Artificial Intelligence (AI): In its broadest sense, AI refers to the simulation of human intelligence processes by computer systems. It is the overarching field dedicated to creating machines that can think, learn, and problem-solve.

Machine Learning (ML): A subset of AI, Machine learning focuses on designing specific systems that can learn from and make decisions or predictions based on data, without being explicitly programmed for the task.

Deep Learning (DL): A subset of Machine Learning that utilizes a specific set of algorithms known as neural networks, often composed of many layers (hence "deep"). Deep Learning has been the driving force behind recent breakthroughs in AI, including in areas like Natural Language Processing (NLP), Generative Adversarial Networks (GANs), and Transformers.

Generative AI (GenAI): A branch of Deep Learning that focuses on creating new, original content. This includes text, images, audio, and more.

Large Language Models (LLMs) are a key component of modern Generative AI.

Supervised Learning

In supervised learning, the model is trained on labeled data, meaning each data point is tagged with a correct output or label. The goal is to learn a mapping function that can predict the output for new, unseen data.

Unsupervised Learning

Unsupervised learning models work with un-labeled data. The objective is to identify hidden patterns within the data without any predefined labels.

Reinforcement Learning

This paradigm involves an agent that learns to make decisions by interacting with an environment. The agent's goal is to maximize a cumulative reward over time.

Shallow Models: Models with a limited number of layers, capable of capturing only linear and simple non-linear relationships.

Deep Models: Models with many layers, capable of capturing complex, hierarchical patterns in data.