AI in the Eyes of the Society

- People get to know AI through news, movies, and actual applications in daily life.

  What is AI in the eyes **of the public?**

Haidian Park: First AI-themed Park in the World
StarCraft II: AlphaStar Beat Professional Players
AI-created Edmond de Belamy Sold at US$430,000
Demand for AI Programmers:↑35 Times! Salary: Top 1!
50% Jobs Will be Replaced by AI in the future
Winter is Coming? AI Faces Challenges
…

The Terminator
2001: A Space Odyssey The Matrix
I, Robot
Blade Runner
Elle
Bicentennial Man
…

Self-service security check
Spoken language evaluation
Music/Movie recommendation
Smart speaker
Ai facial fortune-telling
Vacuum cleaning robot
Self-service bank terminal
Intelligent customer service
Siri
…

News	Movies	Applications in daily life
AI Applications	AI Control over human beings	Security protection
AI industry outlook	Fall in love with AI	Entertainment
Challenges faced by AI	Self-awareness of AI	Smart Home
…	…	Finance
		…

AI in the Eyes of Researchers

"I propose to consider the question, 'Can machines think?'"

— Alan Turing 1950

The branch of computer science concerned with making computers behave like humans.

— John McCarthy 1956

The science of making machines do things that would require intelligence if done by men.

— Marvin Minsky

What Are Intelligences?

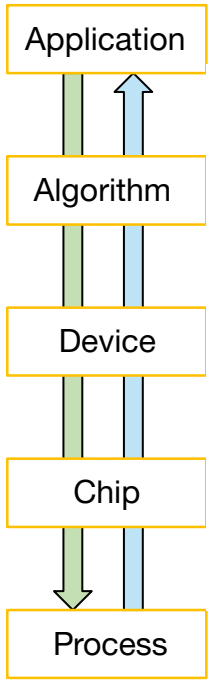
- Howard Gardner's Multiple Intelligences
- Human intelligences can be divided into seven categories:
  - Verbal/Linguistic
  - Logical/Mathematical
  - Visual/Spatial
  - Bodily/Kinesthetic
  - Musical/Rhythmic
  - Inter-personal/Social
  - Intra-personal/Introspective

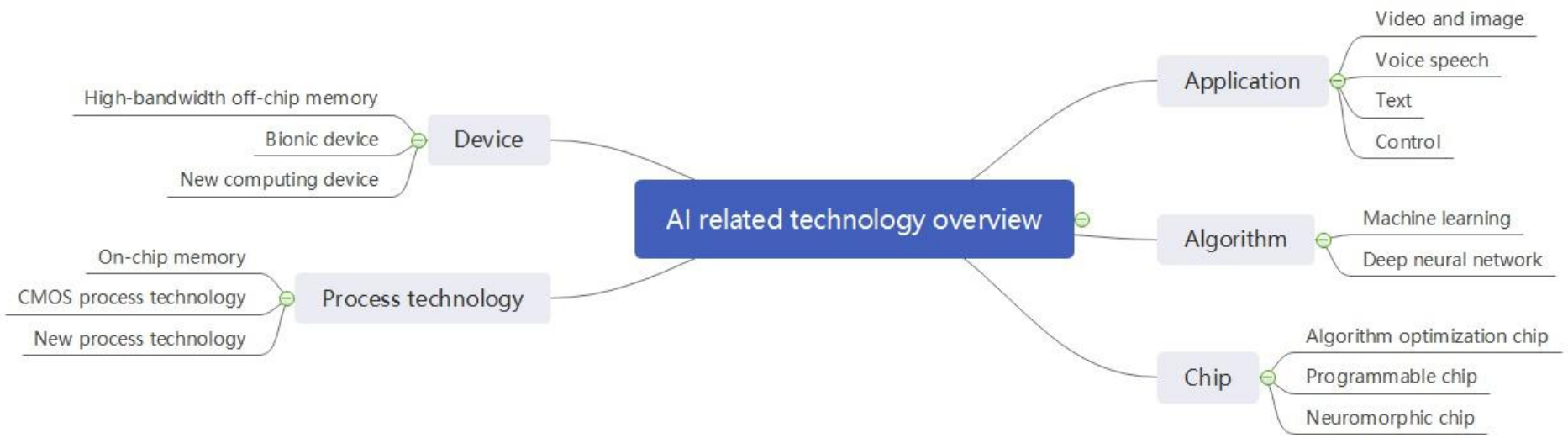
Relationship of AI, Machine Learning and Deep Learning

- AI: A new technical science that focuses on the research and development of theories, methods, techniques, and application systems for simulating and extending human intelligence.
- Machine learning: A core research field of AI. It focuses on the study of how computers can obtain new knowledge or skills by simulating or performing learning behavior of human beings, and reorganize existing knowledge architecture to improve its performance. It is one of the core research fields of AI.
- Deep learning: A new field of machine learning. The concept of deep learning originates from the research on artificial neural networks. The multi-layer perceptron (MLP) is a type a deep learning architecture. Deep learning aims to simulate the human brain to interpret data such as images, sounds, and texts.

