



Get IT Right from RIG

Since 2011



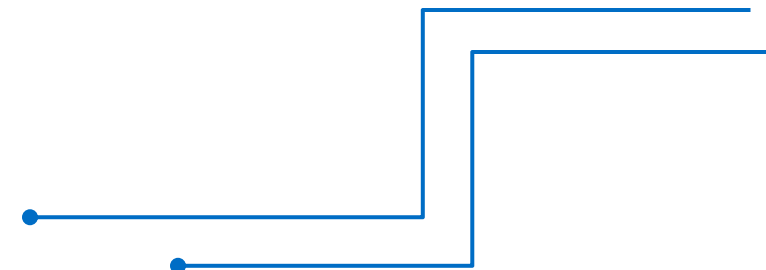
Our outcomes are
over 5000 trainees.

Artificial Intelligence Engineering (Level-1)

Level-1



- Module 1: Introduction to AI and Machine Learning
- Module 2: Linear Algebra, Statistics and Probability for AI
- Module 3: Neural Network Architecture
- Module 4: Building Machine Learning Models
- Module 5: Deep Learning Concepts
- Module 6: Python Data Structure
- Module 7: Data Handling with Pandas and NumPy
- Module 8: Python for AI
- Module 9: Classification AI Project
- Module 10: Prediction AI Project



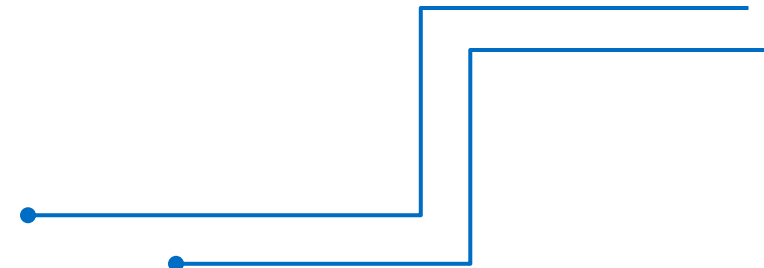
Artificial Intelligence Engineering (Level-1)

Module 1: Introduction to AI and Machine Learning

Content

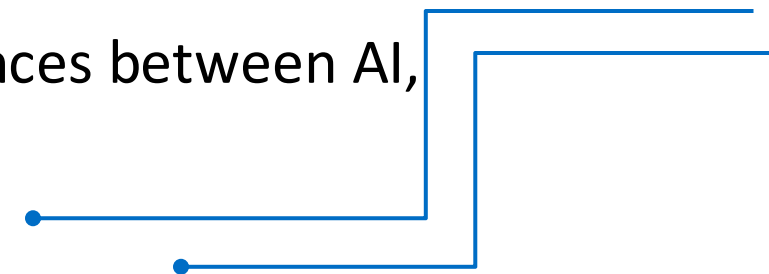


- Overview of AI and Machine Learning
- Types of AI
- Real world Applications in AI
- Introduction to Machine Learning
- Differences between AI, Machine Learning and Deep Learning
- Computational Mathematics for Machine Learning
- Linear Algebra and Matrix Operations Basics



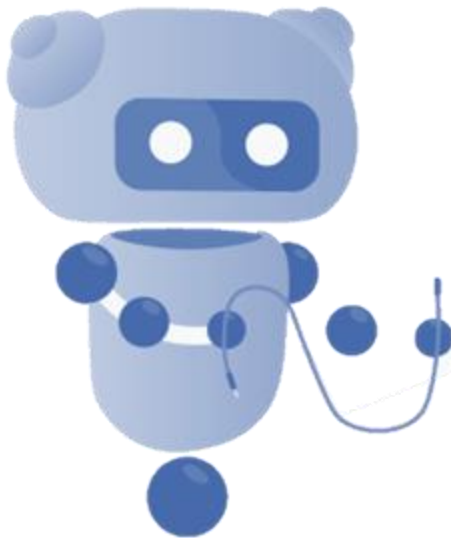
Learning Outcomes

- Understand AI and Machine Learning Basics: Gain an overview of AI, its types, and its distinctions from machine learning and deep learning.
- Explore Real-World AI Applications: Identify and analyze practical applications of AI across industries.
- Learn Machine Learning Fundamentals: Understand the core principles and processes of machine learning.
- Apply Computational Mathematics: Utilize linear algebra, matrix operations, and other mathematical tools essential for machine learning.
- Differentiate AI Concepts: Clarify the relationships and differences between AI, machine learning, and deep learning.

