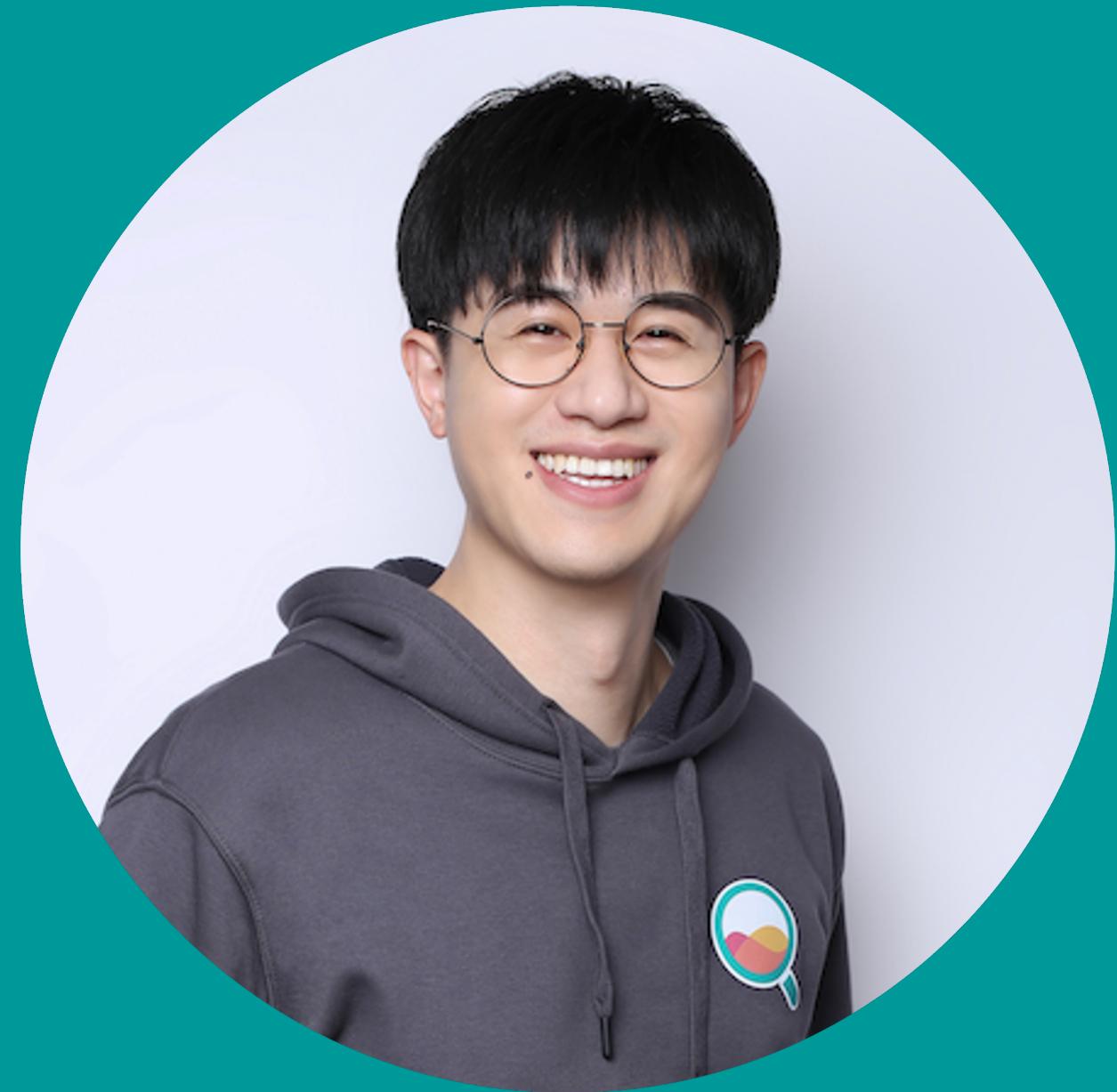


# 从神经搜索到多模态应用

Jina AI联合创始人兼CTO

王楠



# 王 楠

- 2020-now, Jina AI , 联合创始人兼CTO
- 2017-20, 腾讯PCG , 高级研究员
- 2015-17, Zalando搜索与推荐部门 , 数据科学家
- 2009-14, 德国Ruhr-Universität Bochum神经信息研究所, 博士

