Course 1: AI for Everyone in 60 Minutes

Courses

AI Journey - Beginner to Expert

- Course 1: AI for Everyone in 60 Minutes
- Course 2: AI Coding for Fintech in 60 Minutes
- Course 3: Apply AI in Business in 60 Minutes
- Course 4: Machine Learning Algorithms in 60 Minutes
- Course 5: Deep Learning Algorithms in 60 Minutes

Objective

Journey

AI Novice —>AI Engineer

Audience

Skills	Before	After
AI Knowledge	Some	Deep
Coding	Little	Some
Algorithms	No	Little

Prerequisites

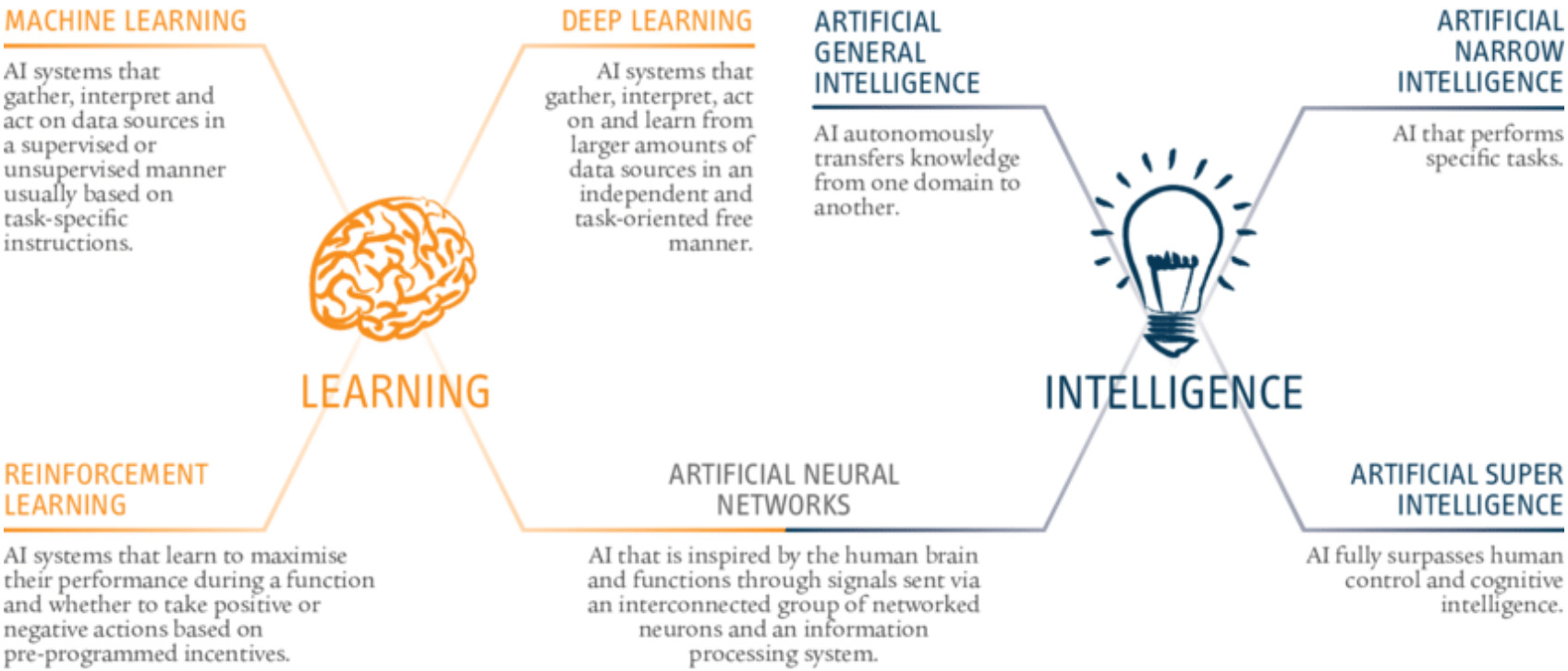
- Google Chrome
- Internet Access

Why AI

AI will be an important part of human future

- Today
  - Smart Phones
- Tomorrow
  - Autonomous Vehicle
  - Robotics
- Singularity

