Artificial Intelligence

Introduction

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Artificial Intelligence

Introduction

Commitment

- Understand what Artificial Intelligence is, the ways in which it learns, and the business cases in which it is used.

What is Artificial Intelligence?

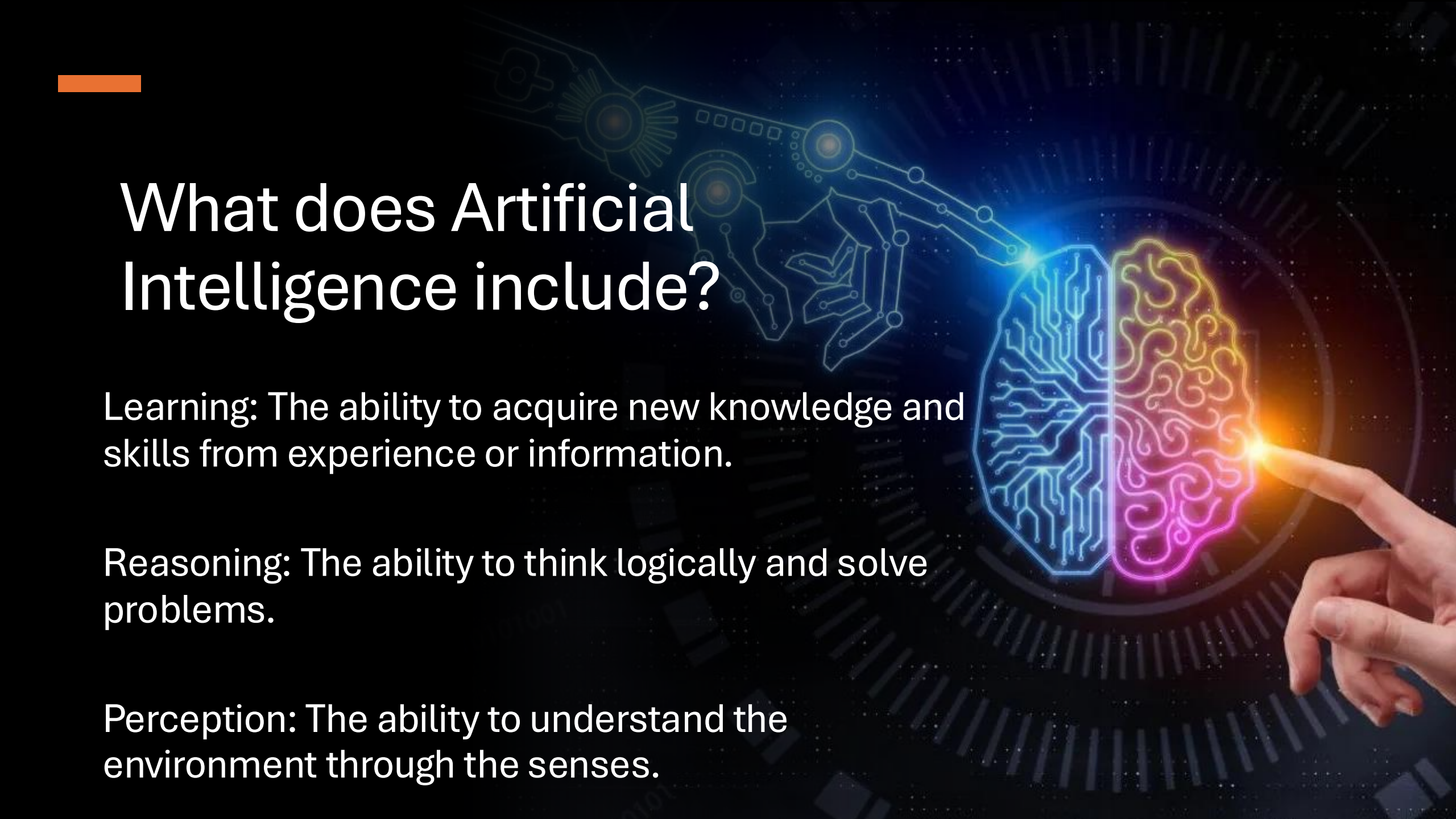
“Artificial intelligence is the new electricity. Just as electricity transformed industries 100 years ago, AI will transform every major industry today.”**Andrew Ng**

What does Artificial Intelligence include?

Learning: The ability to acquire new knowledge and skills from experience or information.

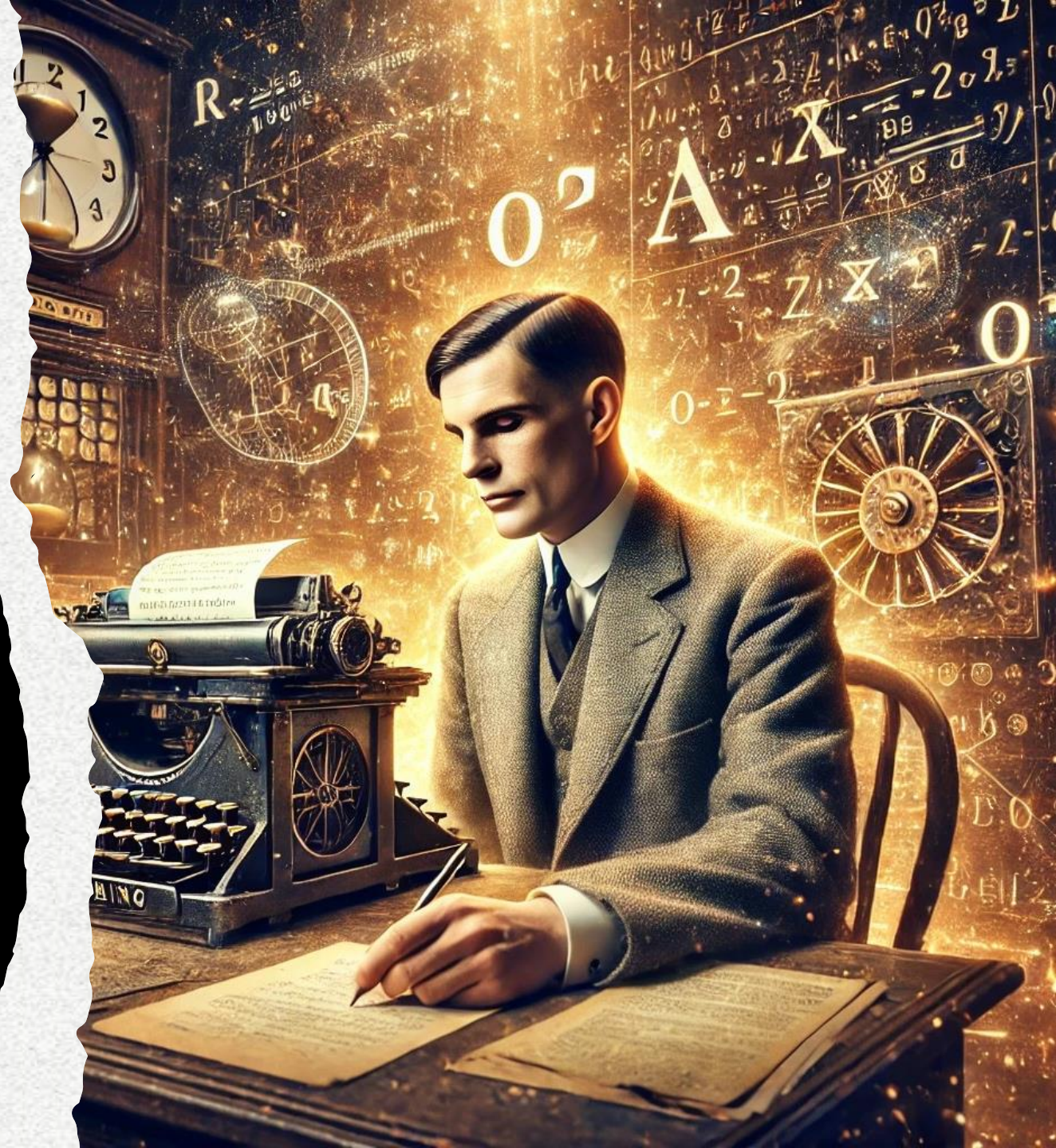
Reasoning: The ability to think logically and solve problems.

