



浙江大学
ZHEJIANG UNIVERSITY

走向数字社会：从Deepseek到群体智慧

浙江大学

吴超



1

从图灵机到大模型

2

走向数字社会

3

应对：群体智慧

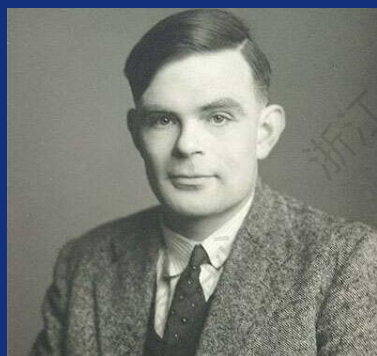
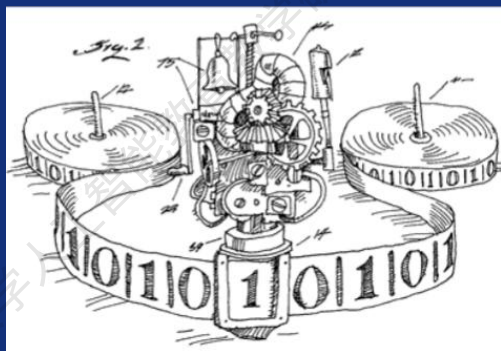


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图片来源: <https://yallatoursblog.com/2017/04/17/talos-mythical-droid-of-crete/>

非人智能体的梦想



图灵与图灵机 Turing, Alan Mathison. "On computable numbers, with an application to the Entscheidungsproblem." Proceedings of the London mathematical society 2, no. 1 (1937): 230-265.



当女孩成为武器：追忆被遗忘的战时人工算力

计算士 <https://sspai.com/post/92219>

recipe

Ingredients

1 litre/1 3/4 pints chicken stock
500g/1lb 2oz frozen peas
10g/1/2oz fresh tarragon leaves
pinch salt
4 very thin slices pancetta (cut on the thinnest possible setting)

Method

1. Heat the chicken stock in a saucepan until it is simmering. Add the peas and simmer for 2 minutes, or until just tender. Stir in the tarragon and salt.
2. Transfer the mixture to a food processor and blend for a few short blasts to a rough-textured soup. Return the soup to the saucepan and keep warm over a low heat.
3. Using a pair of tongs, heat each slice of pancetta over the gas flame of your hob for a few seconds until it crisps up. (Alternatively, preheat your grill to its highest setting, lay the slices of pancetta onto a baking tray and grill for 1-2 minutes, or until crisp.)
4. To serve, ladle the soup into bowls. Break the crisp pancetta into pieces and sprinkle on top of the soup.

code (python)

```
# import random lib
import random
min = 1
max = 6

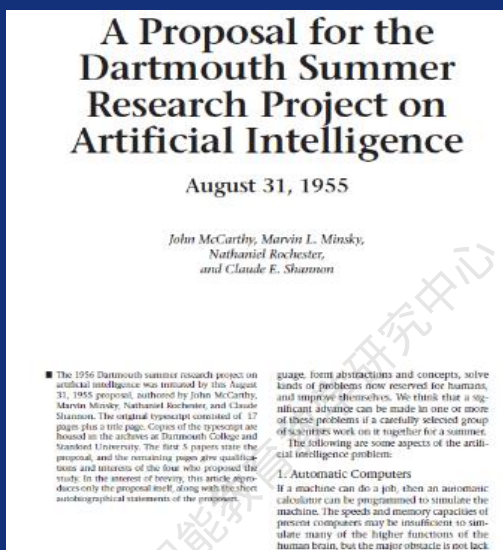
# set yes to let user roll again
roll_again = "yes"

# roll six dices at a time
while roll_again == "yes" or roll_again == "y":
    print "Rolling the dices..."
    print "The values are..."
    print random.randint(min, max)
    print random.randint(min, max)
    print random.randint(min, max)
    print random.randint(min, max)
    print random.randint(min, max)
    print random.randint(min, max)

    #if roll again
    roll_again = raw_input("Roll the dices again?")
```