AI Branches

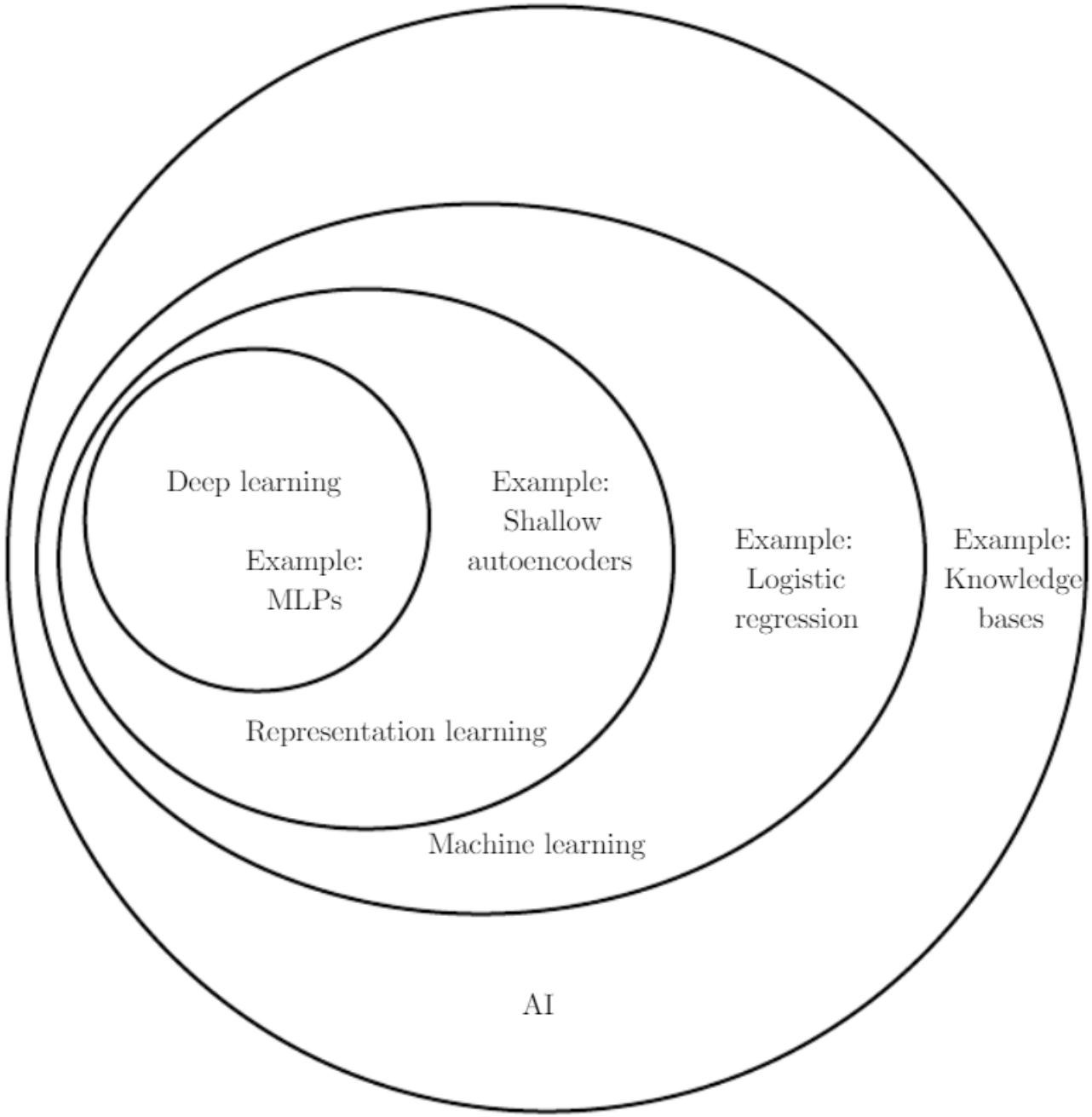

MACHINE LEARNING
AI systems that gather, interpret and act on data sources in a supervised or unsupervised manner usually based on task-specific instructions.
DEEP LEARNING
AI systems that gather, interpret, act on and learn from larger amounts of data sources in an independent and task-oriented free manner.
LEARNING
REINFORCEMENT LEARNING
AI systems that learn to maximise their performance during a function and whether to take positive or negative actions based on pre-programmed incentives.
ARTIFICIAL NEURAL NETWORKS
AI that is inspired by the human brain and functions through signals sent via an interconnected group of networked neurons and an information processing system.
ARTIFICIAL GENERAL INTELLIGENCE
AI autonomously transfers knowledge from one domain to another.
ARTIFICIAL NARROW INTELLIGENCE
AI that performs specific tasks.
INTELLIGENCE
ARTIFICIAL SUPER INTELLIGENCE
AI fully surpasses human control and cognitive intelligence.