Perception: The ability to understand the environment through the senses.



Do computers think?

The basic purpose and goal of artificial intelligence were developed by Alan Turing's paper "Computing Machinery and Intelligence" (1950) and the subsequent Turing Test.



Approaches to Artificial Intelligence

Stuart Russell y
Peter Norvig

1 **Human Thought**

Creating machines that think like humans

2 **Rational Thinking**

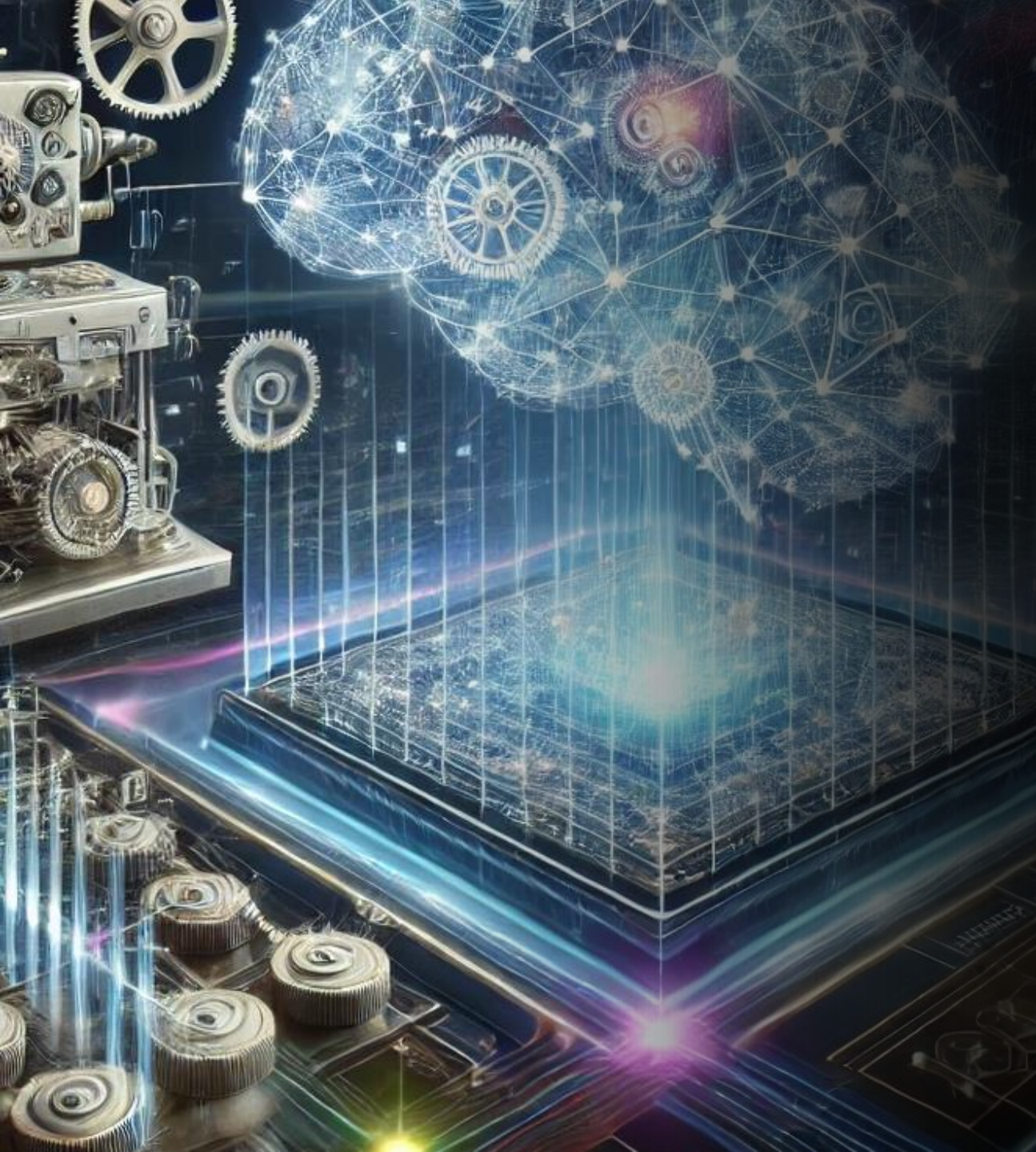
Creating machines that think logically

3 **Human Action**

Create machines that act like humans

4 **Action Rational**

Create machines that act efficiently and effectively



Machine Learning

"Some of these AI systems are powered by machine learning, some are powered by deep learning, and some are powered by very simple things like rules." **Jeremy Achin, CEO of DataRobot**

Concepts

Artificial Intelligence (AI): Simulates human skills such as learning and reasoning.

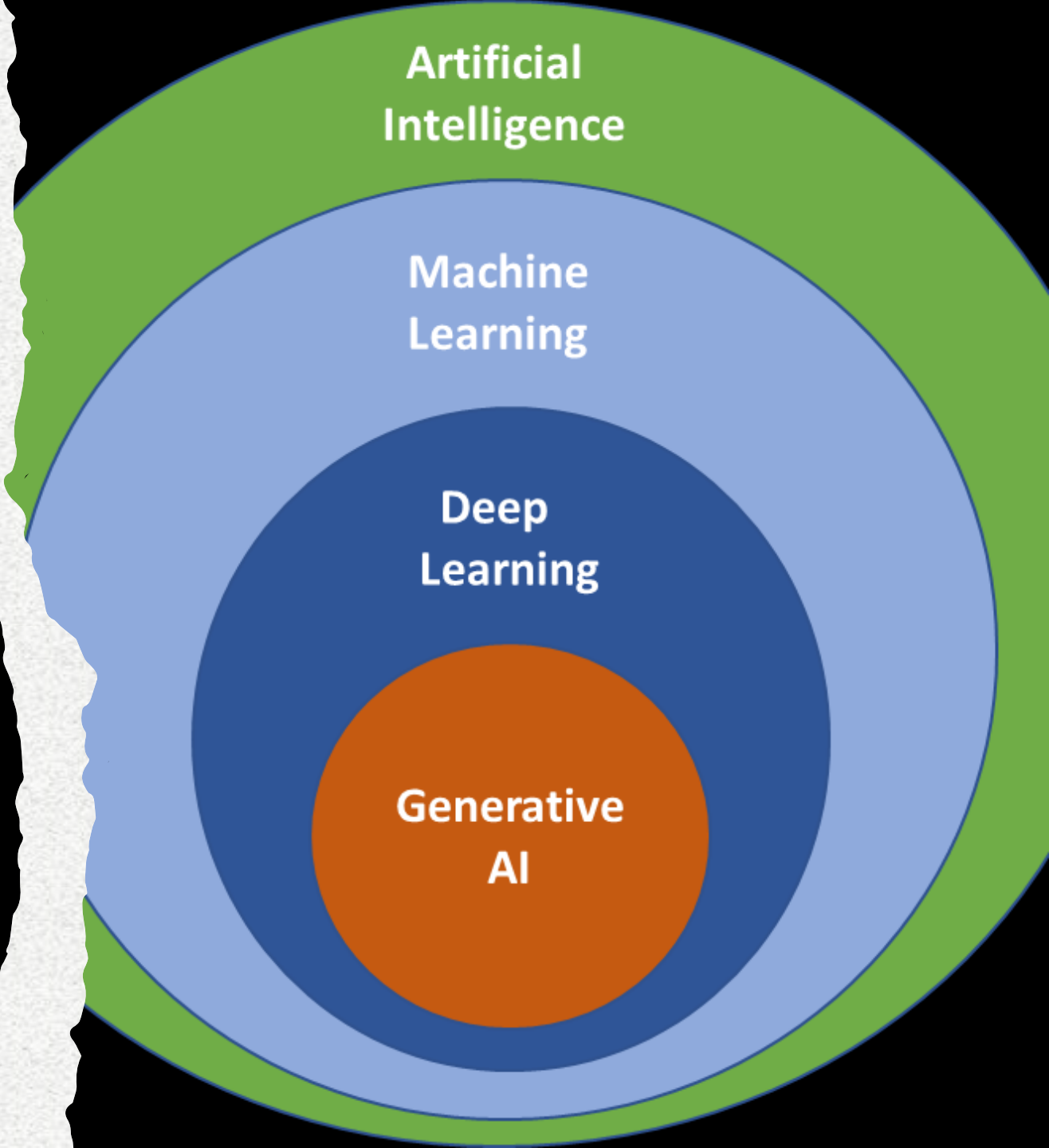
Machine Learning (ML): Learning from data sets, based on an algorithm and a measure of success.

