

Huawei HCCDA-AI Certification



Initiated by



National Vocational And
Technical Training Commission





Welcome To HCIA-AI Certification

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Takeaway



Huawei Cloud AI
Services for AI Agents



AI/ML/DL Core
Fundamentals of AI



AI Agents
AI based Applications

To AI and Huawei Strategy

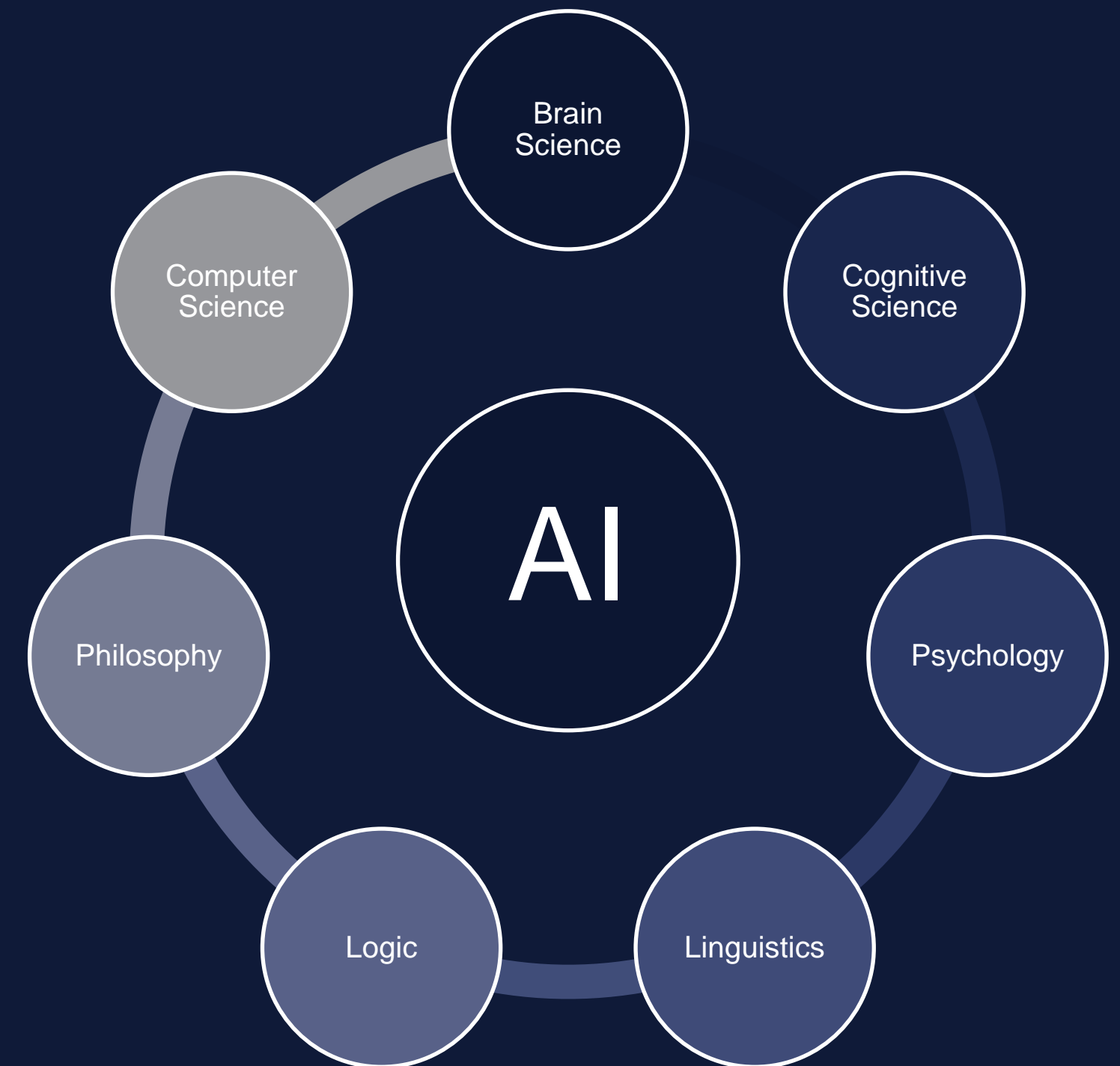
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Introduction to AI & Huawei Strategy



What is AI?