数据与算法

人工智能的诞生与符号主义

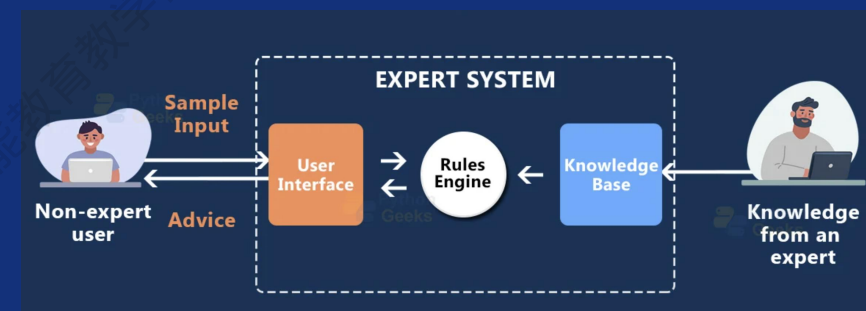
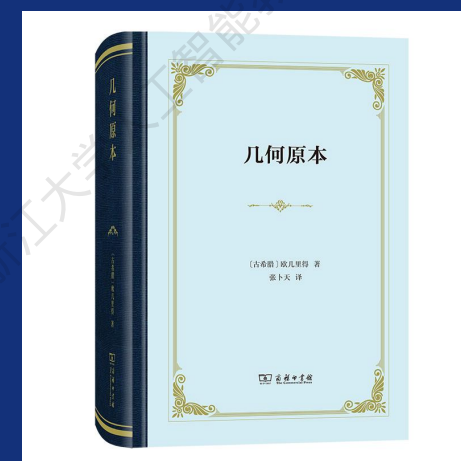


麦卡锡、明斯基、香农和罗切斯特
向美国洛克菲勒基金会递交题为
“关于举办达特茅斯人工智能夏季
研讨会的提议

达特茅斯会议
(1956年6月18日至8月17日)

符号主义:

1. 知识表示
2. 数理逻辑
3. 搜索



机器学习

Write a computer program to recognize digits?

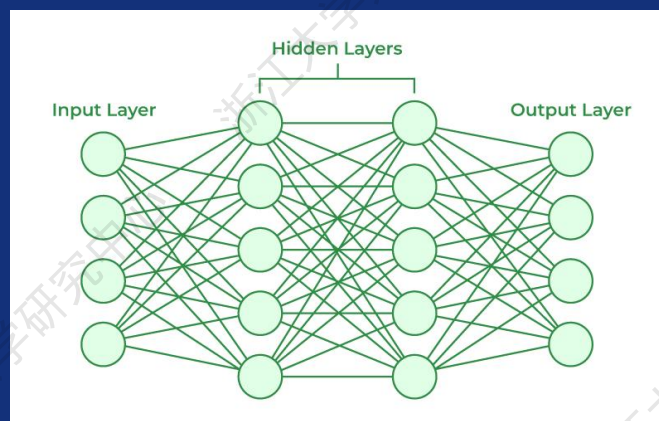
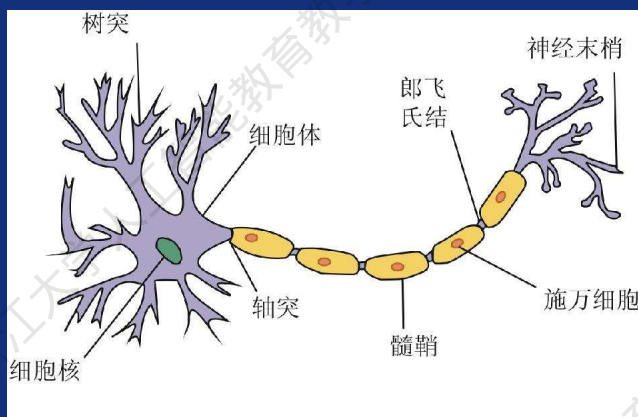
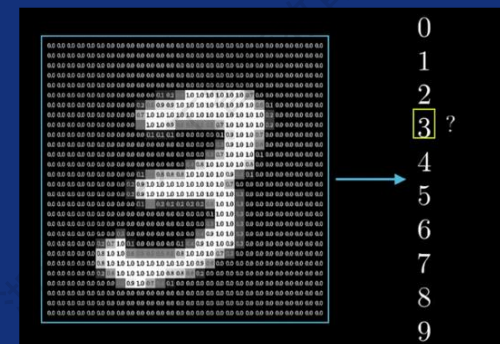
504192