Deep Learning (DL): Encompasses all algorithms based on neural networks.

Generative AI: Creates new content, such as text, images or sounds, from learned patterns.

What is Machine Learning?

Allows machines to learn from data

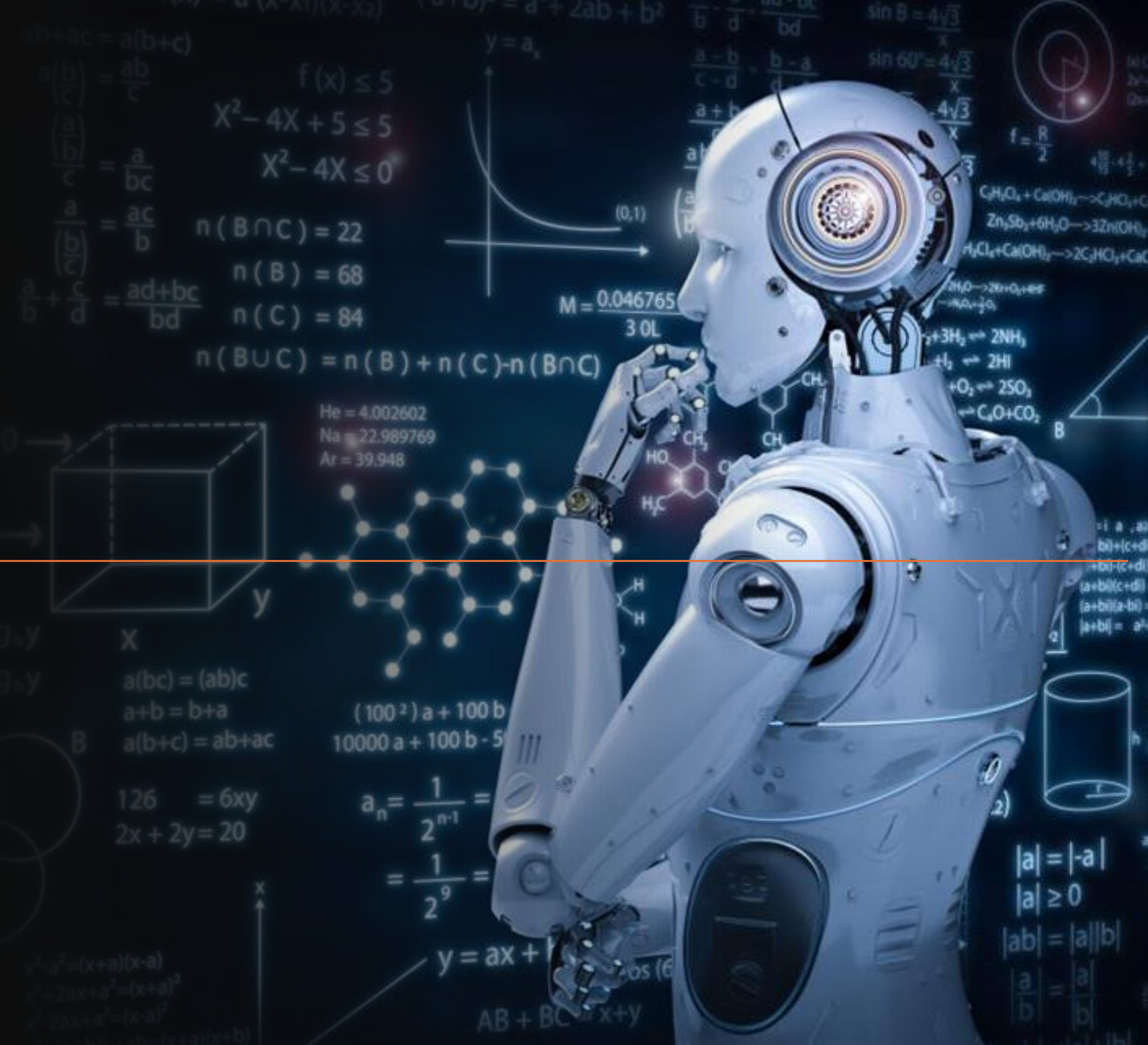


Types of Learning

Supervised

Unsupervised

Reinforcement Learning



Supervised Learning

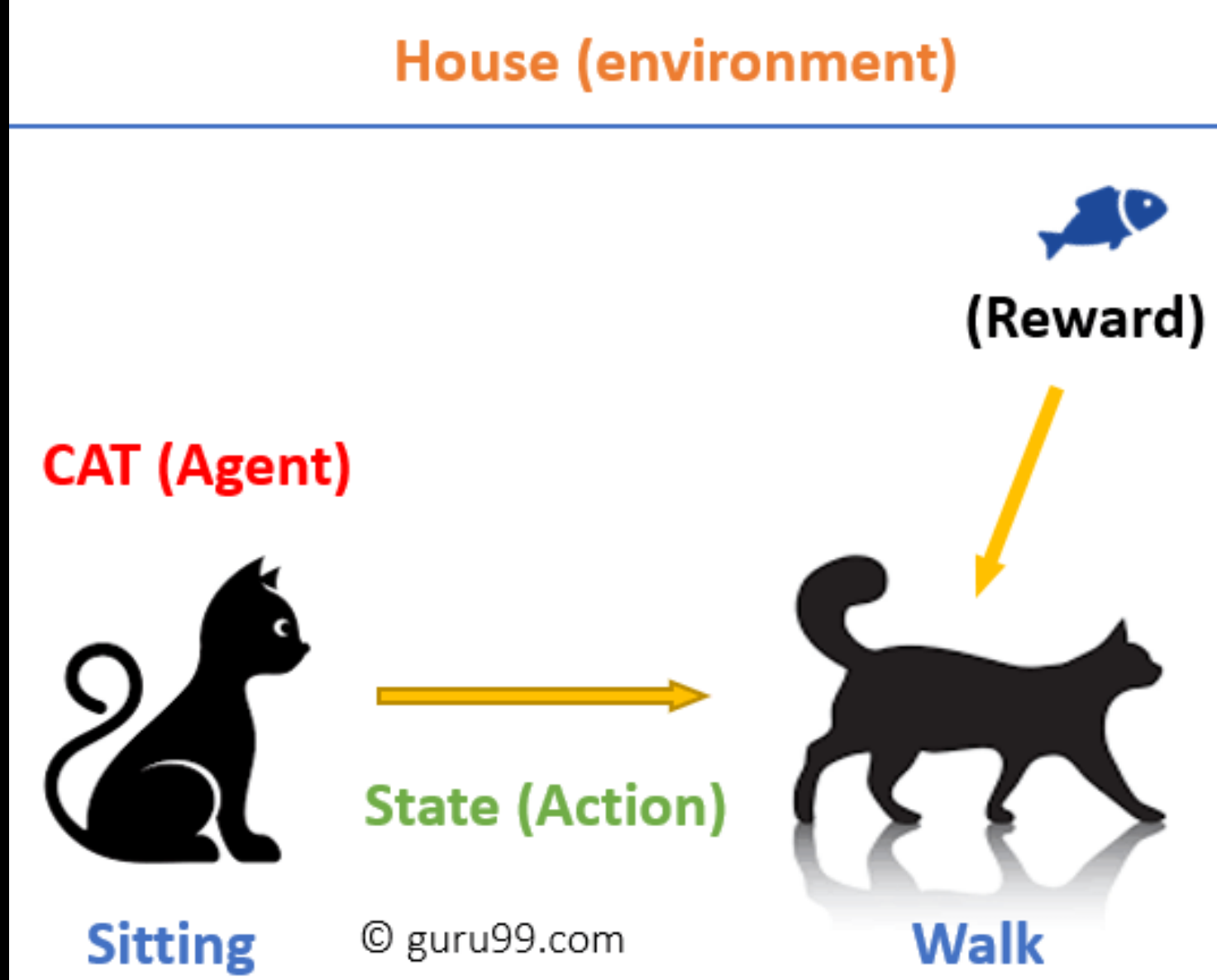
- Learn from examples

Unsupervised Learning

- Find patterns

Reinforcement Learning

- Learn to improve in exchange for rewards



History

Evolution of AI

Neural Networks

Development of neural network models in the 1950s to 1970s

Machine Learning

Emergence of machine learning techniques from 1980 to 2000

