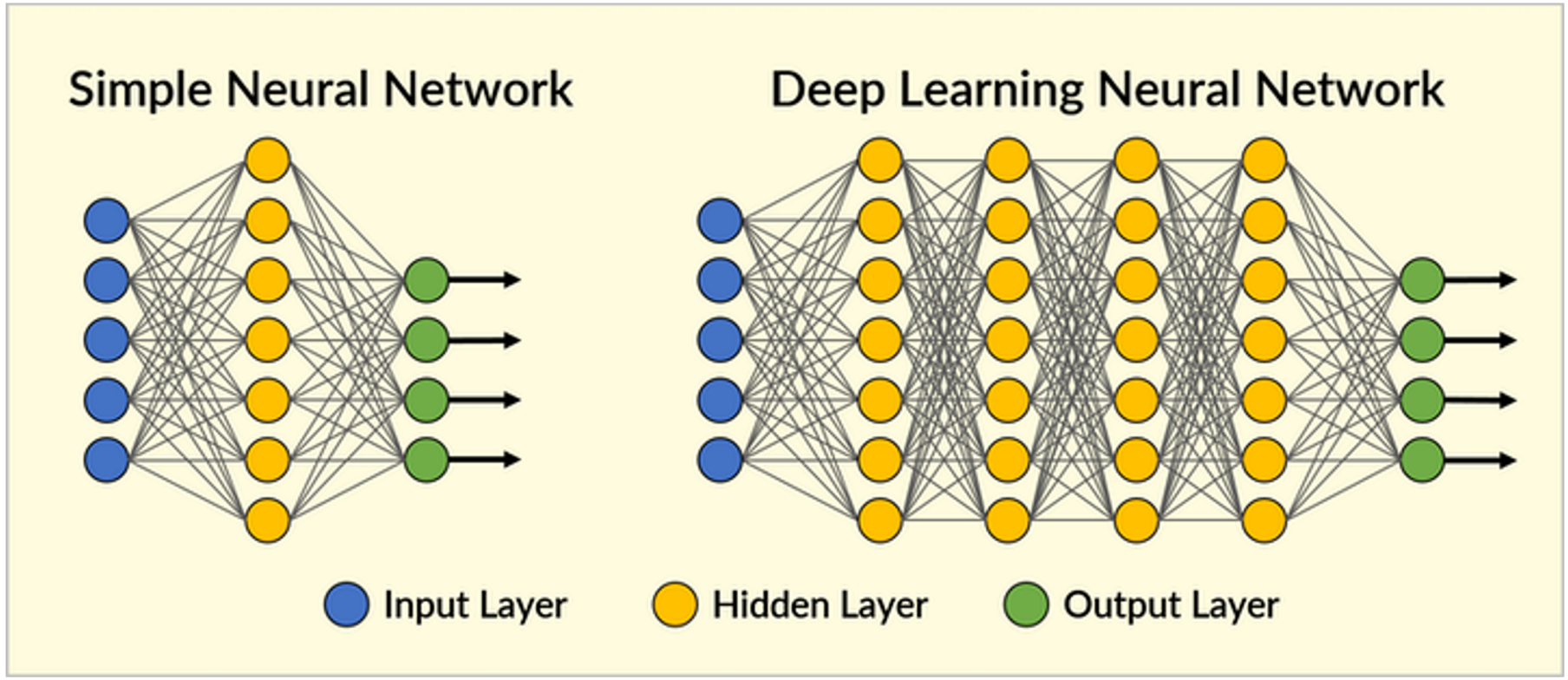
Deep Learning the new cool thing



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