## About Jina AI

成立了于2020.2

拥有50团队成员

分布在4个不同城市

累计融资 \$38M +

荣登全球AI初创企业100





## DocArray

☆ 695

The data structure for unstructured data



## Jina

☆ 14.6k

Cloud-native neural search framework for any kind of data



## Finetuner

Finetuning any DNN for better embedding on neural search tasks



## Hub

Share and discover building blocks for neural search applications



## CLIP-as-service

☆ 10.3k

Embed images and sentences into fixed-length vectors with CLIP



## JCloud

Simplify deploying and managing Jina projects on Jina Cloud



## NOW

A no-code solution for bootstrapping your image search case in minutes

# Creator of Neural Search

# Contributor to Open Source

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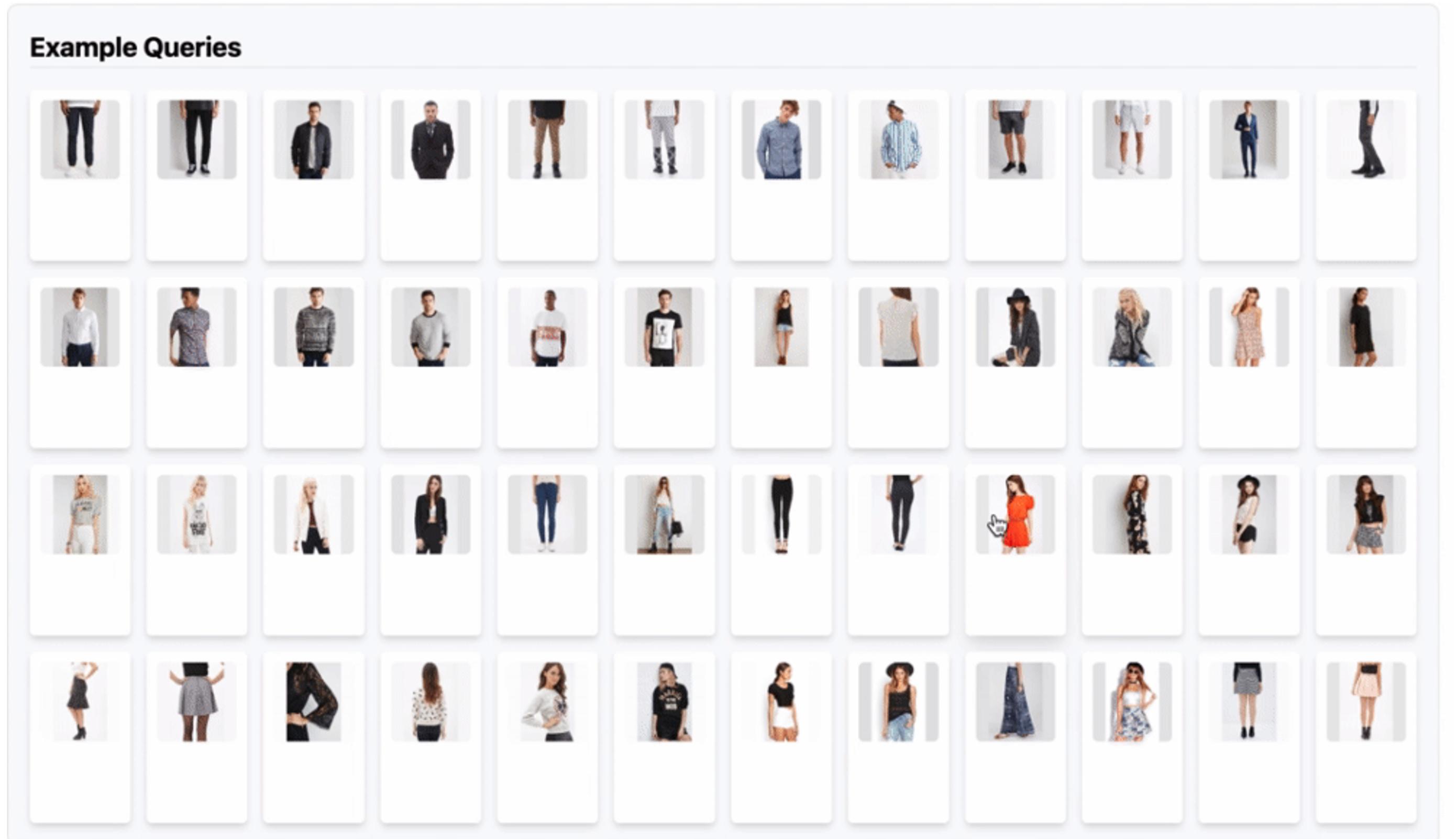
- 01 神经搜索
- 02 神经搜索的挑战
- 03 神经搜索与Jina全家桶
- 04 神经搜索与多模态应用

01

## 神经搜索

## What is Neural Search?

# 相似图片检索



## What is Neural Search?

# 问答机器人

 Ask our docs! ▾

You can ask questions about our docs. Try:

- Does Jina support Kubernetes?
- How can I traverse a nested DocumentArray?
- What are the basic concepts in Jina?

what is jina?



