

From Basics to Artificial Intelligence: Designing Significant Early-Stage AI Courses

CONTENTS

01

Why is it needed

02

**How has artificial
intelligence developed**

03

**What does it
contain**

04

**How does artificial
intelligence generate the
content we want**

05

**AI Applications
&
Products**

06

Limitation

CONTENTS

Why is it

needed

01

Data flood

The information we create far exceeds our processing power

Approximately **250M TB**
of data is generated
globally every day



Approximately equal to



250M units



Data flood

The information we create far exceeds our processing power

Approximately **250M TB**
of data is generated
globally every day



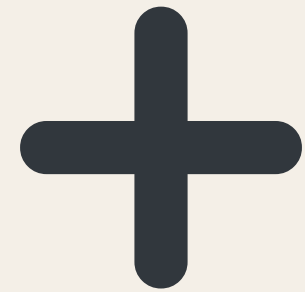
It can only process
about **40 bits**
of information per
second



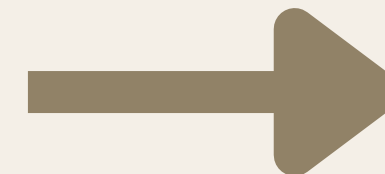
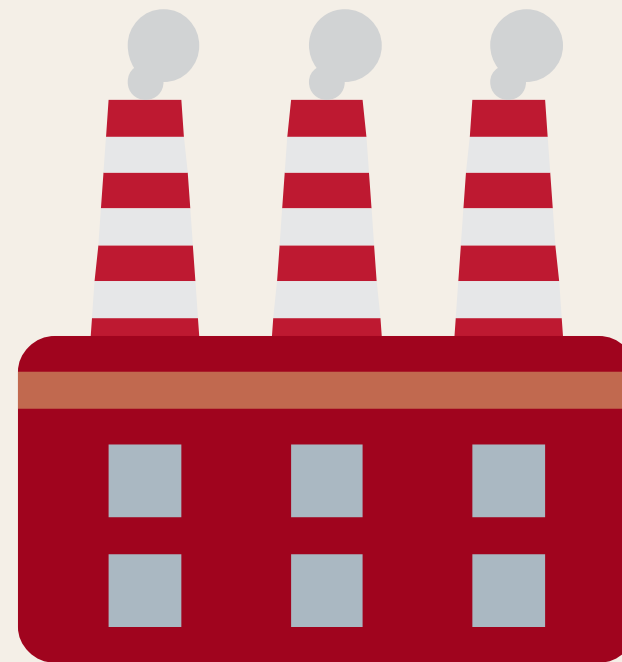
Complexity Trap

The system has become so complex that humans cannot optimize it alone

A modern car has over
30000 components



Involving thousands
of suppliers
worldwide



How to
achieve
optimal cost



Personalized Needs

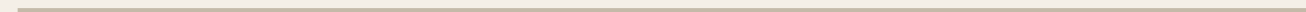
From "One Thousand Faces" to "One Billion Faces"

Scarcity of Resources

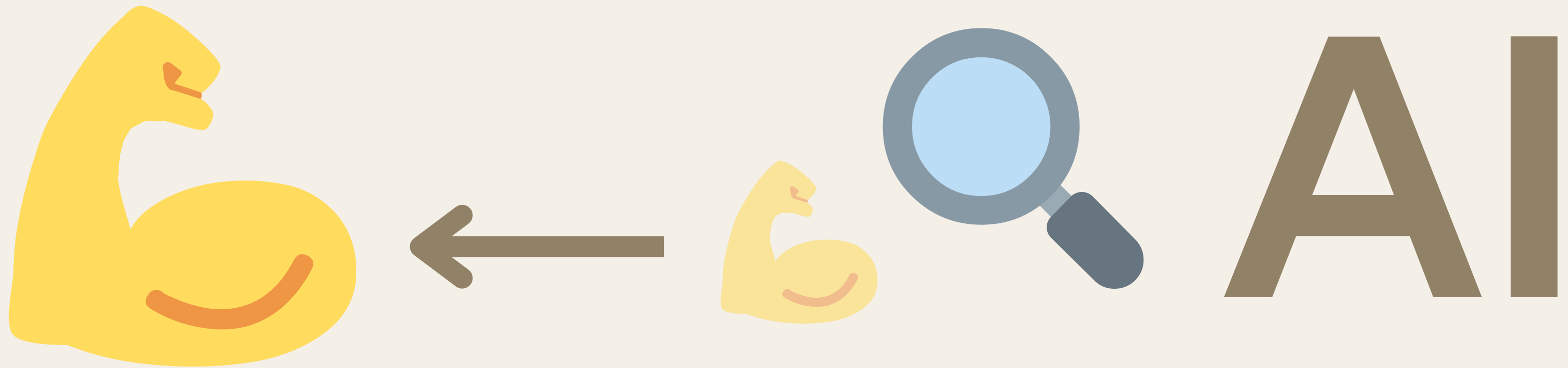
Breaking through the Hard Constraints of the Physical World with AI