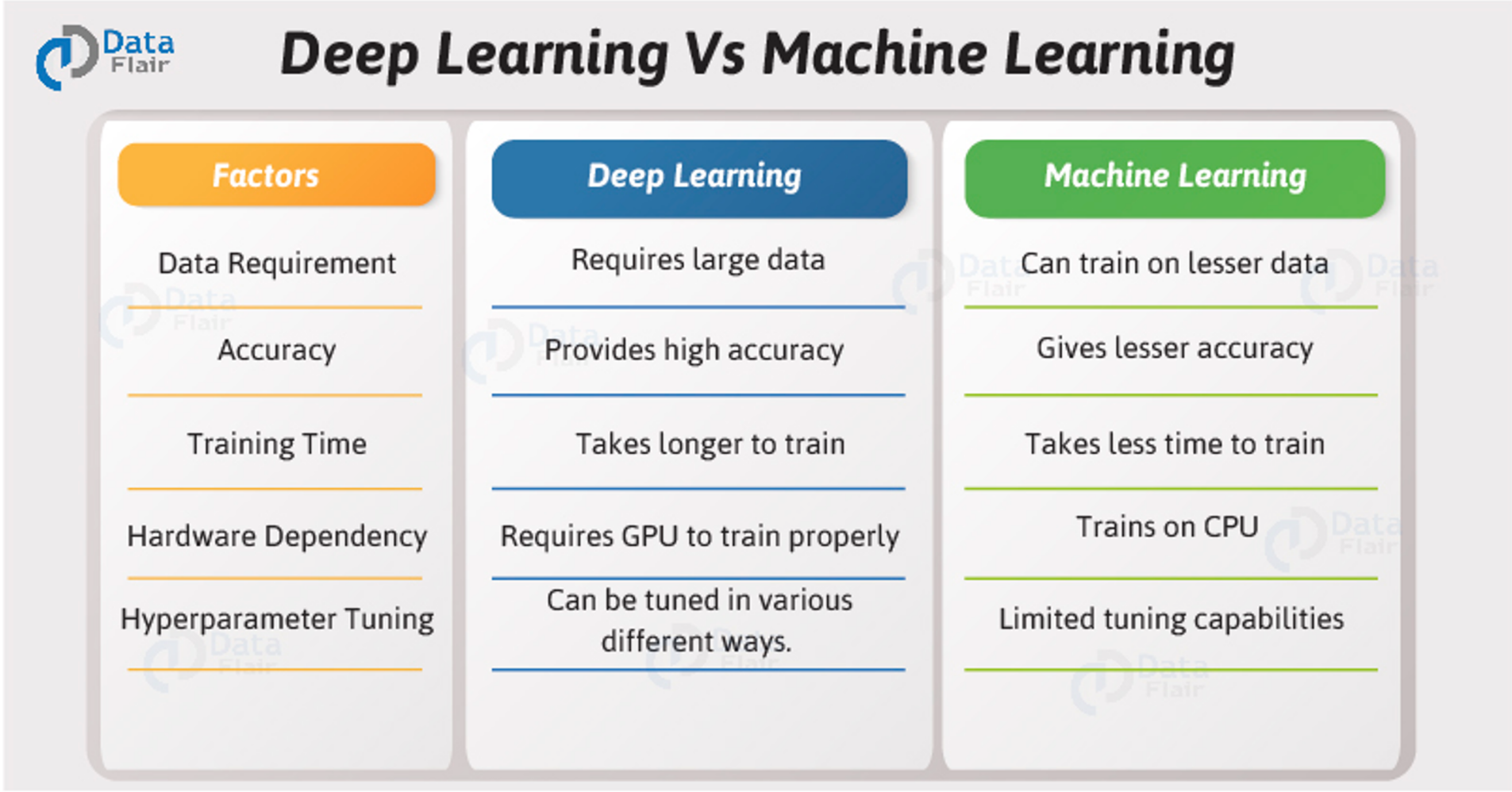
More data, add more layers and it works!

What about Deep Learning?