Overview of AI Technologies

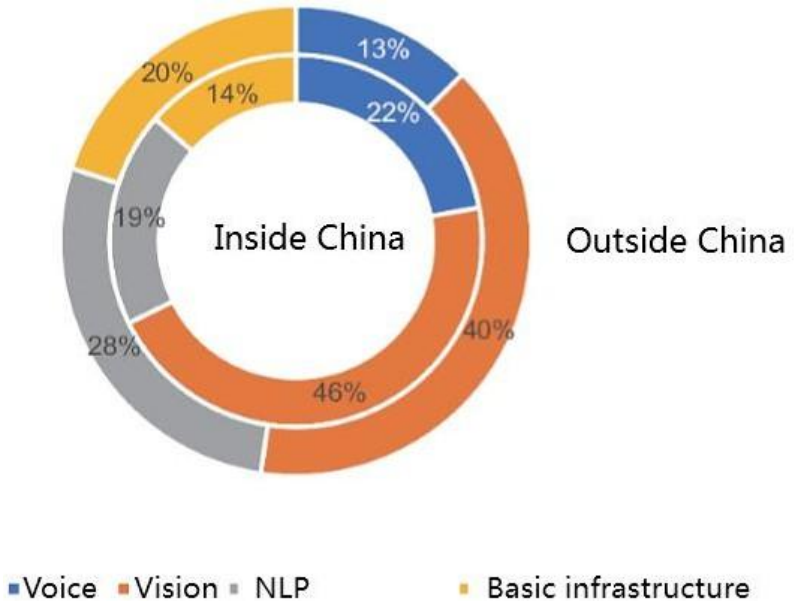
- AI technologies are multi-layered, covering the application, algorithm mechanism, toolchain, device, chip, process, and material layers.





Distribution of AI Application Technologies in Enterprises

- At present, application directions of AI technologies mainly include:
  - **Computer vision**: a science of how to make computers "see"
  - **Speech processing**: a general term for various processing technologies used to research the voicing process, statistical features of speech signals, speech recognition, machine-based speech synthesis, and speech perception
  - **Natural language processing (NLP)**: a subject that use computer technologies to understand and use natural language

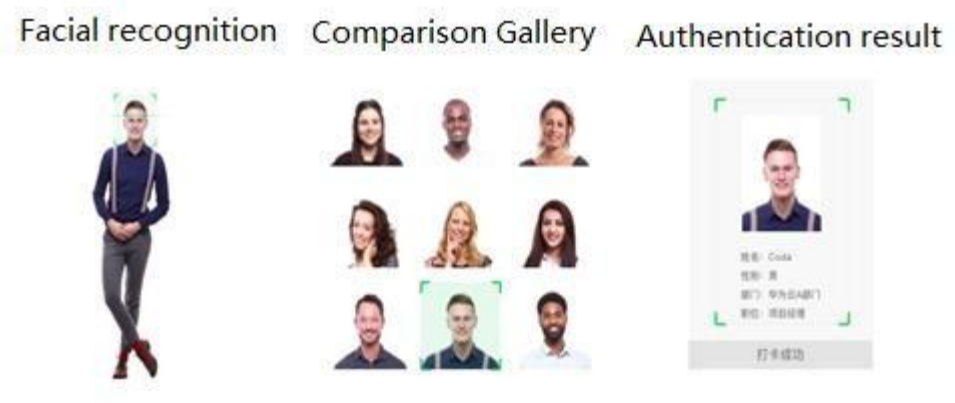


Distribution of AI application technologies in enterprises inside and outside China