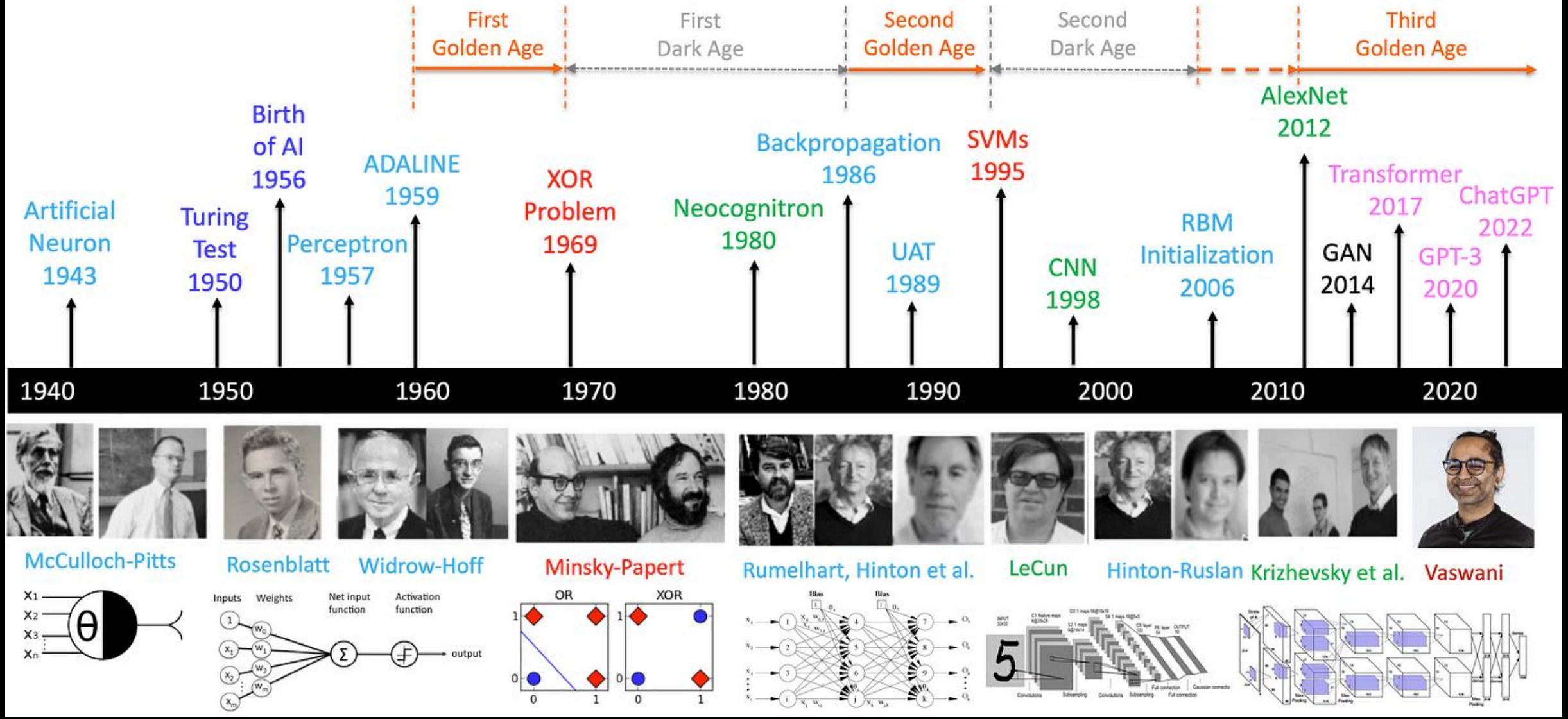
Deep Learning

Rise of deep learning methods between 2010 and 2020

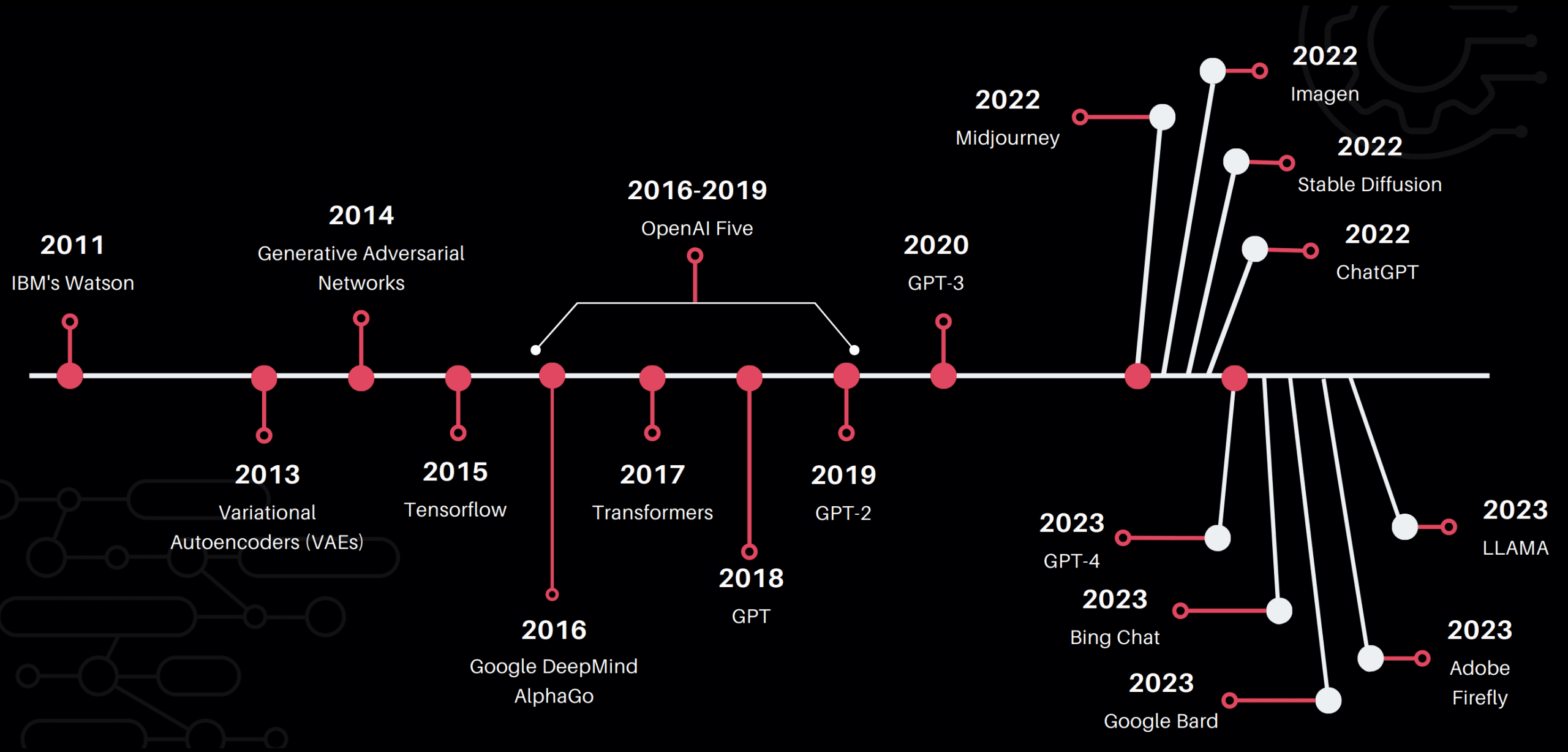
Generative AI

Introduction of generative AI technologies from 2015 onwards

A Brief History of AI with Deep Learning

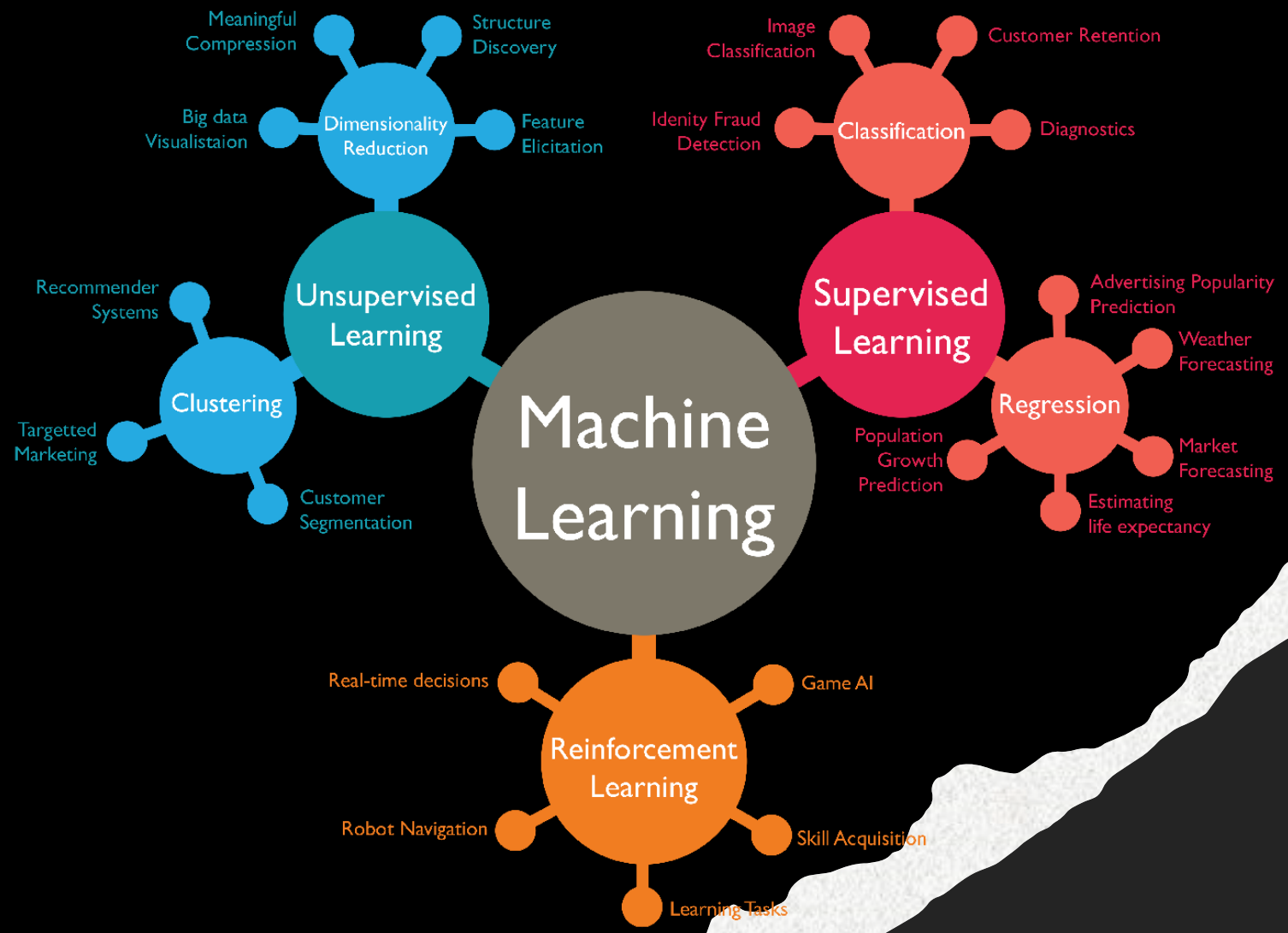


https://medium.com/@lmpo/a-brief-history-of-ai-with-deep-learning-26f7948bc87b



https://www.desdevpro.com/blog/talk-rise-of-generative-ai

Use Cases


Machine Learning
Unsupervised Learning
Dimensionality Reduction
Meaningful Compression
Structure Discovery
Big data Visualistaion
Feature Elicitation
Clustering
Recommender Systems
Targetted Marketing
Customer Segmentation
Supervised Learning
