Network eAcademy

New Learning Units in the Intelligence Management Block

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Open session of the Network eAcademy Working Group

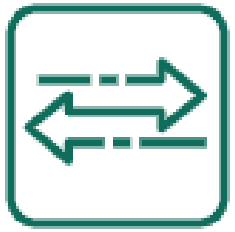
October 08, 2025

Open Digital Architecture (ODA)

People

Organisations

Things



Engagement Management

(Communications Channels)

(Front End, Secure API)

Decoupling and Integration

Party Management
(Customers/Partners)

WHO/ WHY

Decoupling and Integration

WHAT

Core Commerce Management
(Order, Catalogue, Product, SLA, Problem Handling)
Commercial View

Decoupling and Integration

HOW

Production
(CFS, RFS, Orchestration Operational Domain Management)
Technical View

Decoupling and Integration

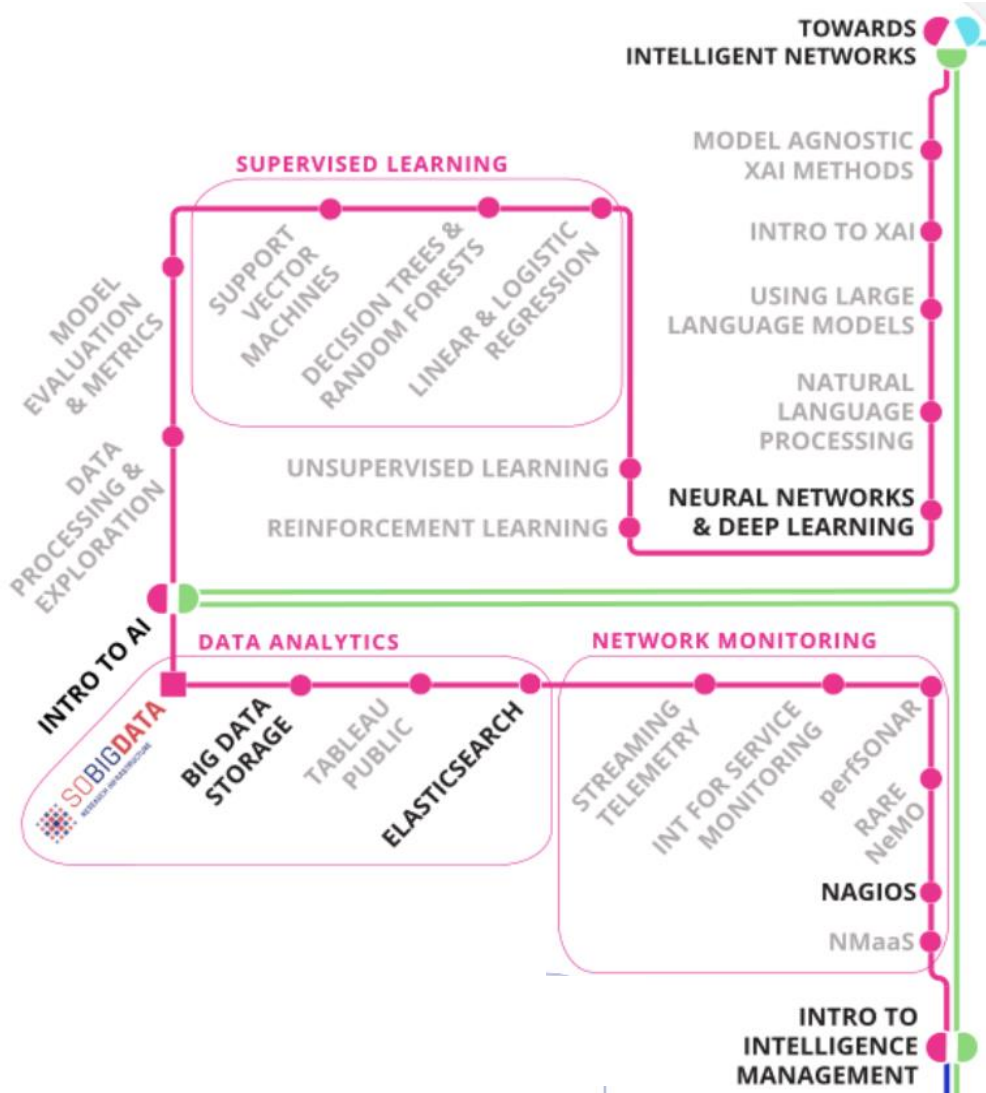
Intelligence Management

(Analytics, Operational Reality)

(Closed Control Loop, Autonomics)

Units in the Intelligence Management Block

- Introduction to Intelligence Management (15')
- Introduction to Automated Monitoring: Nagios (2h)
- Big Data Storage (1.5h)
- Elasticsearch (30')
- Introduction to AI (50')
- Neural Networks & Deep Learning (2h)
- Unsupervised Learning



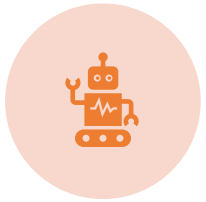
Introduction to Artificial Intelligence

- Part 1: Basic Concepts of Artificial Intelligence
- Part 2: Artificial Intelligence in Everyday Life

https://e-academy.geant.org/moodle/course/view.php?id=590

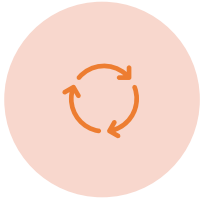
Part 1: Basic Concepts of Artificial Intelligence

Definition and Types of AI



Narrow AI Applications

Machine Learning (ML) Techniques



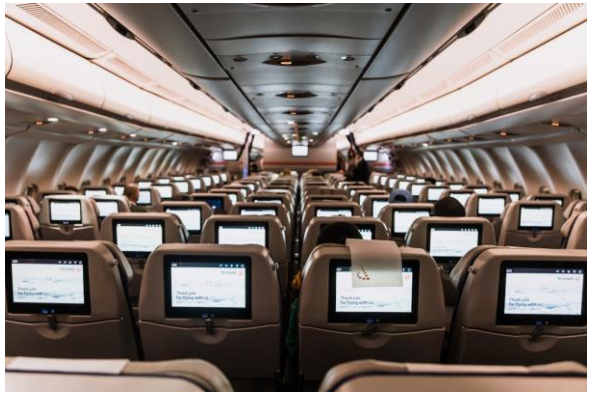
Supervised Learning Algorithms

Deep Learning & Neural Networks

NLP & Large Language Models (LLMs)