Artificial Intelligence (AI) is a new technical science that studies and develops theories, methods, techniques, and application systems for simulating and extending human intelligence. In 1956, the concept of AI was first proposed by John McCarthy, who defined the subject as “Science and engineering of making intelligent machines, especially intelligent computer program. AI is concerned with making machines work in an interdisciplinary course that involves various fields.



**“I propose to
consider the
question, ‘Can
machines think’”**

— Alan Turing in 1950

**“Make machines
behave like
humans”**

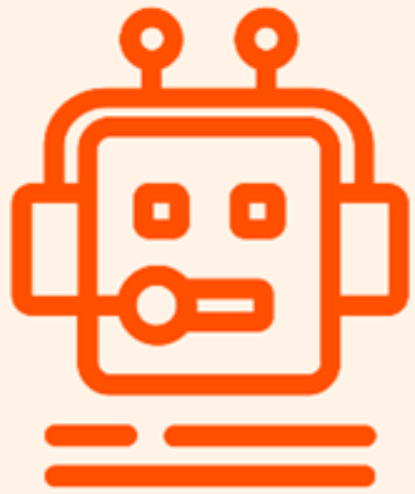
— Jon McCarthy in 1956

**“Artificial intelligence is
the science of making
machine do things that
would require intelligence
if done by men”**

— Marvin Minsky

What is AI?

ANI vs. AGI vs. ASI



Artificial narrow intelligence (ANI)

Designed to perform specific tasks



Artificial general intelligence (AGI)

Can behave in a human-like way across all tasks



Artificial super intelligence (ASI)

Smarter than humans—the stuff of sci-fi

Key differences

Weak AI (Narrow AI)

Designed for specific tasks, like image recognition or language translation. It operates within predefined limits, lacks general intelligence, and can't adapt to unrelated tasks.

Examples: Siri, recommendation algorithms.

Strong AI (AGI)

Hypothetical AI with human-like intelligence, capable of learning, reasoning, and performing any intellectual task a human can. It would adapt across domains without task-specific programming.

Not yet achieved.

General AI

Often used interchangeably with Strong AI, but some distinguish it as a broader concept, implying not just human-level intelligence but potentially superhuman capabilities across all domains, with flexibility to tackle any problem

Future of AI



AI or Die

AI or Die

**How should companies
and countries think
about AI to drive growth
and prosperity?**

**The Mantra of AI or die is real and certainly
companies and countries that do not engage
will die.**

Top 3 Reasons for Choosing AI as a Career in 2025

Reason	Description	Supporting Details
High Demand for AI Talent	AI skills are in short supply, with global demand driving job opportunities across industries.	<ul style="list-style-type: none">- Global AI market projected at \$371.71B in 2025, growing to \$2.4T by 2032 (CAGR 30.6%).- Job postings for AI roles (e.g., ML engineers, data scientists) up 20% YoY in 2024.- Companies like NVIDIA, Microsoft, and OpenAI actively recruit AI specialists.
Well-paid Salaries	AI professionals earn high salaries due to specialized skills and market needs.	<ul style="list-style-type: none">- Average U.S. AI engineer salary: \$160,000-\$250,000 annually (2025).- Senior roles (e.g., AI research scientists) can exceed \$500,000 with bonuses.- Startups like Anthropic and xAI offer competitive equity packages.
Impactful Innovation	AI careers enable professionals to drive cutting-edge solutions for real-world challenges.	<ul style="list-style-type: none">- Contribute to advancements like autonomous vehicles (NVIDIA), drug discovery (BenevolentAI), or conversational AI (xAI's Grok).- Aligns with mission-driven goals (e.g., xAI's focus on human discovery).- Shapes future technologies like generative AI and neuro-symbolic systems.