人工智能 ≈ 机器学习

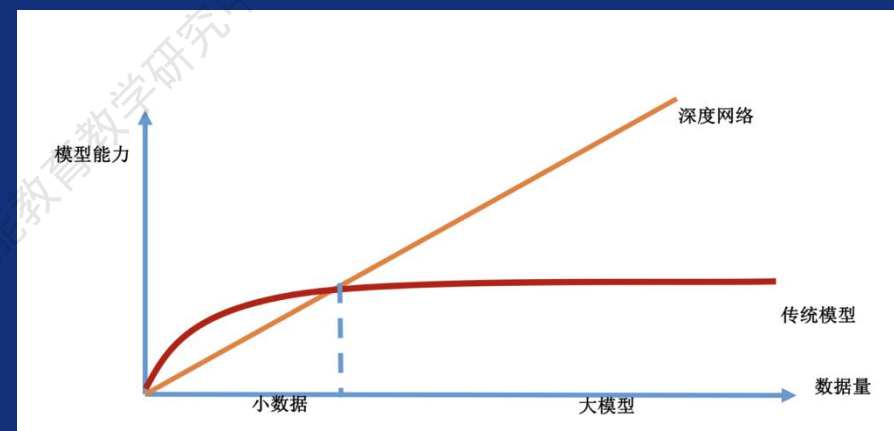
1959 by **Arthur Samuel**: "Some Studies in Machine Learning Using the Game of Checkers". IBM Journal of Research and Development. 3 (3): 210–229. CiteSeerX 10.1.1.368.2254. doi:10.1147/rd.33.0210.

"Field of study that gives computers the ability to learn without being explicitly programmed."

