

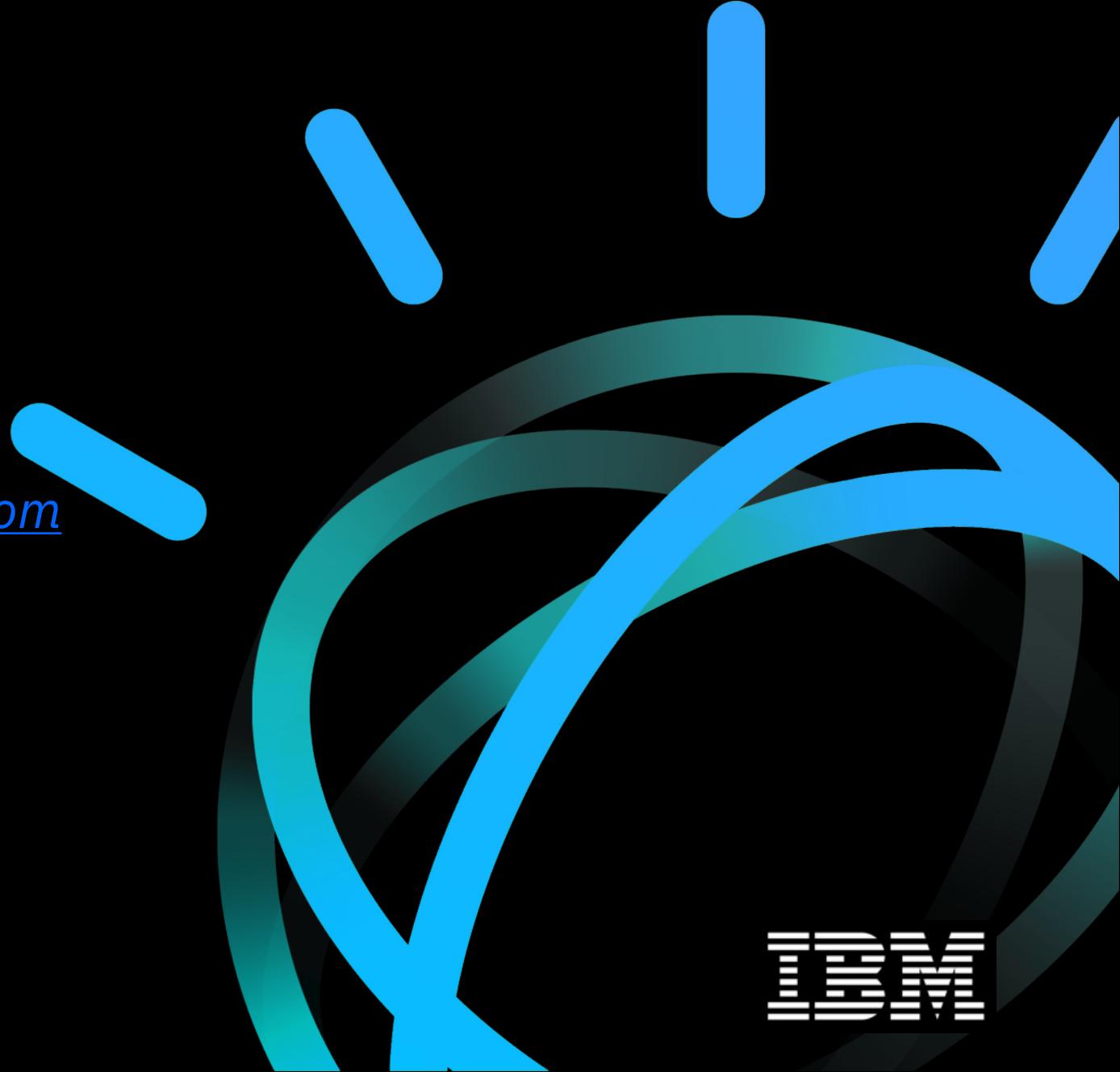
Watson Studio

Machine Learning Deep Learning

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Cloud Developer Advocate Europe &
Data Scientist

October 2019



POWER7

WATSON

POWER7

POWER7

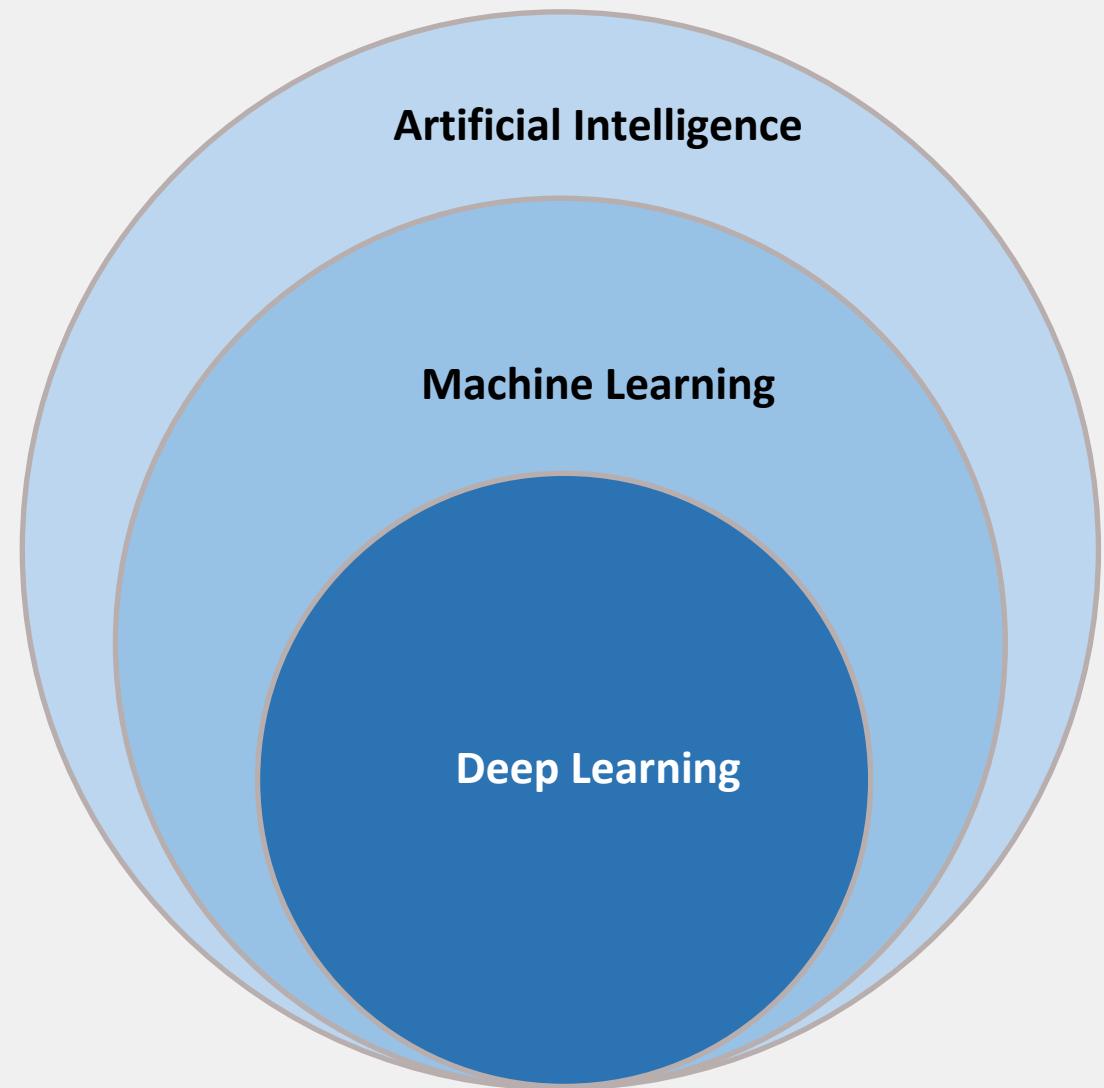
Machine Learning is algorithm selection

Deep learning is neural network design

AI is systems architecture

AI is probabilistic

- Science of building intelligent machines
- Needs to be trained
- Deep Learning is where AI truly shines



Learning

One critical component of any kind of intelligence is the ability to learn.