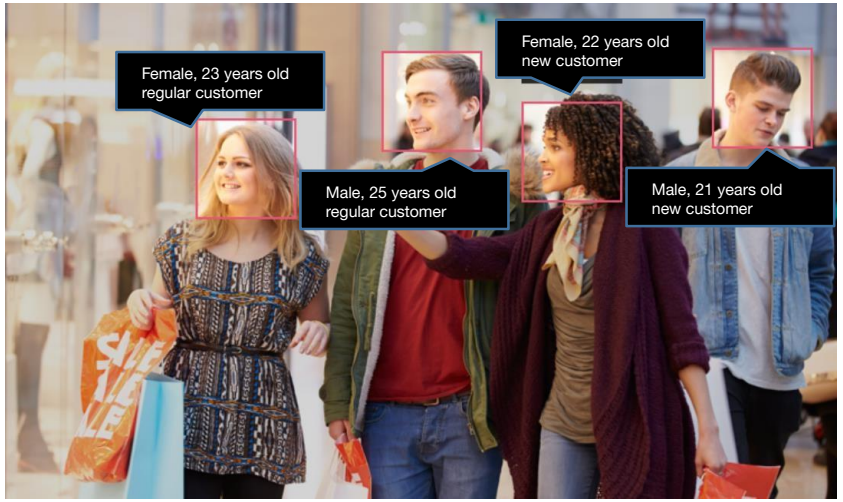
China AI Development Report 2018

Computer Vision Application Scenario (1)

- Computer vision is the most mature technology among the three AI technologies. The main topics of computer vision research include image classification, target detection, image segmentation, target tracking, optical character recognition (OCR), and facial recognition.
- In the future, computer vision is expected to enter the advanced stage of autonomous understanding, analysis, and decision-making, enabling machines to "see" and bringing greater value to scenarios such as unmanned vehicles and smart homes.
- Application scenarios:



Electronic attendance

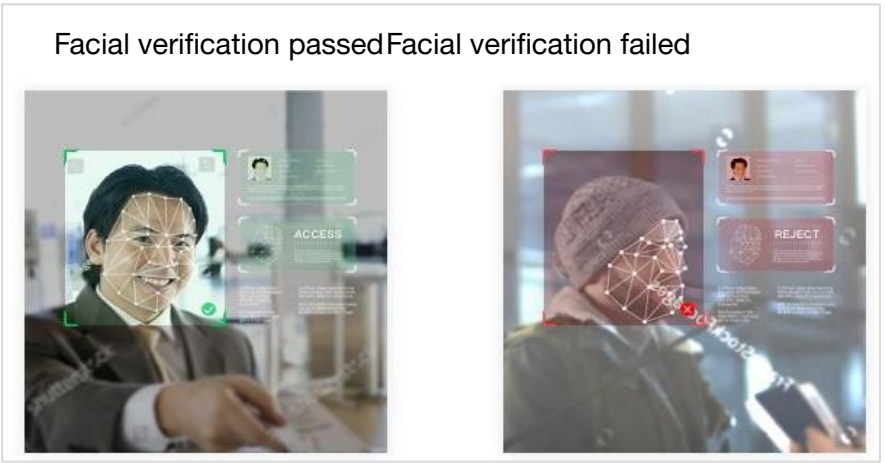


Traffic analysis

Computer Vision Application Scenario (2)

Action analysis

Authentication



Smart album

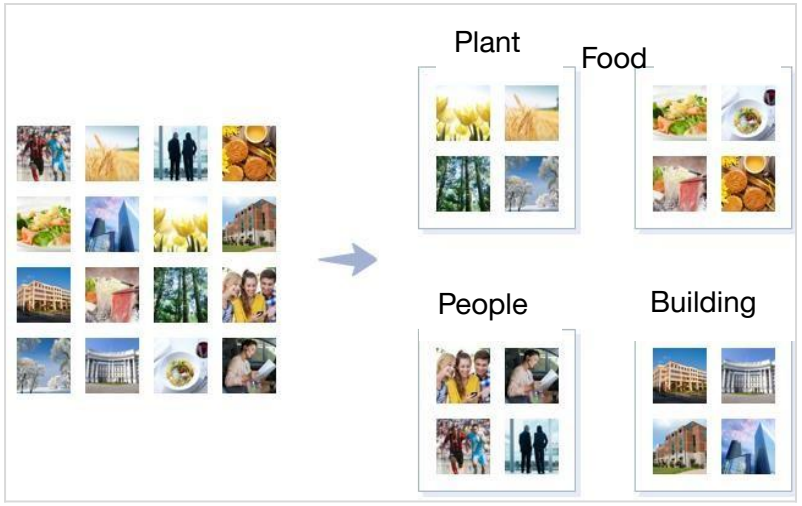
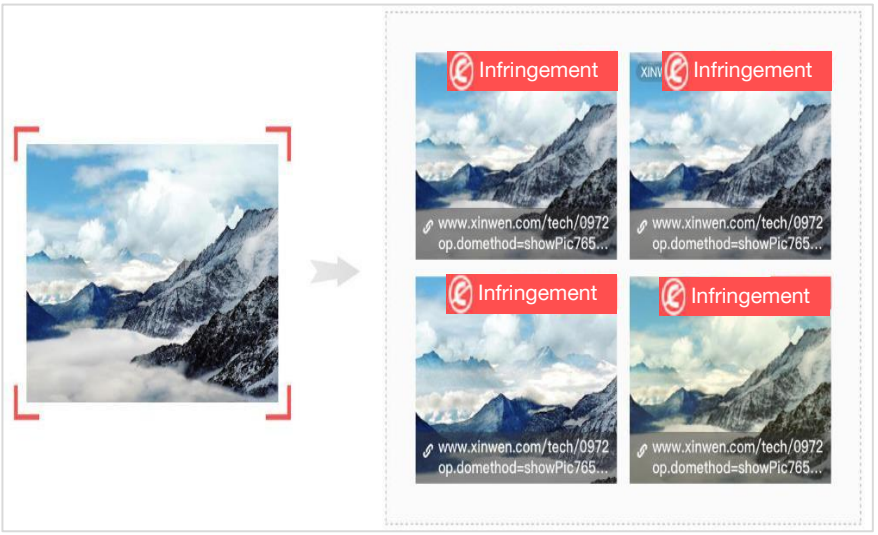