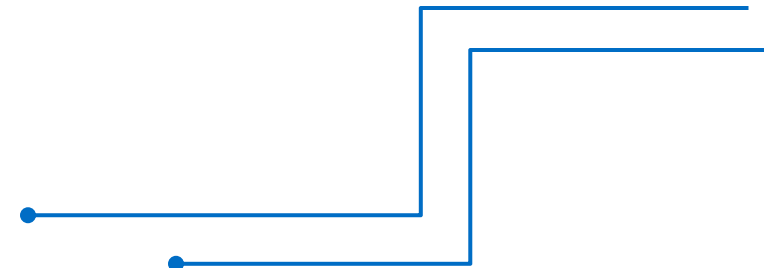


What is AI?

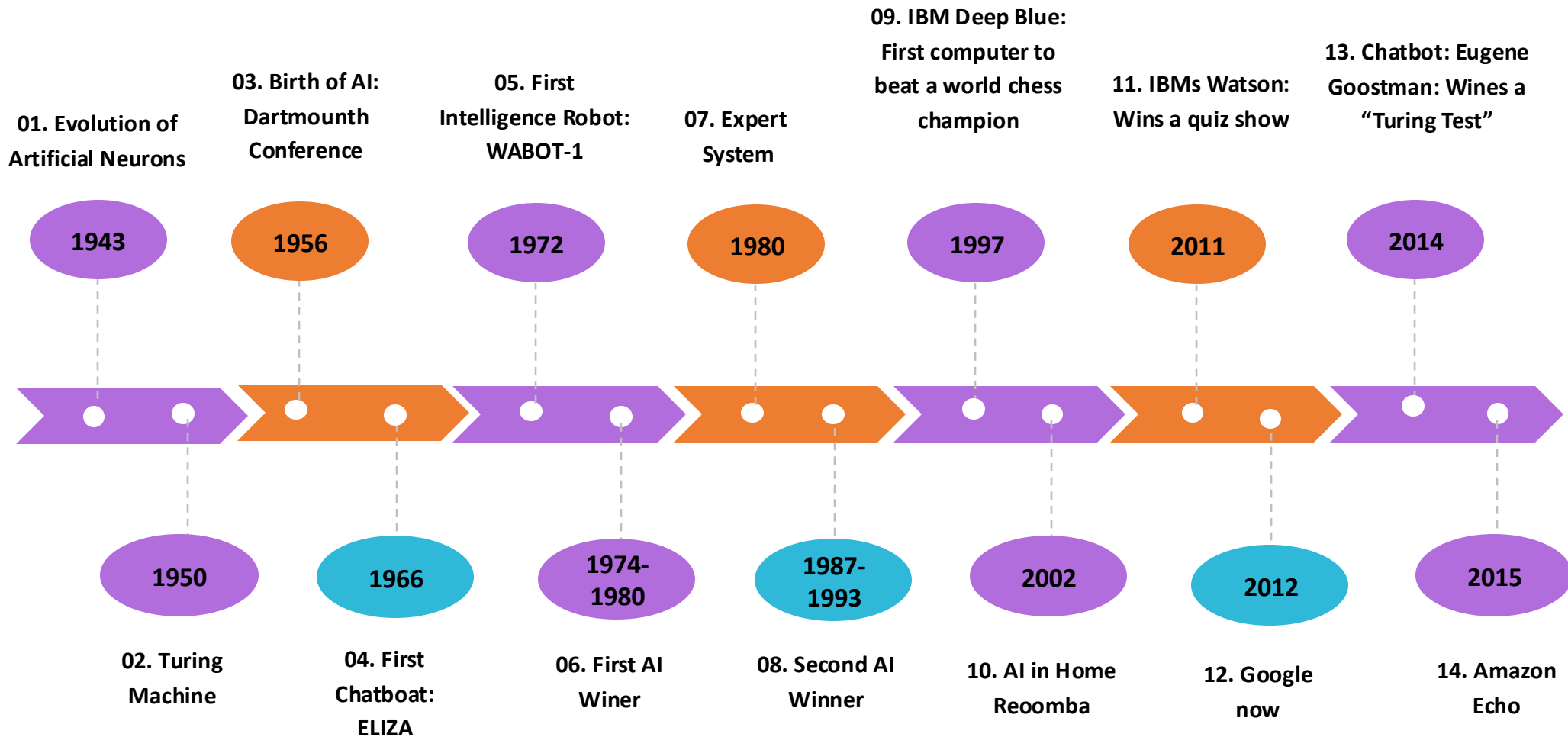
Artificial intelligence (AI) is technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy.