Top Five AI Careers in 2025

Career	Description	Key Details
Machine Learning Engineer	Designs, builds, and deploys machine learning models for tasks like image recognition and NLP.	<ul style="list-style-type: none">- Salary: \$150,000-\$250,000 (U.S. average, 2025).- Demand: High, with 20% YoY job posting growth.- Skills: Python, TensorFlow, PyTorch; expertise in neural networks (Connectionism).- Employers: NVIDIA, Google, Amazon.
Data Scientist	Analyzes large datasets to derive insights, using statistical and AI techniques for predictive modeling.	<ul style="list-style-type: none">- Salary: \$120,000-\$200,000 annually.- Demand: Critical in finance, healthcare (e.g., IBM Watsonx).- Skills: Bayesian methods, data visualization, SQL.- Employers: Microsoft, Palantir, BenevolentAI.
AI Research Scientist	Conducts cutting-edge research to advance AI algorithms, focusing on LLMs or neuro-symbolic AI.	<ul style="list-style-type: none">- Salary: \$200,000-\$500,000+ (senior roles).- Demand: Growing in R&D hubs like DeepMind, xAI.- Skills: PhD often required; expertise in deep learning, reinforcement learning.- Employers: OpenAI, Anthropic, xAI.
AI Ethics Specialist	Ensures AI systems are fair, transparent, and compliant with regulations like GDPR and CCPA.	<ul style="list-style-type: none">- Salary: \$100,000-\$180,000 annually.- Demand: Rising due to ethical concerns (e.g., bias in LLMs).- Skills: Policy analysis, knowledge of AI frameworks.- Employers: Anthropic, Meta, government agencies.
Robotics Engineer	Develops AI-driven robots for automation, navigation, and industrial applications.	<ul style="list-style-type: none">- Salary: \$130,000-\$220,000 annually.- Demand: Strong in automotive, manufacturing (e.g., NVIDIA's platforms).- Skills: ROS, behavior-based AI, computer vision.- Employers: NVIDIA, Amazon, Tesla.

Road To AGI

OpenAI Imagines Our AI Future

Stages of Artificial Intelligence

Level 1	Chatbots, AI with conversational language
Level 2	Reasoners, human-level problem solving
Level 3	Agents, systems that can take actions
Level 4	Innovators, AI that can aid in invention
Level 5	Organizations, AI that can do the work of an organization

Source: Bloomberg reporting

Bloomberg

Three Waves of AI

Predictive AI

Focus on analyzing data to predict outcomes.

Analyze past data to predict future outcomes.

Why It Mattered: Enabled data-driven decision-making.

Generative AI

Focus on creating content from data.

Creating content (text, images, code, videos).

Why It Mattered: Empowered creativity and productivity.

Agentic AI

Focus on autonomous actions and learning iteratively.

Autonomous actions, environment interaction, iterative learning.

Why It Matters: AI becomes proactive, managing complex tasks.