Limitations of AI

Part 2: Artificial Intelligence in Everyday Life



Neural Networks and Deep Learning

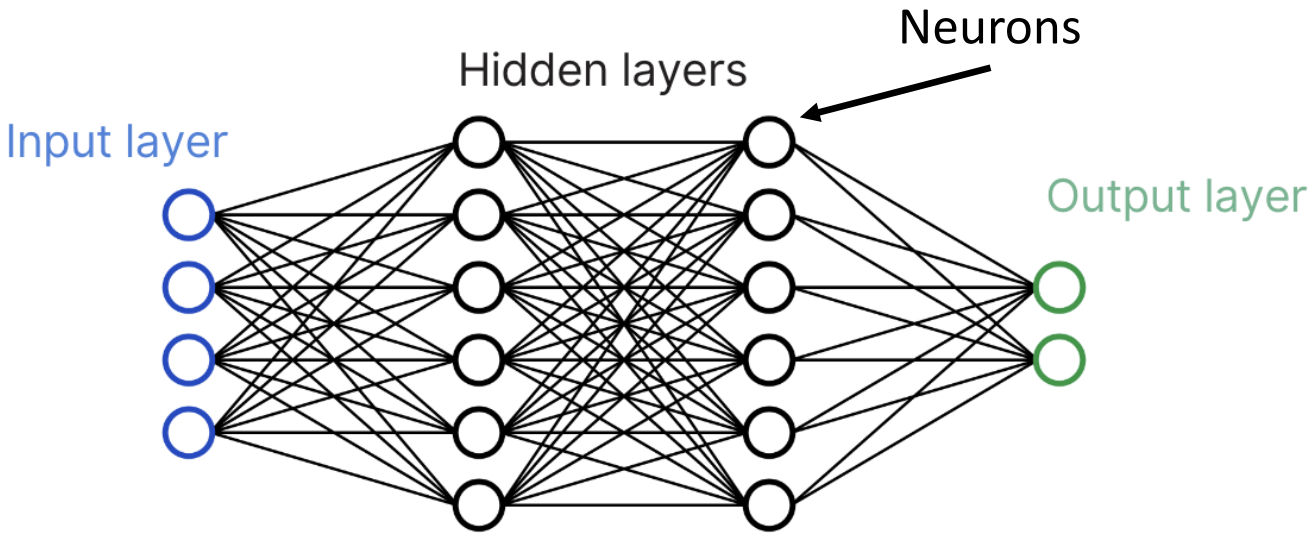
- Part 1: Introduction to Neural Networks
- Part 2: Deep Learning Fundamentals
- Part 3: Hands-On Deep Learning with Python

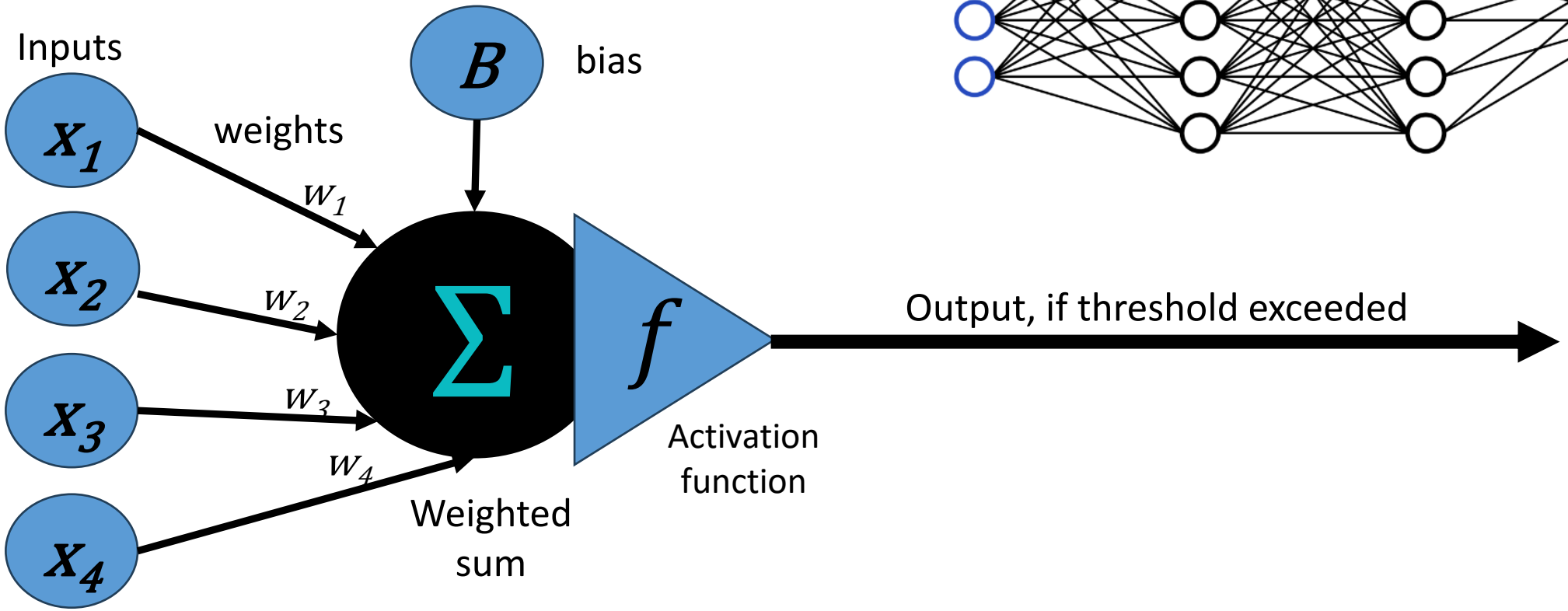
COURSE DATE:	DURATION:	COMMITMENT:
From March 2025	60 minutes	120 minutes
REQUIREMENT:	**COURSE TYPE:**	**CREDENTIAL:**
Python	Self-paced	Certificate of Completion

https://e-academy.geant.org/moodle/course/view.php?id=627

Part 1: Introduction to Neural Networks

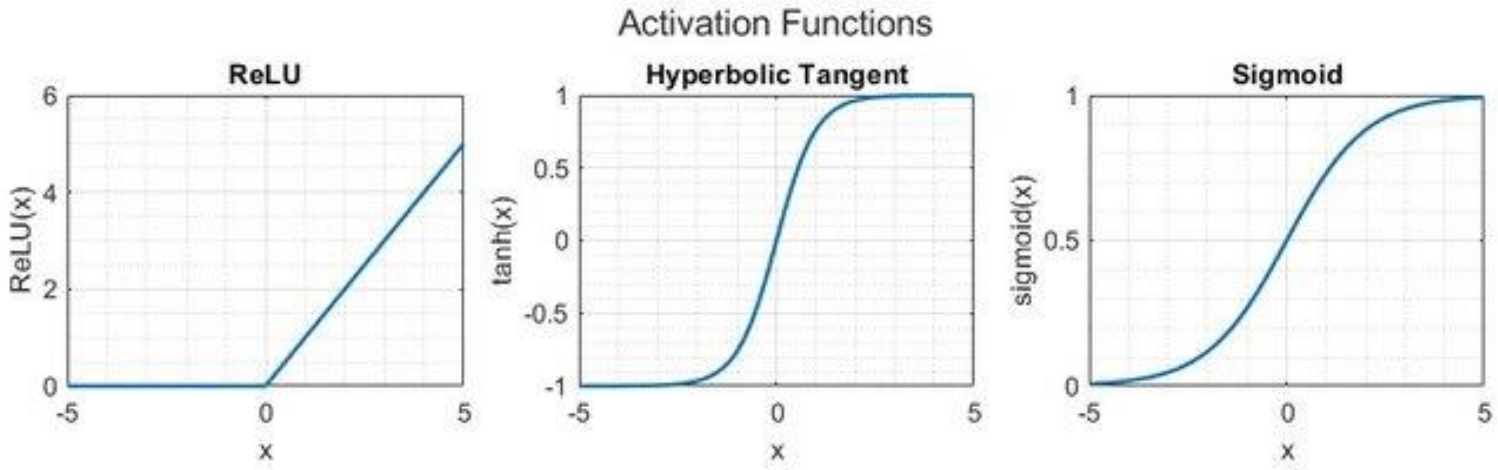
- What is a Neural Network?
- History of Neural Networks
- Core Components
- Neurons