Classification
Image Classification
Customer Retention
Idenity Fraud Detection
Diagnostics
Regression
Advertising Popularity Prediction
Weather Forecasting
Population Growth Prediction
Market Forecasting
Estimating life expectancy
Reinforcement Learning
Real-time decisions
Game AI
Robot Navigation
Skill Acquisition
Learning Tasks

AI Applications in Various Sectors

Credit Risk Analysis

Evaluating financial data to assess lending risks

Trading Techniques

Methods for executing profitable trades in financial markets

Marketing

Strategies to enhance brand visibility and customer engagement

Investment Techniques

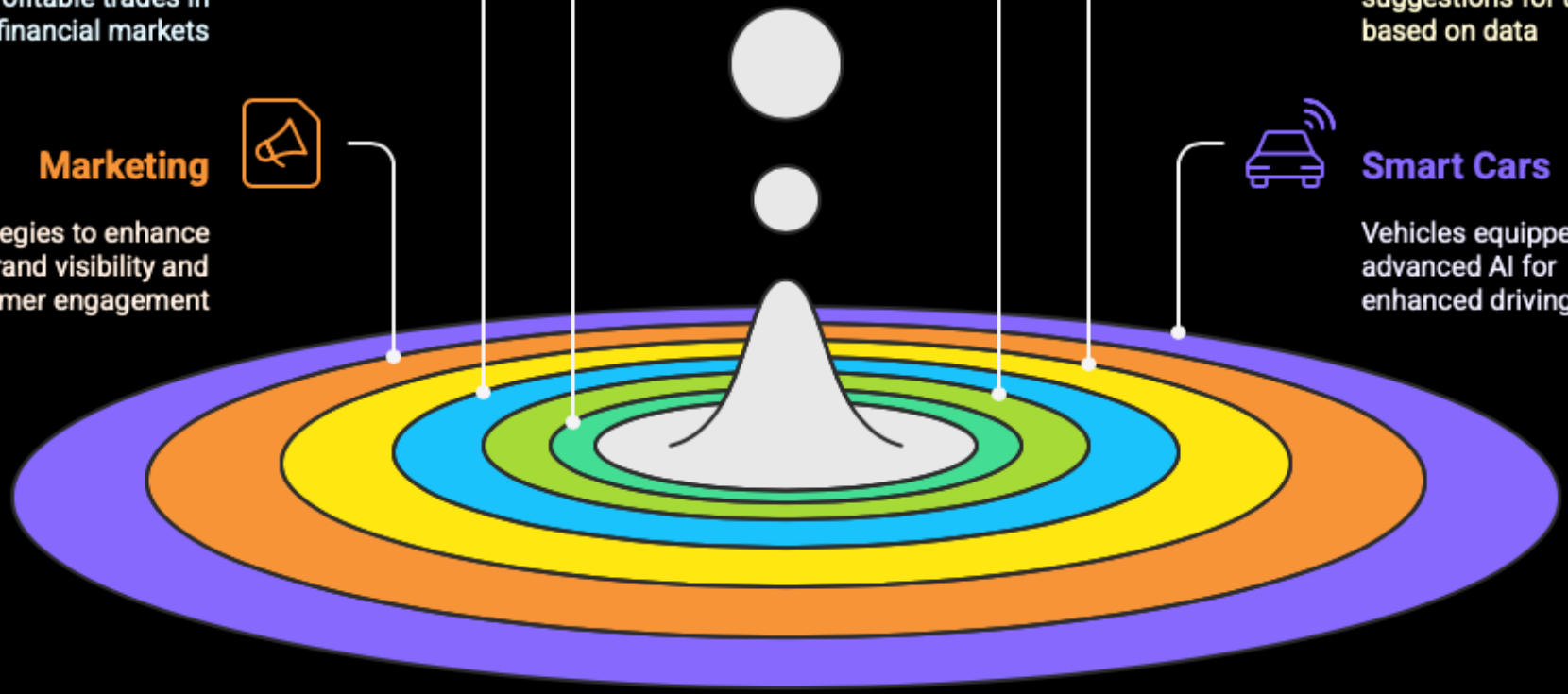
Strategies for optimizing financial growth and stability

