

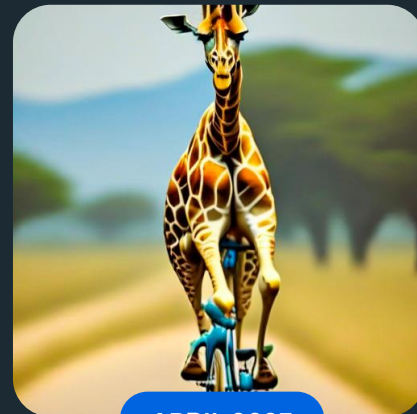
# A culture of open science in the era of large AI foundation models

PROMPT

“A giraffe riding a bicycle”



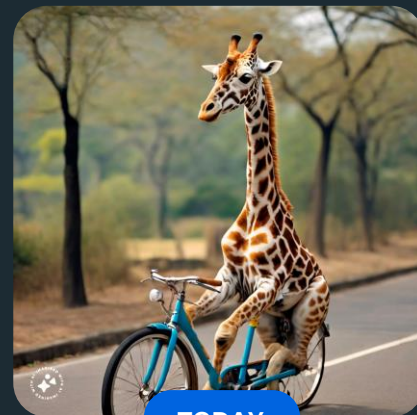
MARCH 2023



APRIL 2023

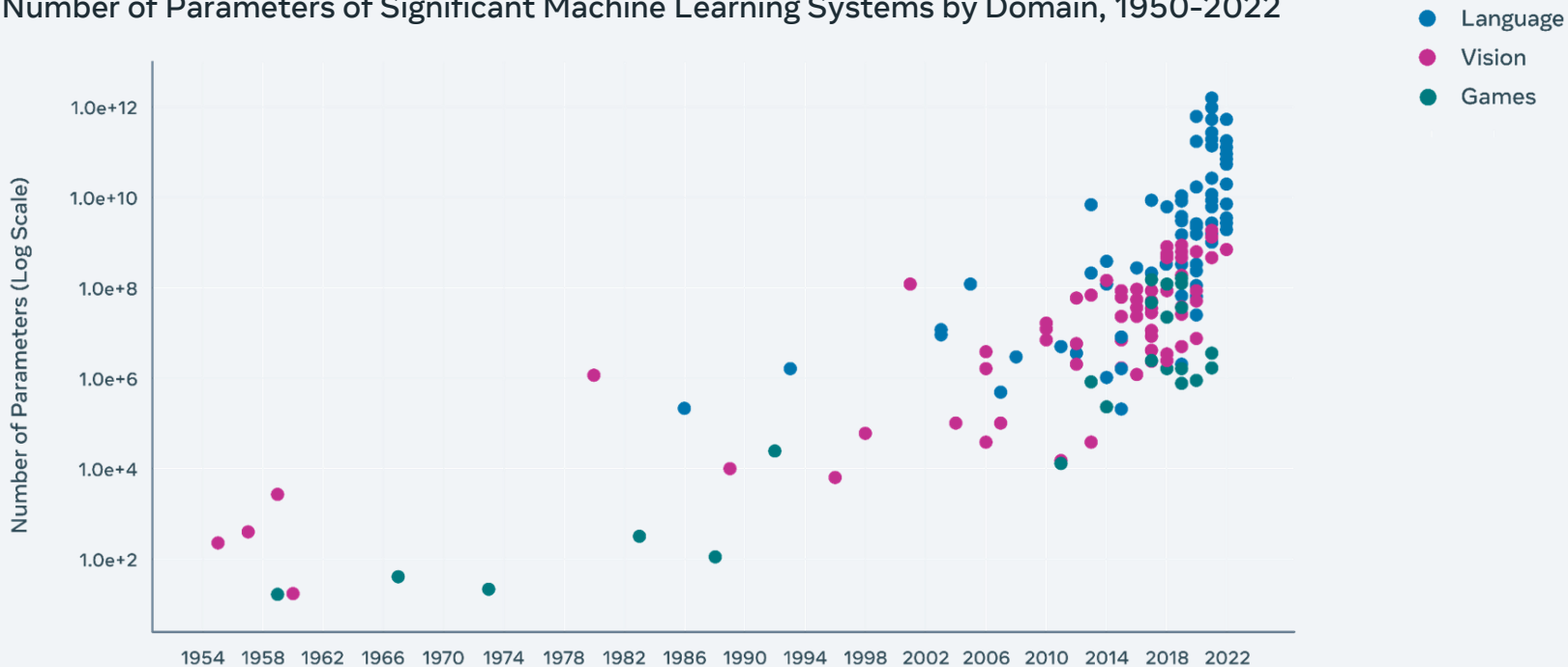


JUNE 2023

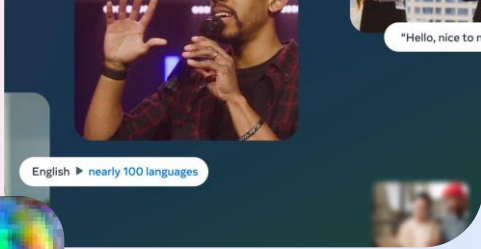


TODAY

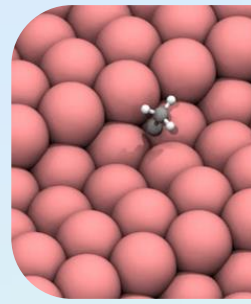
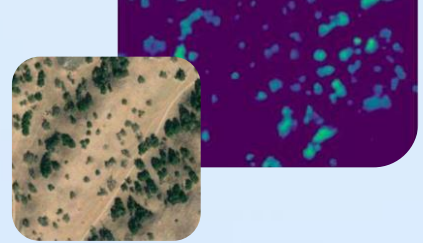
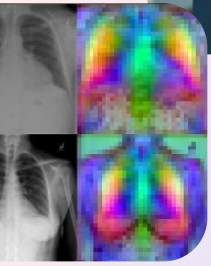
### Number of Parameters of Significant Machine Learning Systems by Domain, 1950-2022



Source: Epoch, 2022 | Chart: 2023 AI Index Report.

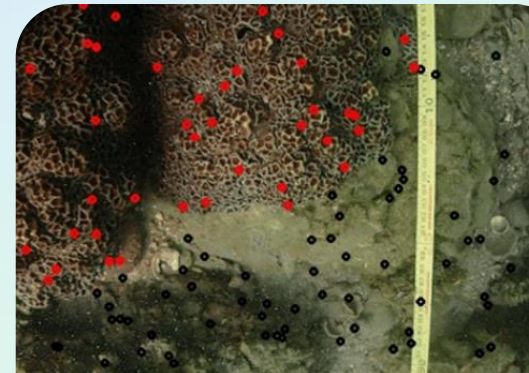


English ▶ nearly 100 languages



# Build the world of tomorrow

- Galician
- Gujarati
- Haitian Creole
- Hebrew
- Hindi
- Chhattisgarhi
- Croatian
- Armenian
- Igbo
- Indonesian
- Italian
- Japanese
- Kannada
- Kashmiri
- Korean
- Malayalam
- Malay
- Burmese
- Dutch
- Hyndok
- Bokmal
- Nepali
- Northern
- Rajasthani
- Luxembourgish
- Luba-Kasai
- Ganda