- Supervised
- Unsupervised
- Reinforcement Learning
- Deep Learning



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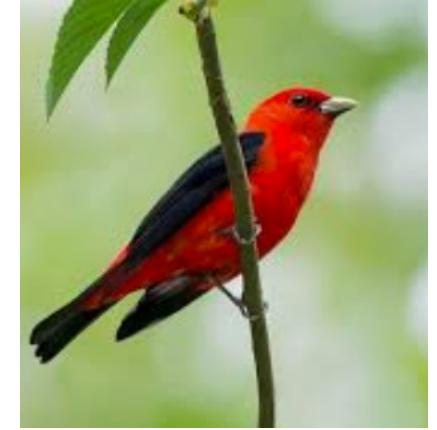
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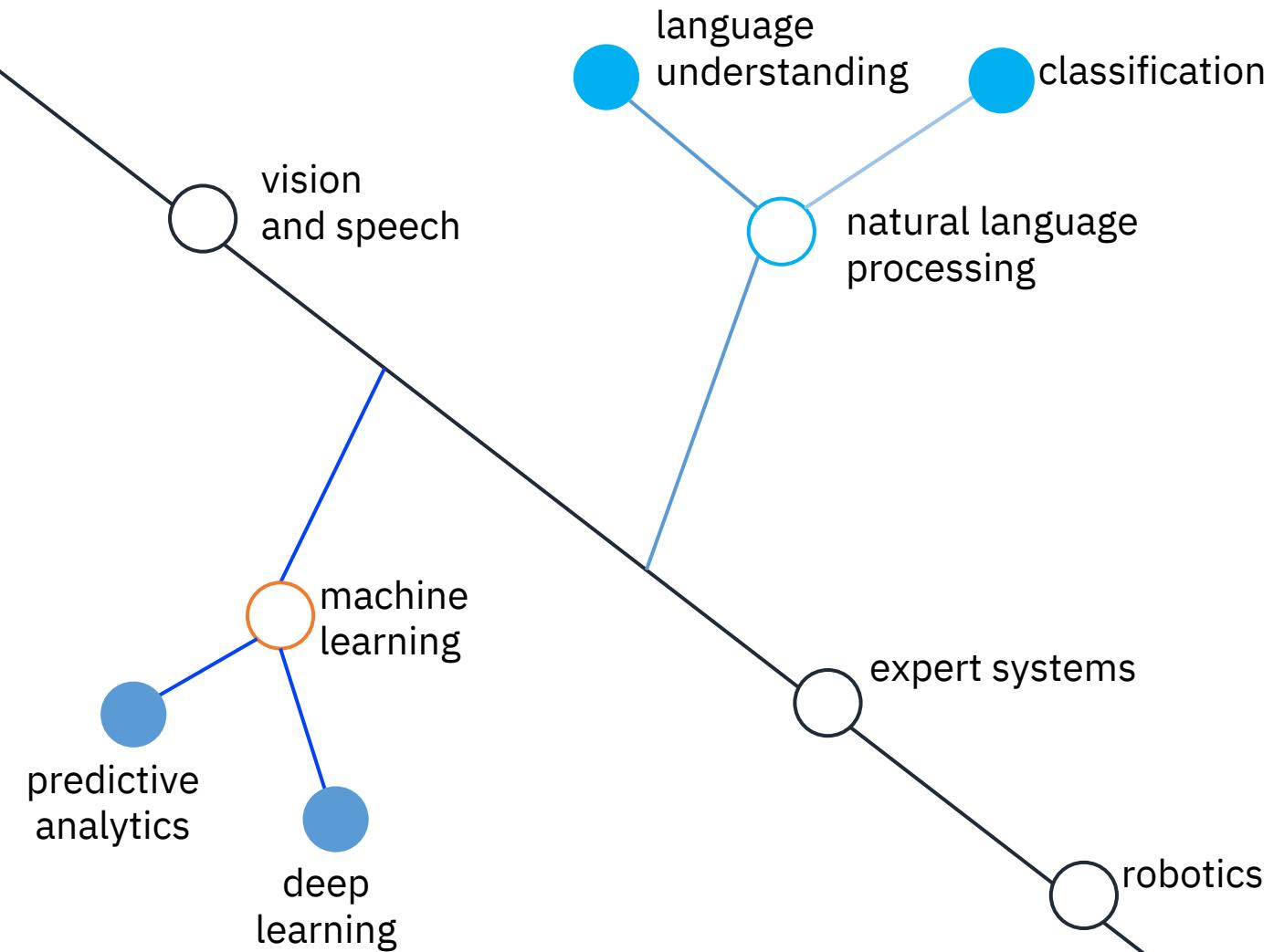
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Artificial Intelligence

AI is the theory and development of computer systems to perform tasks that normally require human intelligence.

AI systems continuously learn using such techniques as machine learning and deep learning to solve problems in machine vision, speech and natural language.



Every Business and Enterprise is Embracing AI

Leaders everywhere
are monetizing data
and developing
strategies to embed
AI in business



Sales

Market basket analysis,
next-best offer,
customer churn,
propensity to buy, and
smart engagement.



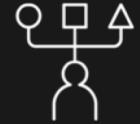
Marketing

Discount targeting, email
optimization, and lifetime
client value, basket
recommendation
systems.



Human Resources

Medicare fraud, AI-
assisted diagnosis, and
drug demand
forecasting.



Supply Chain

Predictive maintenance,
process optimization,
and demand forecasting.



Energy & Utilities

Power usage prediction,
maintenance, and smart
grid management.



Finance

Customer segmentation,
credit risk, and credit
card fraud detection.



Security

Activity monitoring,
intrusion detection, and
log analysis.



Data & Technology

Dynamic pricing, call
center assistance,
tourism forecasting, and
self-driving cars.

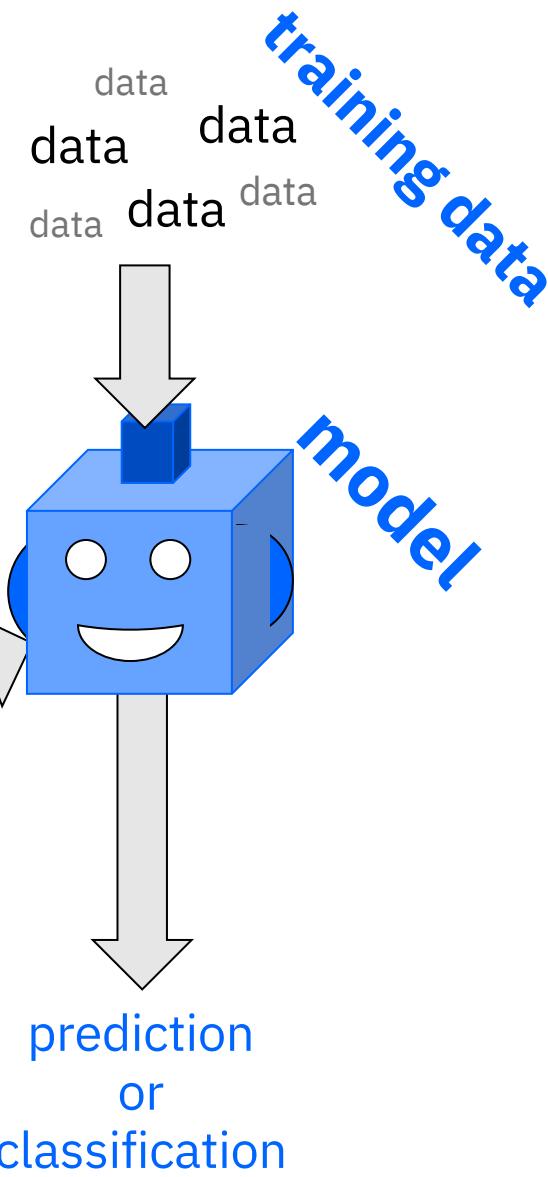
How does machine learning work?