AI Definition

Artificial intelligence (AI) is a very large research field, where machines show cognitive capabilities such as learning behaviours, proactive interaction with the environment, inference and deduction, computer vision, speech recognition, problem solving, knowledge representation, perception, and many others

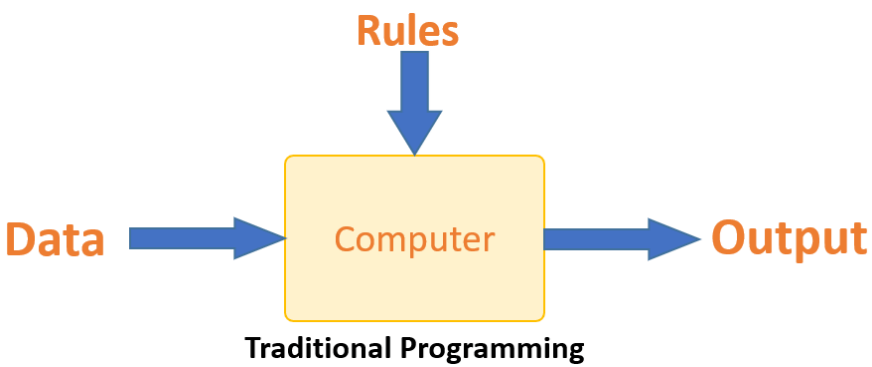
- Cognitive: Image, Audio and Language
- Tactical: Game

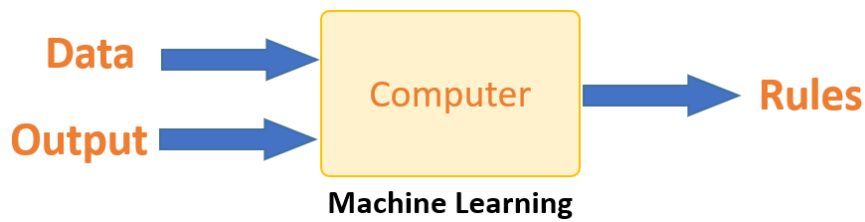
AI, ML and DL


Deep learning
Example:
MLPs
Example:
Shallow
autoencoders
Representation learning
Example:
Logistic
regression
Machine learning
Example:
Knowledge
bases
AI