Strong AI vs Weak AI

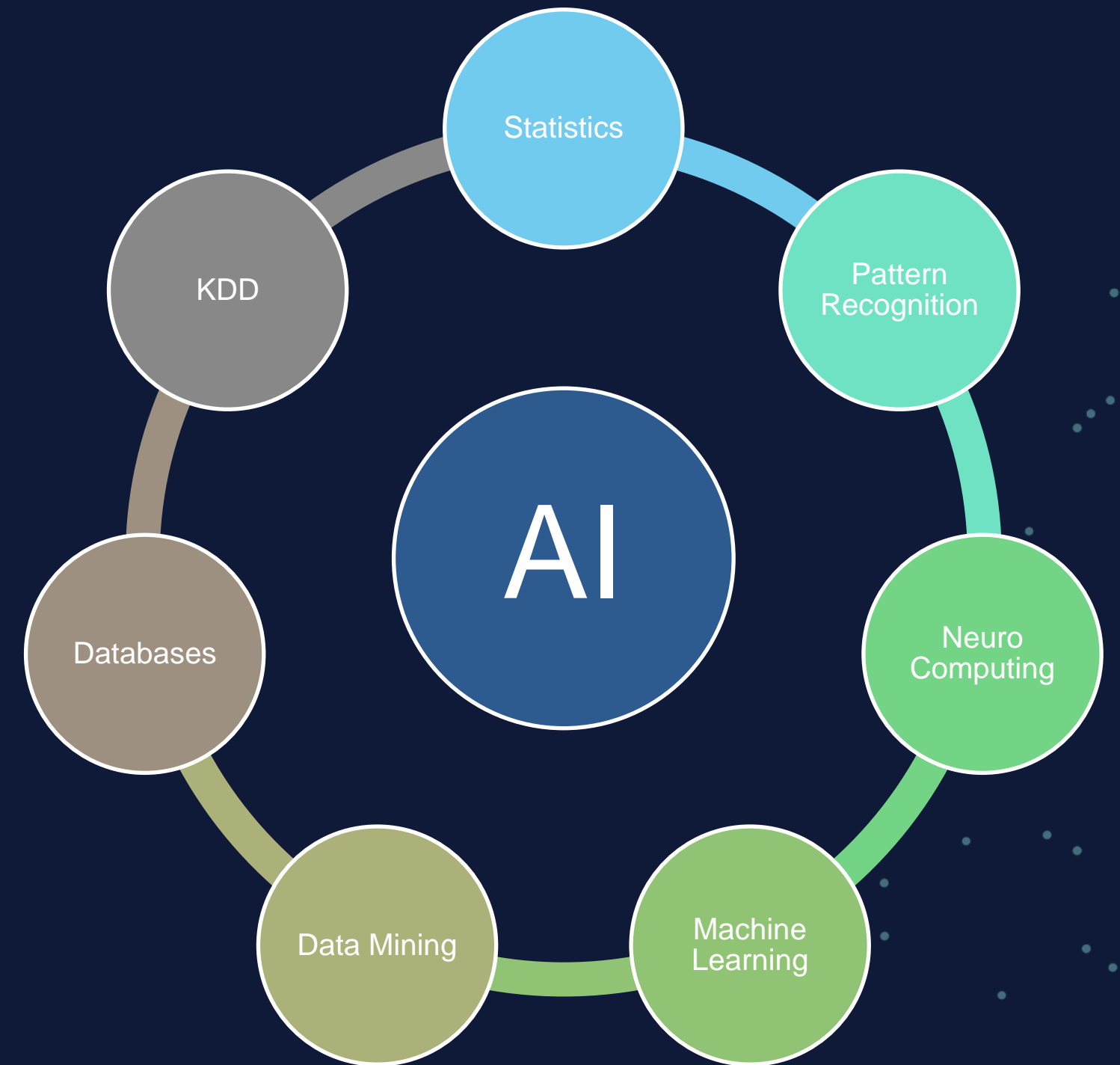
Strong AI

The strong AI views hold that it is possible to create intelligence machines that can really reason and solve problems. Such machines are considered to be conscious and self-aware, can independently think about problems and work out optimal solutions to problems, have their own system of values and world views, and have all the same instincts as living things, such as survival and security needs. It can be regarded as new civilization in a certain sense.

Weak AI

The weak AI views hold that intelligence machines can not really reason and solve problems. These machines only look intelligent, but do not have real intelligence or self-awareness.

Concepts about Artificial Intelligence and Machine Learning





Scope of AI



Scope of AI



Machine Learning

Algorithms that learn from data to make predictions or decisions



NLP

Enabling machines to understand and generate human language.



Computer Vision

Interpreting and processing visual information like images and videos



Robotics

Designing intelligent machines for physical tasks



Expert Systems

AI that mimics human expertise in specific domains



Automation

Streamlining repetitive tasks across industries.

Difference between AI, Machine Learning and Deep Learning



AI (Artificial Intelligence) is the broad field of creating systems that mimic human intelligence, such as reasoning, problem-solving, and decision-making.