Machine learning requires
TONS OF DATA

- ① A machine learning model is trained to recognize patterns in historical data

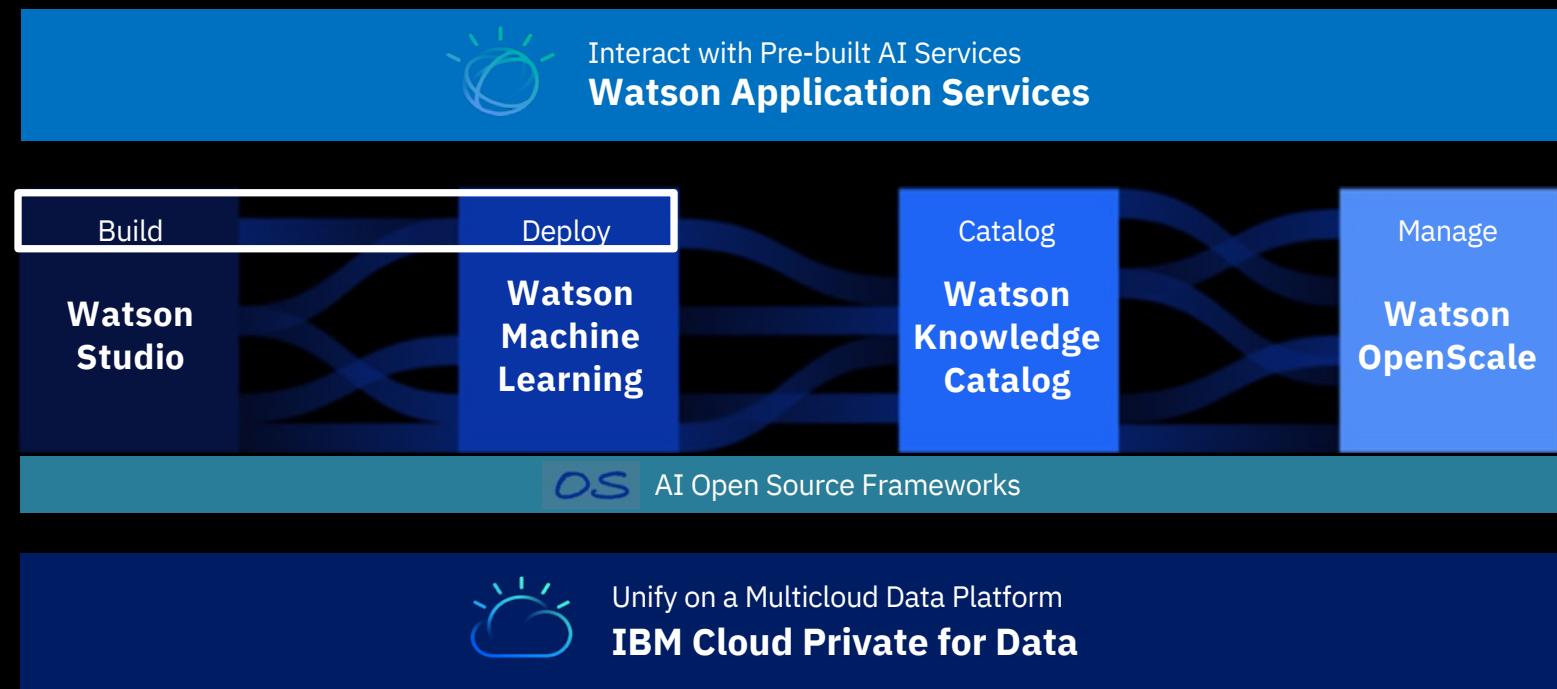
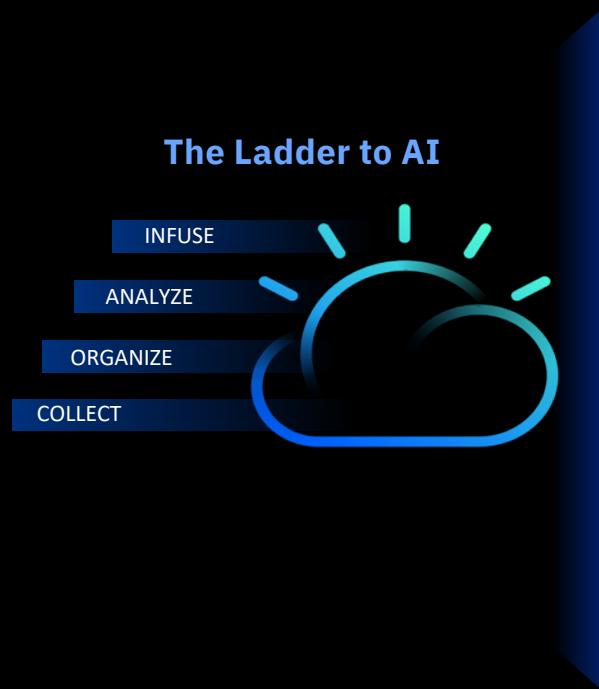
- ② The model is then shown new data and asked to predict or classify it.

- ③ If patterns in the new data match the training data then the model makes accurate predictions

