CONTENTS

machine learning, deep

learning, computer vision,

natural language processing,

and data mining…

Data Intelligence

- Data ——"Oil in the 21st Century "
- The technical essential characteristics of AI is **data intelligence,** and the difference is reflected in **the execution of the logic algorithm.**
- How does data make a difference : One is the characteristics of the dataset (versatility, specificity). The other is the quality of the data (without bias and discrimination).
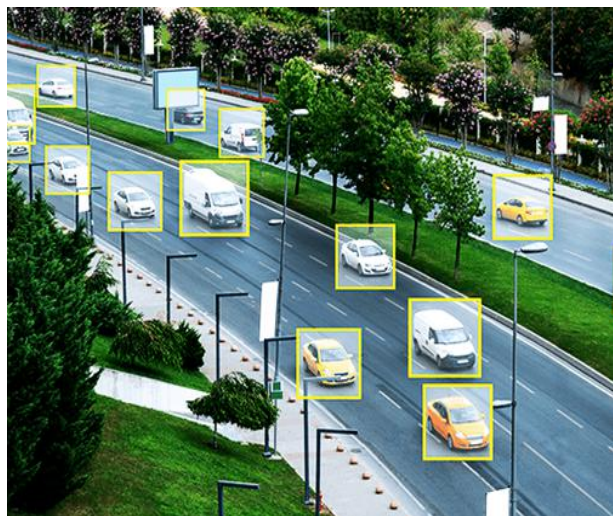
Traditional: dedicated data

- Traditional models are usually developed for **specific tasks** (e.g. classification, recognition, translation, etc.) or trained for **specific domains** (e.g. medical care, transportation, etc.).
- These data usually need to be manually labeled in advance

ChatGPT: global data

- GPT-3 was learning in an **unsupervised training** on a massive **45TB** corpus, with a very **simple training model**.
- GPT3.5 further uses **12,000 supervised <prompt,answer> data**.
- ChatGPT's excellent ability to "learning" and "understanding" comes from the emergent effect of increasing the amount of data.

- **Models with more parameters, more training data, or more training computations will perform better**
  - Minerva of Google —— 540 billion parameters, 780 billion labeled datasets, 118GB dataset of scientific papers
- **Large models generate huge energy consumption**
  - One training of the GPT-3 consumes as much energy as 126 Danish homes in a year and produces the same amount of CO_2 emissions as driving 700,000 km

Foundation model

Small modelization

- **Biologically, the human brain has 86 billion neurons and about 100 trillion synaptic connections**
  - Biological neurons remain mostly quiet with only occasional spikes of activity, while neural network neurons are constantly on
  - **Hinton** argues that future AI systems will be primarily unsupervised from a biological perspective, with cognitive capabilities needed to be called human-level AI systems
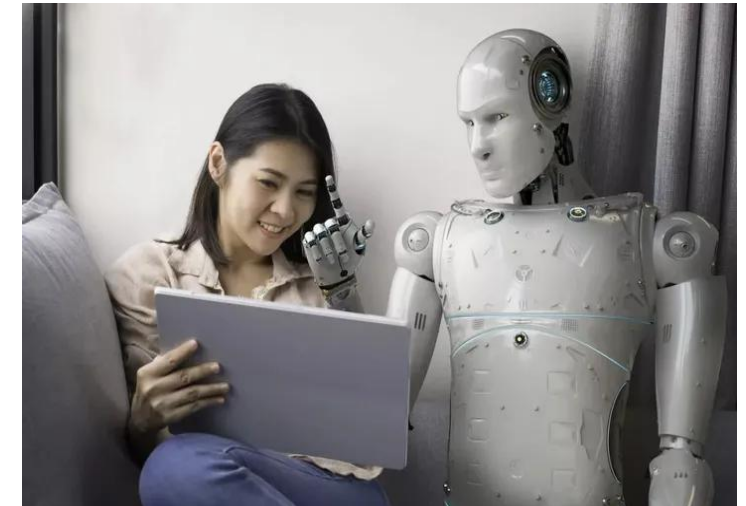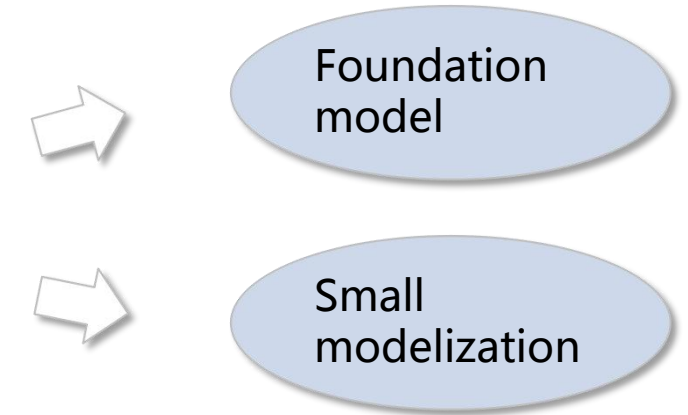
CONTENTS