AI is a powerful tool that can bring about significant benefits and improvements in various aspects of life, but it also carries risks that must be carefully managed.



History of AI



Why AI is popular?

Integration with Everyday Technology

- AI is integrated into many everyday technologies, such as virtual assistants (e.g., Siri, Alexa), recommendation systems (e.g., Netflix, Amazon), and smart devices

Automation and Efficiency

- AI automates repetitive tasks and improves efficiency in various industries, reducing human workload and increasing productivity.

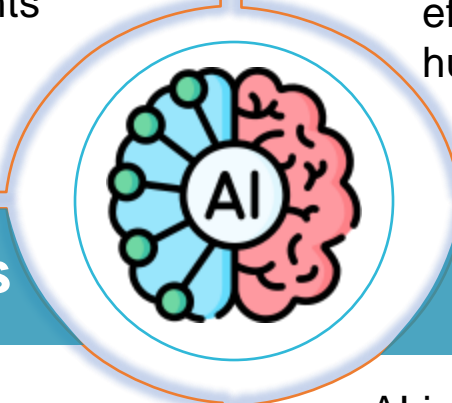
Solving Complex Problems

Healthcare & Climate Change

Early diagnosis, personalized treatment plans, AI models predict weather patterns, optimize energy consumption, and analyze climate data to develop solutions.

Broad Applicability

- AI is not limited to a single industry; it has applications across almost all sectors, including finance, healthcare, manufacturing, education, and entertainment, making it a versatile and valuable technology.



Overview of AI and Machine Learning

Artificial Intelligence

Artificial Intelligence (AI) is the simulation of human intelligence in machines that are programmed to perform tasks that typically require human intelligence, such as problem-solving, learning, and pattern recognition.

Machine Learning

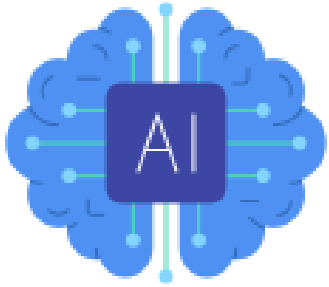
Machine Learning (ML) is a subset of AI focused on training algorithms to learn from and make predictions or decisions based on data without being explicitly programmed for specific tasks.

Data Science

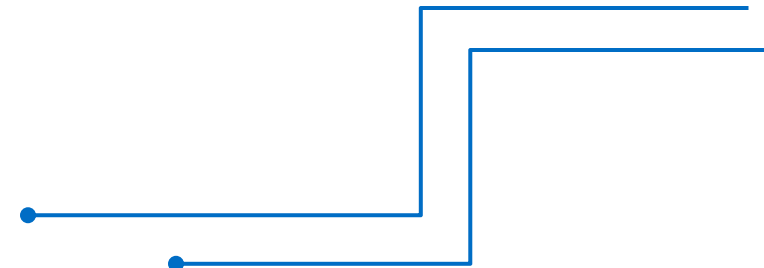
Data Science is the interdisciplinary field that uses scientific methods, processes, algorithms, and systems to extract knowledge and insights from data. It often incorporates AI and ML techniques to analyze and interpret complex data.

"More insights into **Machine Learning** will be provided in the Module 4."

Is AI useful or harmful?



- Both harmful and useful, depending on how it is developed, deployed, and regulated.
- Balancing the useful and harmful aspects of AI requires collaboration between governments, businesses, and communities to ensure that AI serves the greater good while minimizing potential harms.