Cognitive outsourcing

Human attention becomes the final bottleneck



AI amplifies human muscle strength, AI is
amplifying our cognitive bandwidth



CONTENTS

**How has artificial
intelligence**

developed

Q2

From Professor Dong Chao of Shanghai Institute of Artificial Intelligence



**AI is far more dangerous
than nukes**

Symbolic logic reasoning

1971

The First AI winter

1969

The first general-purpose mobile robot, Shakey



1964

The first Chatbot, Eliza



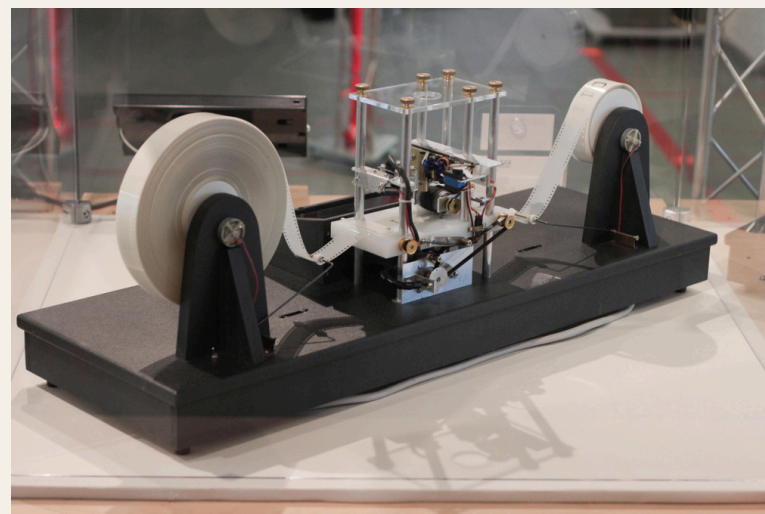
1956

Dartmouth Conference



Turing Machine

1943



Artificial Knowledge Expert Repository

1997

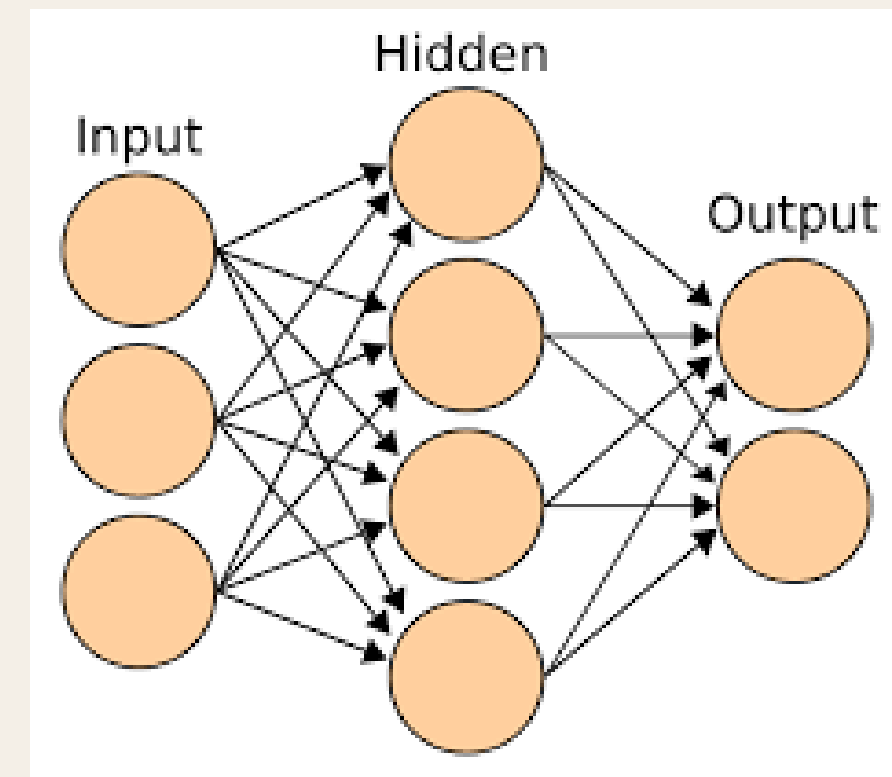