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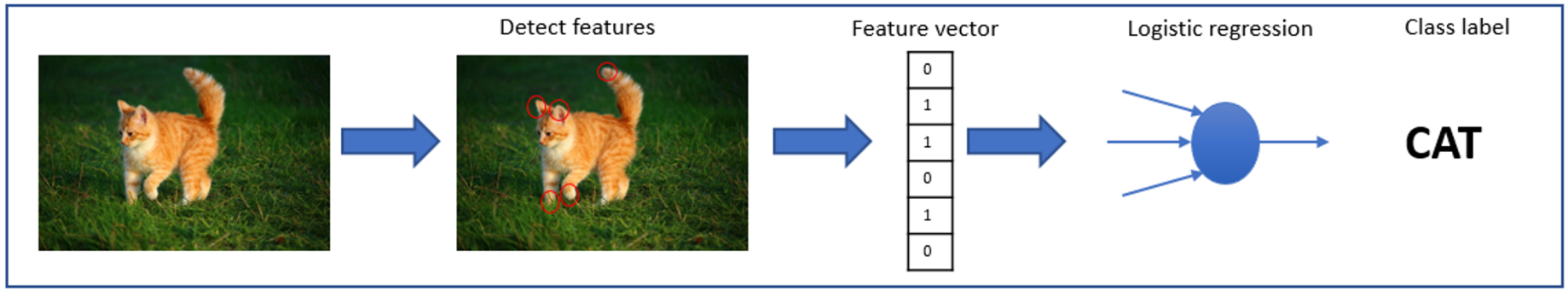
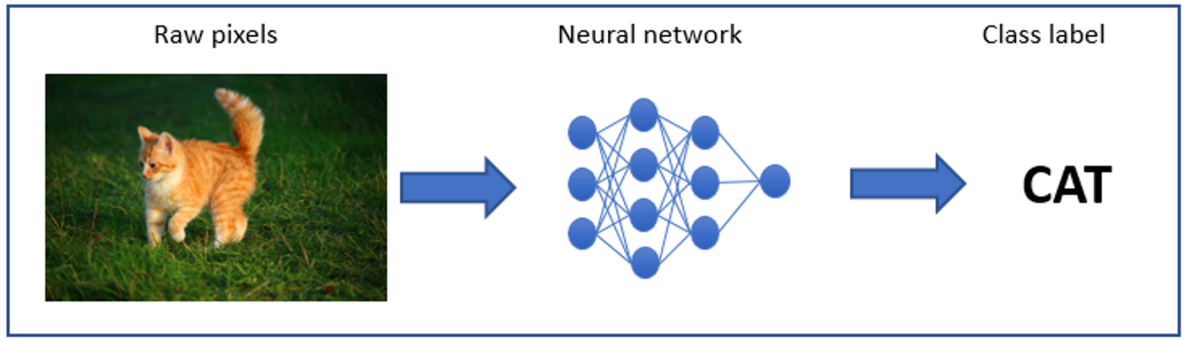
How to easily build visual AI applications

Traditional Computer Vison



Deep learning



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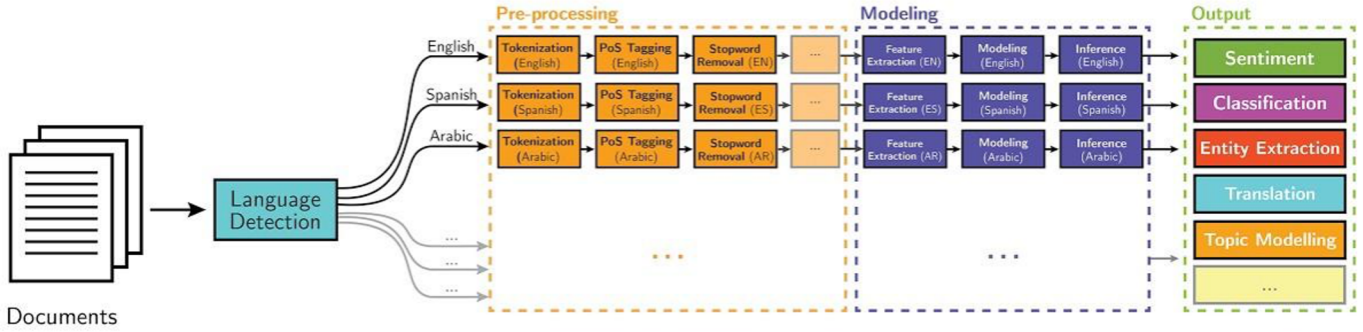
OpenCV