Emotional

Privacy

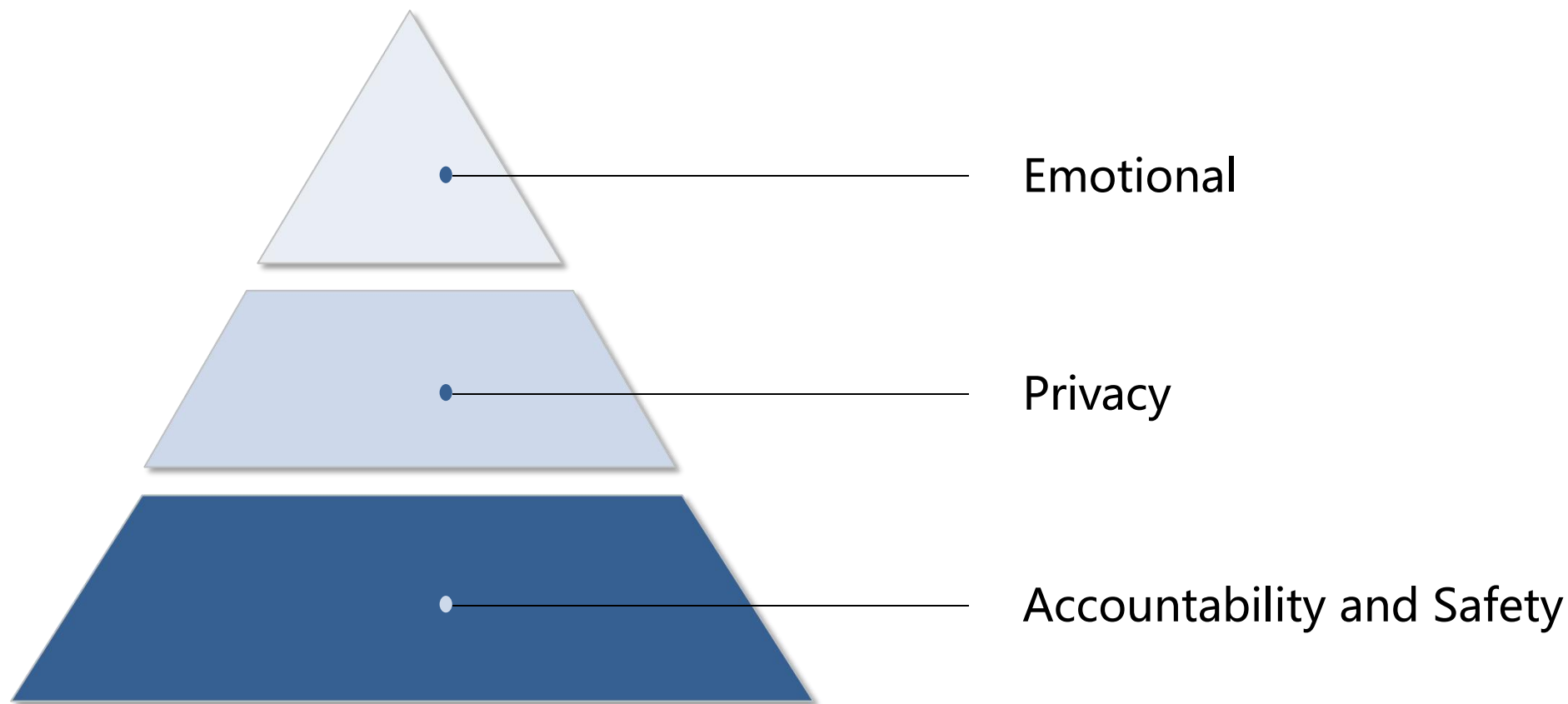Accountability and Safety

Artificial intelligence ethical risks mainly arise in the application process

- **The damage or error that an AI system may cause when performing a task or making a decision, and how to determine where responsibility belongs and how to compensate, moral dilemma is a hard issue.**
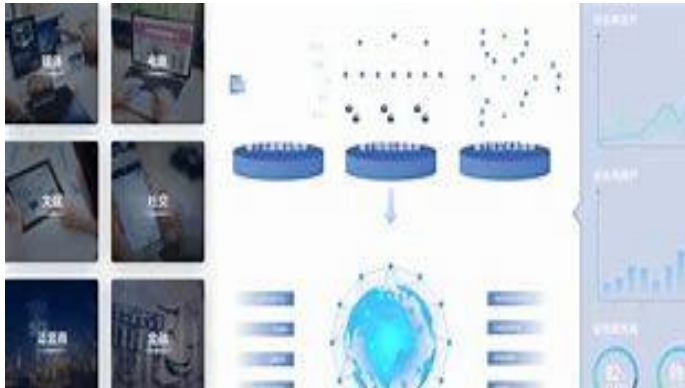

- Autonomous driving
- Medical diagnosis of AI
- Weaponization of AI

- **AI systems may violate or disclose individual or collective privacy information when collecting, processing, storing, and sharing data, and how to protect and respect privacy rights**

- Targeted advertising

- Public safety

- Data correlation

- **AI systems may affect human emotional states when interacting with humans, which may adversely affect human emotional health and well-being or make humans feel dependent**

- Nursing robots

- Educational robots

- Companion robots

Position 1: Intelligence belongs to humans

The existing embodied "intelligence" is human-like intelligence based on data simulation, without real consciousness, creativity, or moral sense. Intelligence is performed or expressed according to the rules of human-set goals.

- AI is the manipulation of **symbols** without understanding (*Chinese Room,* John Searle, 1980)
- AI is based on **classical physics** and is fundamentally different from human consciousness, which may be related to quantum mechanics (*The Emperor's New Mind*, Roger Penrose,1989)
- **Common sense** helps us make plans by understanding the probabilities of what will happen next, the possible consequences of our actions, which is hard for machines (Yann LeCun)

Position 2: AI has had some success

AI has moved into the field of human language and logic, and it is possible to generate or modify languages with a logic different from that of humans, which can replace simpler language and logic work.

- AI can reach or surpass human level in some fields, and can perform some relatively simple, repetitive, normative language and logic work
- Knowledge workers will face a greater threat of unemployment, highly social and flexible occupations, such as caregivers, physical therapists and hair stylists, are less at risk. (*AI Superpowers*, Kai-Fu Lee, 2018)
- AGI has made tremendous progress and the rate of growth is not slowing down, and will likely **achieve human-level AI within a decade** (Demis Hassabis, CEO of DeepMind)

Position 3: Disaster is coming

AI systems with the same or higher level of intelligence capabilities as humans will emerge in the near future and may pose a threat to humans