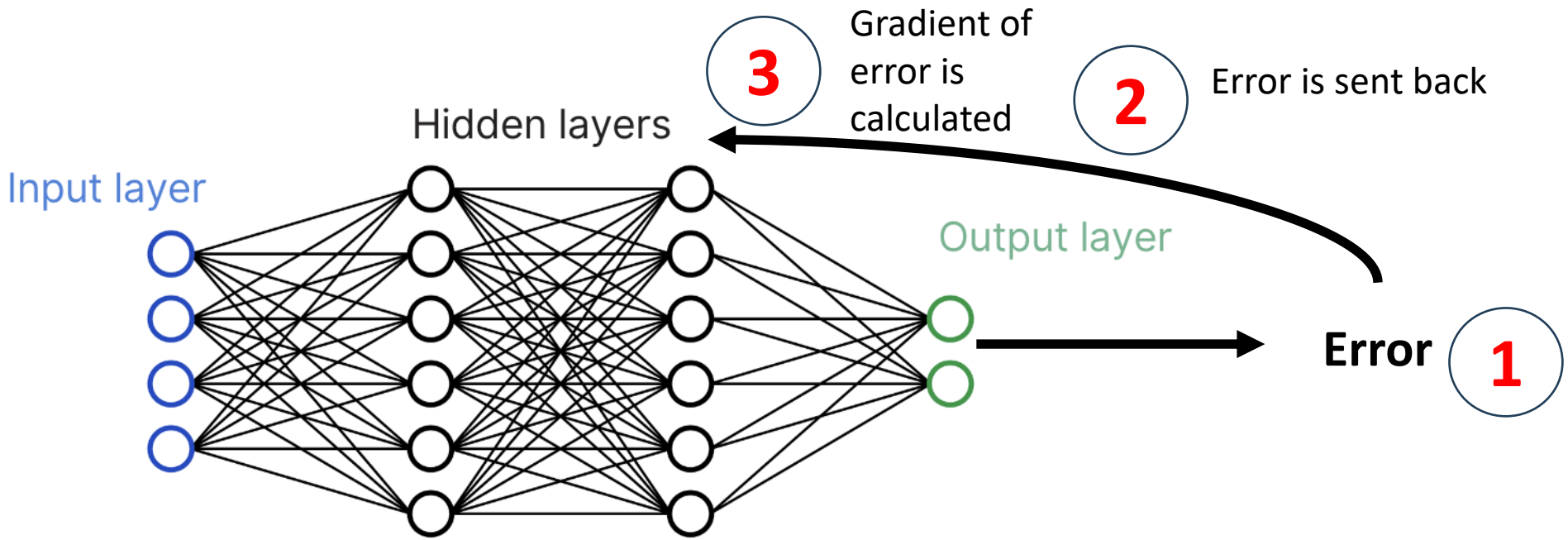




Part 1: Introduction to Neural Networks

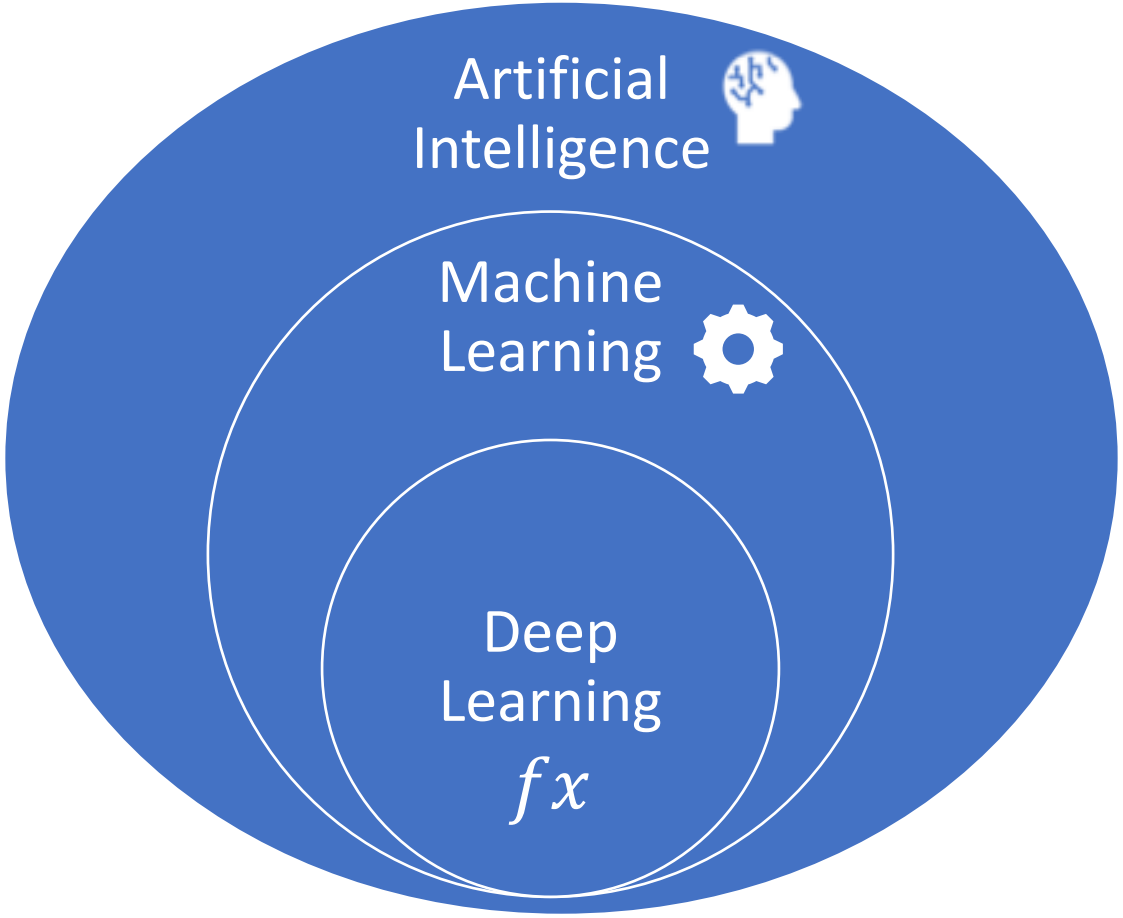
- Activation Functions
- Layers in Neural Networks
- Connections and Weights
- Training Process
- Types of Neural Networks
- Simple Example