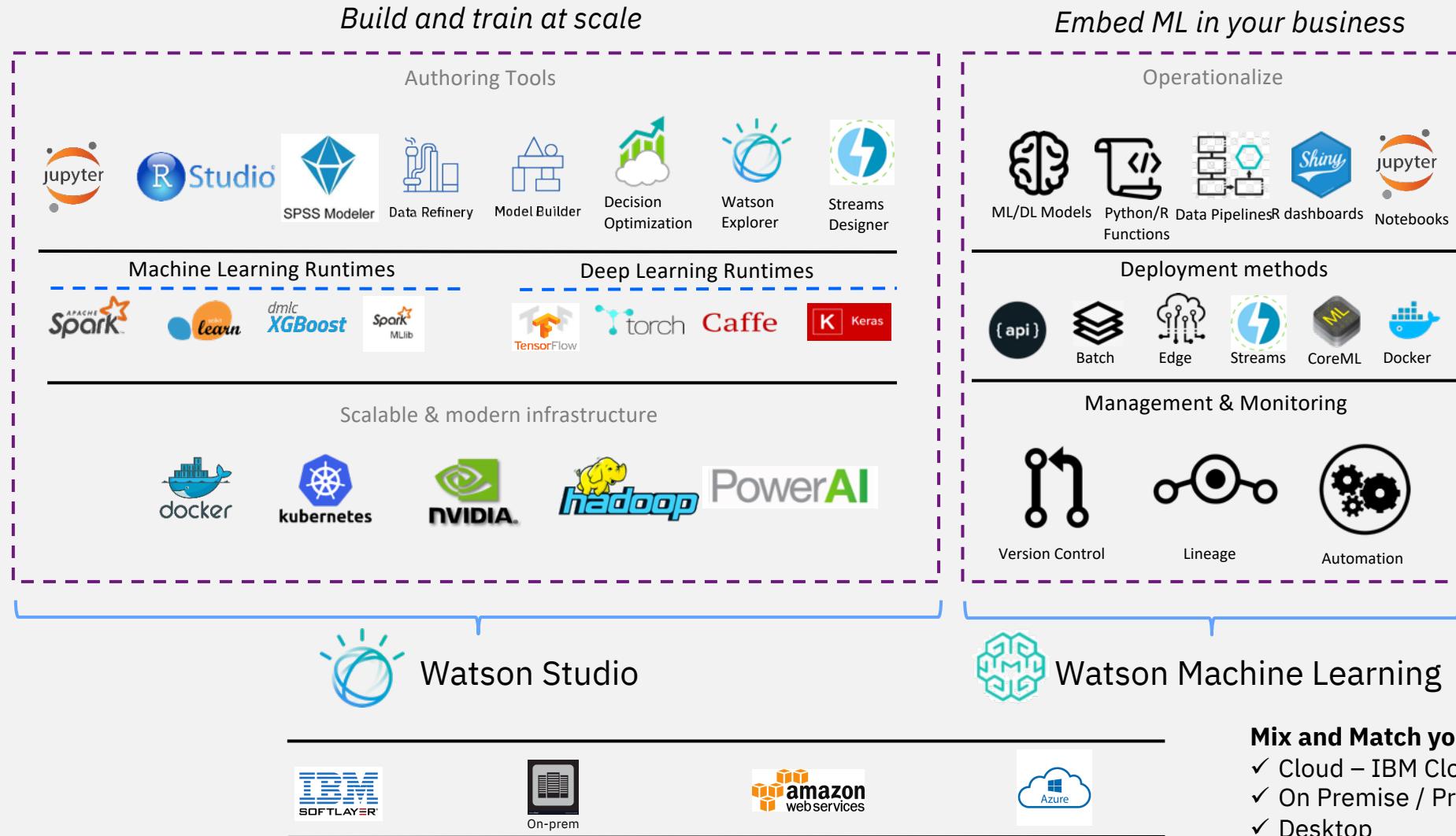


IBM AI Portfolio

Everything you need for Enterprise AI, on any cloud

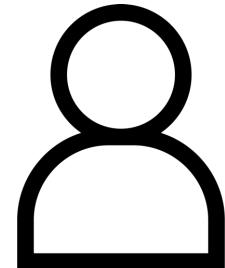
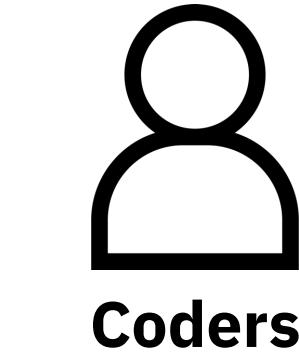


Watson Studio and Watson Machine Learning inject AI firepower into your business



Watson Studio

Two types of custom model builders



**Non-Coders
(Clickers)**



Deep Learning



Caffe



What is Watson Studio?

Enterprise Data Science platform that helps your team work together to build models to make better data driven decisions for your business

Analyze any data, no matter where it lives

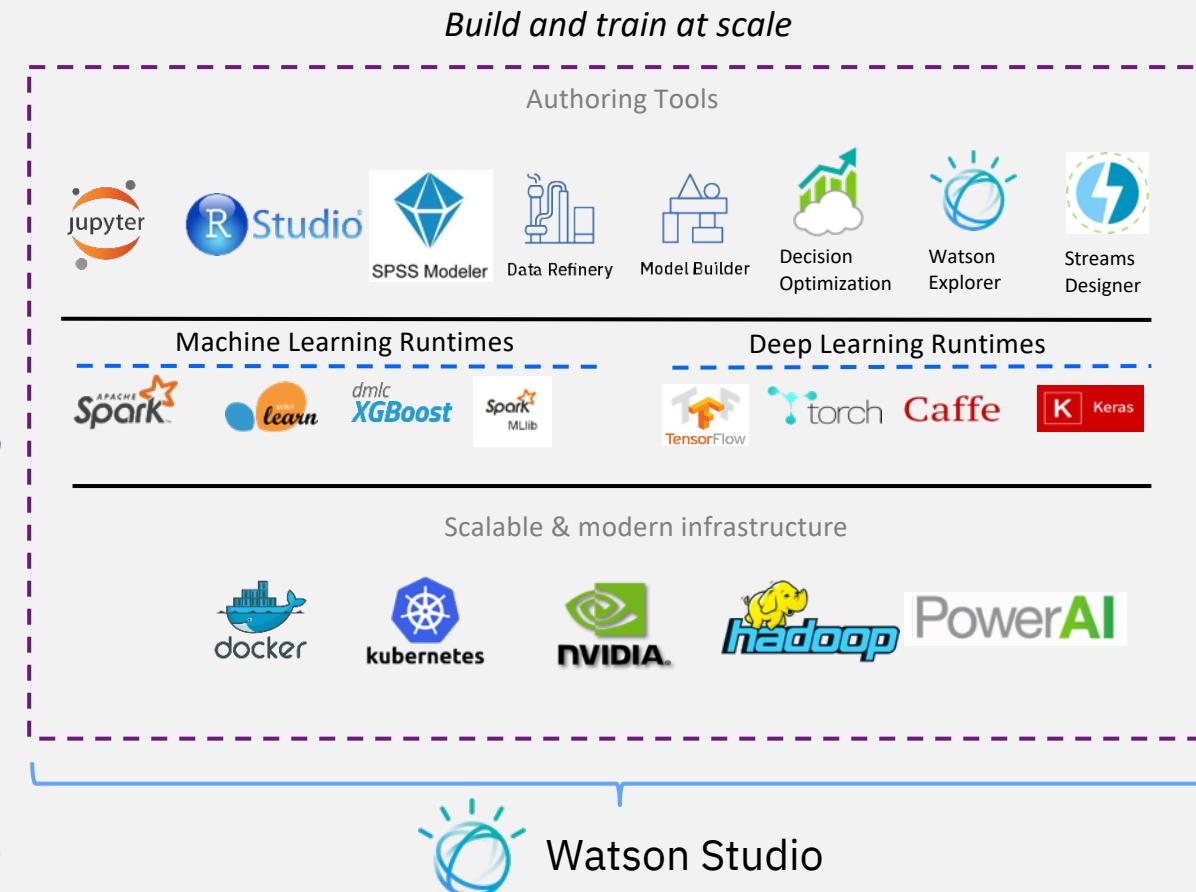
Connect to and analyze your data without moving a single byte through dozens of connectors and multiple deployment options

Empower your entire organization with notebooks, visual productivity, and automation tools

Leverage your entire organization with a variety of tools in a single integrated platform

One platform to rule them all from discovery to production

Analyze data, build predictive models, and seamlessly integrate with Watson Machine Learning to deploy



What is Watson Machine Learning?

Embed Machine Learning and Deep Learning in your Business

Deploy and Manage Models

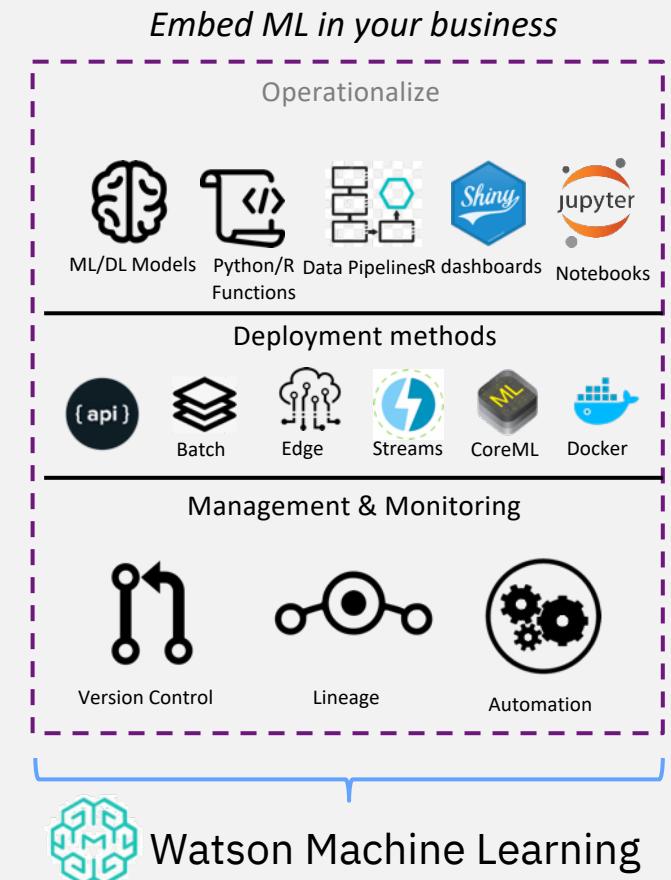
Move models to production, in an easy, secure, and compliant way