Regain Attention



XCON, for expert Configurer

1982

Connectionism



Deep Learning and Large Language Models



Current Research

After 2024

Technical layer and application layer are highly intertwined

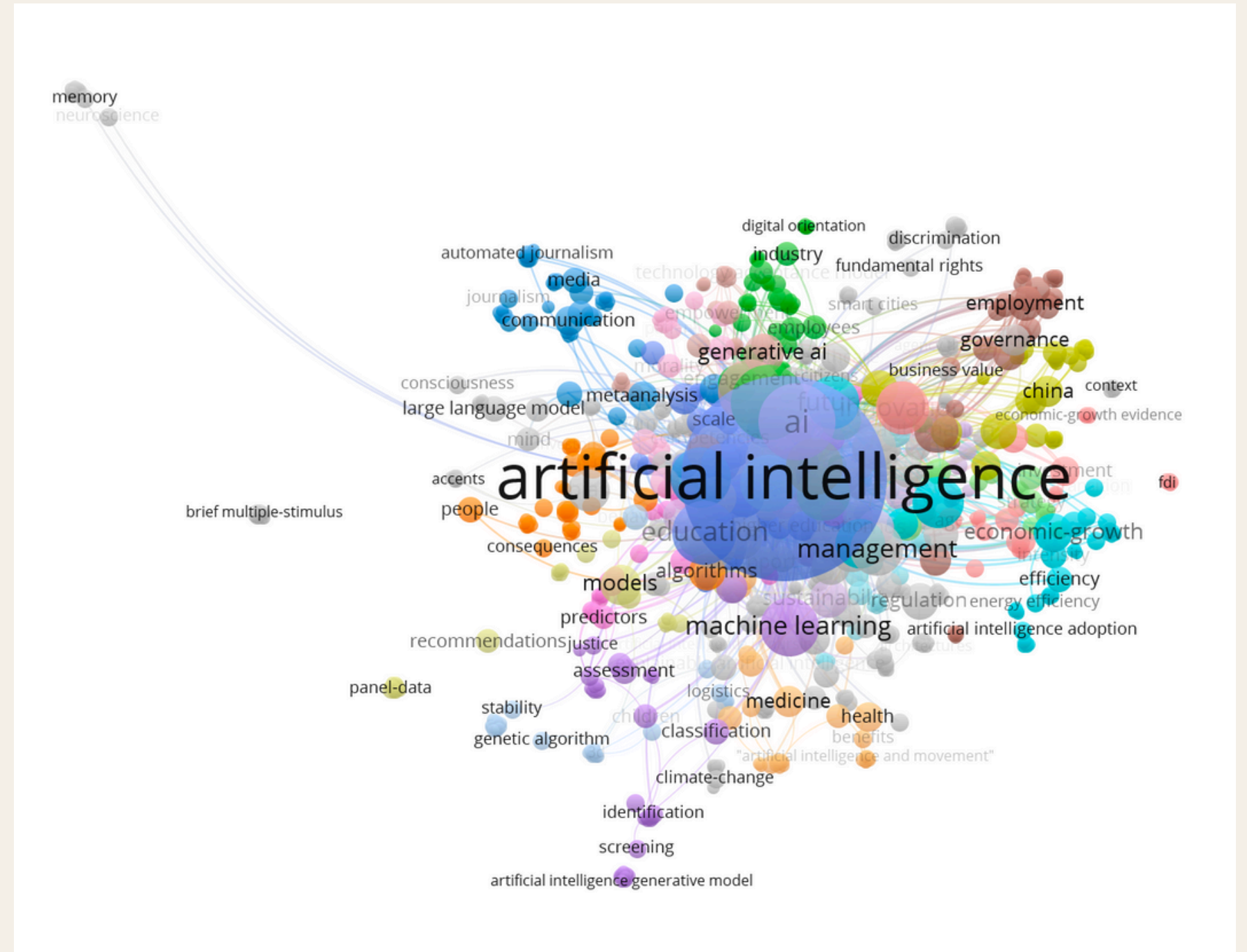
AI has penetrated from general technology to vertical fields

Explicitization of ethical and governance issues

Shift towards a collaborative framework of "technology society"

Methodology shifts towards 'large-scale evidence integration'

Upgrade from single case or small sample experiments to causal inference based on macro data, such as tracking the long-term impact of AI on economic growth