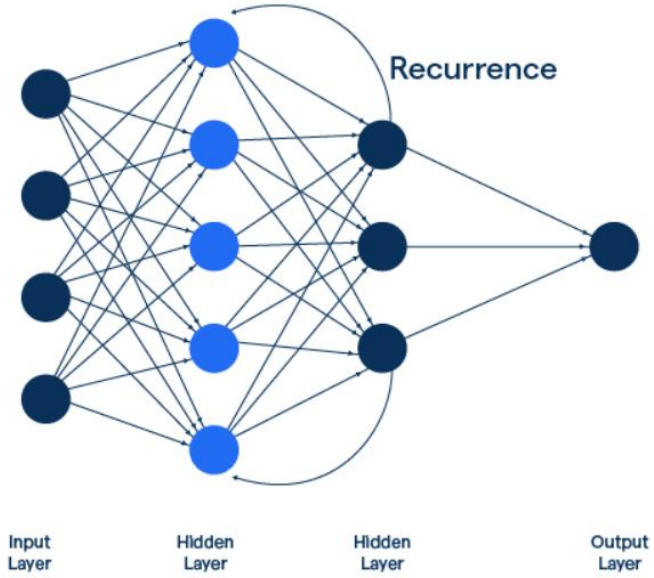
Part 2: Deep Learning Fundamentals

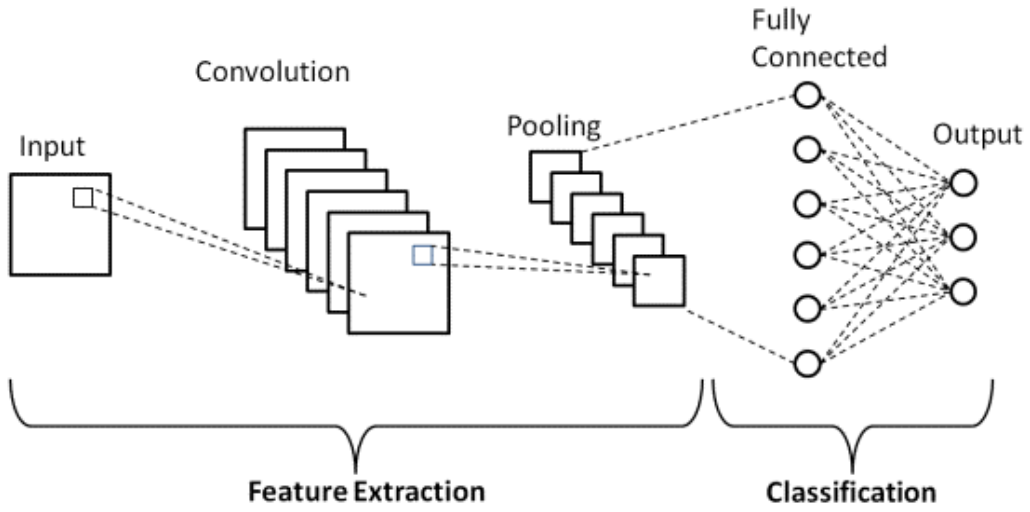
- What is Deep Learning (DL)?
- DL vs ML
- Why DL Surpasses ML?
- Key Concepts in DL
- Types of DL

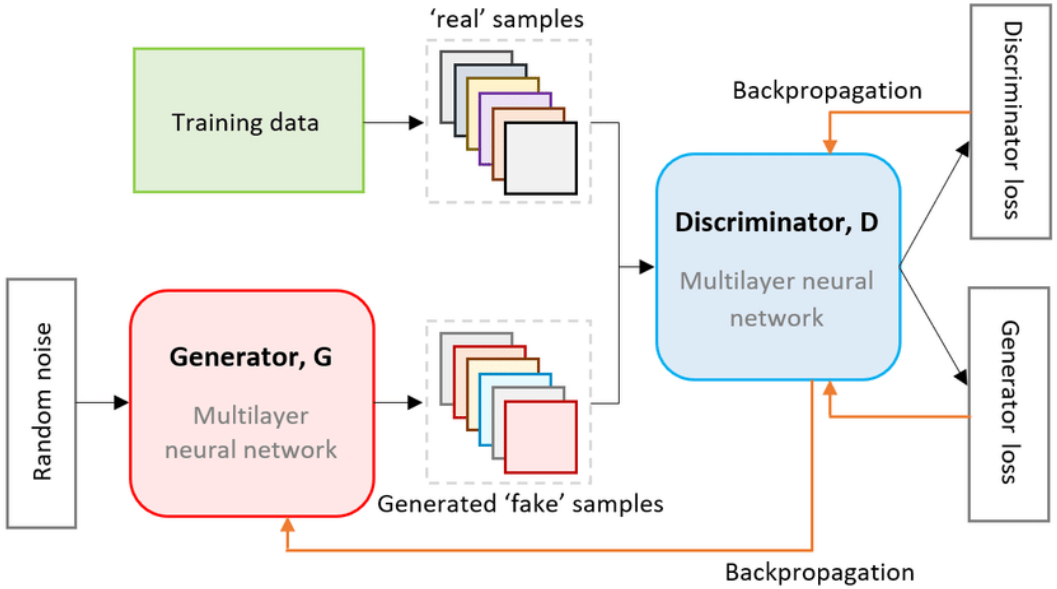


Part 2: Deep Learning Fundamentals

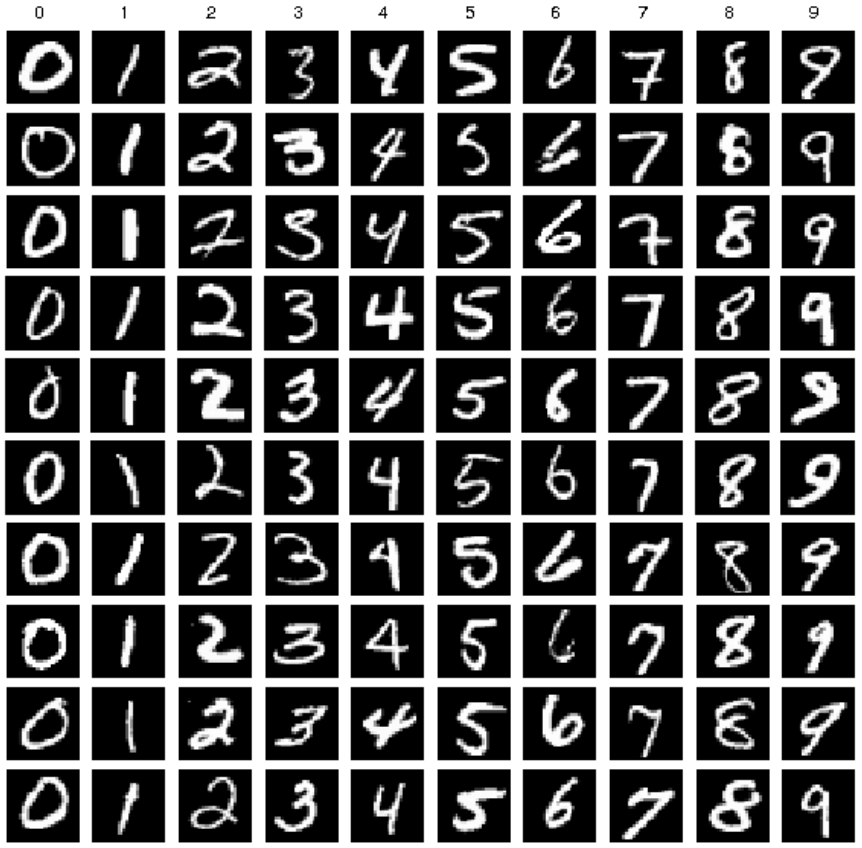
- Most Popular DL Architectures
- CNNs, RNNs, LSTM, Transformers and GANs
- Powering Computer Networks with DL
- Training DL Models
- DL Limitations