- *Pause Giant AI Experiments: An Open Letter*
- AI is inherently unstable, and AGI, if used for military purposes, could be even **scarier than nuclear weapons** (Henry Kissinger)
- Super artificial intelligence may replace human beings as the main form of species on earth, and we should pay attention to the **AI control problem** (*Superintelligence: Paths, Dangers, Strategies*, Nick Bostrom, 2014)
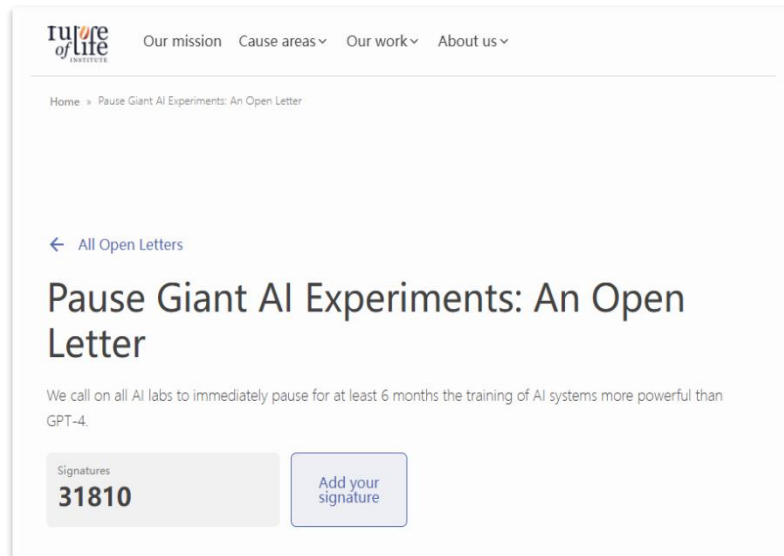
1. govern technology with technology

- Alignment techniques，Privacy protection technology, encryption technology, blockchain technology, etc.

2. Govern technology with laws/rules

- Formulate policies to restrict the use of AI and protect basic rights

3. Govern technology with social participation

- Call for multiple stakeholders to participate in the discussion

Ability to pass exams

ChatGPT

Widely used
(copying、cheating)