Powered by 

## What is Neural Search?

# 3D 模型检索

The image displays two examples of 3D model search results from a neural search interface.

**Example 1: Humanoid Model**

Query: ./assets/MAN-ZULU\_RIG.FBX-man-zulu\_Rig.glb

Dense Layer: 0

class: `man_rig`

edges: 1500

faces: 500

triangles: 500

vertices: 1010

**Example 2: Building Model**

Query: ./assets/BUILDING-CINEMA.FBX-building-cinema\_7.glb

Dense Layer: 0

class: `cinema_building`

edges: 648

faces: 216

triangles: 216

vertices: 420

**Search Results Grid:**

The search results are presented in a grid format. Each row contains a query image on the left and a grid of 12 similar models on the right. Each grid cell includes a "Find similar" button.

- Row 1 (Humanoid):**
  - Query: Humanoid Rig (man\_rig)
  - Similar models include: woman\_rig, soldier\_special\_man\_rig, casual\_woman\_rig, ginger\_woman\_rig, soldier\_man\_rig, female\_man\_rig, soldier\_man\_rig, pinka\_rg\_woman, cowboy\_man\_rig, soldier\_special\_man\_rig.
- Row 2 (Building):**
  - Query: Cinema Building (cinema\_building)
  - Similar models include: post\_building, cinema\_building, building\_industry, building\_restaurant, post\_building, big\_tower, curved\_bowl, post\_building, building\_industry.

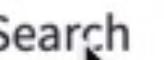
## What is Neural Search?