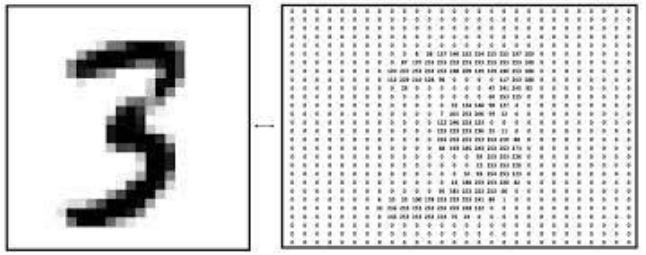


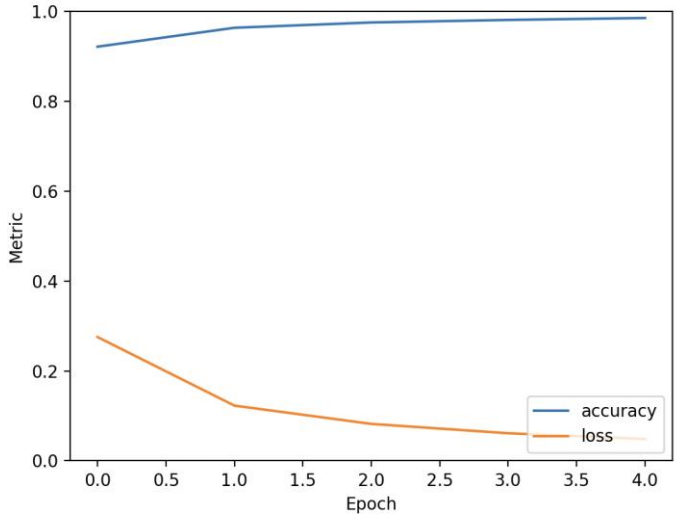


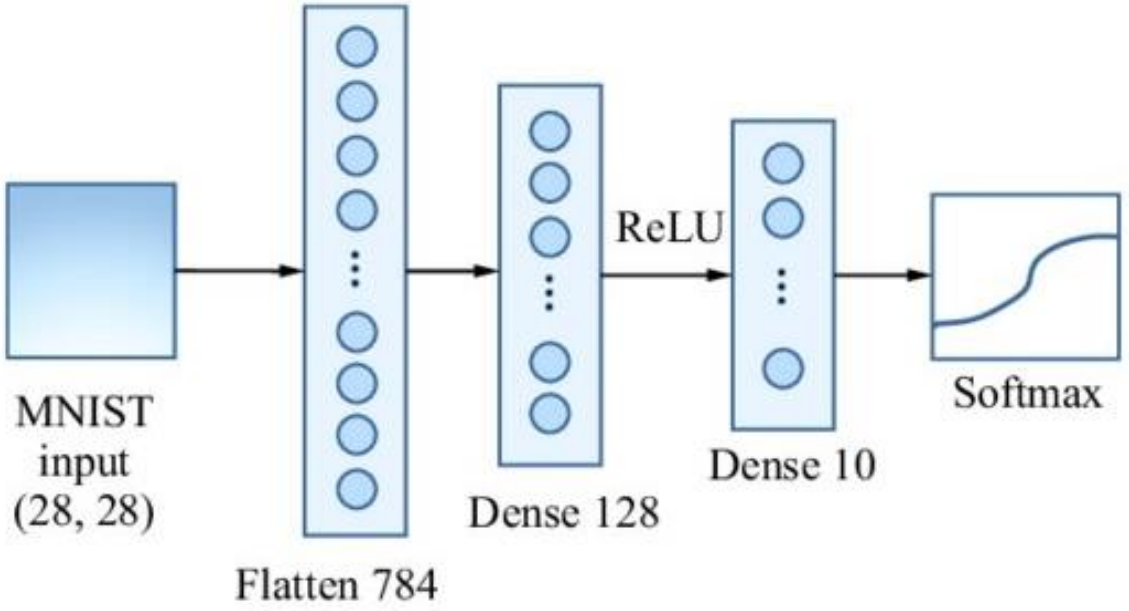


Part 3: Hands-On Deep Learning with Python



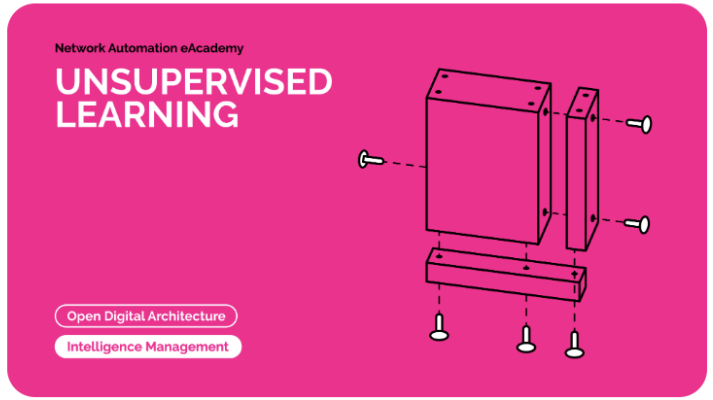






Unsupervised Learning

- Part 1: Introduction to Unsupervised Learning
- Part 2: Unsupervised Learning Algorithms
- Part 3: Practical Application of Clustering in Network Traffic Analysis



COURSE DATE:	DURATION:	COMMITMENT:
From October 2025	90 minutes	120 minutes

REQUIREMENT:	COURSE TYPE:	CREDENTIAL:
Introduction to AI	Self paced	Certificate of Completion