Enable Intelligent Model Operations

Embed intelligent training services, with feedback loops that constantly learn from new data, regardless where it resides

Accelerate Compute Intensive Workloads

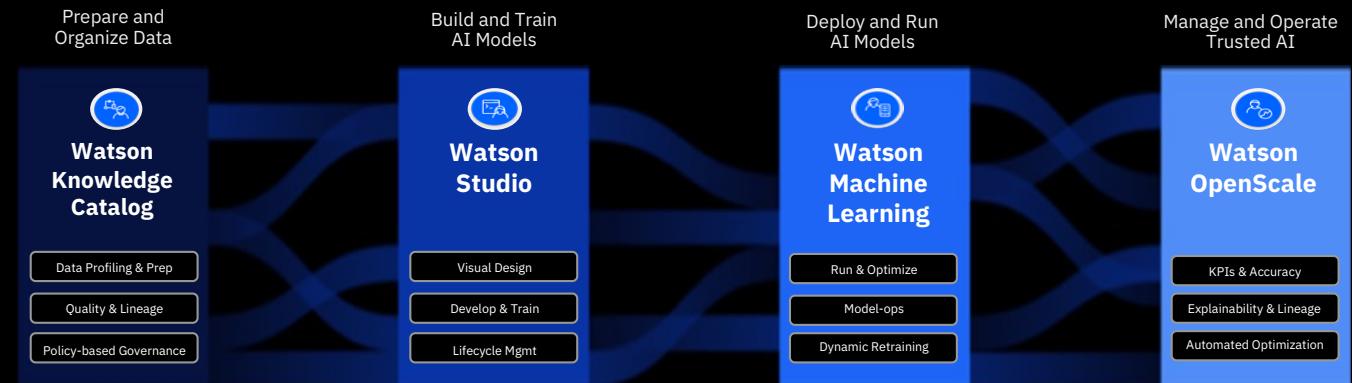
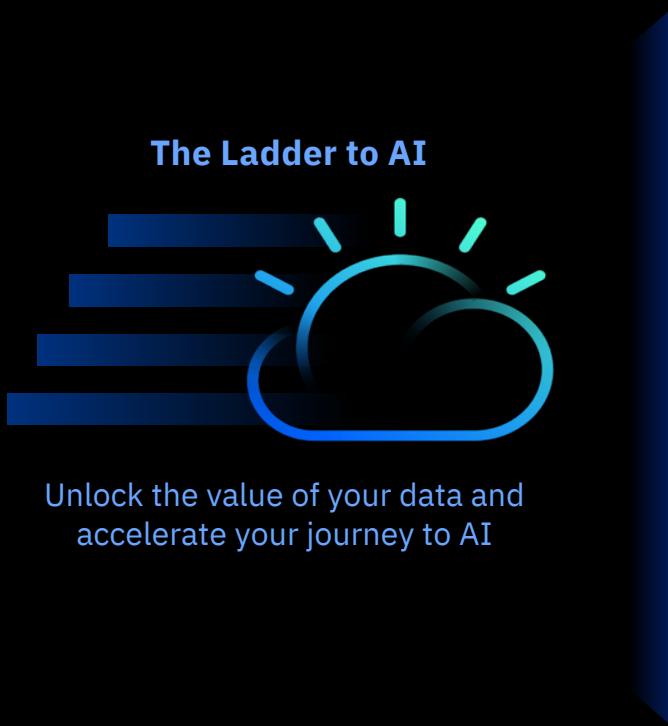
Distribute your deep learning training and Hadoop/Spark workloads with multi-tenant job scheduling



IBM Data and AI portfolio

Delivers the AI Ladder within one unified multicloud platform

Everything you need for enterprise data science and AI



✓ AutoAI Lifecycle Automation – “AI developing AI”



IBM Cloud



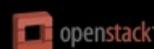
RED HAT
OPENSHIFT



aws



Azure



openstack



Google Cloud

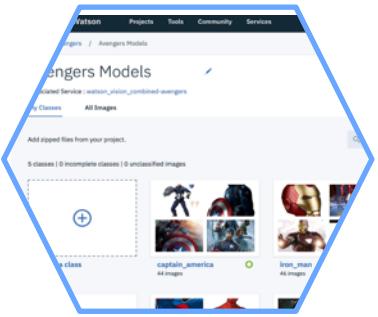


IBM Z

IBM Power Systems



IBM's Strategy for Automation of AI Development



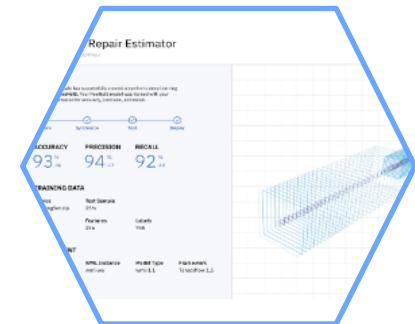
Transfer Learning

- Transfer knowledge learning in one deep learning system to apply to a different domain
- Featured in Watson Services, available through Watson Studio



AutoAI Experiments | Pipeline optimization

- Auto clean data, engineer features, and complete HPO to find the optimal end to end pipeline
- **New! AutoAI** GA as of May 2019



Neural Network Search

- Just bring data and automatically generate a custom deep neural network through searching the best architectures for the input data
- **NeuNetS** as a feature of Watson Studio, available in Open Beta

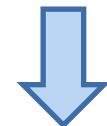
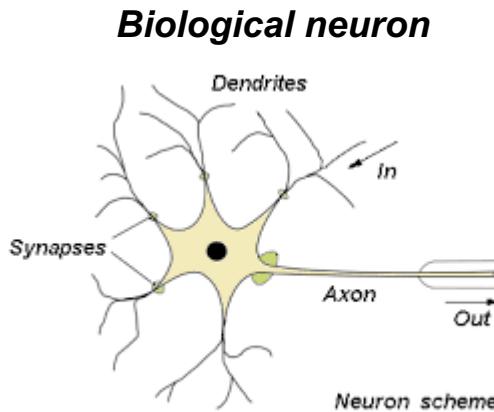
Connectionists : the Basics



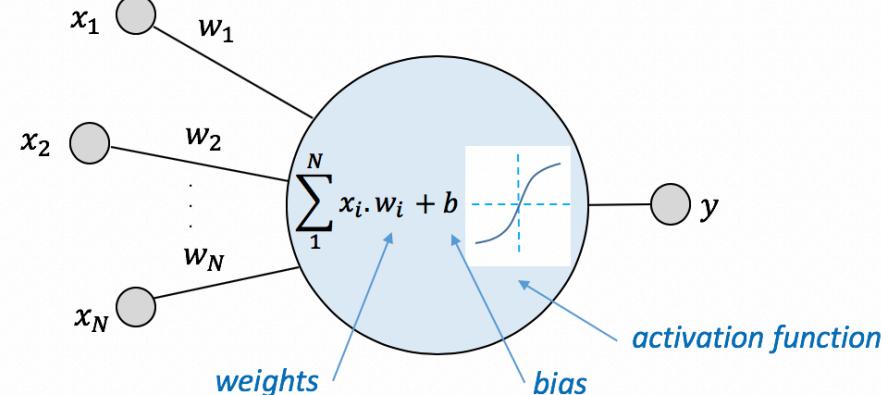
Brain

To acquire knowledge, brain uses an iterative automatic process in order to classify and create patterns.