Types of AI

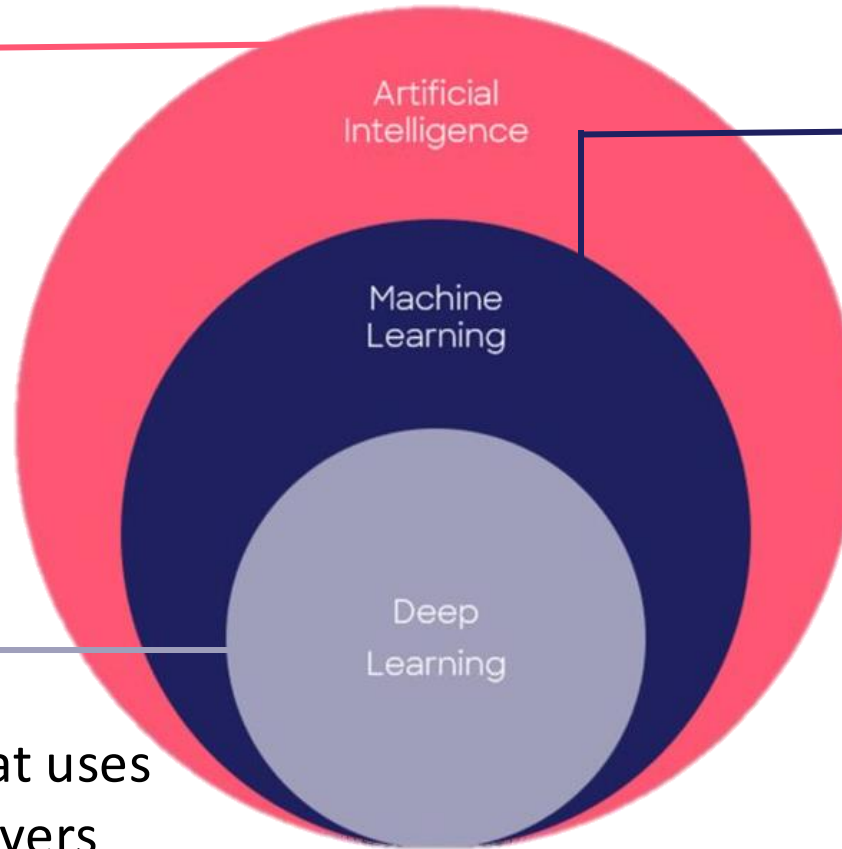


Artificial Intelligence

Encompasses the broad concept of machines being able to perform tasks that mimic human intelligence.

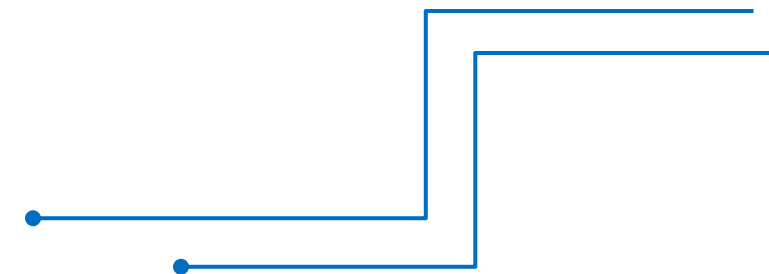
Deep Learning

A specialized subset of ML that uses neural networks with many layers (hence “deep”) to analyze various data forms, including images, sound, and text.



Machine Learning

A subset of AI where algorithms are trained on data to make predictions or decisions based on patterns in the data.



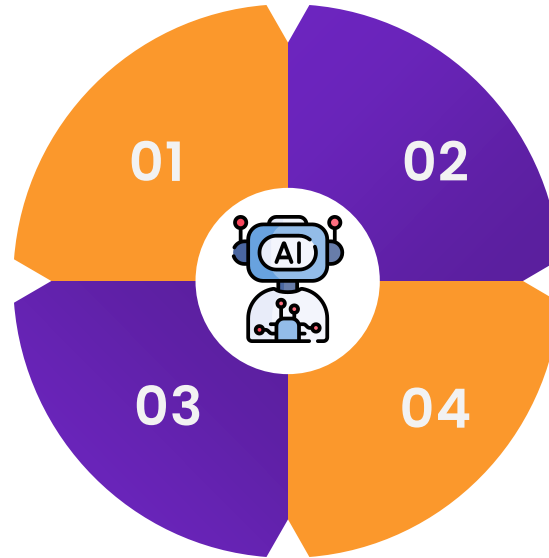
Types of AI

Narrow AI (Weak AI)

- AI systems designed to perform a specific task or solve a particular problem.
- Virtual assistants like **Siri or Alexa**, recommendation algorithms on streaming services, and chatbots.

General AI (Strong AI)

- AI that has generalized human cognitive abilities, allowing it to understand, learn, and apply knowledge across a broad range of tasks.

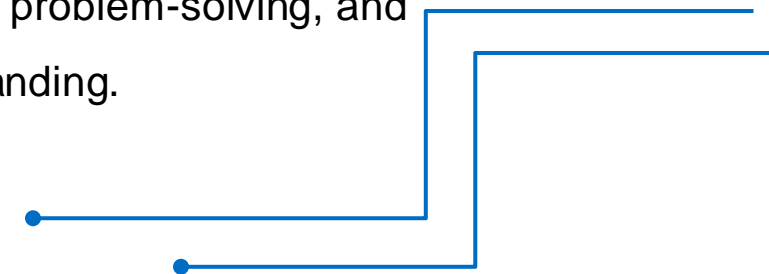


Machine Learning (ML)

- A subset of AI where algorithms learn from data to make predictions or decisions without being explicitly programmed

Artificial Superintelligence (ASI)

- Artificial Superintelligence refers to a theoretical AI that surpasses human intelligence across all domains, including creativity, problem-solving, and emotional understanding.