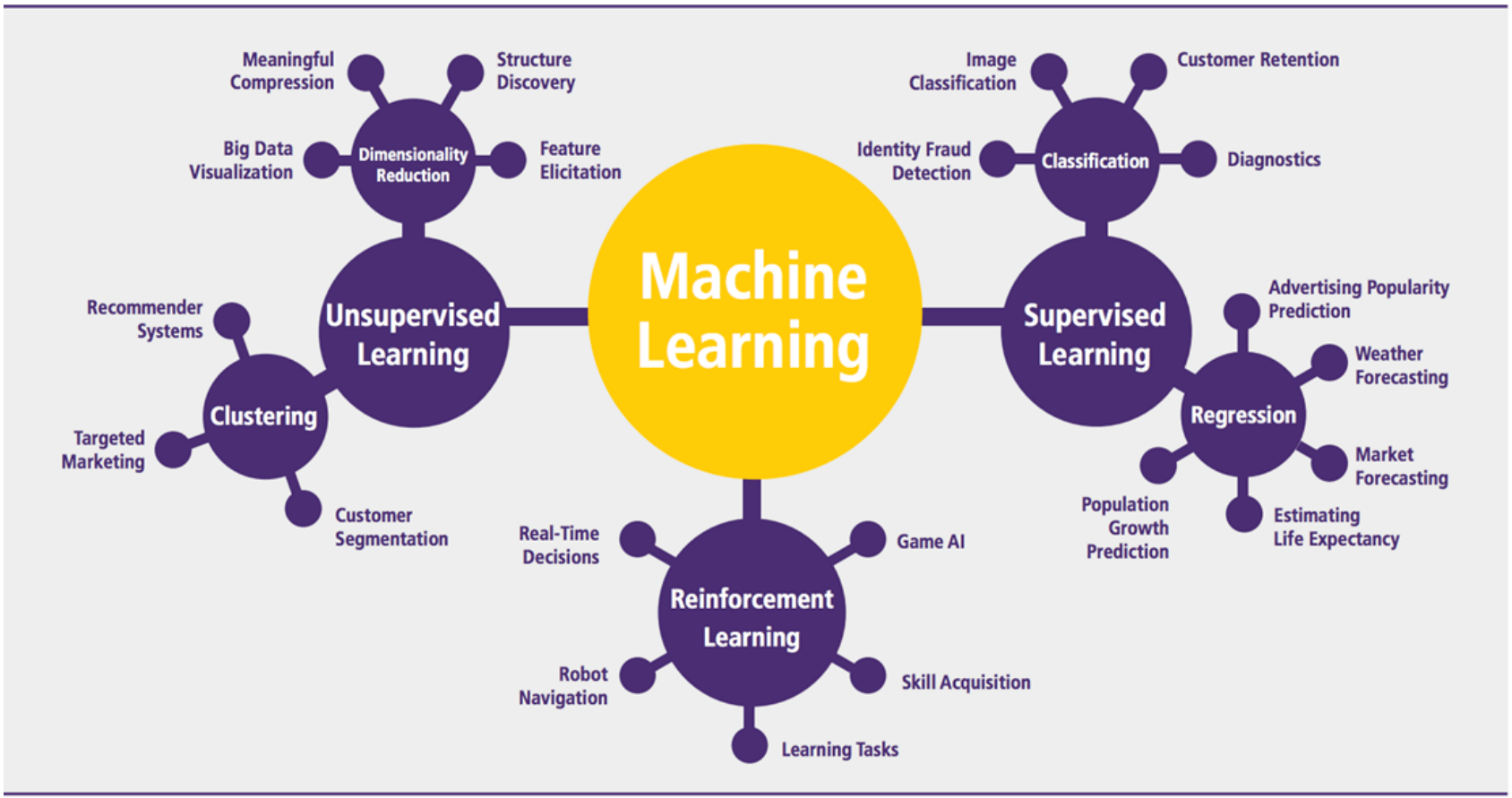
Machine Learning

Machine learning (ML) is a subbranch of AI that focuses on teaching computers how to learn from data but without the need to be programmed for specific tasks