The physical support of patterns is a huge network of neurons and synapses. Neurons and synapses form a dynamic Mesh.

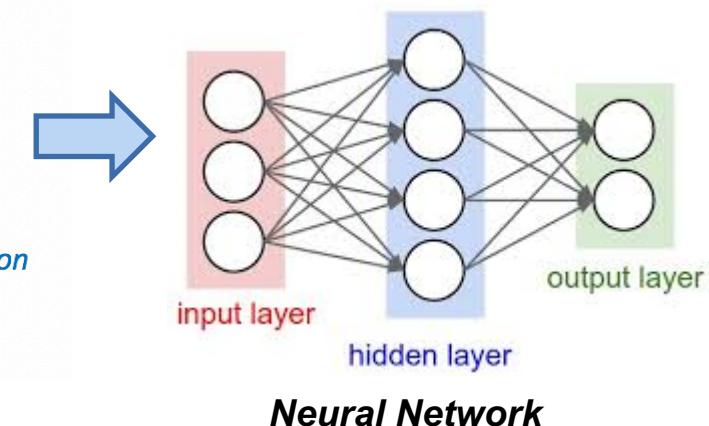


Digital neuron



A Cognitive system uses the same approach. It learns by automatically classifying information ingested, using a joint process :

- Natural Language Processing
- Knowledge Representation
- Pattern Recognition
- Generalization



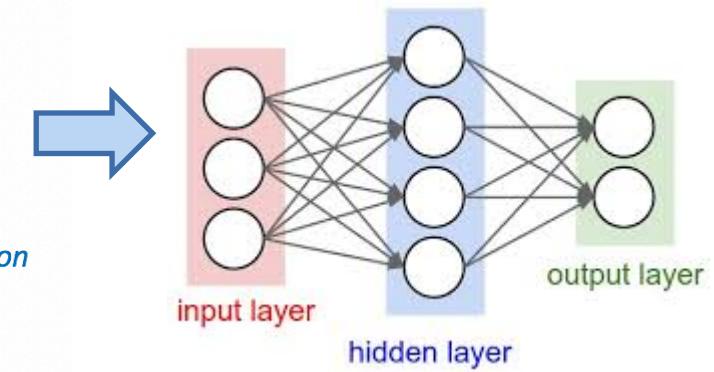
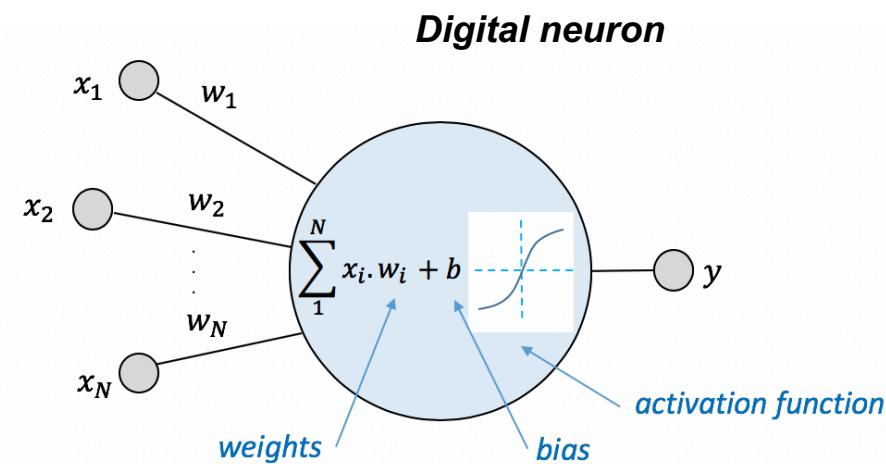
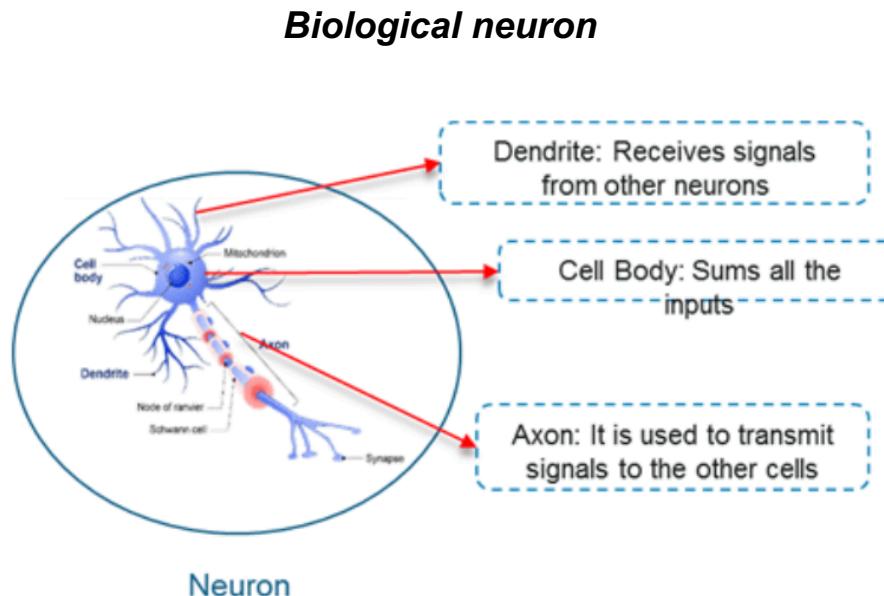
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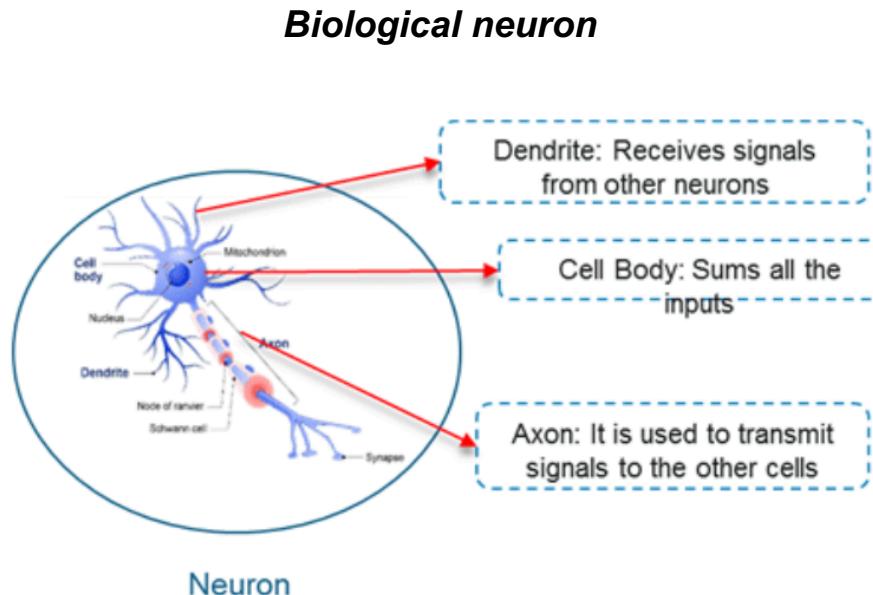
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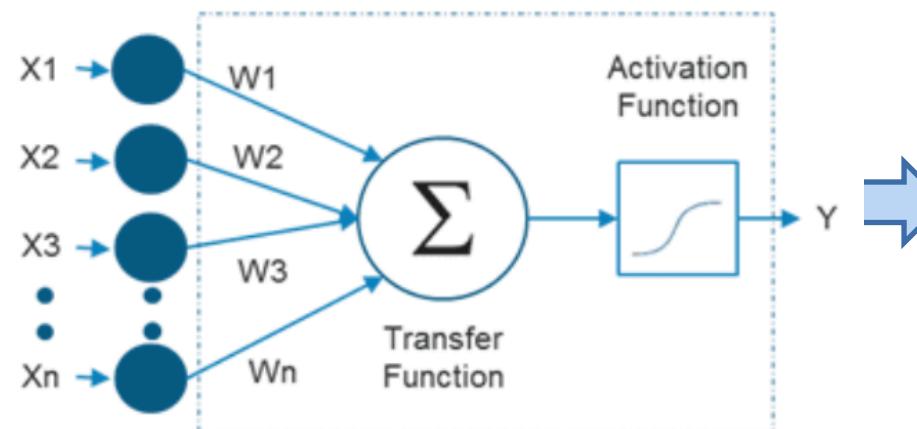
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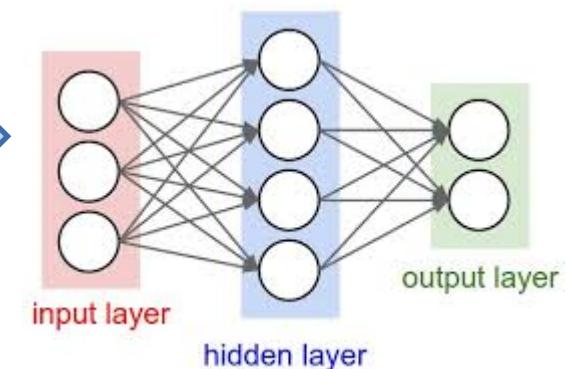