$$y = f(x)$$



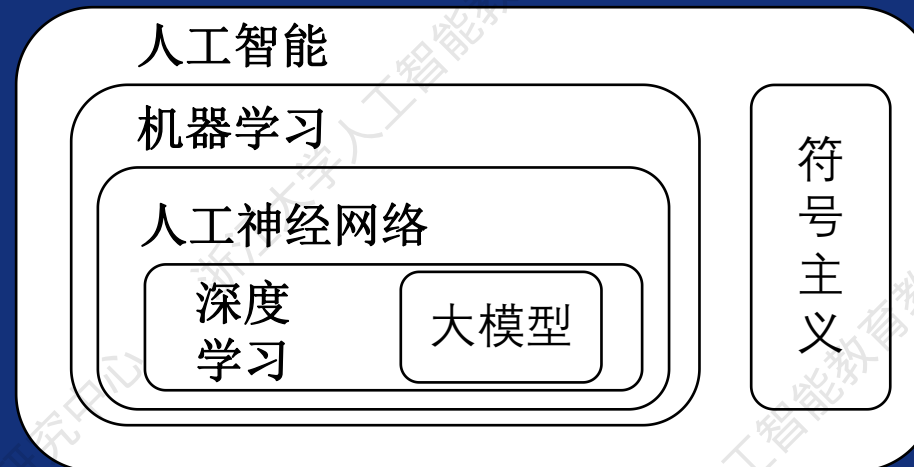
从生物神经网络到人工神经网络



深度学习



生成式模型



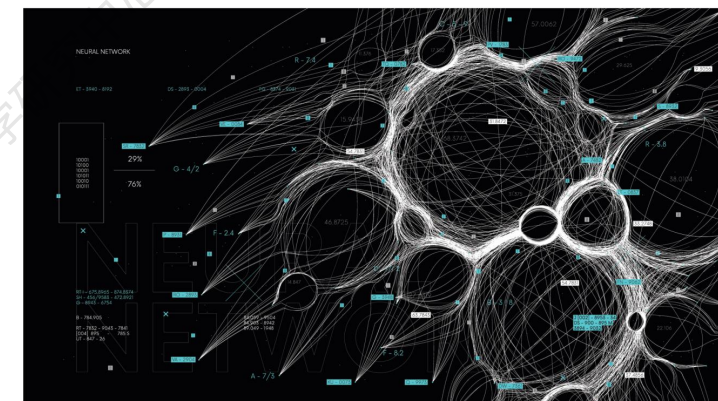
规模和涌现 Emergent ability

大模型（1750亿参数）

大数据（45TB）

大算力（1万张A100）

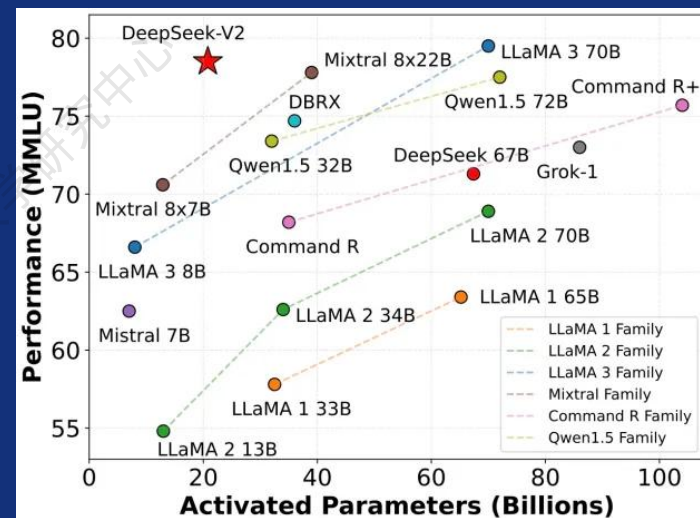
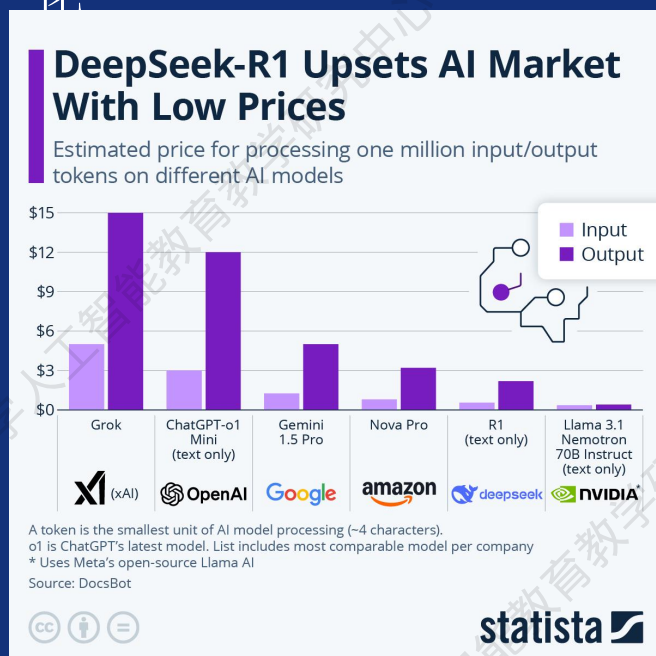
仍不是通用AI，
但有望成为通用入口



生成式大（语言）模型

Deepseek的意义

- 挑战大模型的“扩展定律” (Rich Sutton -The Bitter Lesson)：在2048块英伟达H800 GPU上训练
- 挑战闭源大模型优于大模型现状（普及本地部署）
- 算法改进和工程优化：混合专家模型 / 多头潜在注意力 / 强化学习 / 蒸馏 / 思维链 / 计算优化