Recommendation Systems

Personalized suggestions for users based on data

Smart Cars

Vehicles equipped with advanced AI for enhanced driving



AI Applications in Various Sectors

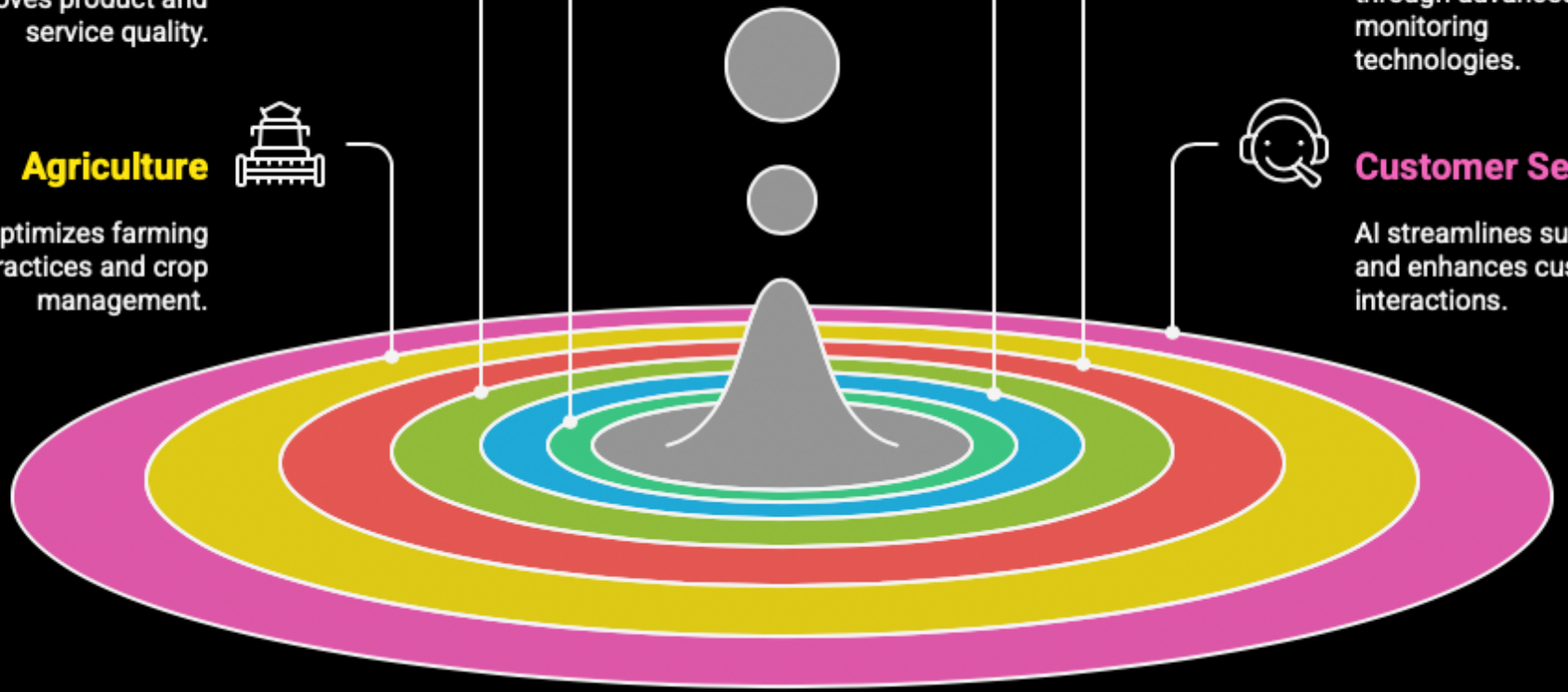


Image Management

AI enhances image processing and organization systems.

Quality Systems

AI ensures and improves product and service quality.

Agriculture

AI optimizes farming practices and crop management.

Social Networks

AI algorithms improve user engagement and content curation.

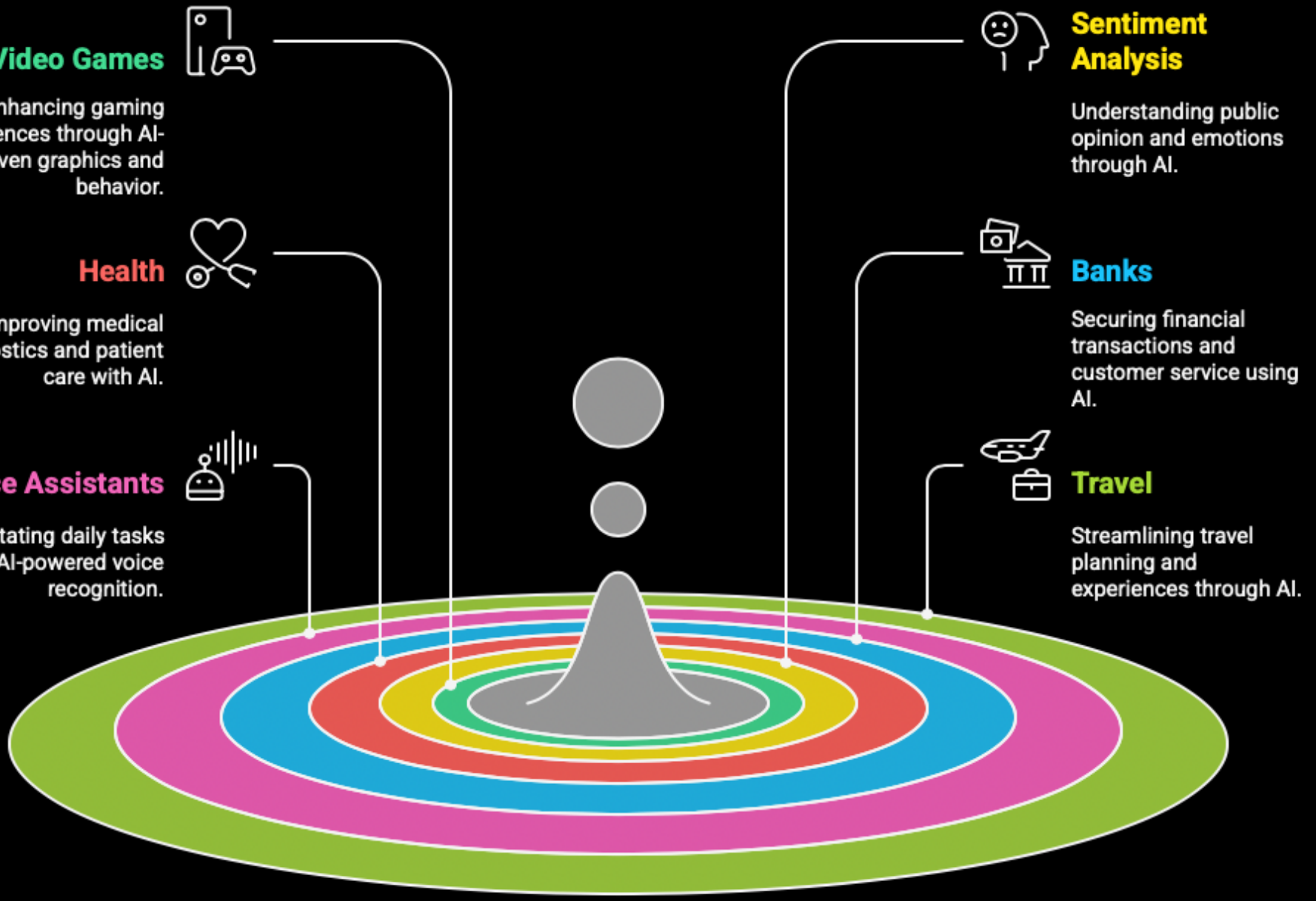
Surveillance Systems

AI enhances security through advanced monitoring technologies.