CONTENTS

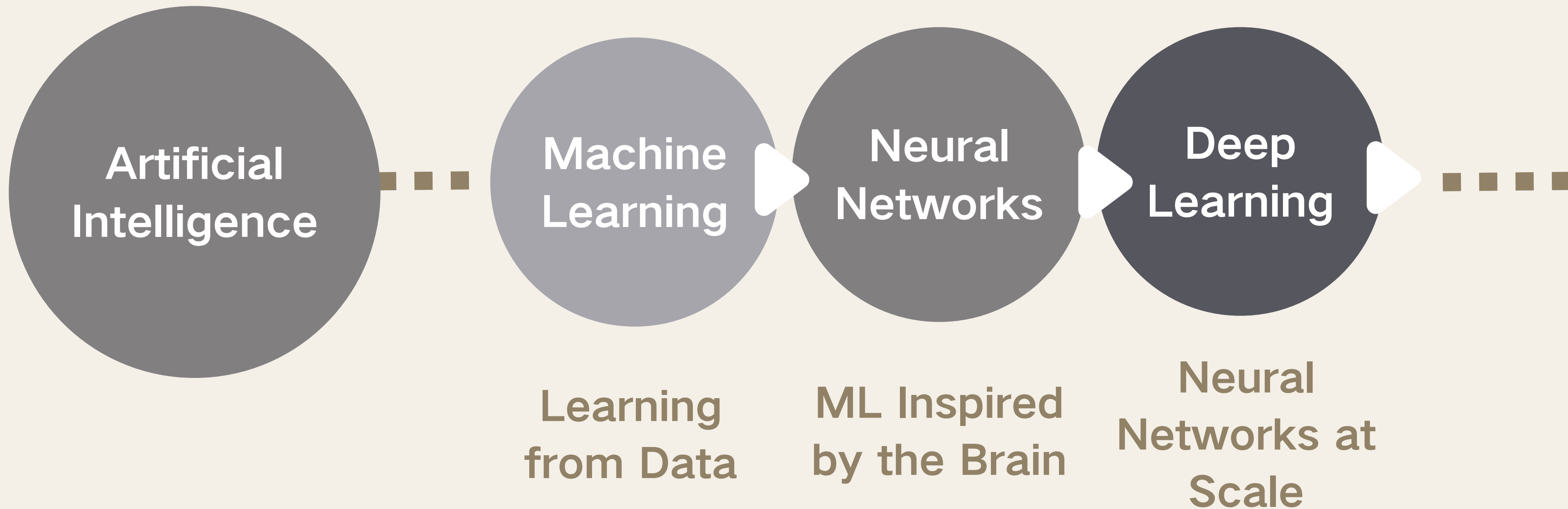
What does it

Contain

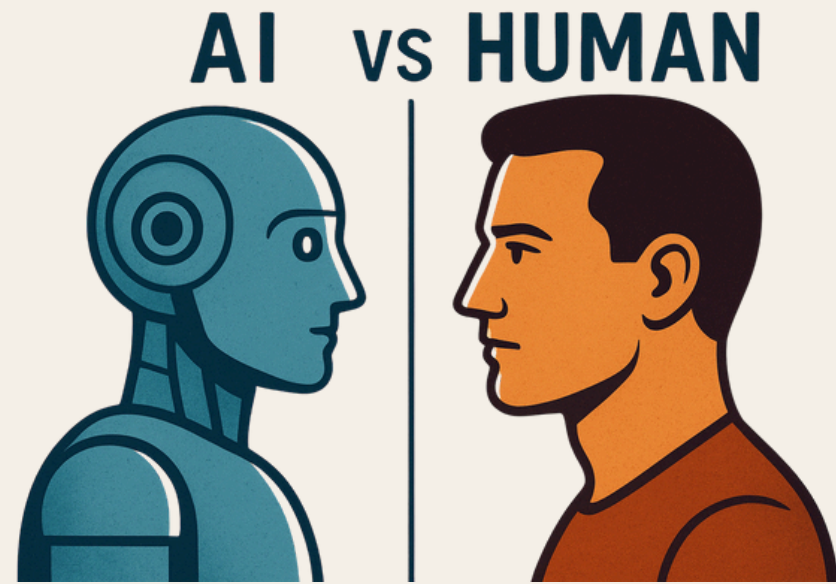
03

Technical aspects of AI

Think of AI like **a student** who learns from examples



AI vs. Our Brains



Similarities

- Learning from Examples
- Practice Improves Skills
- Making Mistakes and Adjusting
- Recognizing Patterns

Differences

Speed & Scale

- AI can process millions of examples in hours; humans can't

Understanding vs. Correlation

- Humans can grasp why something is true.
- AI often just finds patterns.

Transfer of Knowledge

- Humans can apply what they learn in one area to a new situation easily.
- AI needs retraining.

AI Tools

Data Analysis & Automation

- Data Analytics
- Automation
- Code Assistance

Video Creation & Editing

- Video Editing
- Animation

Audio & Speech Tools

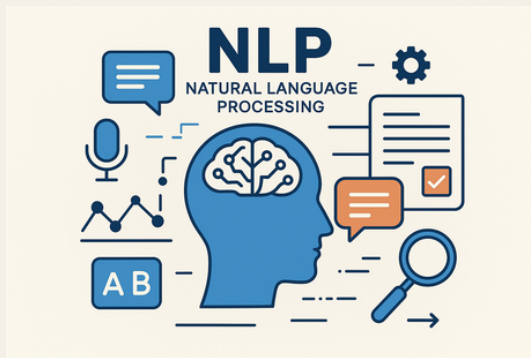
- Speech-to-Text
- Text-to-Speech
- Music Generation

Image Generation & Editing

- Image Generation
- Photo Editing
- Design Assistance

Text & Language Processing (NLP)

- Chatbots & Assistants
- Writing Aids
- Translation
- Summarization/Note-taking



AI TOOLS

Text & Language Processing (NLP)

Read, write, summarize, translate, or understand human language

ChatGPT Google Bard
Microsoft Copilot
Grammarly Jasper
Copy.ai DeepL
Google Translate
Otter.ai Notion AI

Image Generation & Editing

Create or modify visuals from text prompts or existing image

DALL-E
Midjourney
Stable Diffusion
Adobe Photoshop (Generative Fill)
Luminar AI
Remove.bg

Audio & Speech Tools

For converting between speech and text, generating voices, or analyzing sound

Whisper AI Rev.ai
Descript
ElevenLabs Murf.ai
Amazon Polly AIVA
Suno Soundraw

Video Creation & Editing

Generate or edit videos with minimal manual effort

Runway Gen-2
Pika Labs
Adobe Premiere Pro AI tools
Synthesia (AI avatars)
Lumen5

Data Analysis & Automation

Make sense of large datasets or automate repetitive tasks

Tableau with AI Dore v
Power BI Copilot

Specialized AI Tools

Built for niche applications

PathAI (diagnostics)
Viz.ai (stroke detection)
Khanmigo (Khan Academy)
Quillionz (quiz generation)

Text & Language Processing (NLP)