Image search

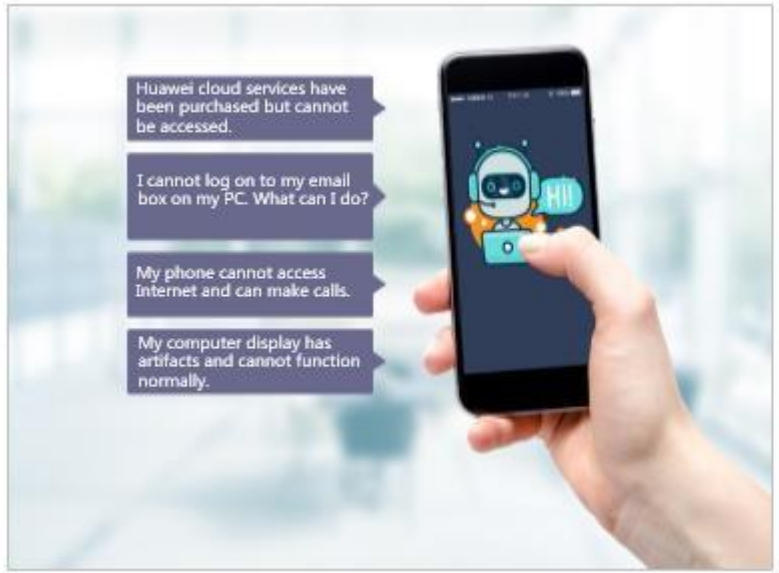


Voice Processing Application Scenario (1)

- The main topics of voice processing research include voice recognition, voice synthesis, voice wakeup, voiceprint recognition, and audio-based incident detection. Among them, the most mature technology is voice recognition. As for near field recognition in a quite indoor environment, the recognition accuracy can reach 96%.

- Application scenarios:

Question Answering Bot (QABot)



Voice navigation

Voice Processing Application Scenario (2)

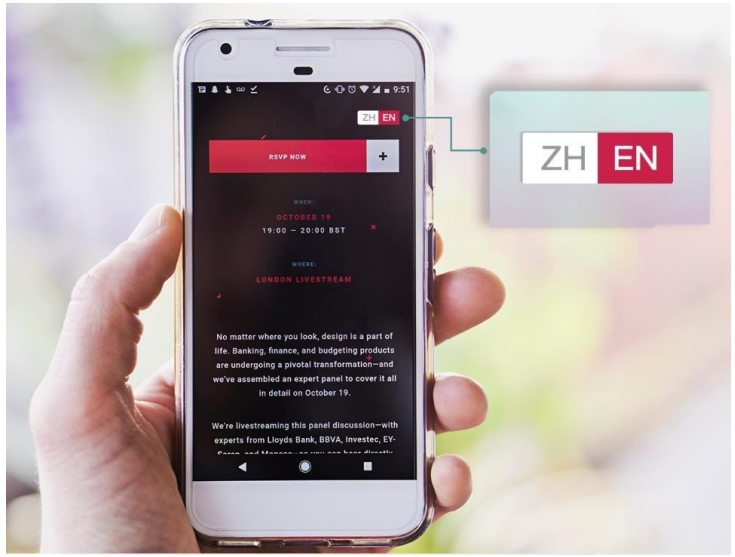
Intelligent education

Real-time conference records

- Other applications:
  - Spoken language evaluation
  - Diagnostic robot
  - Voiceprint recognition
  - Smart sound box
  - ...