Real world Applications in AI



Healthcare:

Disease diagnosis, personalized treatment plans, drug discovery (e.g., predictive analysis in medical imaging).



Finance:

Fraud detection, credit scoring, algorithmic trading.



Retail:

Personalized recommendations, inventory management, and customer sentiment analysis.



Transportation:

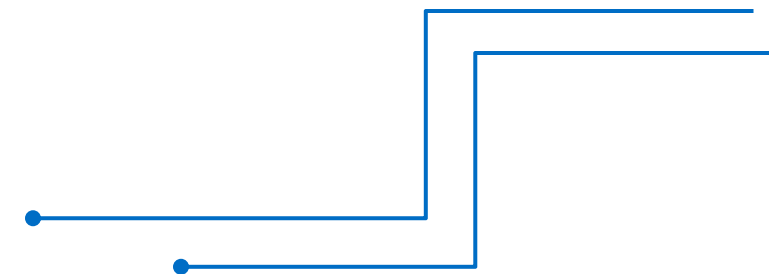
Autonomous vehicles, traffic management, route optimization.

AI



Manufacturing:

Predictive maintenance, quality control, production automation.



Introduction to Machine Learning



Types of Machine Learning	Definition	Examples
Supervised Learning	<ul style="list-style-type: none">○ Learning method where the model is trained on labeled data, meaning each input has an associated correct output.	<ul style="list-style-type: none">○ Spam detection in email, image classification, and sentiment analysis.
Unsupervised Learning	<ul style="list-style-type: none">○ Learning method that deals with unlabeled data, meaning the model identifies patterns without guidance on specific outcomes.	<ul style="list-style-type: none">○ Customer segmentation, anomaly detection, and recommendation systems
Reinforcement Learning	<ul style="list-style-type: none">○ Learning method where an agent interacts with an environment and learns to perform actions that maximize cumulative rewards.	<ul style="list-style-type: none">○ Robotics, game-playing AI (like AlphaGo), and self-driving cars.

"A more detailed discussion awaits in the **Module 4**."

Differences between AI, Machine Learning and Deep Learning

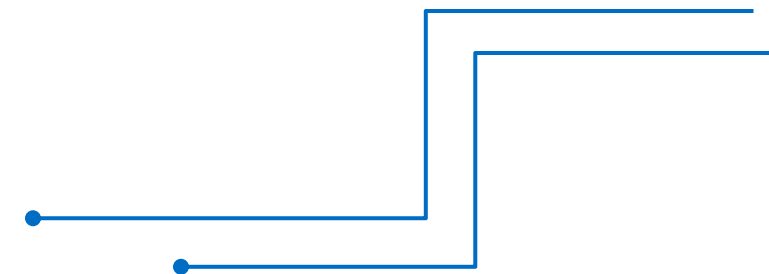
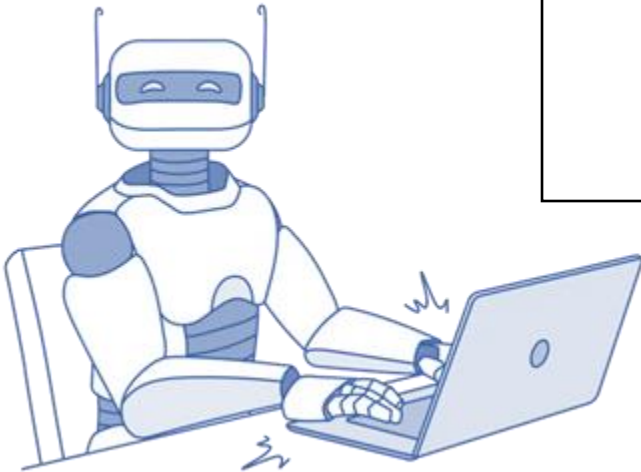


Artificial Intelligence

AI is the umbrella term for all methods and processes that emulate human intelligence.