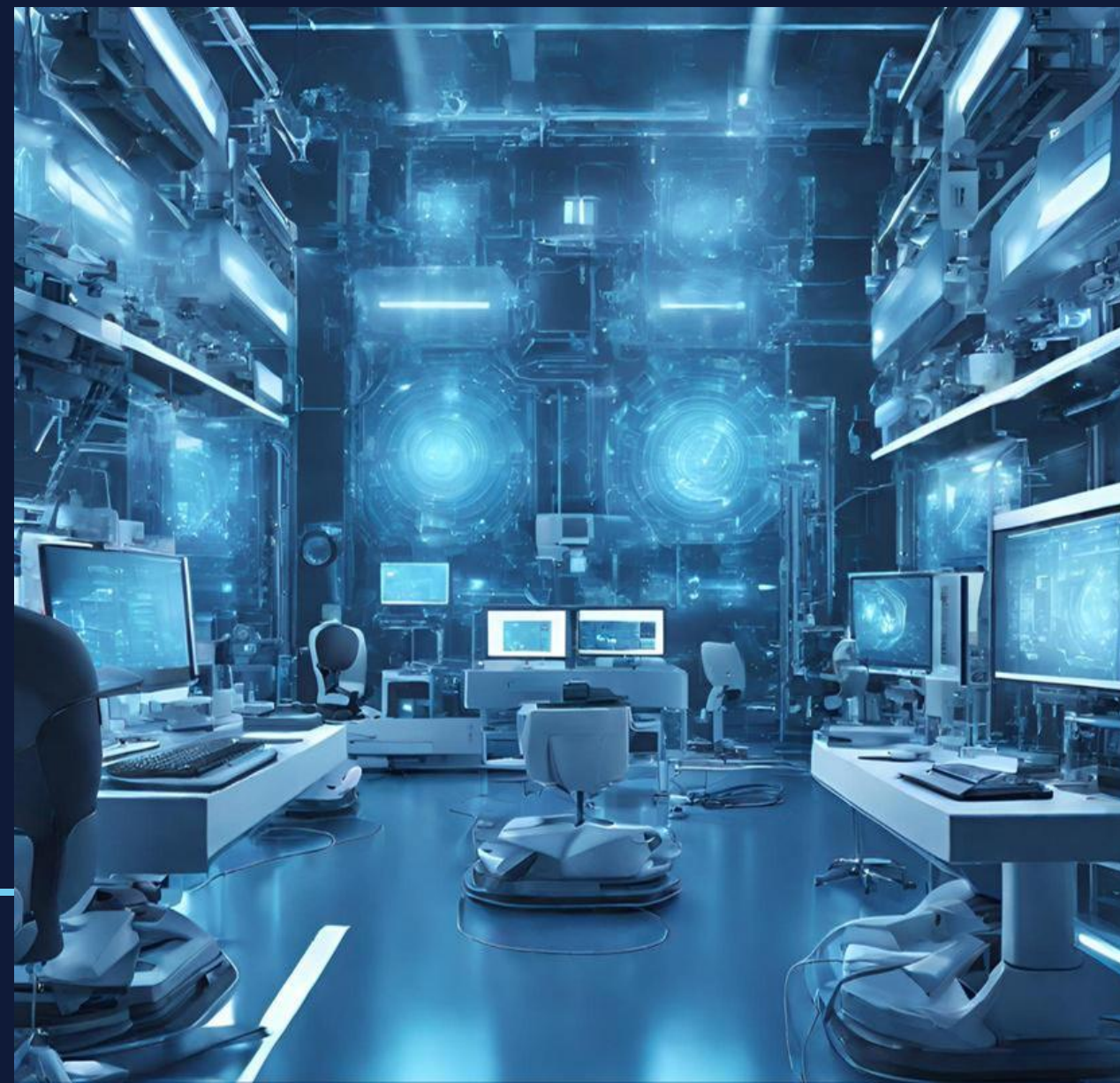
Machine Learning (ML) is a subset of AI, where algorithms learn patterns from data to make predictions or decisions without explicit programming.

Deep Learning (DL) is a specialized subset of ML, using neural networks with multiple layers to process complex data, like images or speech, achieving high accuracy in tasks like recognition and generation.