NLP Application Scenario (2)

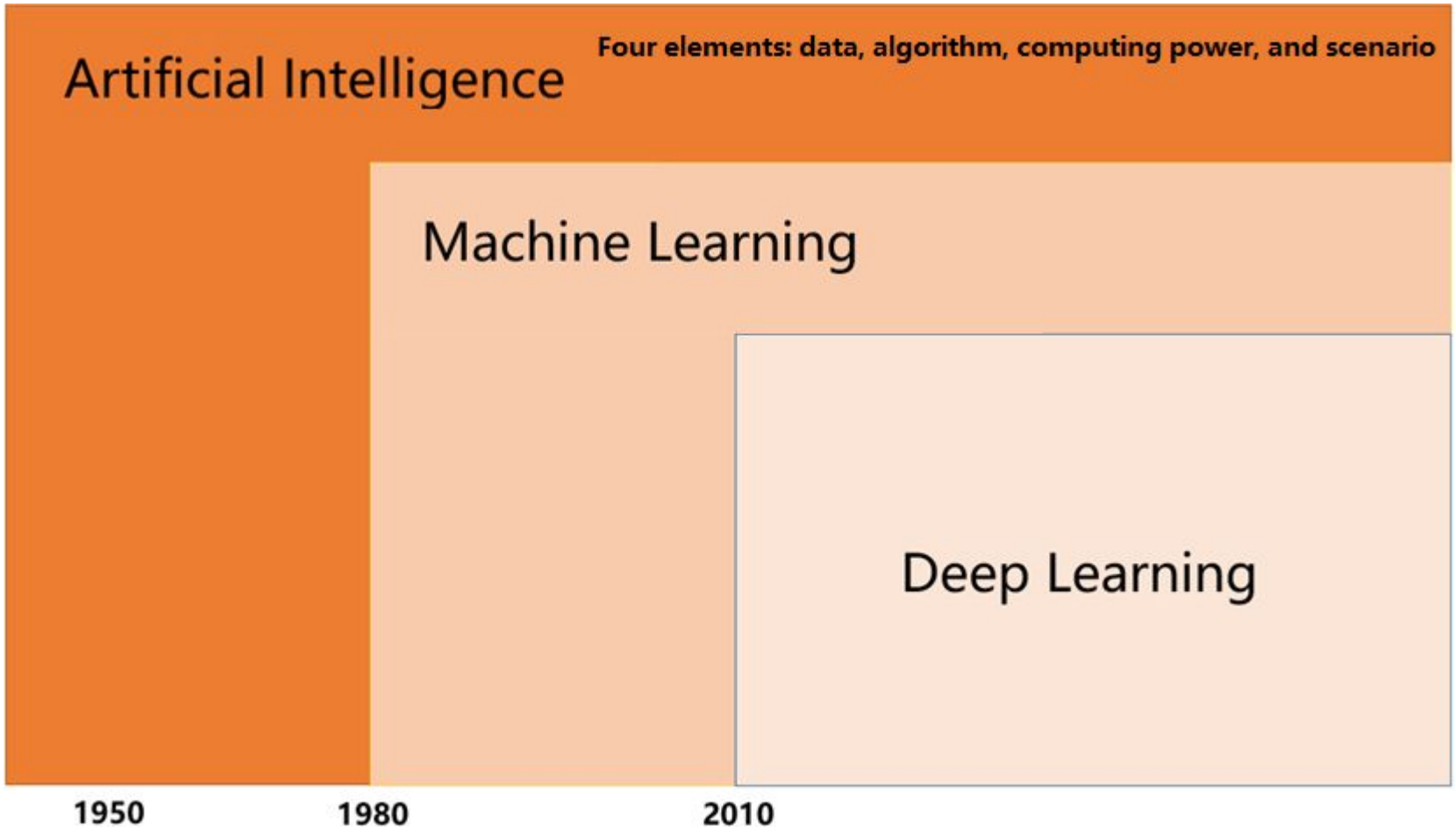
Machine translation



Text classification

- Other applications:
  - Knowledge graph
  - Intelligent copywriting
  - Video subtitle
  - ...

Relationship of AI, Machine Learning, and Deep Learning



Where does generative AI fit?

Artificial intelligence (AI)

Any technique that allows computers to mimic human intelligence using logic, if-then statements, and machine learning

Machine learning (ML)

A subset of AI that uses machines to search for patterns in data to build logic models automatically

Deep learning (DL)

A subset of ML composed of deeply multi-layered neural networks that perform tasks like speech and image recognition

Generative AI

Powered by large models that are pretrained on vast corpora of data and commonly referred to as foundation models (FMs)

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

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