- Dholuo
- Ido
- Kiswahili
- Maltrali
- Malayalam
- Marathi
- Minangkabau (Latin)
- Macedonian
- Malagasy
- Maltese
- Melish (Bangali script)
- Mongolian
- Mossi
- te reo Māori
- Malay
- Burmese
- Dutch
- Hyndok
- Bokmal
- Nepali
- Northern





AI Transformation:  
The Field is Moving Fast



AI in the future will  
flourish with openness



How we'll get there

# Accelerated Innovation

PERCEPTION



2012

**ALEXNET**

(U. Toronto)



2015

**FASTER R-CNN**

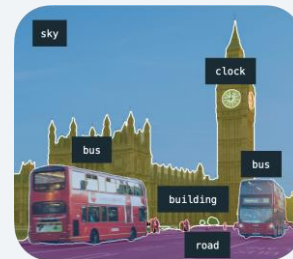
(Microsoft, Facebook)



2017

**MASK R-CNN**

(Facebook)



2019

**PANOTOPIC**

**FPN**

(Facebook)

# SAM: Segment Anything Model



**Bigger, Better,  
Faster, Stronger**

**1.7M**

people tried SAM  
on the first month

**6X**

increase in  
labeling speed



**SA-1B: Largest ever released  
segmentation dataset**

**11M**

images

**1B+**

masks

# Composability



## Extensible Inputs

Bounding box prompts from an object detector can enable text-to-object segmentation