- **Relationship:** AI encompasses ML, which includes DL as a more advanced technique leveraging neural networks for complex tasks.

About AI

Major Schools of Thought in Artificial Intelligence



Major Schools of Thought in Artificial Intelligence

School of Thoughts	Core Principals	Strengths	Limitations	Example Applications
Symbolic AI (GOFAI)	Uses symbols and explicit rules for knowledge representation and logical reasoning.	Transparent, interpretable; effective for structured, rule-based tasks.	Struggles with scalability, ambiguity, and perception tasks; labor-intensive	Expert systems (e.g., MYCIN), chess engines
Connectionism	Neural networks learn patterns from data via interconnected nodes and optimization	Excels in pattern recognition, scales with data, handles unstructured inputs	Black-box nature, data/compute-intensive, vulnerable to adversarial examples	Image recognition, NLP (e.g., GPT, BERT).
Bayesian AI	Probabilistic reasoning using Bayes' theorem to manage uncertainty and inference	Robust for noisy data, interpretable probabilities, handles uncertainty	Computationally intensive, needs accurate priors, less suited for deep learning.	Robotics, medical diagnosis, spam filtering
Evolutionary AI	Mimics biological evolution with population-based optimization and fitness functions	Finds novel solutions, robust for complex optimization, no need for gradients.	Slow, computationally expensive, requires parameter tuning	Neural architecture search, optimization
Behavior-Based AI	Reactive systems with modular behaviors interacting in real-world environments	Adaptive, efficient for real-time tasks, robust in dynamic settings	Limited for planning or abstract reasoning, potential behavior conflicts	Robotic navigation, obstacle avoidance
Hybrid Approaches	Combines multiple paradigms (e.g., symbolic + neural) for versatile intelligence	Leverages strengths of multiple approaches, aims for general intelligence	Complex to design, inherits some limitations, resource-intensive	Neuro-symbolic AI, autonomous driving

Top 10 Companies in the Global AI Industry Landscape 2025

Company	Key AI Offerings	Primary Sectors	Notable Details
NVIDIA	AI chips (Blackwell platform, H100 GPUs), DGX systems, autonomous driving platforms	Semiconductor, Automotive, Data Centers, Defense	Market cap ~\$3 trillion; dominates AI hardware with CUDA; demand outstrips supply
Microsoft	Azure OpenAI, Copilot, AI-integrated cloud services	Healthcare, Finance, Retail, IT/Telecom, Manufacturing	Invested \$14B in OpenAI; plans \$80B for AI data centers in 2025
Google (Alphabet)	Gemini models, Vertex AI, DeepMind, AI for search and cloud	Healthcare, Finance, Retail, Transportation, Marketing	Investing \$75B in AI infrastructure; Gemini enhances smart devices
Amazon	AWS Bedrock, Rufus (shopping assistant), Rekognition, Lambda	Retail, Cybersecurity, Healthcare, Finance	Rufus launched 2024; AWS powers scalable AI deployment
OpenAI	ChatGPT, DALL-E, Sora for text, image, and video generation	Media & Entertainment, Education, Customer Service	Valuation ~\$340B; faces copyright litigation; partnered with Microsoft
Anthropic	Claude (safety-focused LLMs), AI for enterprise applications	Finance, Legal, Customer Service	Valuation \$61.5B; founded by ex-OpenAI researchers; 100M monthly Claude visits
xAI	Grok (conversational AI with web search, image understanding)	Education, Research, Customer Service	Valuation ~\$75B; focuses on human discovery; Grok 3 widely accessible
Palantir	Foundry, Gotham, AIP for AI-driven analytics	Defense, Manufacturing, Intelligence	Market cap ~\$220B; strong in government contracts; AIP for secure LLMs
Meta	Meta AI, Llama models, AI for content recommendations, Metaverse	Social Media, Virtual Reality, Marketing	Enhances user experiences on Facebook, Instagram; invests in AI for Metaverse
IBM	Watsonx (AI suite with governance), hybrid cloud AI solutions	Healthcare, Insurance, Telecom	Focuses on trustworthy AI for regulated industries; strong enterprise adoption