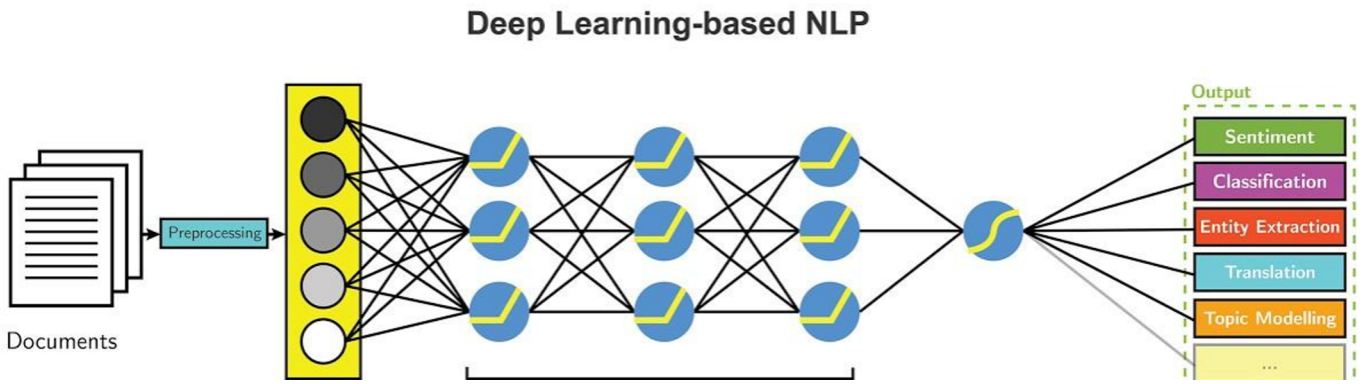
PyTorch

TorchVision

Facebook Open Source

How to easily build NLP AI applications





spaCy

RASA NLU

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Transformers

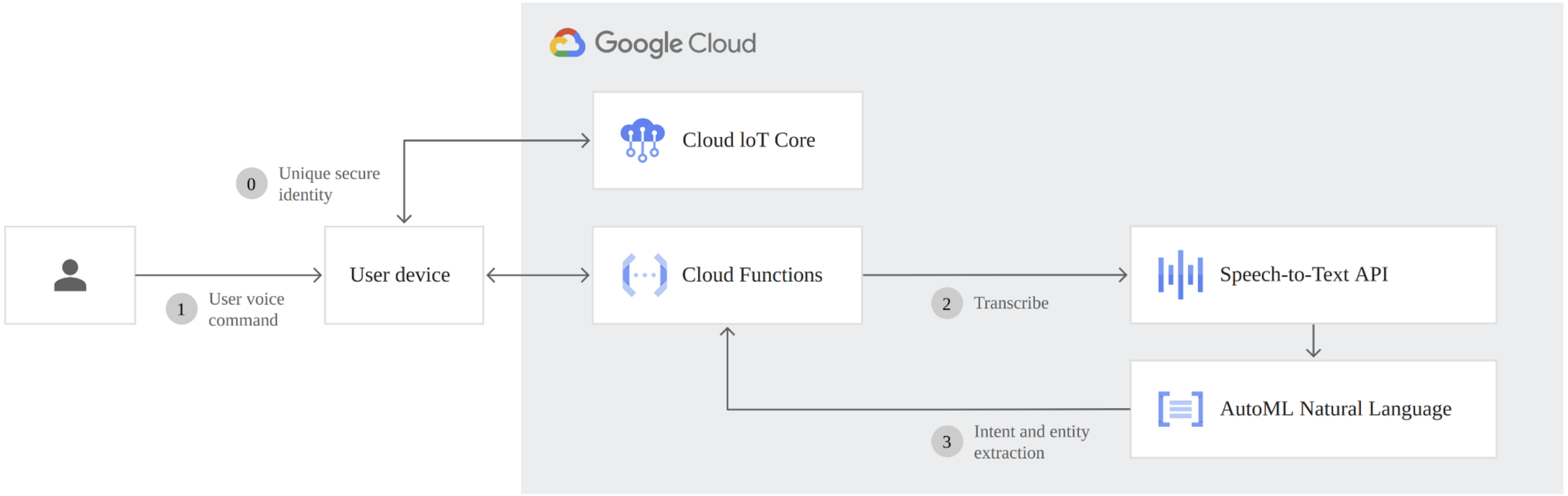
Transformers

build failing license Apache-2.0 website online release v4.6.0 Contributor Covenant v2.0 adopted

State-of-the-art Natural Language Processing for Jax, PyTorch and TensorFlow

1. **ALBERT** (from Google Research and the Toyota Technological Institute at Chicago) released with the paper ALBERT: A Lite BERT for Self-supervised Learning of Language Representations, by Zhenzhong Lan, Mingda Chen, Sebastian Goodman, Kevin Gimpel, Piyush Sharma, Radu Soricut.
2. **BART** (from Facebook) released with the paper BART: Denoising Sequence-to-Sequence Pre-training for Natural Language Generation, Translation, and Comprehension by Mike Lewis, Yinhan Liu, Naman Goyal, Marjan Ghazvininejad, Abdelrahman Mohamed, Omer Levy, Ves Stoyanov and Luke Zettlemoyer.
3. **BARThez** (from École polytechnique) released with the paper BARThez: a Skilled Pretrained French Sequence-to-Sequence Model by Moussa Kamal Eddine, Antoine J.-P. Tixier, Michalis Vazirgiannis.
4. **BERT** (from Google) released with the paper BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding by Jacob Devlin, Ming-Wei Chang, Kenton Lee and Kristina Toutanova.