1

从图灵机到大模型

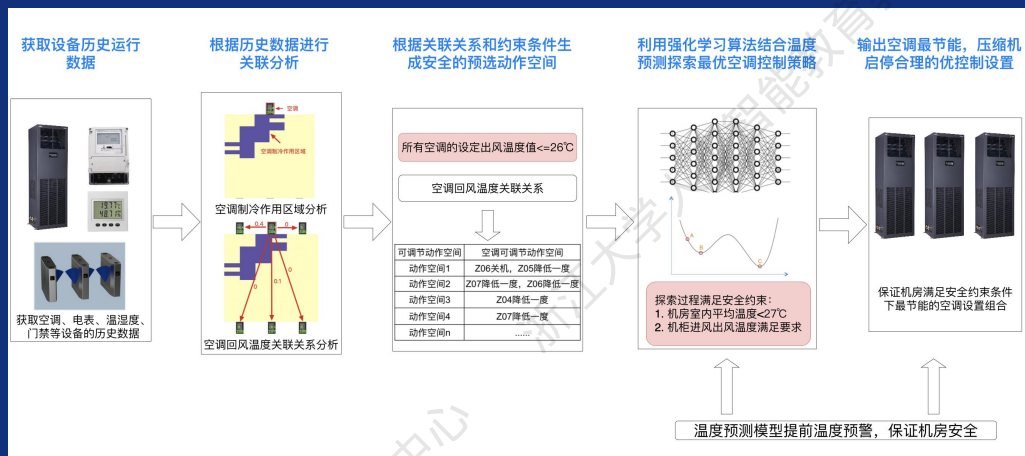
2

走向数字社会

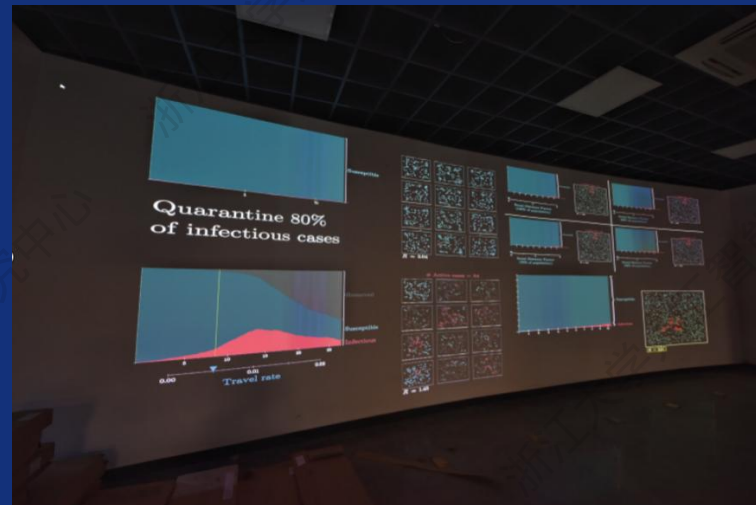
3

应对：群体智慧

人工智能促进社会数字化转型 - 融入千行百业



机房节能



疫情传播预测



网约车需求预测

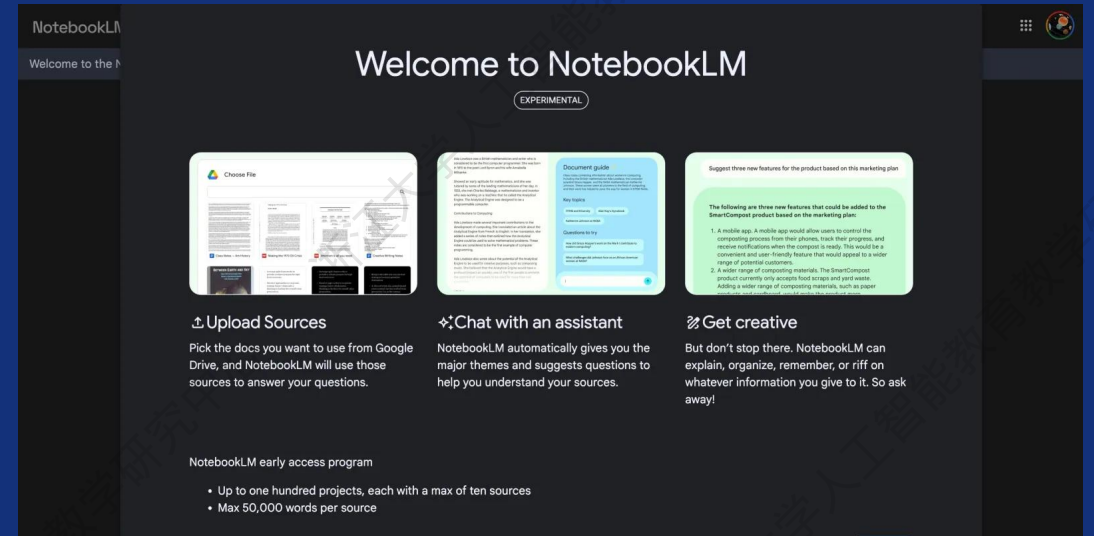


智能康复训练

AI for Science



SciSpace



NotebookLM



Co-Scientist