- Chatbots & Assistants
- Writing Aids
- Translation
- Summarization/Note-taking

Image Generation & Editing

- Image Generation
- Photo Editing
- Design Assistance

AI Tools



Data Analysis & Automation

- Data Analytics
- Automation
- Code Assistance

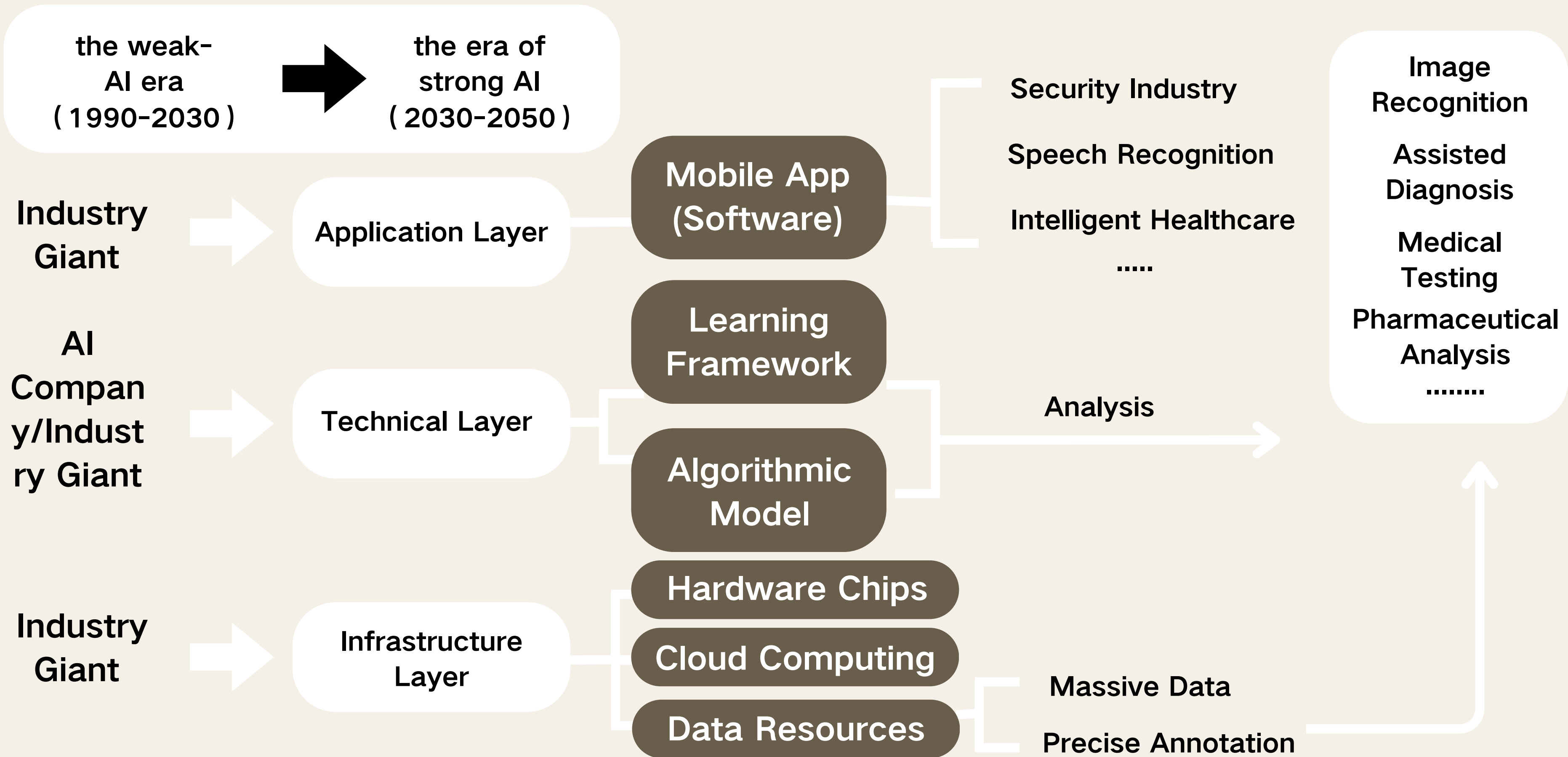
Video Creation & Editing

- Video Editing
- Animation

Audio & Speech Tools