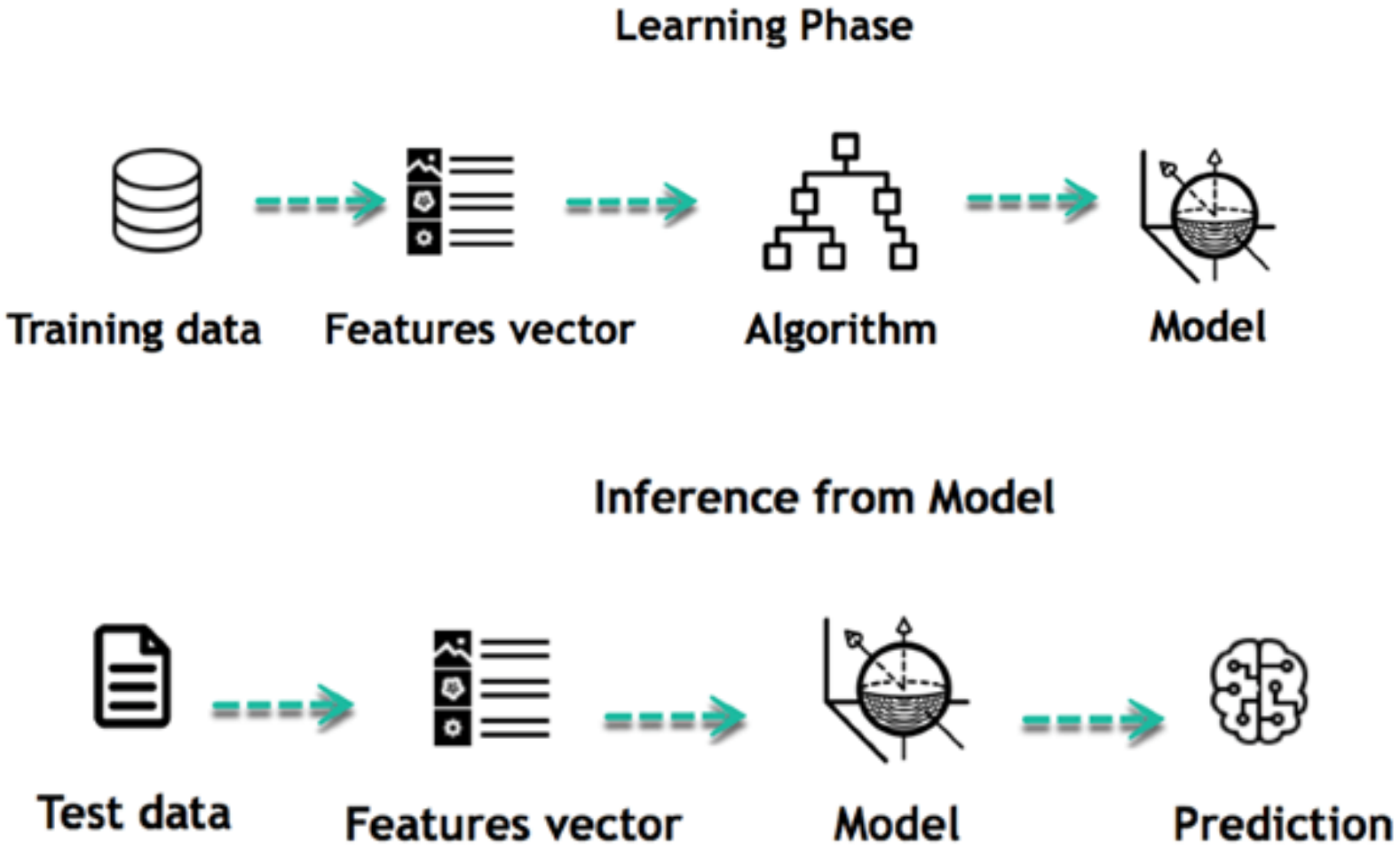




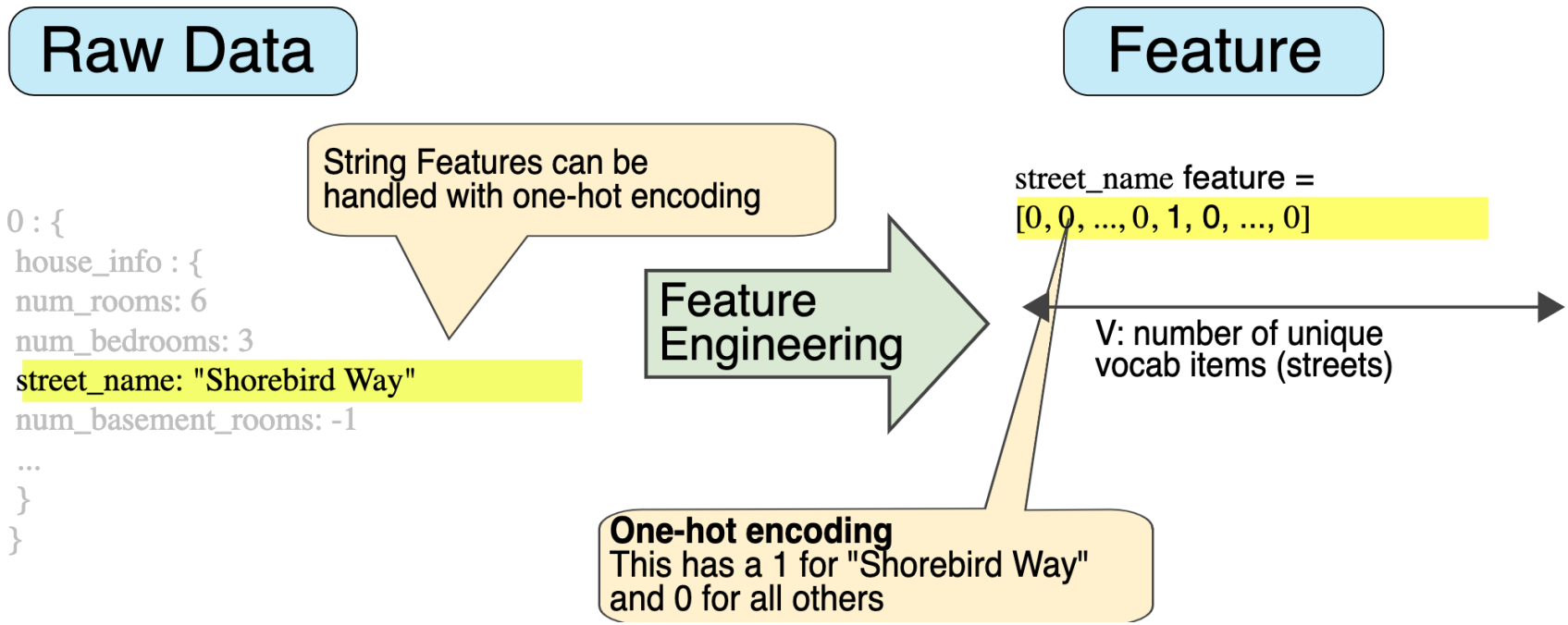
ML Types


Machine Learning
Unsupervised Learning
Dimensionality Reduction
Meaningful Compression
Structure Discovery
Big Data Visualization
Feature Elicitation
Clustering
Recommender Systems
Targeted Marketing
Customer Segmentation
Supervised Learning
Classification
Image Classification
Customer Retention
Identity Fraud Detection
Diagnostics
Regression
Advertising Popularity Prediction
Weather Forecasting
Market Forecasting
Estimating Life Expectancy
Population Growth Prediction
Reinforcement Learning
Real-Time Decisions
Game AI
Robot Navigation
Skill Acquisition
Learning Tasks