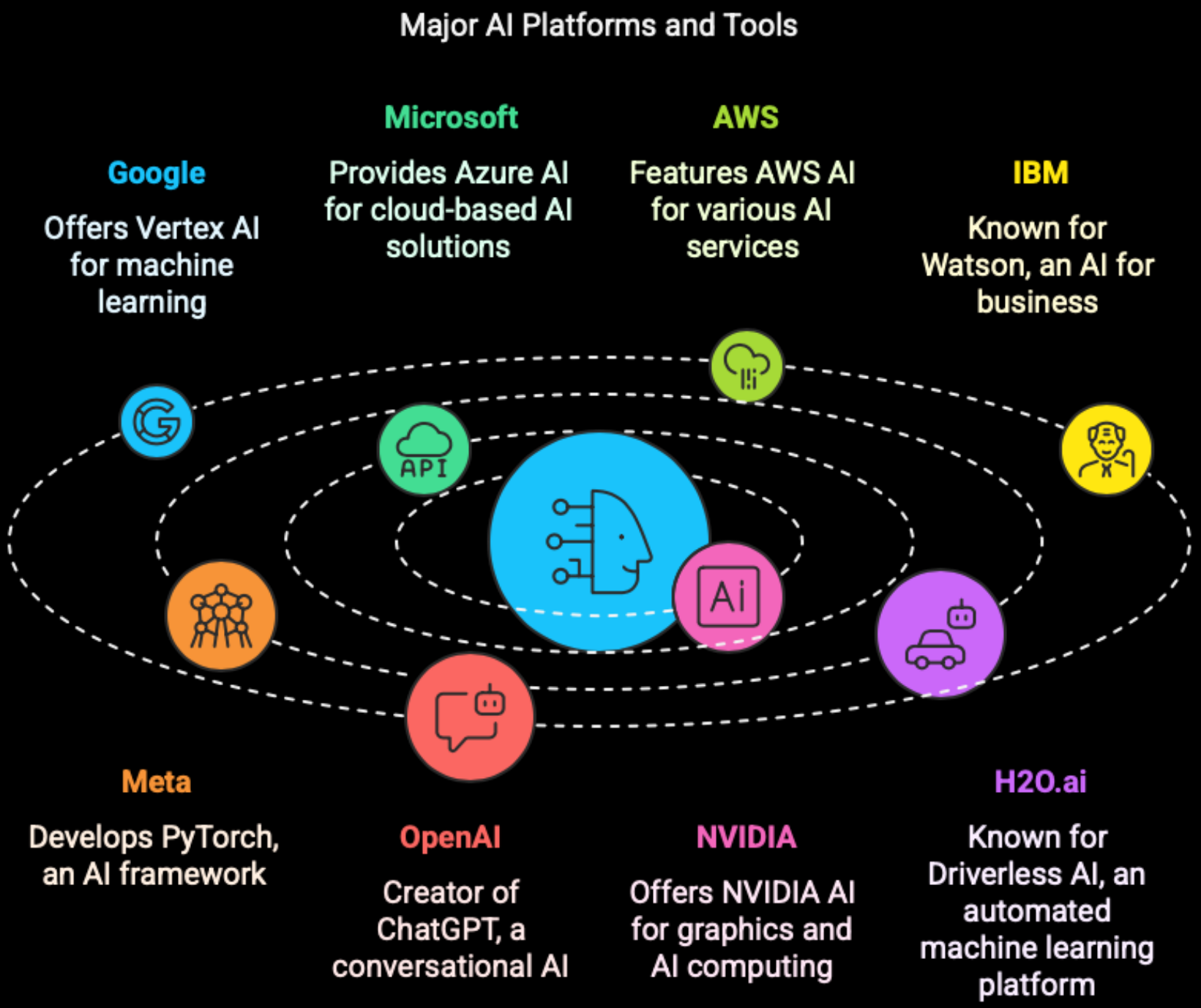
Customer Service

AI streamlines support and enhances customer interactions.

AI Applications Across Sectors



Platforms


Major AI Platforms and Tools
Google
Offers Vertex AI for machine learning
Microsoft
Provides Azure AI for cloud-based AI solutions
AWS
Features AWS AI for various AI services
IBM
Known for Watson, an AI for business
API
Ai
Meta
Develops PyTorch, an AI framework
OpenAI
Creator of ChatGPT, a conversational AI
NVIDIA
Offers NVIDIA AI for graphics and AI computing
H2O.ai
Known for Driverless AI, an automated machine learning platform

LLM

Global AI Model Landscape

ChatGPT

Developed by OpenAI, known for conversational AI.

LLaMA

Meta's language model AI, focused on research and development.

Claude

AI model by Anthropic, emphasizing safety and alignment.

Gemini

Google's AI model, integrating various AI technologies.

Mistral

French AI model known for its open-weight architecture.

Copilot

Microsoft's AI tool for enhancing productivity in coding.

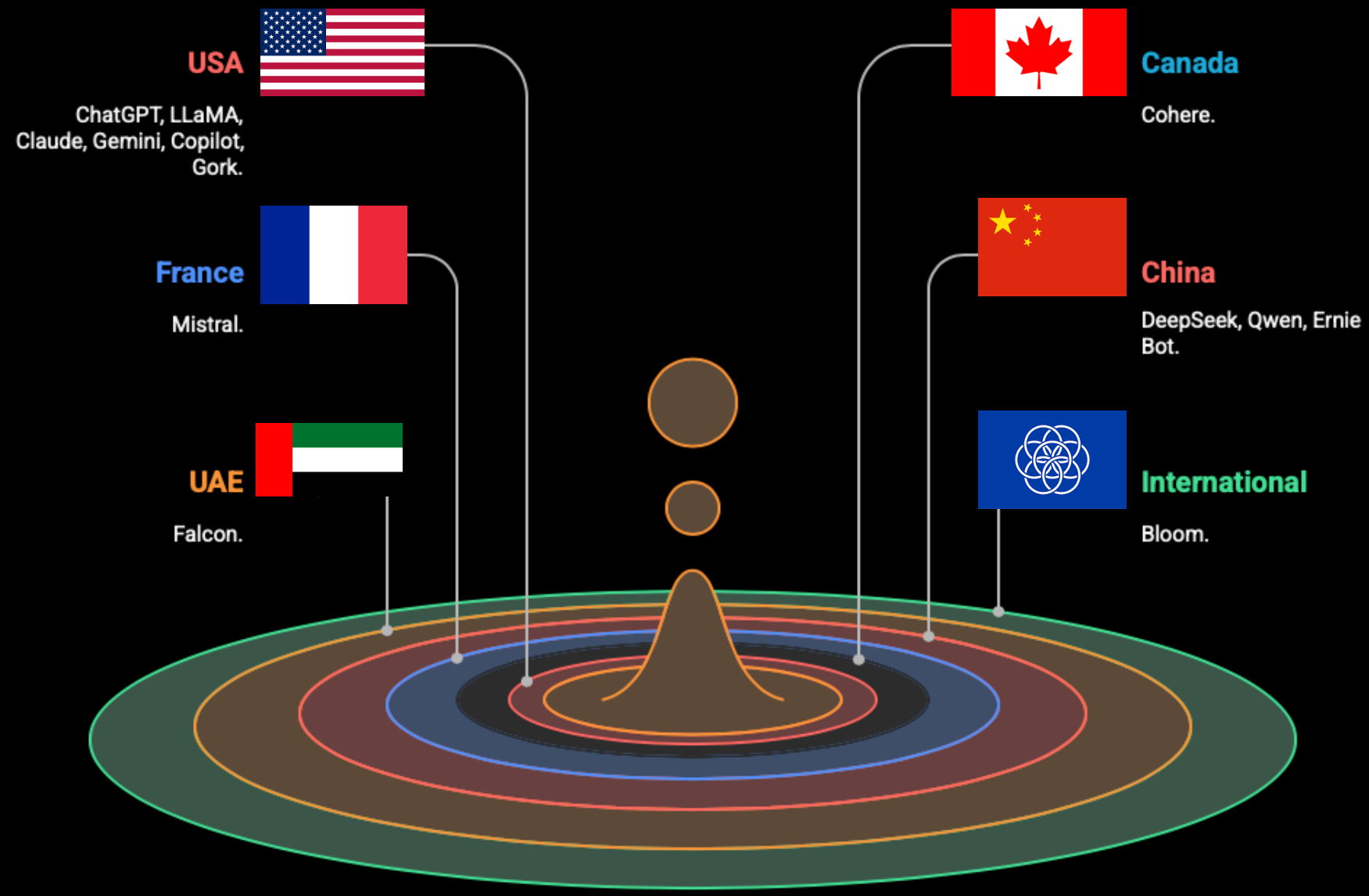
Qwen

Alibaba's AI model, part of its cloud and AI services.