Lack of ethics
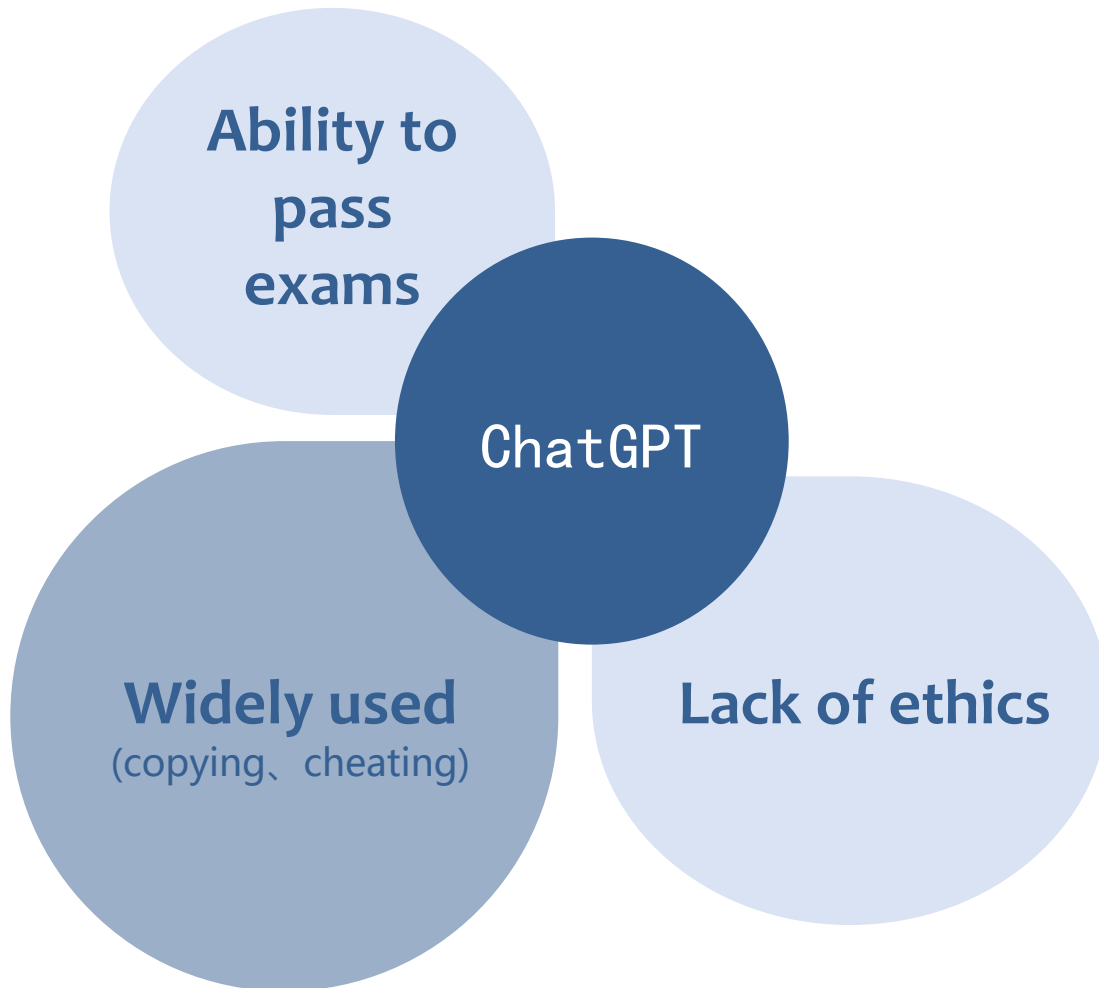
Attitude of the journals

- *Science* prohibits the use of ChatGPT generated text and cannot list it as a co-author of a paper.

- *Nature* states that ChatGPT cannot be listed as an author, but it is not completely prohibited.

- *Cell* allows the use to improve article readability, but not to interpret data or draw conclusions, and requires an explanation of whether and how to use them

Breaking the "Order of Knowledge Prodcution"

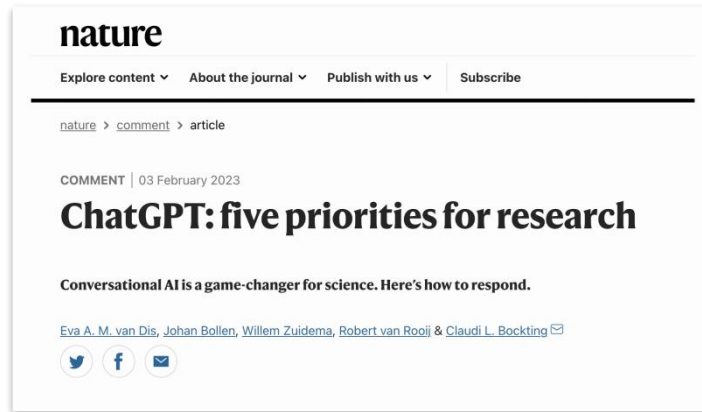| The subject of knowledge production	The process of transferring knowledge	The ownership of knowledge discovery
■ Traditional knowledge production relies on human creativity, rationality and experience ■ AGI can create knowledge using big data, algorithms, and computing power	■ Traditional knowledge transfer relies on teachers and teaching materials, and the content comes from verifiable and repeatable knowledge ■ AGI provides knowledge in a personalized, diverse way, and knowledge is not validated	■ Traditional knowledge ownership relies on the intellectual property, which is based on the original contribution ■ AGI has innovation discovery ability, whose ownership is controversial

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COMMENT | 03 February 2023

ChatGPT: five priorities for research

Conversational AI is a game-changer for science. Here's how to respond.

Eva A. M. van Dis, Johan Bollen, Willem Zuidema, Robert van Rooij & Claudi L. Bockting ✉

"Banning it will not work. It is imperative that the research community engage in a debate about the implications of this potentially disruptive technology"

- **Development:** Fully understand and prevent risks on the basis of development

- **Legislation**: Legislation for different fields

- **Adaptation**: Adapt to this intervention
  - The education model needs to change, and teachers need to redesign the teaching and assessment process to fully stimulate students' creativity
  - In scientific research, AI disclosure mechanism should be established. In the short term, disclosure without attribution is the solution. In the long term, AI intellectual property mechanism should be established