Machine Learning

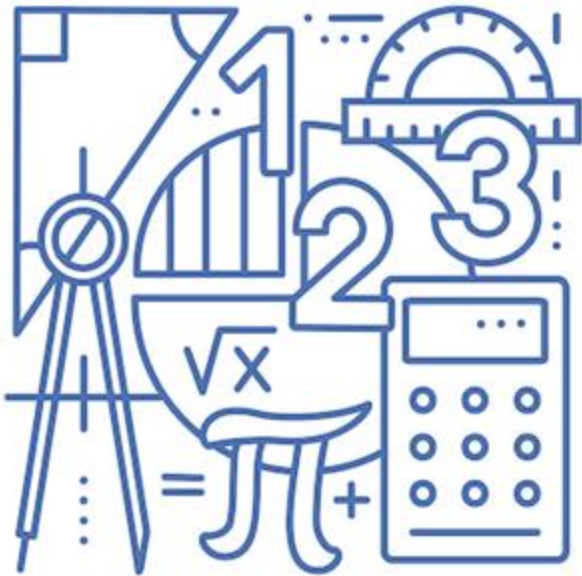
ML allows systems to learn from data without being explicitly programmed, whereas **Deep Learning** utilizes complex neural networks that can process unstructured data (e.g., images, text) to learn representations automatically.



Computational Mathematics for Machine Learning

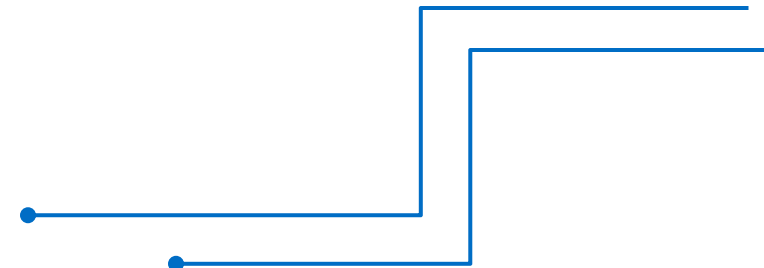
Why Computational Math Matters?

- ❑ Mathematical concepts like linear algebra, calculus, probability, and optimization form the foundation of AI algorithms.
- ❑ Computational math enables precise and efficient processing, model training, and decision-making.



Examples of Importance

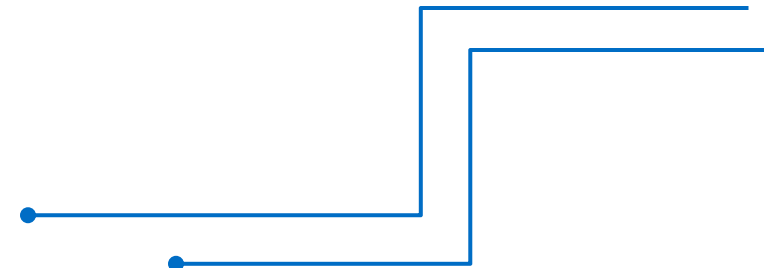
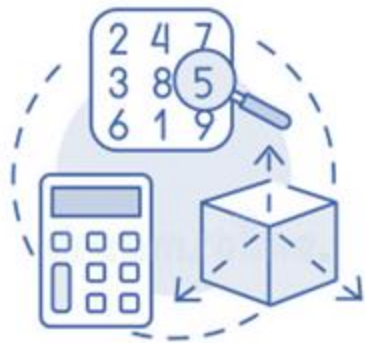
- ❑ Calculus is used for model optimization through gradient descent.
- ❑ Linear algebra underpins data representation and transformations.



Computational Mathematics for Machine Learning

Computational math is vital for ML as it enables model training and optimization. Key areas include:

- ❑ **Linear Algebra:** Essential for data transformations and neural network computations.
- ❑ **Calculus:** Supports optimization techniques like gradient descent.
- ❑ **Probability:** Forms the basis of many ML algorithms by handling uncertainty in data.



Linear Algebra and Matrix Operations Basics

Linear algebra is fundamental in ML:



Vectors

Vectors represent feature sets

Matrices

Matrices facilitate data transformations.

Matrix Multiplication

Matrix Multiplication is a core operation for neural network data processing.

Linear transformations like scaling, rotation, and projection are essential in ML, especially in neural networks, for data processing and model accuracy improvement. Further details about Linear Algebra will be explored in the next module(**Module 2**).



Realistic Infotech Group
IT Training & Services
No.79/A, First Floor
Corner of Insein Road and
Damaryon Street
Quarter (9), Hlaing Township
Near Thukha Bus Station
09256675642, 09953933826
<http://www.rig-info.com>