- Speech-to-Text
- Text-to-Speech
- Music Generation

What are the application fields of artificial intelligence



CONTENTS

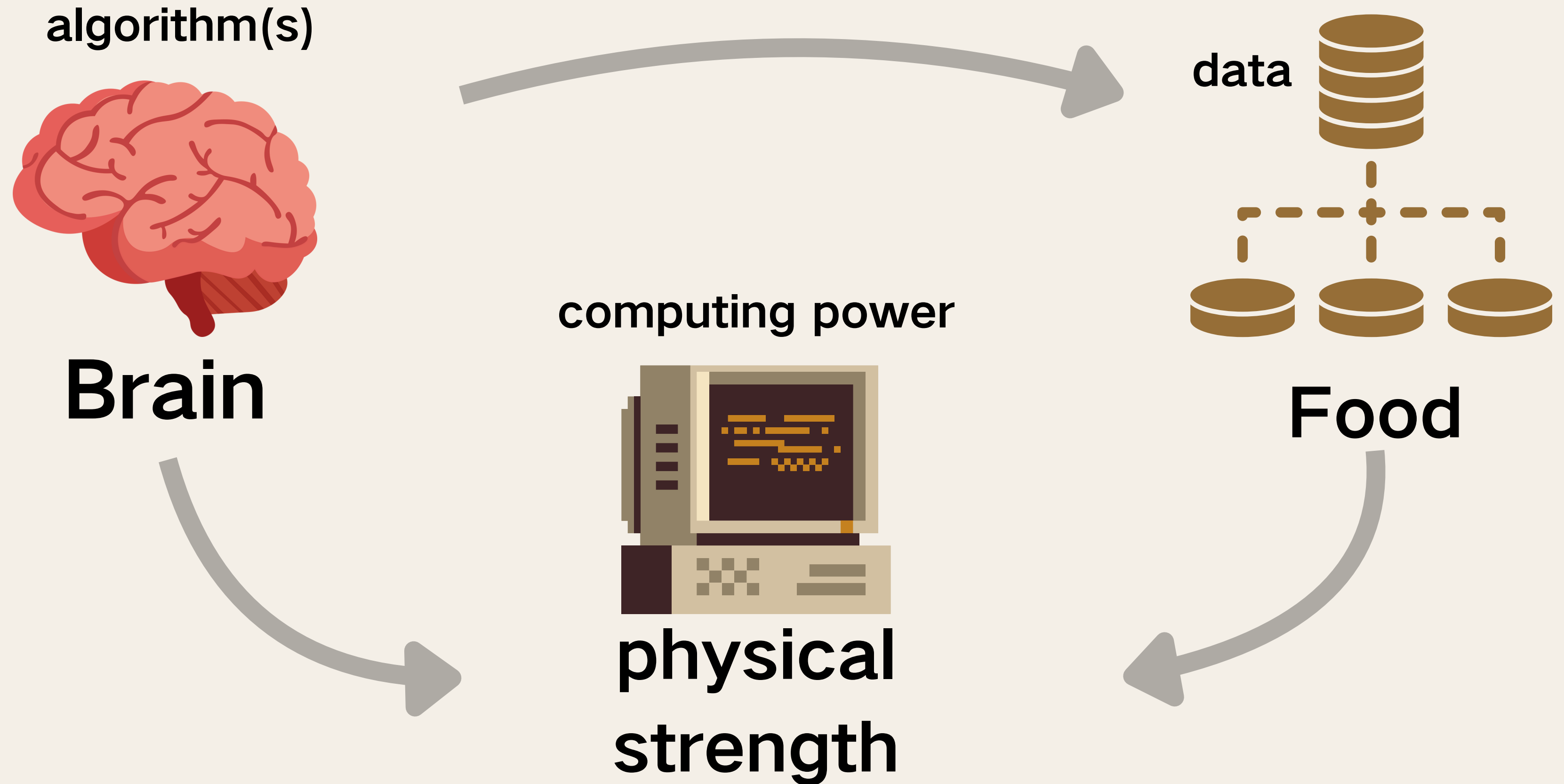
**How does artificial
intelligence generate**

the content

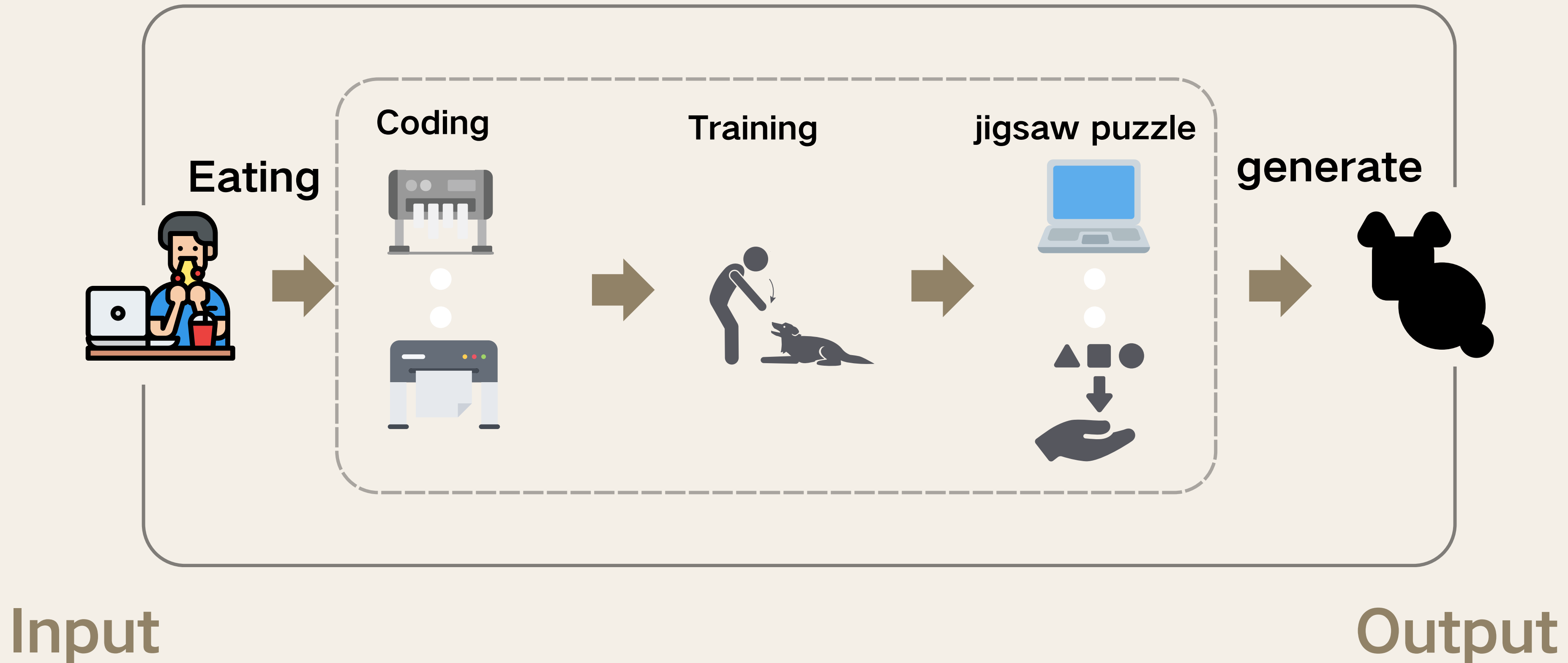
we want

04

The three pillars of artificial intelligence



How does AI generate the content we want?