How to easily build audio AI applications



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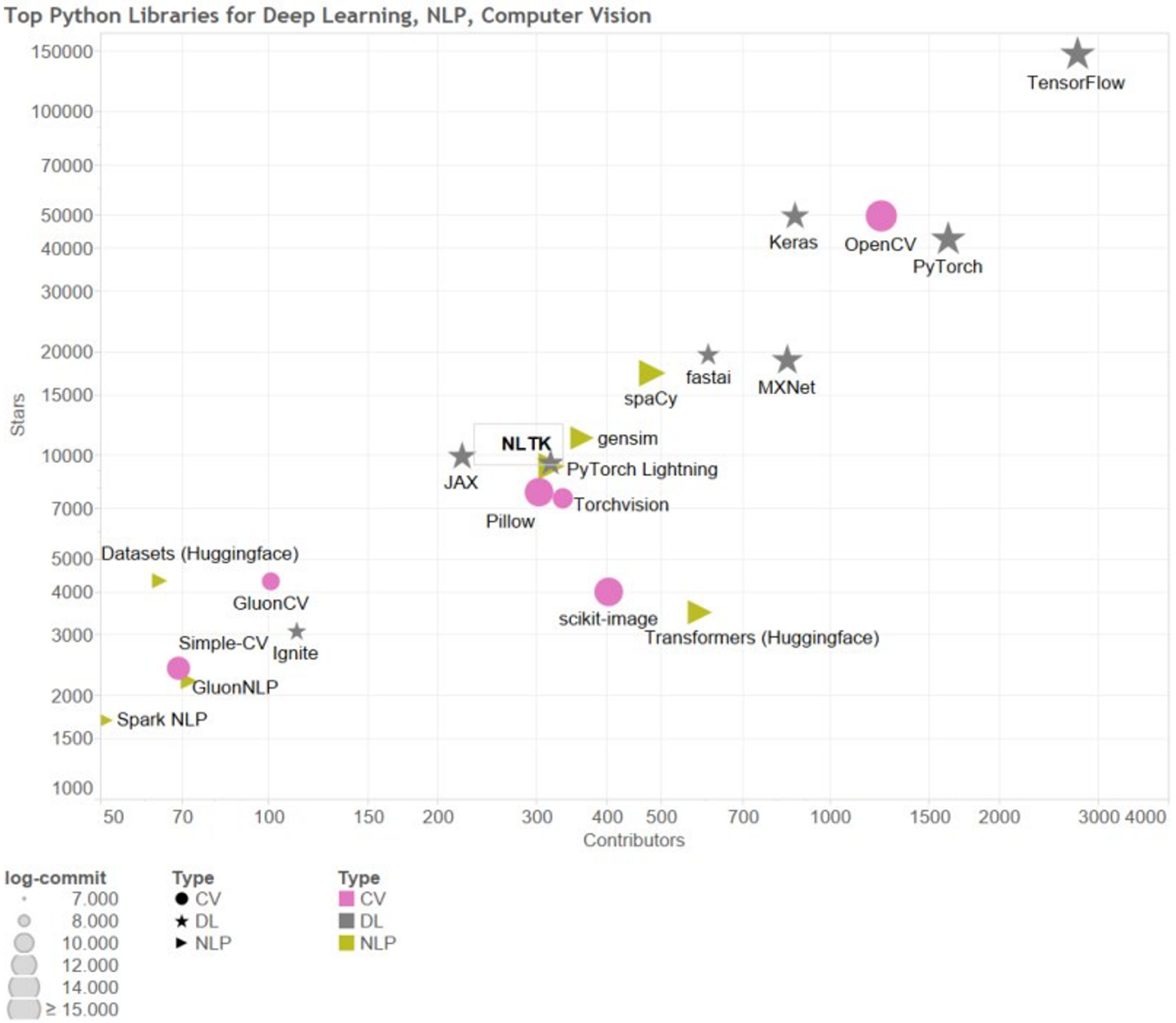
Top Python Libraries for Deep Learning, NLP, Computer Vision
Stars
Contributors
150000
100000
70000
50000
40000
30000
20000
15000
10000
7000
5000
4000
3000
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300
400
500
700
1000
1500
2000
3000
4000
TensorFlow
Keras
OpenCV
PyTorch
fastai
MXNet
spaCy
NLTK
gensim
JAX
PyTorch Lightning
Pillow
Torchvision
Datasets (Huggingface)
GluonCV
scikit-image
Transformers (Huggingface)
Simple-CV
Ignite
GluonNLP
Spark NLP
log-commit
7.000
8.000
10.000
12.000
14.000
≥ 15.000
Type
CV
DL
NLP
Type
CV
DL
NLP

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How to easily build AI applications

Questions?

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