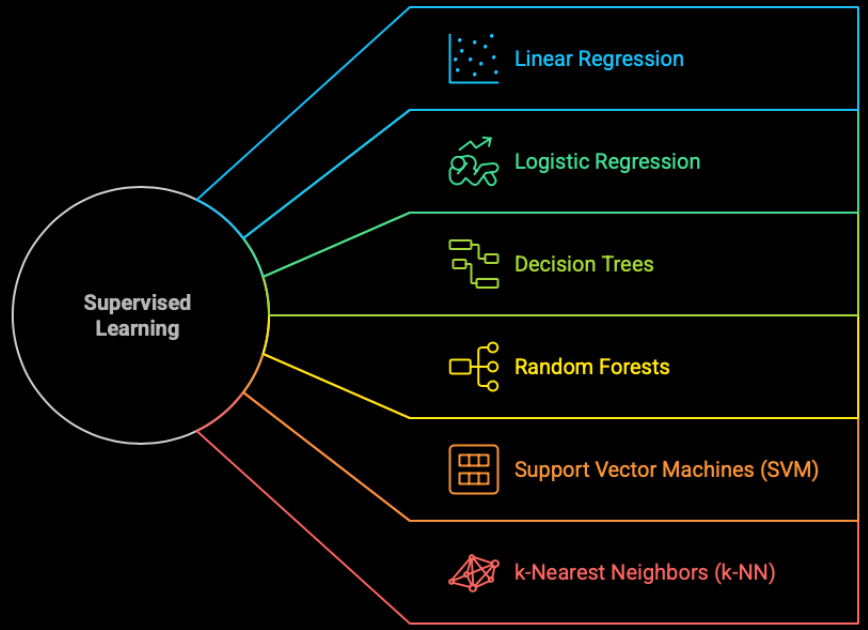
DeepSeek

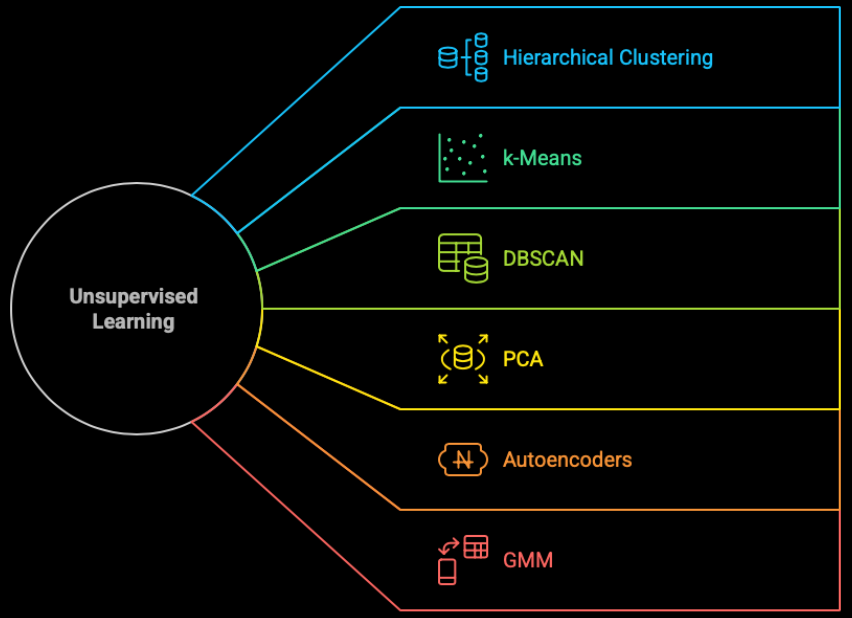
Chinese AI model specializing in search and data analysis.

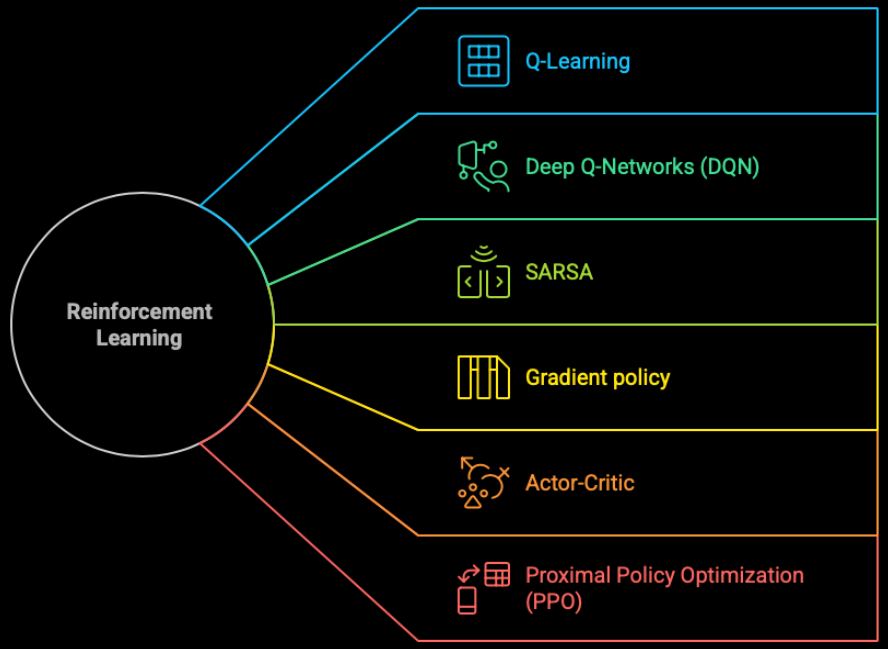
Global AI Language Models

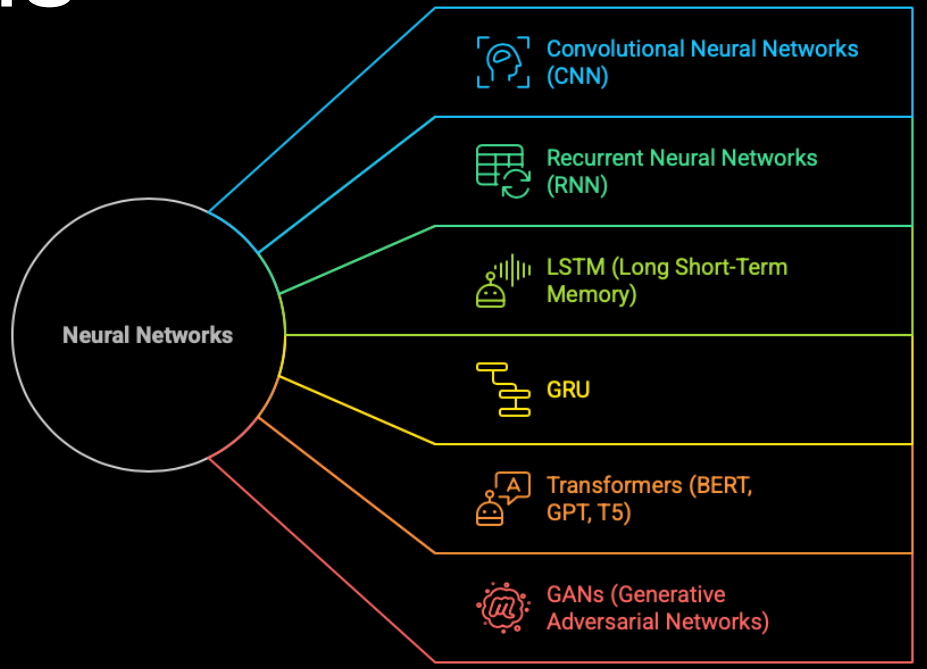


Algorithms


Supervised Learning
Linear Regression
Logistic Regression
Decision Trees
Random Forests
Support Vector Machines (SVM)
k-Nearest Neighbors (k-NN)


Unsupervised Learning
Hierarchical Clustering
k-Means
DBSCAN
PCA
Autoencoders
GMM


Reinforcement Learning
Q-Learning
Deep Q-Networks (DQN)
SARSA
Gradient policy
Actor-Critic
Proximal Policy Optimization (PPO)


Neural Networks
Convolutional Neural Networks (CNN)
Recurrent Neural Networks (RNN)
LSTM (Long Short-Term Memory)
GRU
Transformers (BERT, GPT, T5)
GANs (Generative Adversarial Networks)

Educator in AI

Artificial Intelligence

Data Engineering

Machine Learning

Data Science

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