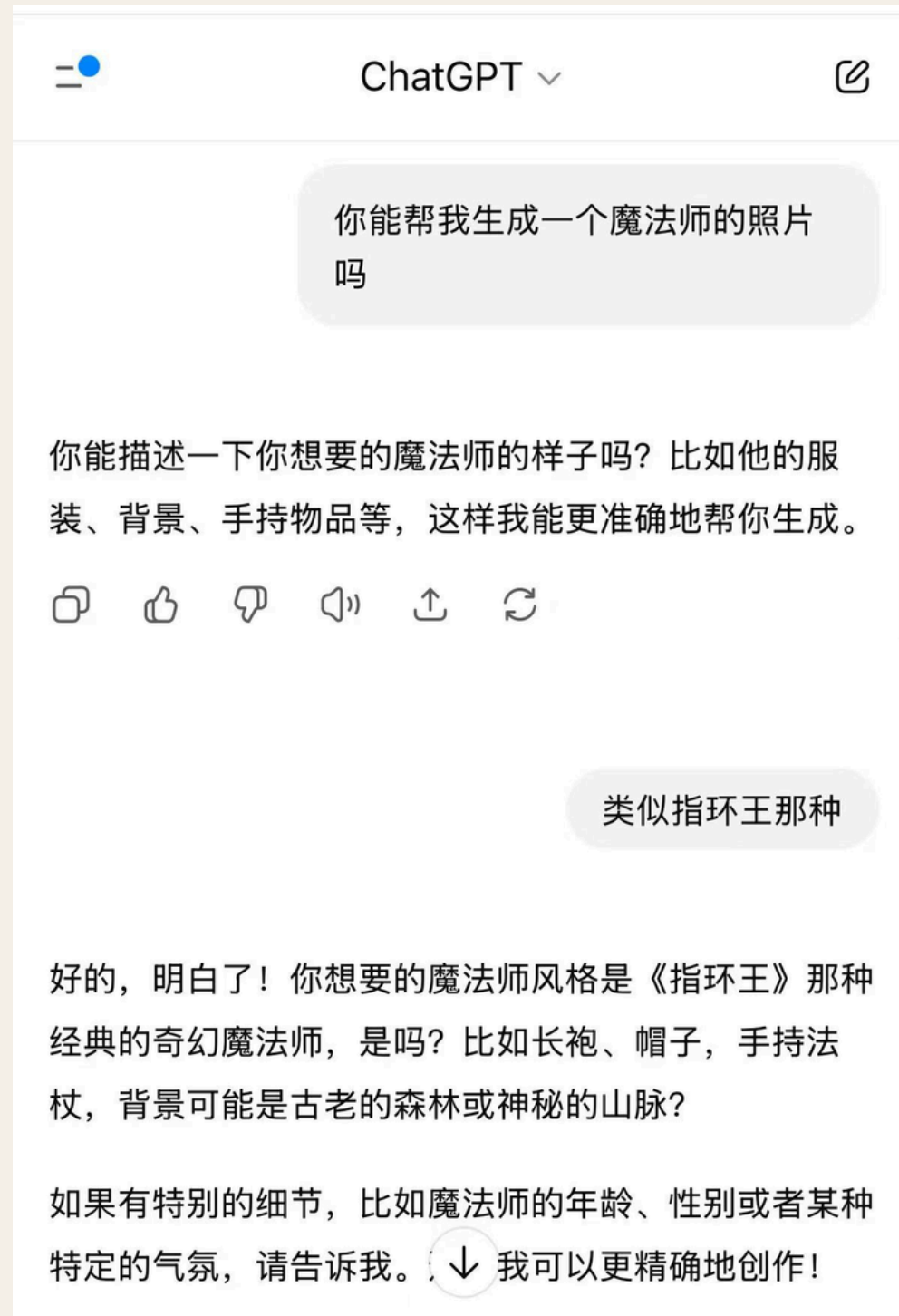


CONTENTS

**AI Applications
&
Products**

05

Chatgpt 5



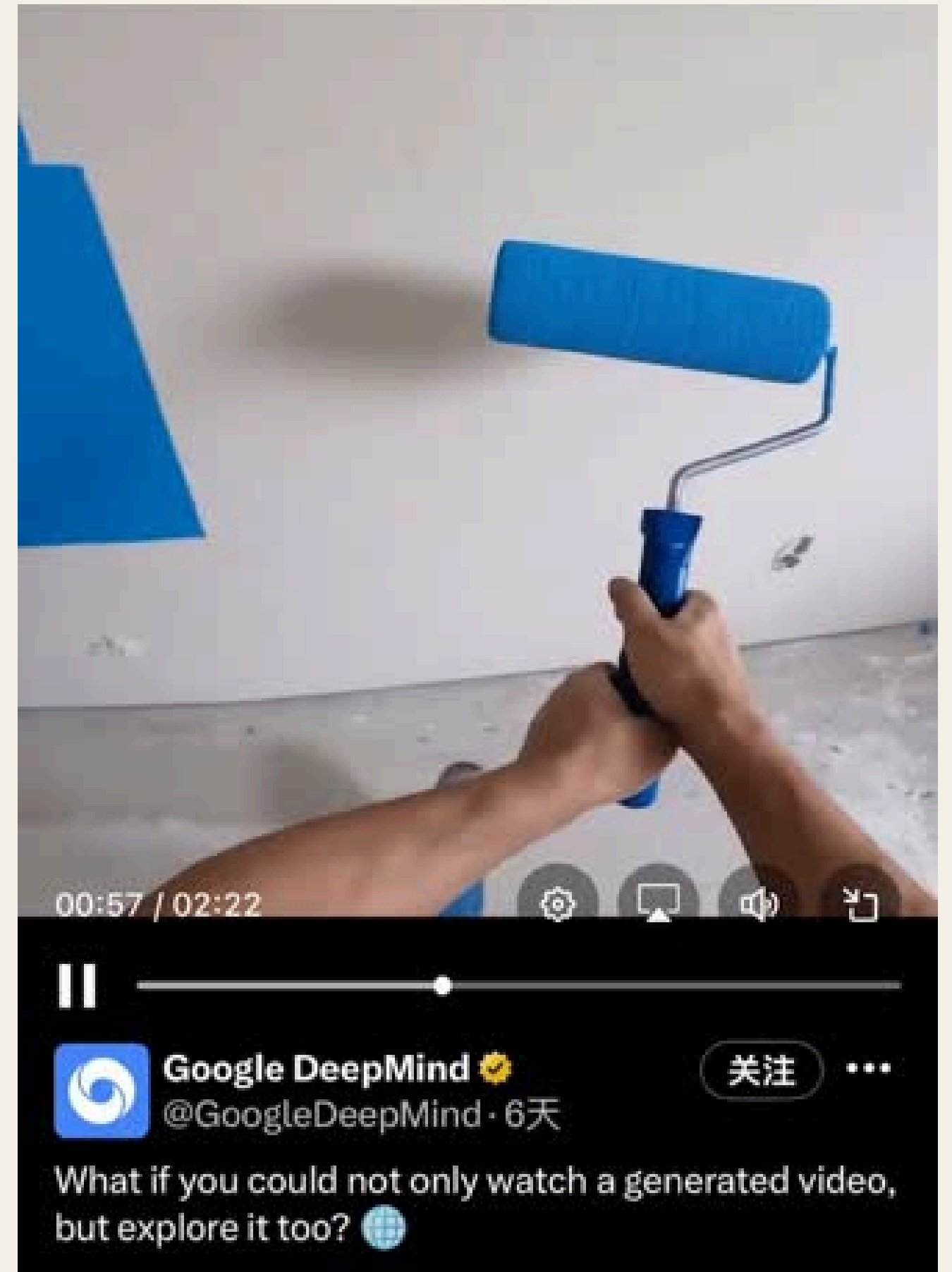
what we got



GENIE 3

Google DeepMind

A 3D world that can
be freely explored can
be created in real-
time through text.



DouBao

1 That's a sea. There is a shark.
There is a hot air balloon. There
is ship and some trees. It is sunset.

2 The background is the Forbidden
City, in the middle is a pikachu with
a sunglass and a blue jacket, it is
a rainy day.

**Some students use their own words
to describe a picture**