# 文本-图片跨模态搜索

## Multimodal fashion search with Jina

Search term

blue tshirt

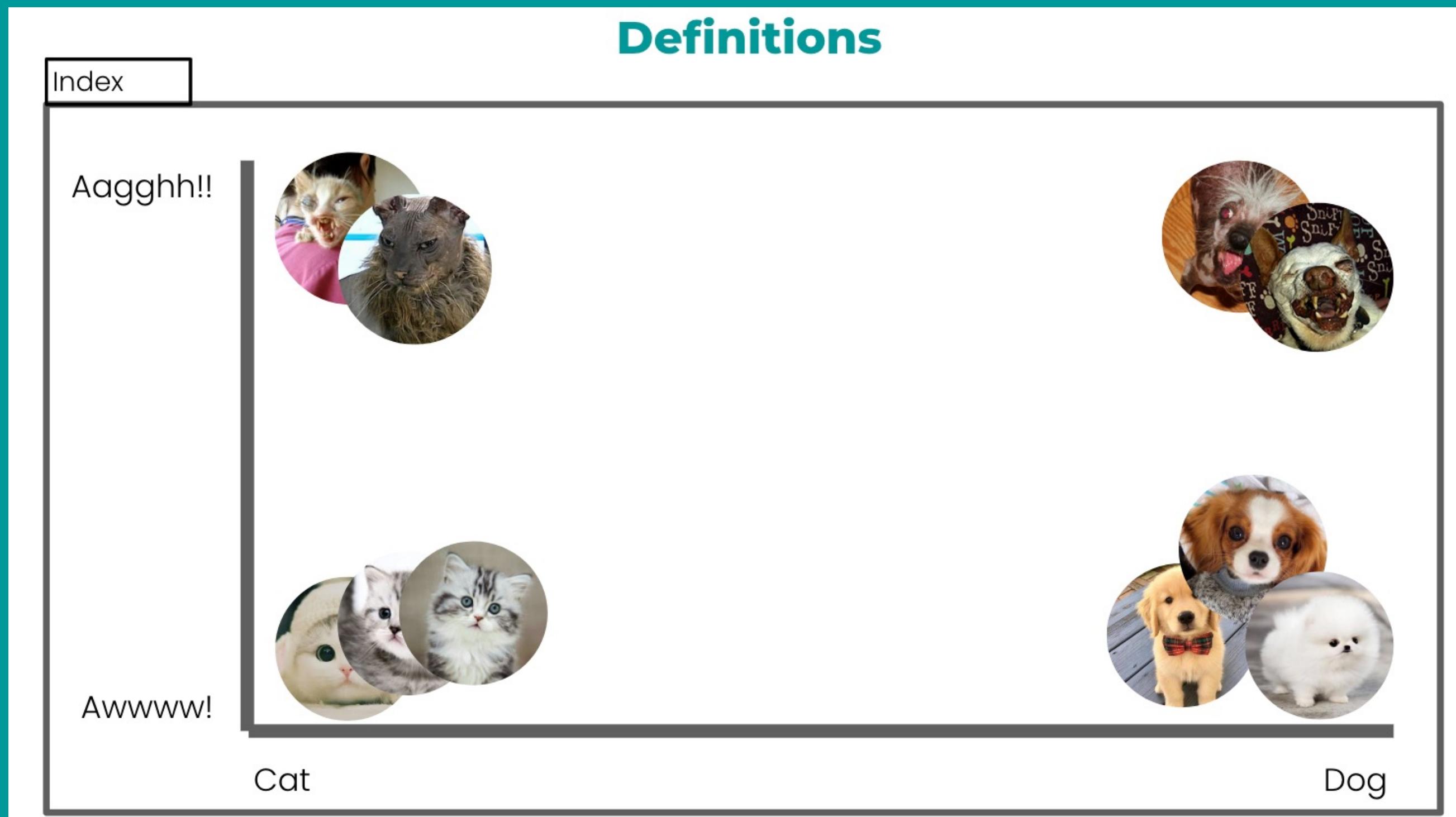
Search 

神经搜索是基于深度学习的信息检索技术，尤其适合处理多模态及跨模态的**非结构化数据**



# 神经搜索

- 利用神经网络模型得到**向量表示**
- **存储向量表示**
- 利用向量表示**查找相似数据**



02

## 神经搜索的挑战

## Neural Search

# 搭建神经搜索系统的挑战

用什么样的神经网络模型表示数据？



表征学习、对比学习、自监督学习...

如何获取不同模态/颗粒度的信息？



OCR、关键词抽取、语义分割、  
物体识别、语音转文字...