ML Workflow


Learning Phase
Training data
Features vector
Algorithm
Model
Inference from Model
Test data
Features vector
Model
Prediction

ML Feature Engineering



ML Toolsets

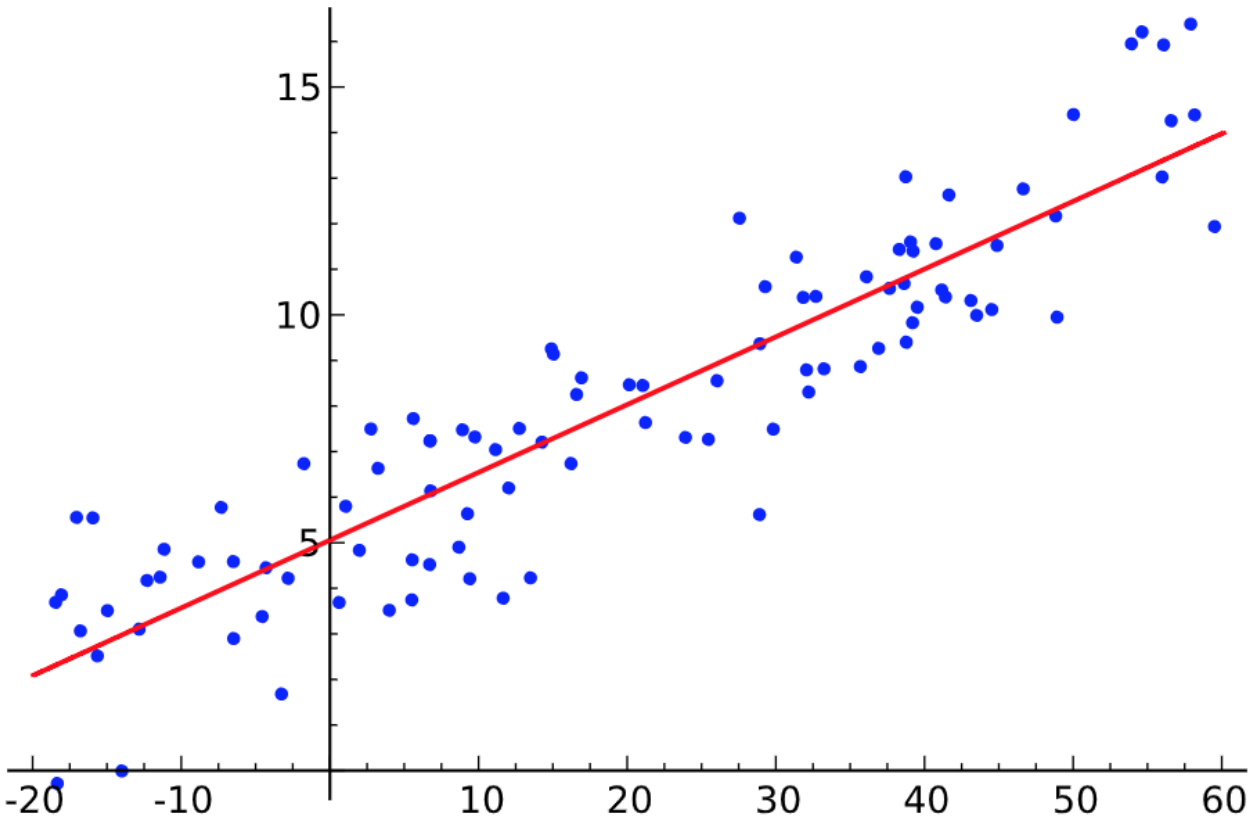
Python libraries and packages generally used in performing various machine learning tasks

- numpy – is used for its N-dimensional array objects
- pandas – is a data analysis library that includes dataframes
- matplotlib – is 2D plotting library for creating graphs and plots
- scikit-learn – the algorithms used for data analysis and data mining tasks
- seaborn – a data visualization library based on matplotlib

ML Demo

Linear Regression: a supervised machine learning algorithm where the predicted output is continuous and has a constant slope.