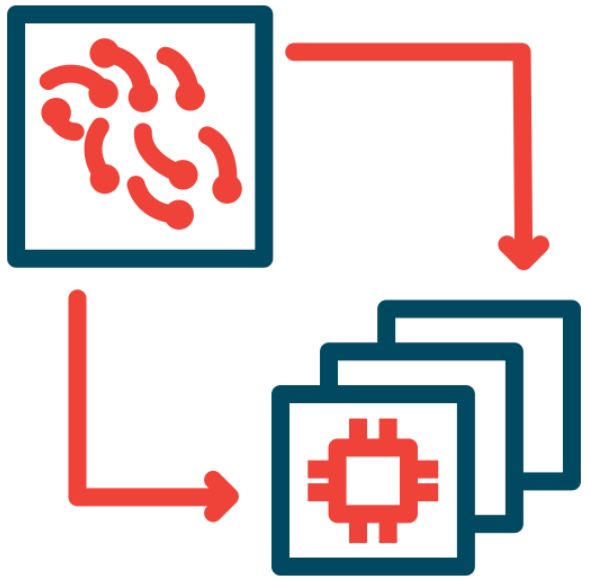
https://e-academy.geant.org/moodle/course/view.php?id=667

Part 1: Introduction to Unsupervised Learning

Clustering

Groups similar data points together

Dimensionality Reduction



Simplifies complex data while preserving important features

Part 1: Introduction to Unsupervised Learning

Use Cases of Unsupervised Learning in Computer Networks

Network Traffic Anomaly Detection

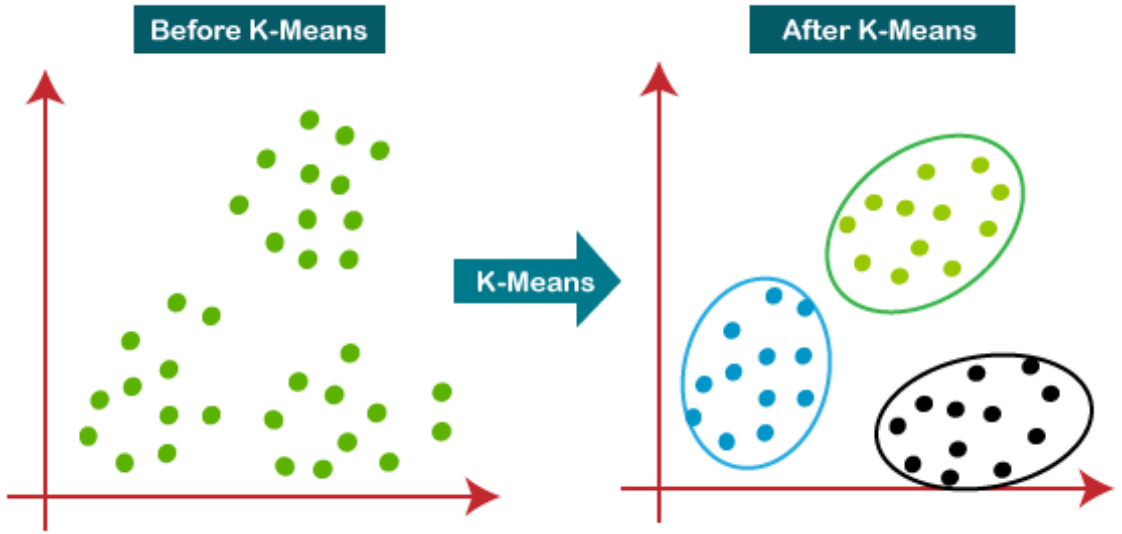
Intrusion Detection and Prevention Systems (IDPS)

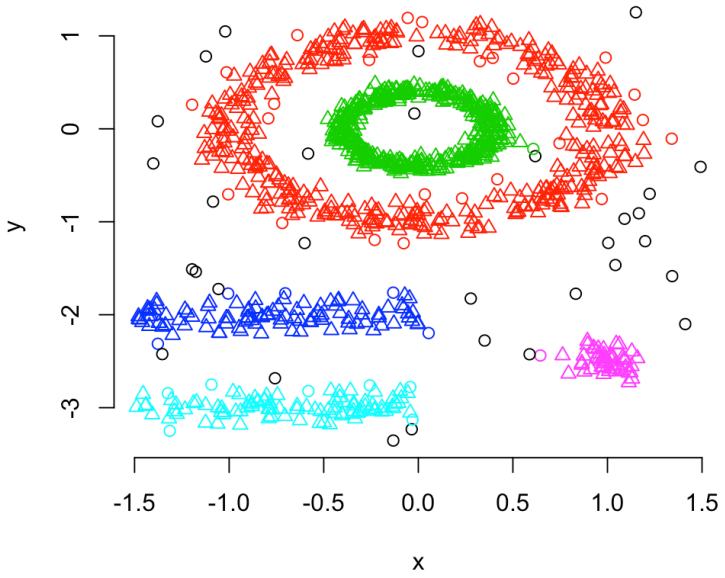
Traffic Flow Prediction

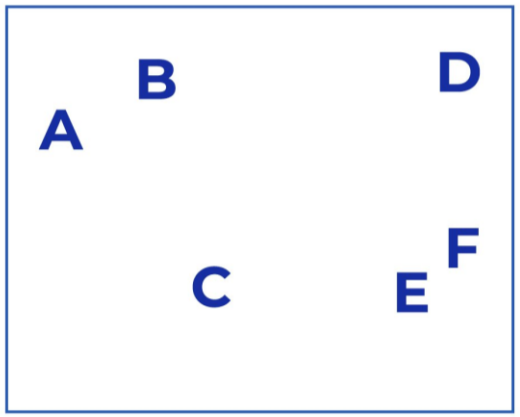
Network Fault Detection and Maintenance

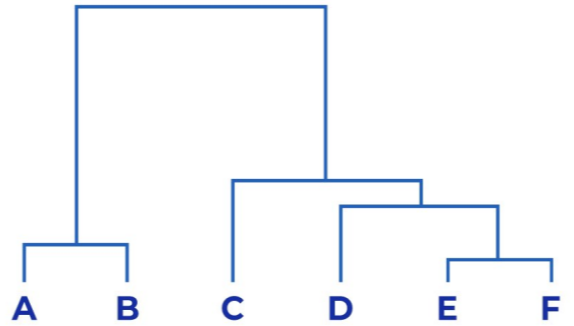
Part 2: Unsupervised Learning Algorithms

- **Clustering Algorithms:**
  - K-Means
  - DBSCAN (Density-Based Spatial Clustering)
  - Hierarchical Clustering
  - Gaussian Mixture Models (GMM)