what we got



陈靖瑜1.png



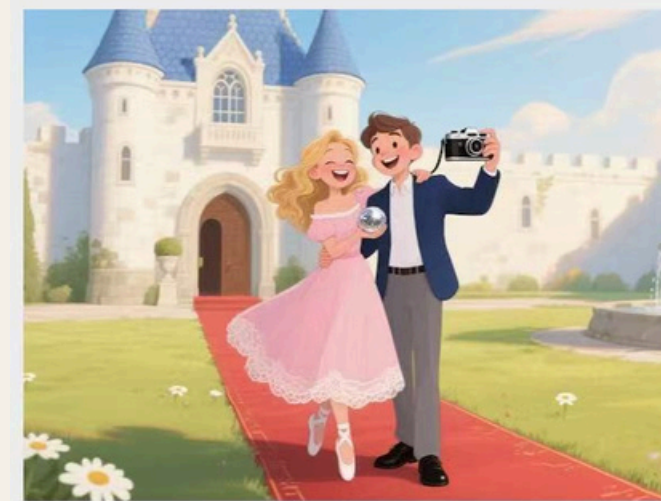
靖瑜2.png



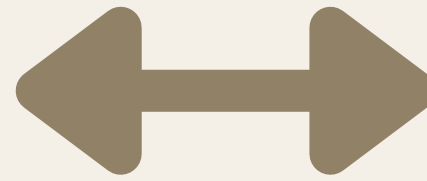
靖瑜3.png



靖瑜4.png



Intelligent Robot



CONTENTS

06

Limitation

Limitations of Artificial Intelligence



In the Fields of:

1. Healthcare
2. Education
3. Autonomous Vehicles
4. Content Creation
5. Natural Language Processing

.....



- Limited Creativity & Common Sense
- Data Dependence
- Bias and Fairness Issues
- Dependence & Job Displacement

- Inaccurate diagnoses
 - Data privacy
 - Manipulability
 - Misaligned incentives
-