如何高效的存储和查找相似数据？



向量数据库、对象存储

如何在线上生产环境部署？



云原生、可伸缩性、安全性

Neural Search & Cloud-Native

# 神经搜索与云原生

神经搜索系统是一个完整流水线

不同模块需要不同的运行环境

底层基建需要稳定、高效运行

**微服务**保证每个步骤在以分布式形式独立运行

**编排系统**负责协调流水线的持续运行和弹性伸缩

**容器化技术**保证每个步骤都有独立的运行环境

**可观测性方法**及时捕获故障原因

# 03

## 神经搜索与Jina全家桶



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# Jina生态提供端到端的神经搜索开发体验



处理非结构化数据的python库



使用Jina Cloud部署和管理神经搜索系统



神经搜索系统的低代码环境



提供文字与图片的向量表示



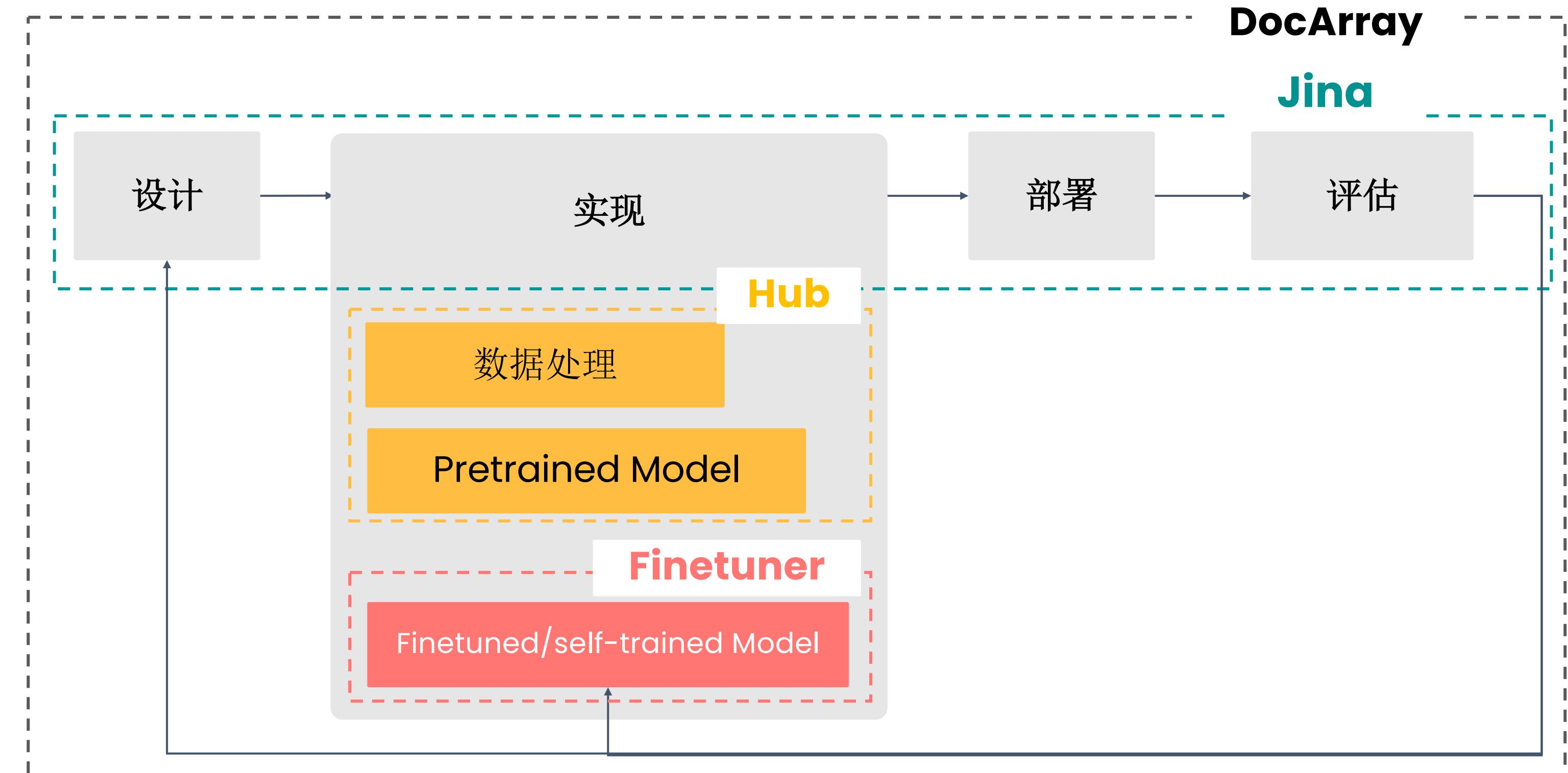
支持不同数据类型的云原生神经搜索框架



神经搜索系统模块的分享平台



神经搜索系统的结果调优器



## Neural Search

# Jina全家桶与神经搜索

用什么样的神经网络模型表示数据 ?

表征学习、对比学习、自监督学习...

SOTA模型和微调服务

如何获取不同模态/颗粒度的信息 ?

OCR、关键词抽取、语义分割、  
物体识别、语音转文字...

垂直领域的处理模块

如何高效的找到有相似表示的数据 ?

向量数据库、对象存储

集成多种对象存储和  
向量数据库

如何在线上生产环境部署 ?