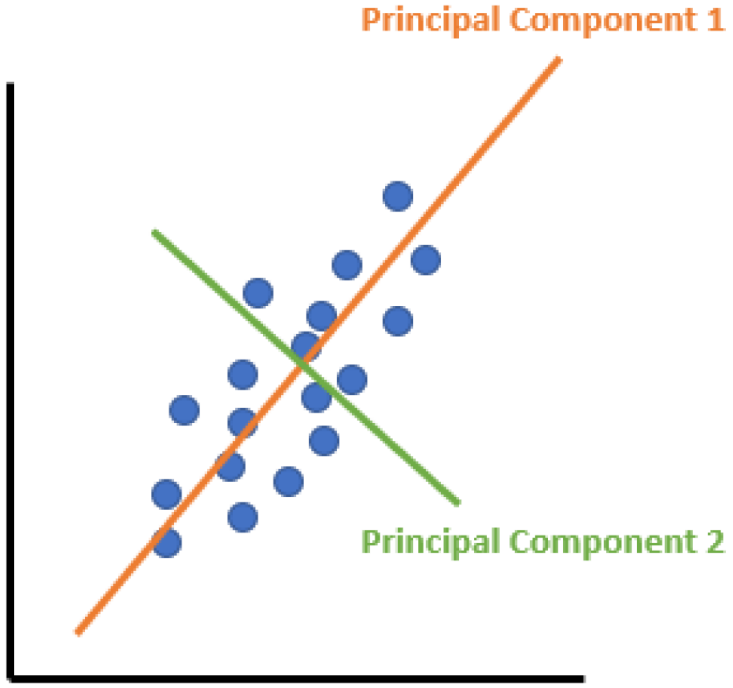


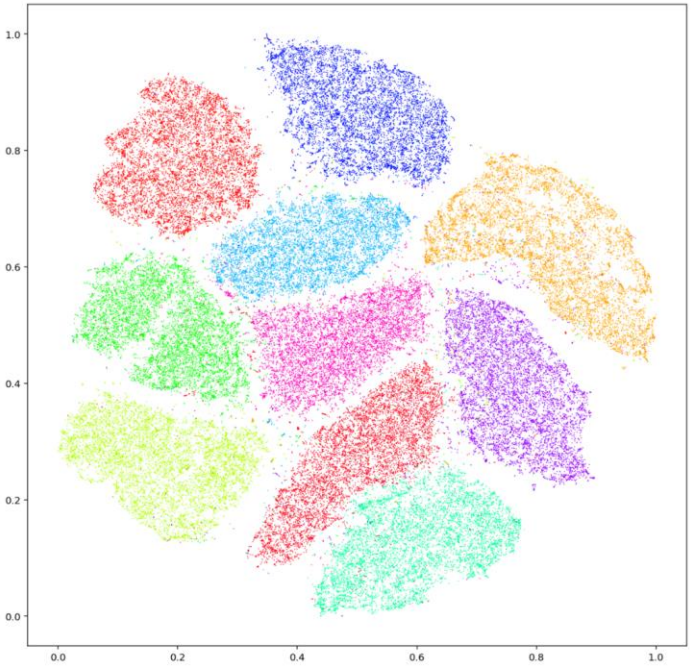


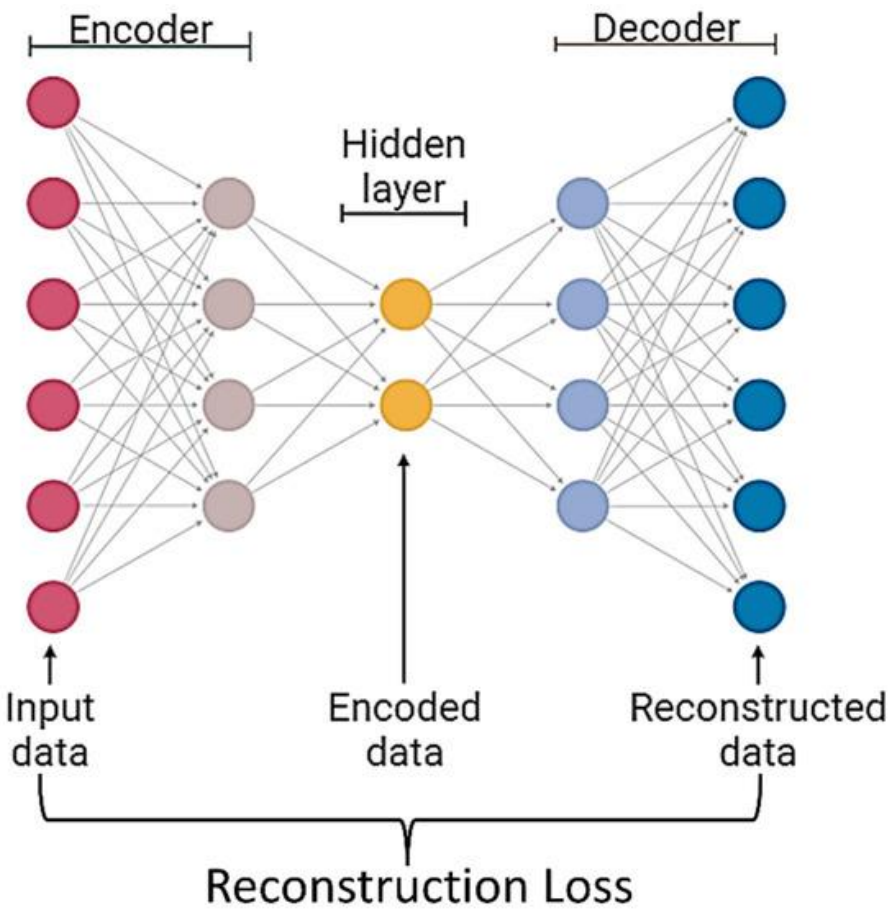


Part 2: Unsupervised Learning Algorithms

- **Dimensionality Reduction Algorithms:**
  - Principal Component Analysis (PCA)
  - t-Distributed Stochastic Neighbour Embedding (t-SNE)
  - Autoencoders (neural network-based compression)