- Math Explaination with Python Code
- Example with Python Scikit Learn

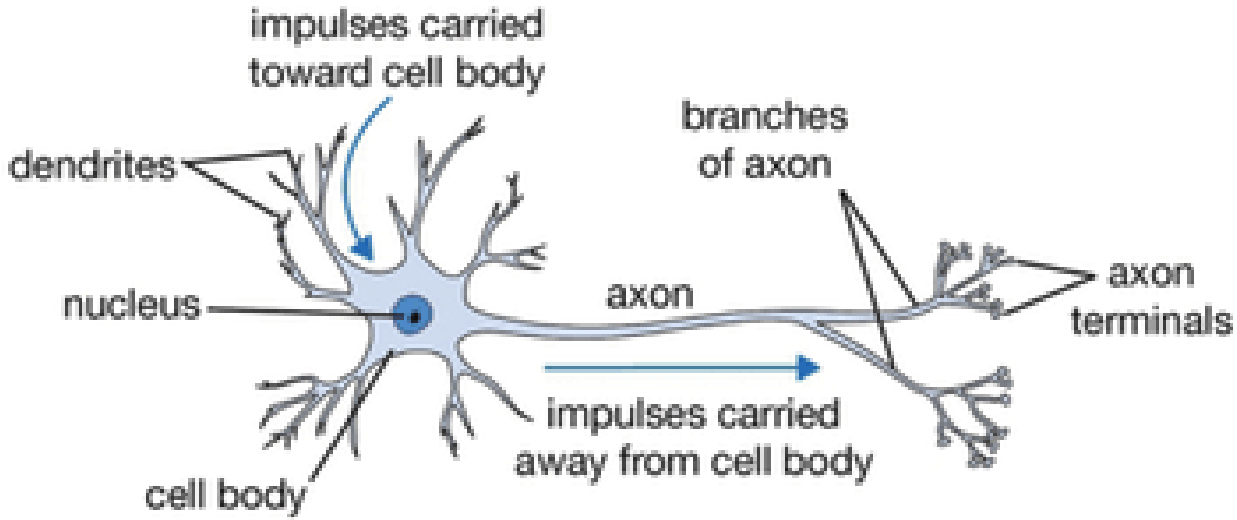


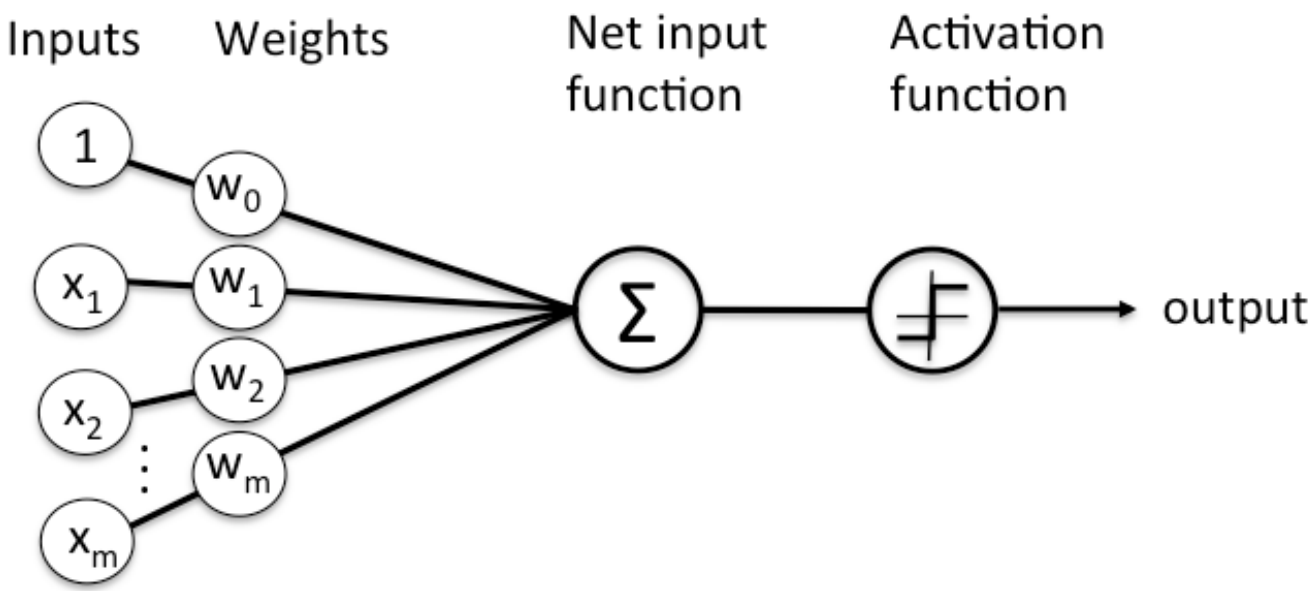
Deep Learning

Deep learning (DL) is a particular subset of ML methodologies using artificial neural networks (ANN) slightly inspired by the structure of neurons located in the human brain