云原生、可伸缩性、安全性

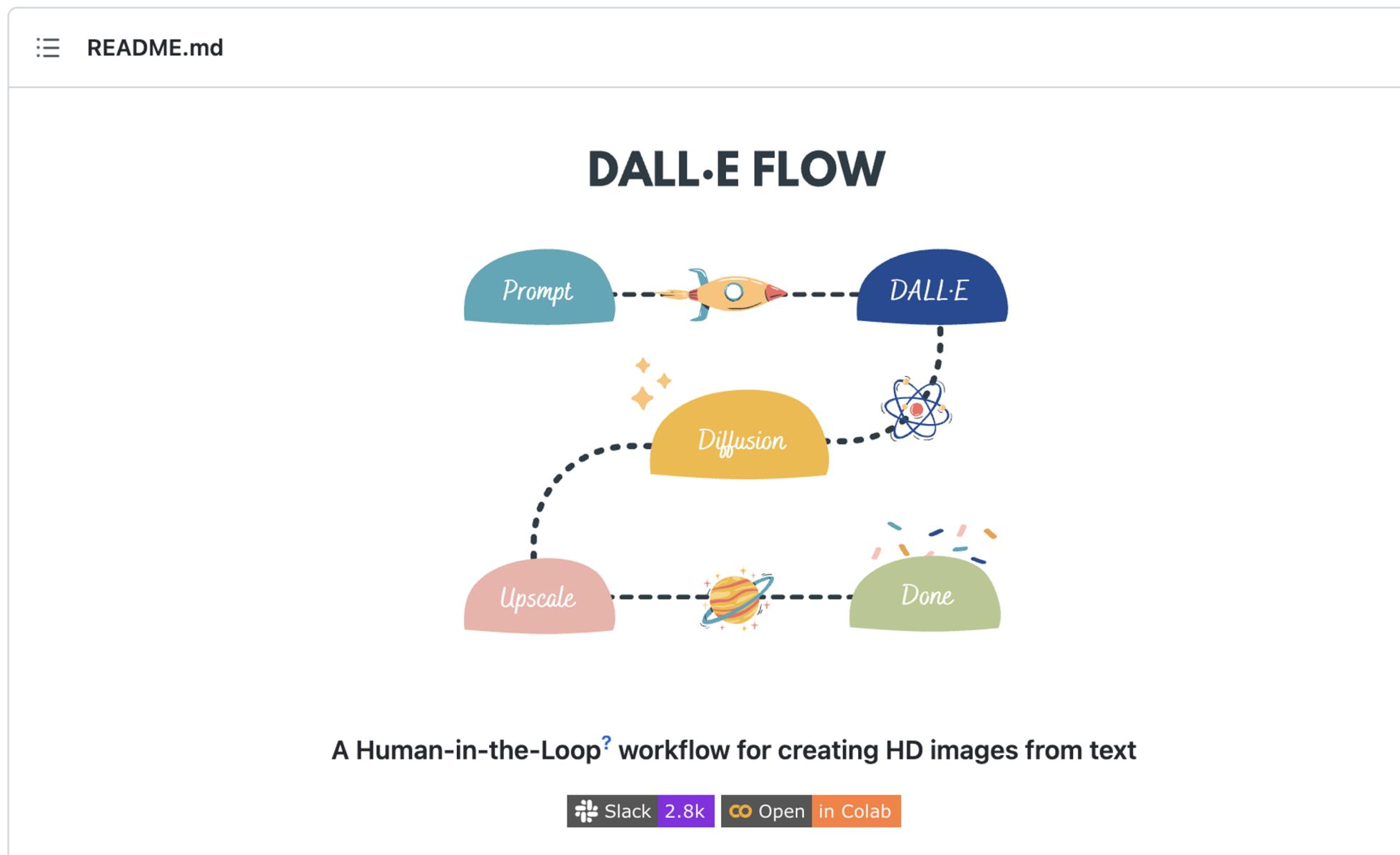
.jina

# 04

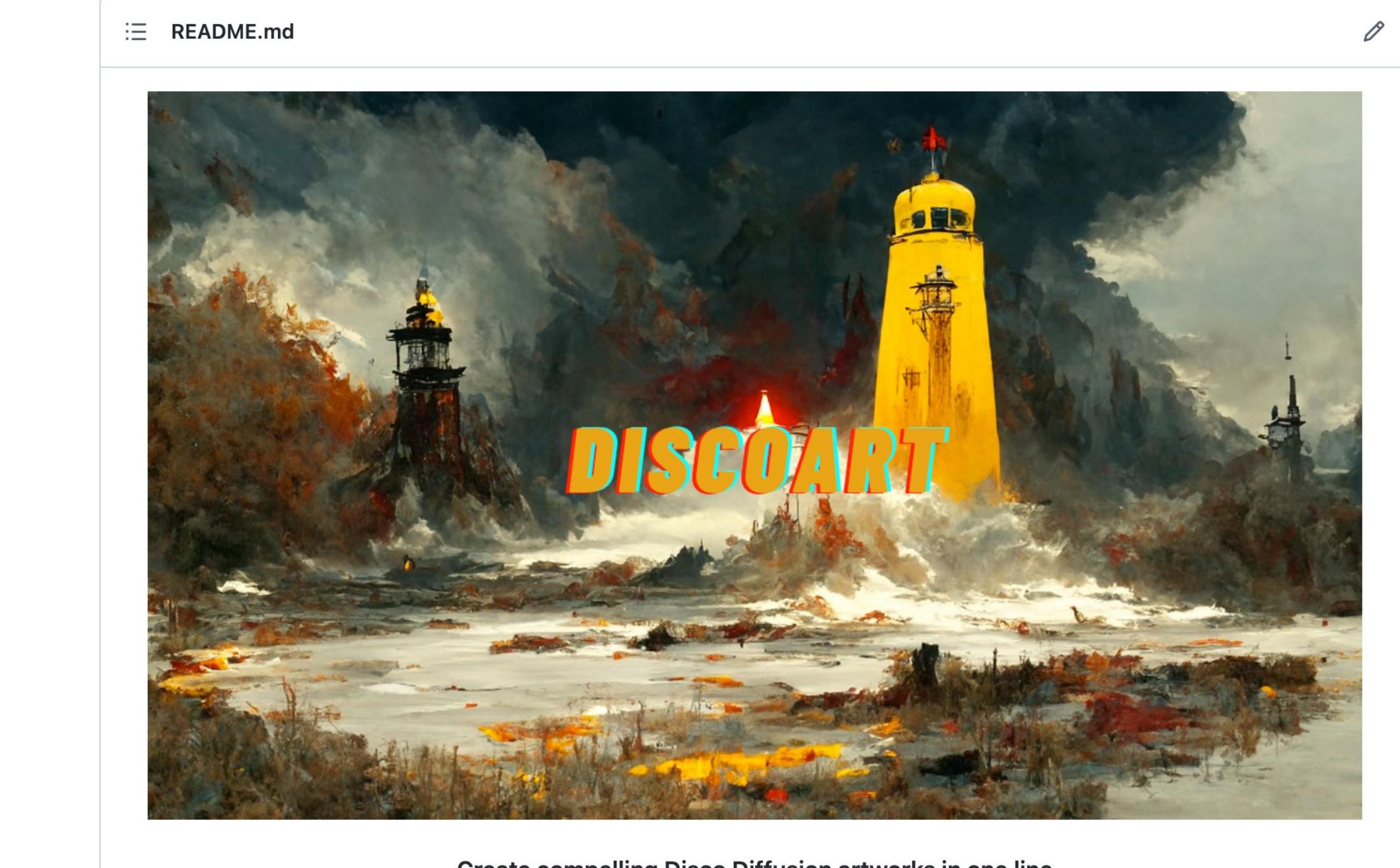
## 神经搜索与多模态应用

## Generative Art

# DALL-E Flow & DISCOART



[github.com/jina-ai/dalle-flow](https://github.com/jina-ai/dalle-flow)



[github.com/jina-ai/discoart](https://github.com/jina-ai/discoart)

*"a historical photo of  
ancient greek scholars  
doing pair  
programming on the  
laptop"*