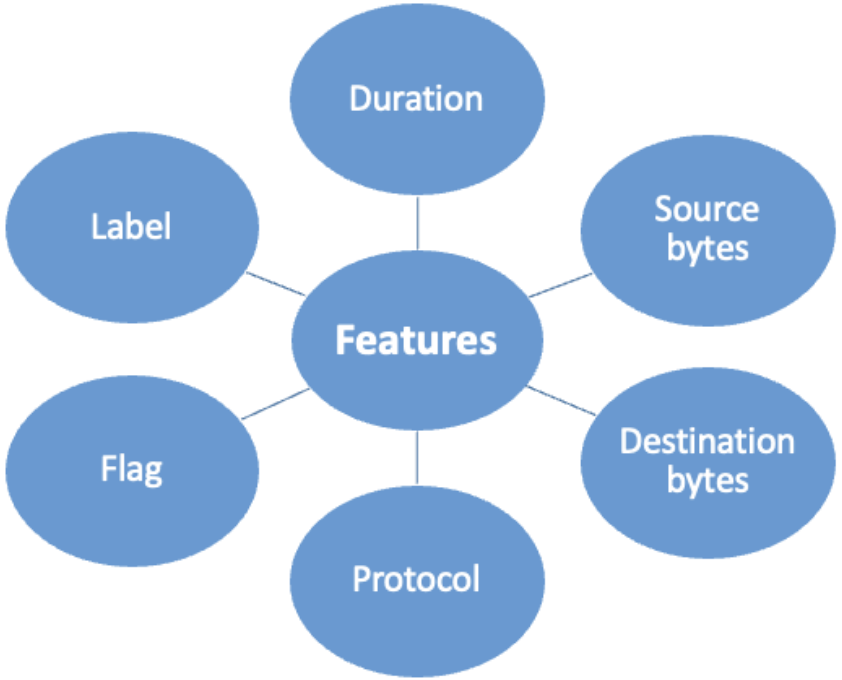


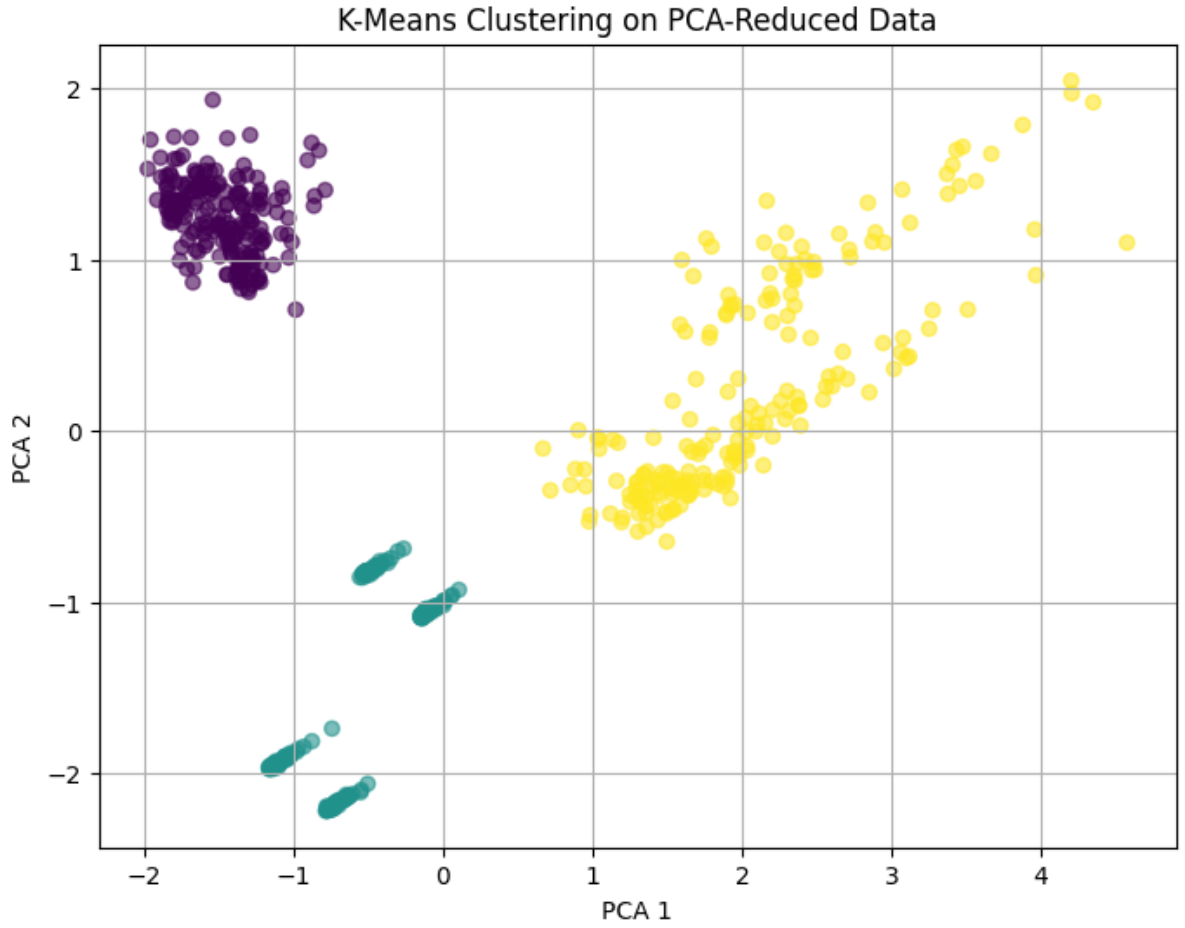


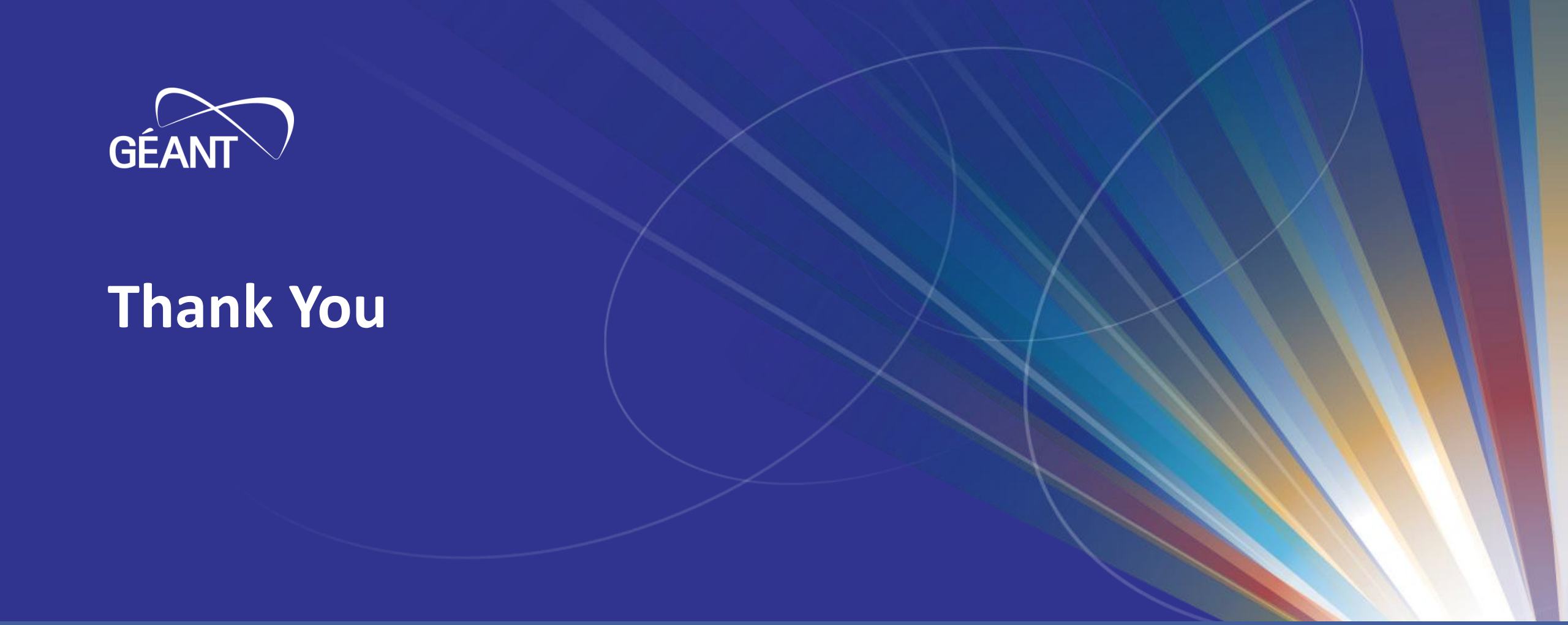


Part 3: Practical Application of Clustering in Network Traffic Analysis

- Synthetic data with three traffic types:
- Normal Traffic
- DoS
- Port Scanning







Thank You

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