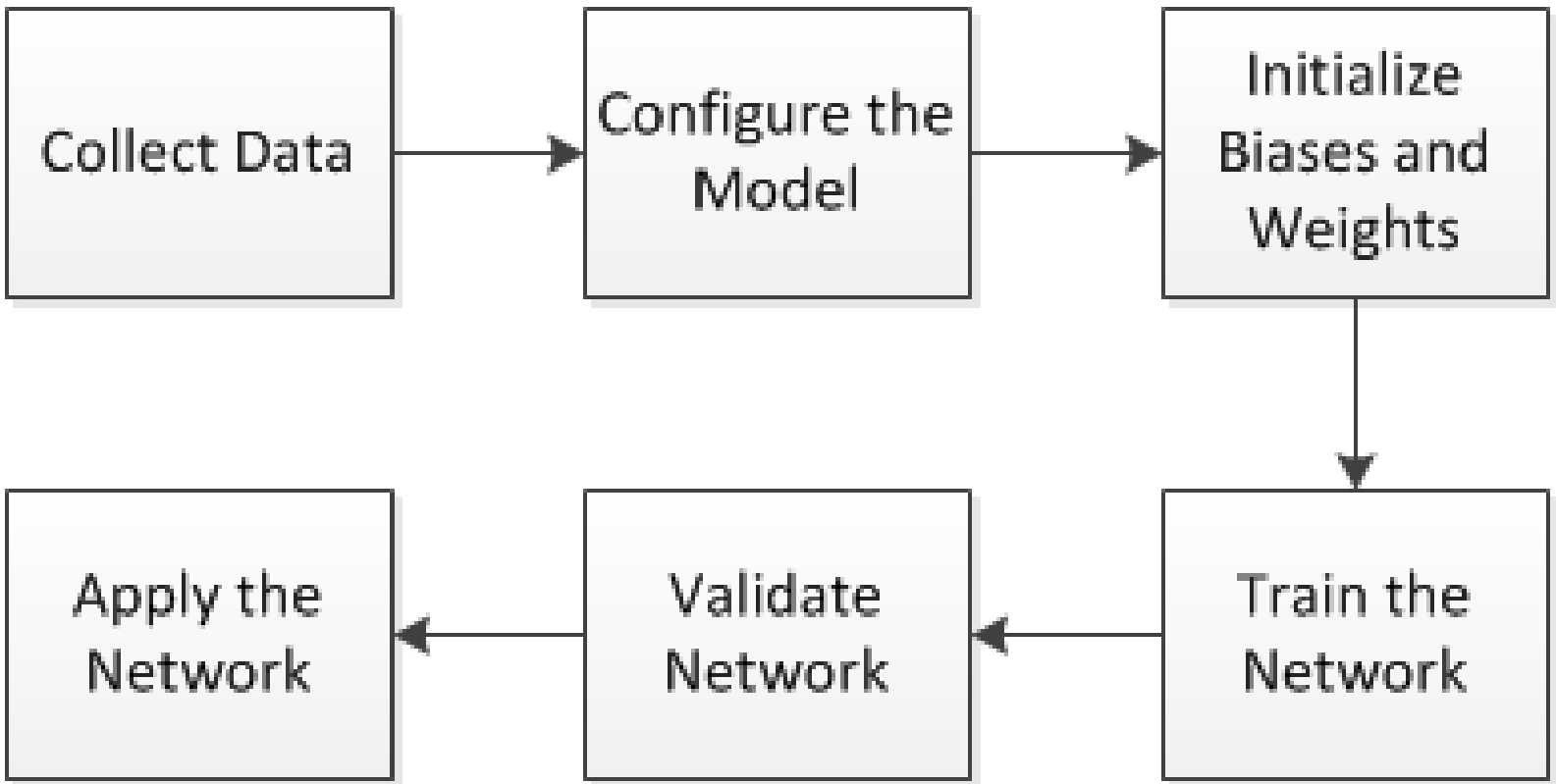
- Algorithms: Perceptron & MLP
- Neural Networks: CNN, RNN, GAN

Neural Network Basics





DL Workflow


Collect Data
Configure the Model
Initialize Biases and Weights
Train the Network
Validate Network
Apply the Network

DL Demo

Google Colab Notebooks is a Google research project created to help disseminate machine learning education and research. It's a Jupyter notebook environment that requires no setup to use and runs entirely in the cloud.

- Tutorial: ML & DL
- Demo 1: CNN - Handwritten Digit Recognition
- Demo 2: RNN - Text generation

Q & A

Thank You!

Appendix

- Google Colab Notebooks
  https://colab.research.google.com/
- AI in 5 Minutes (Video)
  https://youtu.be/2ePf9rue1Ao
- Python - Learn the Basics
  https://www.learnpython.org
- Python Jupyter Notebook Basics
  https://plot.ly/python/ipython-notebook-tutorial/
- Machine Learning Basics
  https://www.tutorialspoint.com/machine_learning_with_python/index.htm