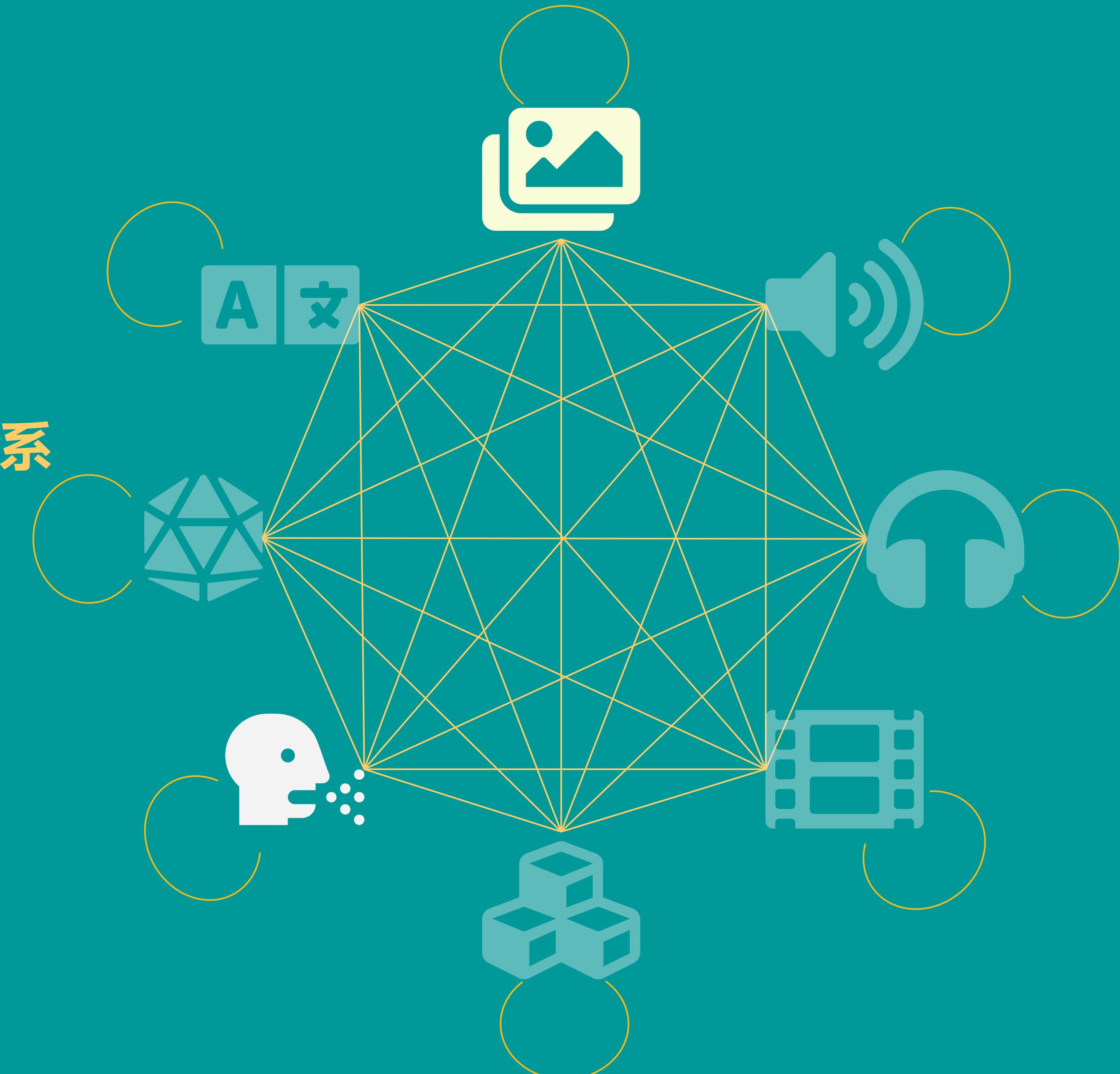


*"a painting of a robot writing codes, futurism style"*



# AI生成

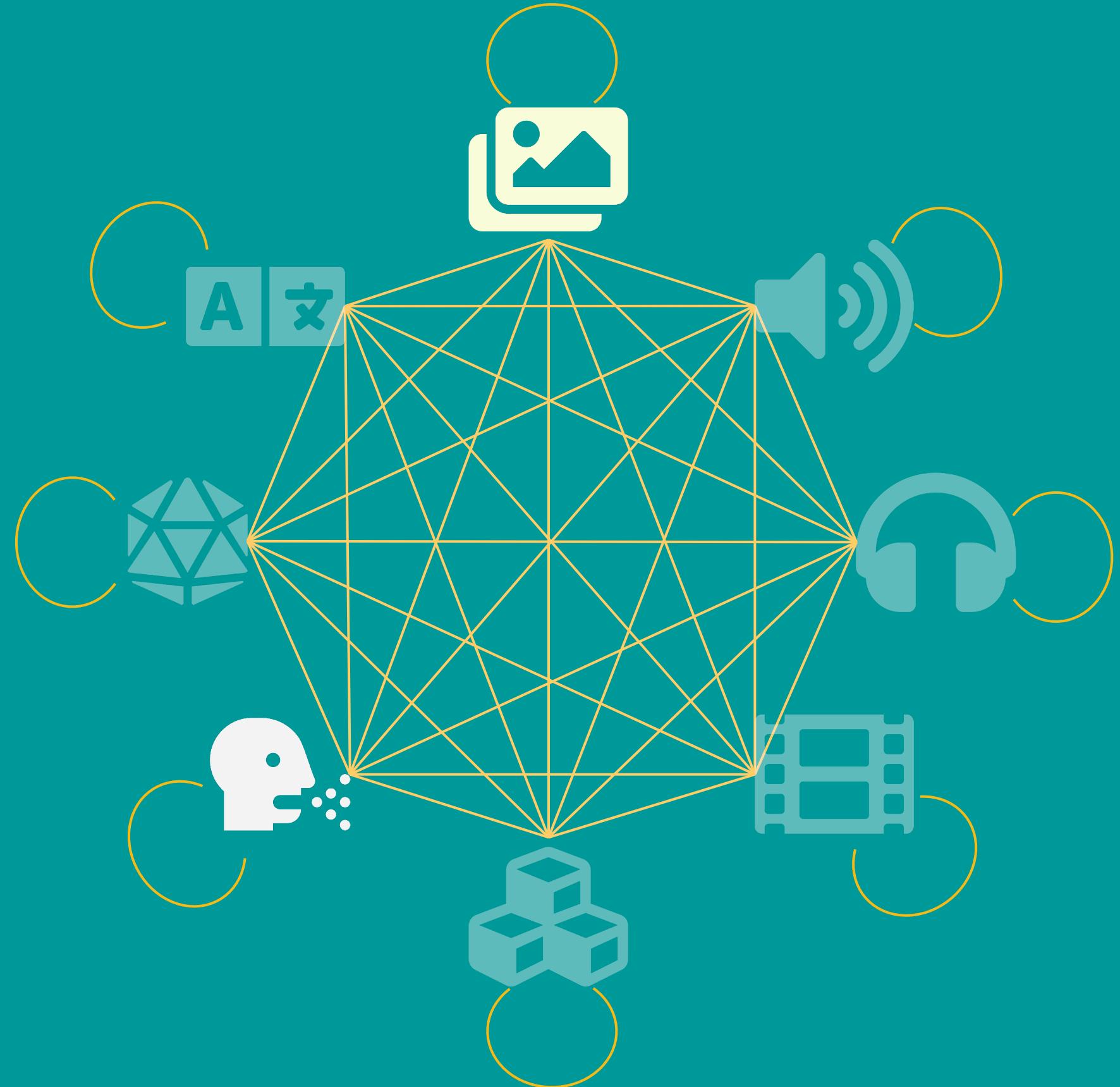
- 利用神经网络模型**表示数据和关系**
- 利用模型**生成相似数据**
- **存储数据关系**，不存数据表示





## 神经搜索

数据表示 数据关系 ? 查找数据



## AI生成

数据表示 ? 数据关系 生成数据

跨模态/多模态应用

# 谢谢观看

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王楠