Schematic for a neuron in a neural net



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Neural Network

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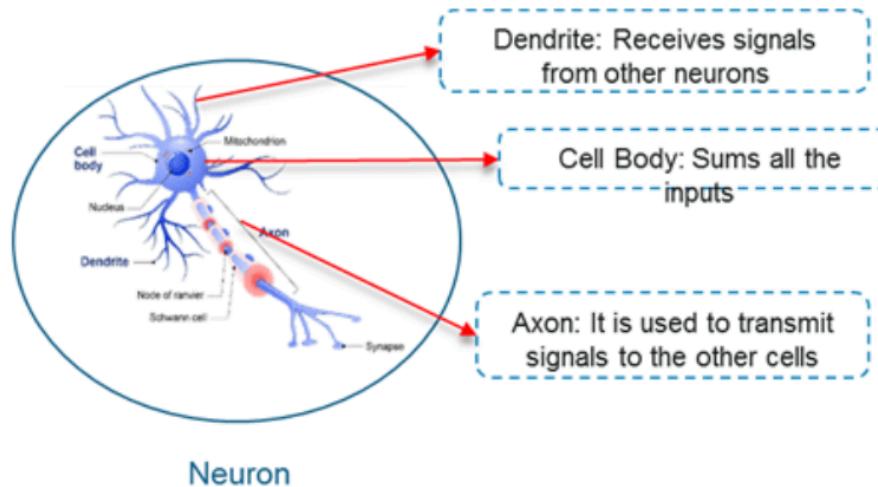


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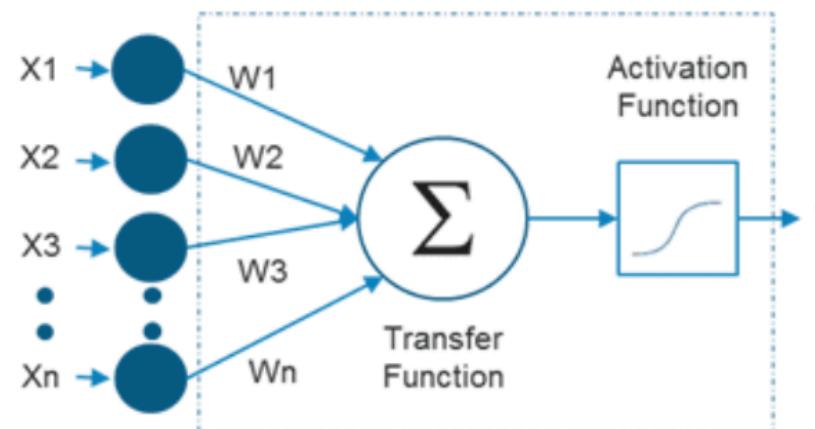
Biological neuron



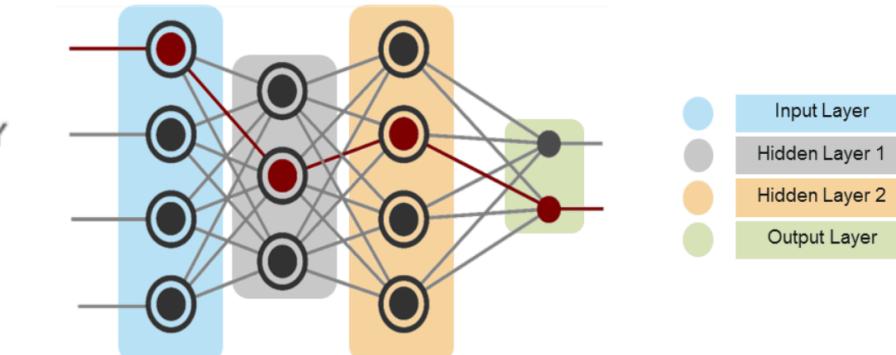
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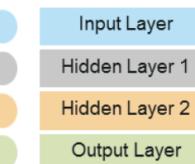
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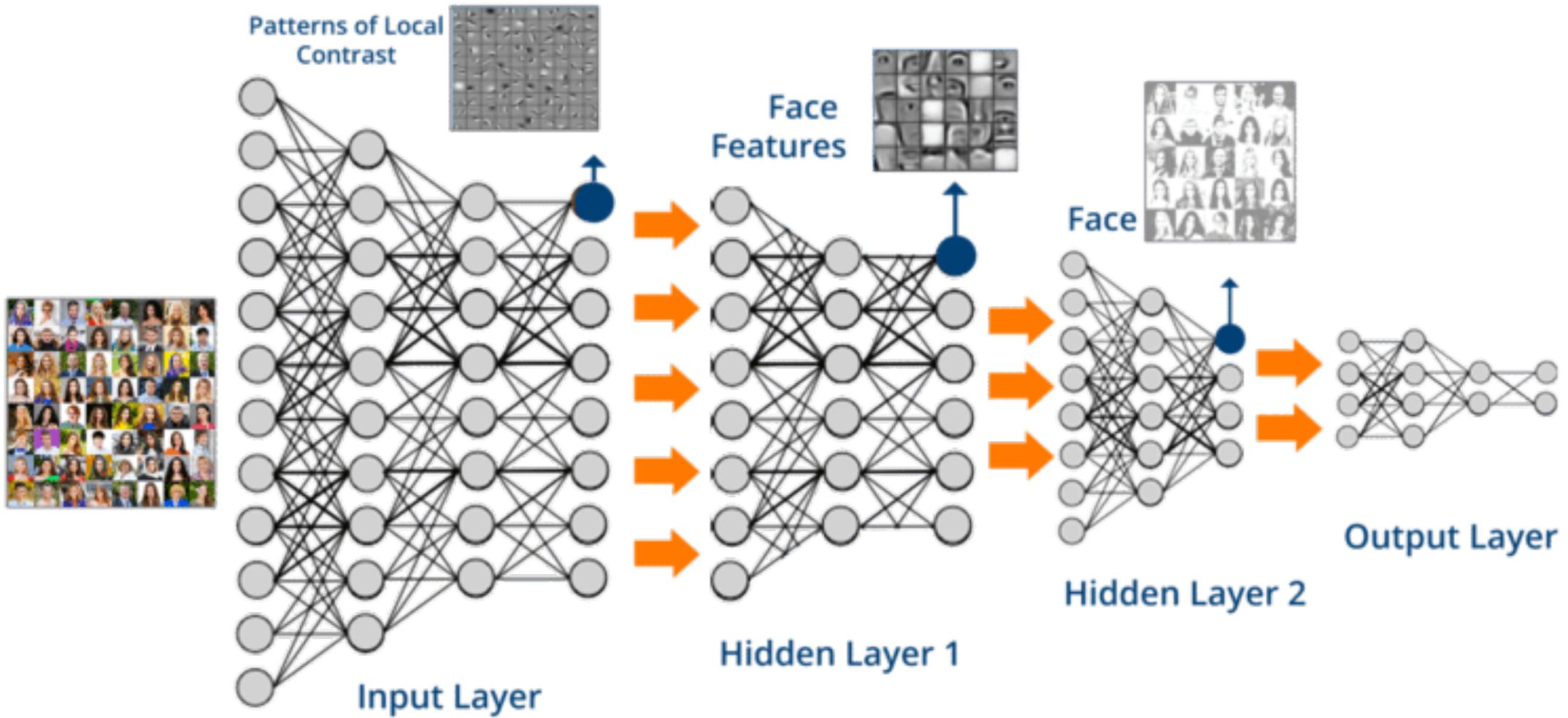
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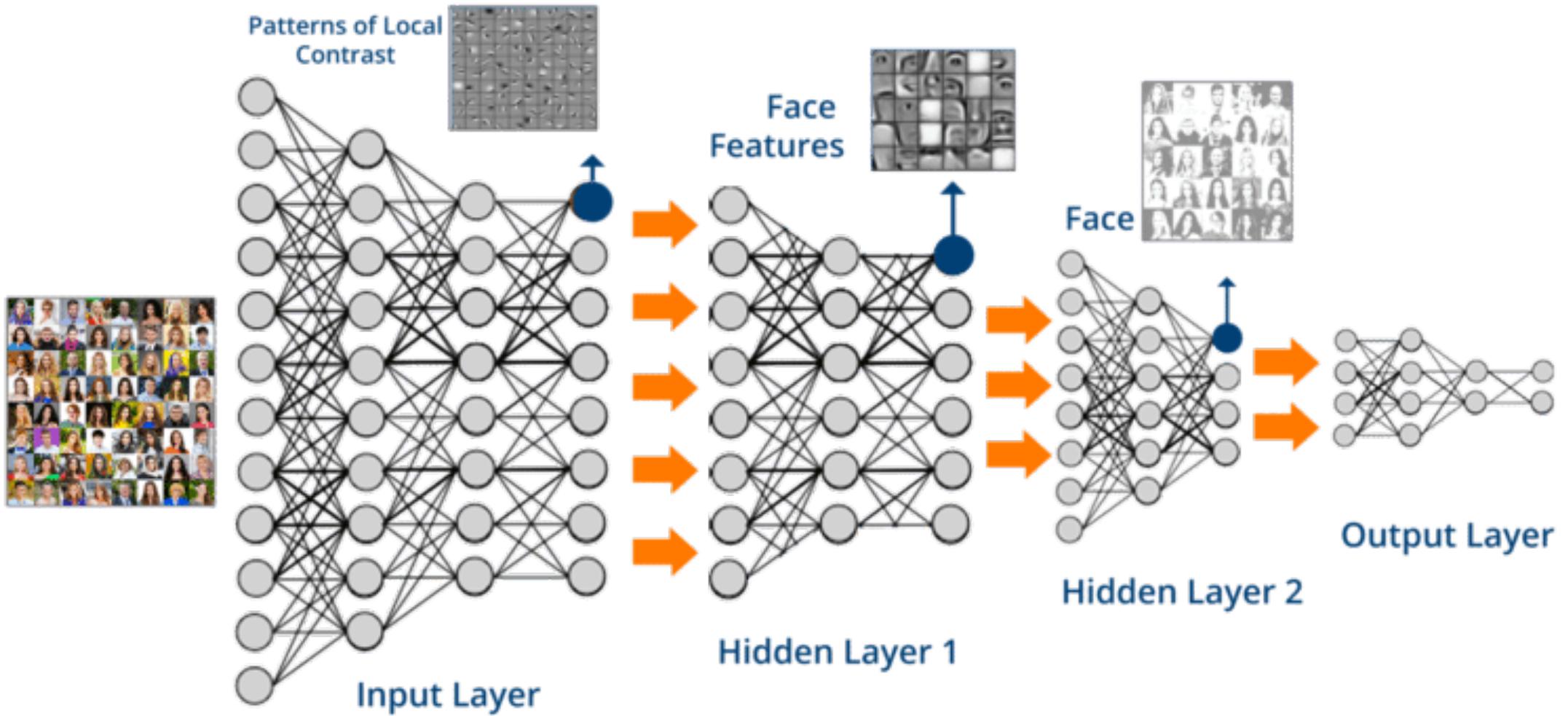
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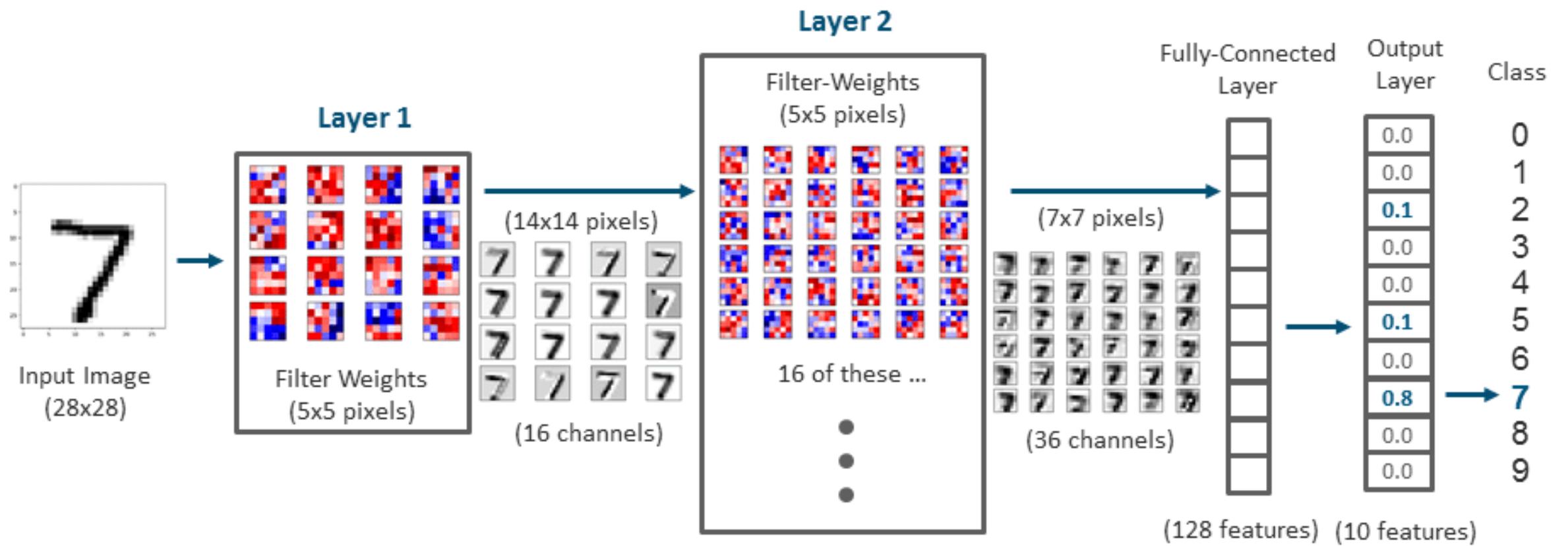
Deep Learning Use – Case : Image Recognition



Deep Learning Use – Case : Image Recognition



Deep Learning Use – Case : Image Recognition



Thank You