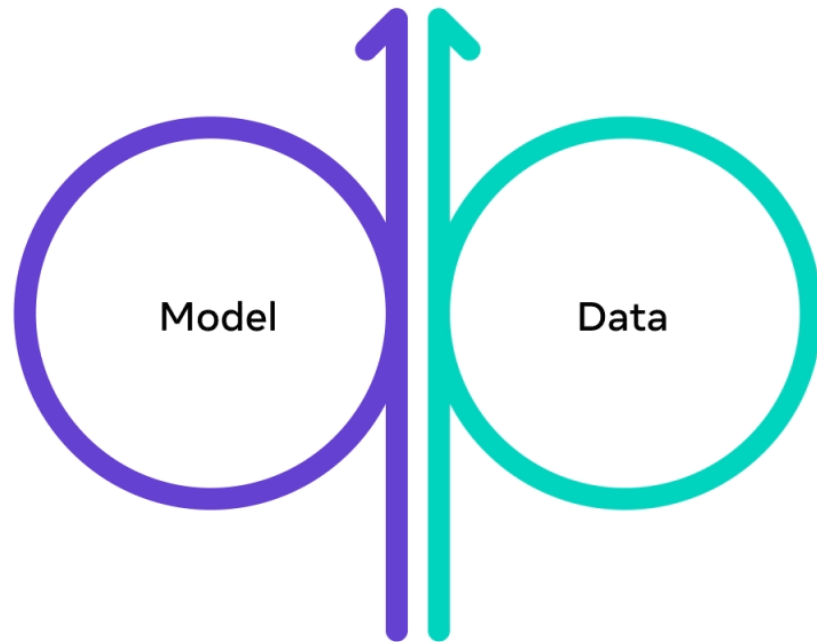


## Extensible Outputs

SAM masks can be used as input to other models to go from images to 3D shapes

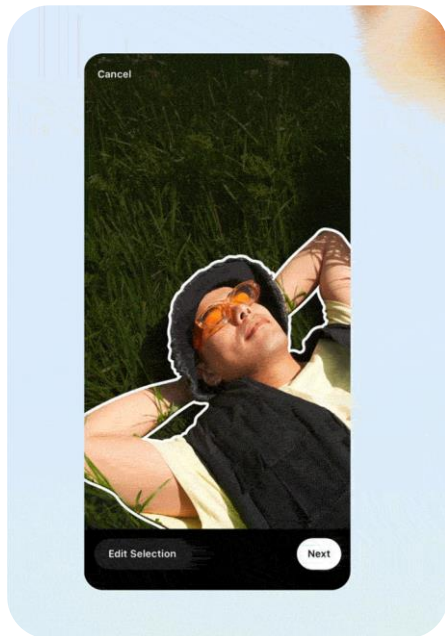


# Model in the loop data engine



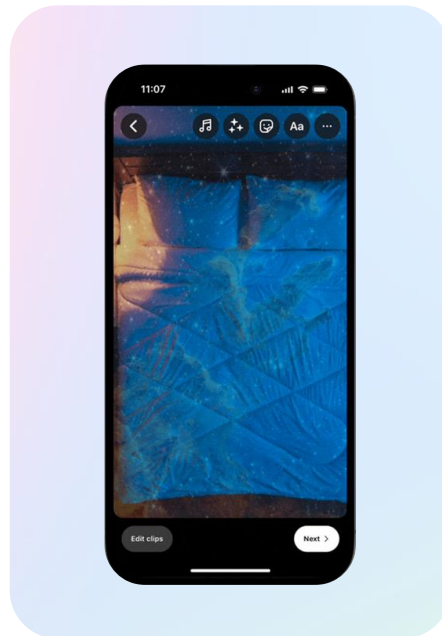
## Backdrop on Instagram

Segment the salient object and  
customize the background



## Custom stickers on Instagram

Create stickers from images  
and videos



## Enterprise annotation platforms

Significantly speeds up  
segmentation annotation



roboflow

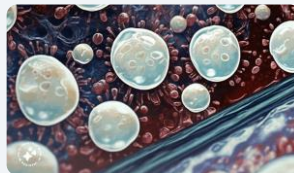
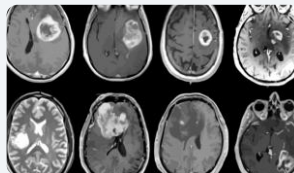


SuperAnnotate

scale



Labelbox



## Social impact

Use cases in science  
and medicine



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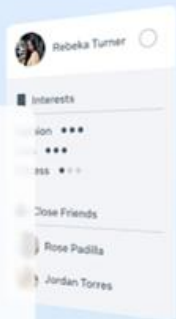


How we'll get there



## RESEARCH

Meta has long been an industry leader in AI research.



2023

# Foundation Models

- Llama
- Toolformer
- CM3Leon
- I-Jepa
- Segment Anything
- DINOv2
- ImageBind
- VoiceBox
- Massively Multilingual Speech
- MusicGen
- SeamlessM4T
- Llama 2
- Code Llama

Collections 13

^ Collapse

## Seamless Communication

A significant step towards removing language barriers through ...

Seamless: Multilingual Expressive and Streaming Speec...

Paper • 2312.05187 • Published Dec 8, 2023 • 3

facebook/seamless-m4t-v2-large

Automatic Speech Recognition • Updat... • 52.5k • 365

Seamless M4T v2

376

## Wav2Vec 2.0

A collection for the first release of Wav2Vec 2.0, a speech encod...

facebook/wav2vec2-large-960h-1v60-self

Automatic Speech Recognition • Updat... • 36.5k • 100

facebook/wav2vec2-large-960h

Automatic Speech Recognition • Updat... • 41.3k • 17

facebook/wav2vec2-base-960h

Automatic Speech Recognition • Upda... • 7.91M • 188

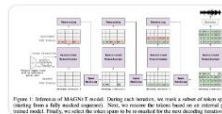
facebook/wav2vec2-base-100h

## MAGNeT

Masked Audio Generation using a Single Non-Autoregressive Tr...

Masked Audio Generation using a Single Non-Autoregr...

Paper • 2401.04577 • Published 10 days ago • 30



facebook/magnet-small-10secs

## SeamlessM4T

SeamlessM4T is designed to provide high quality translation, a...

Seamless M4T

840

facebook/hf-seamless-m4t-large

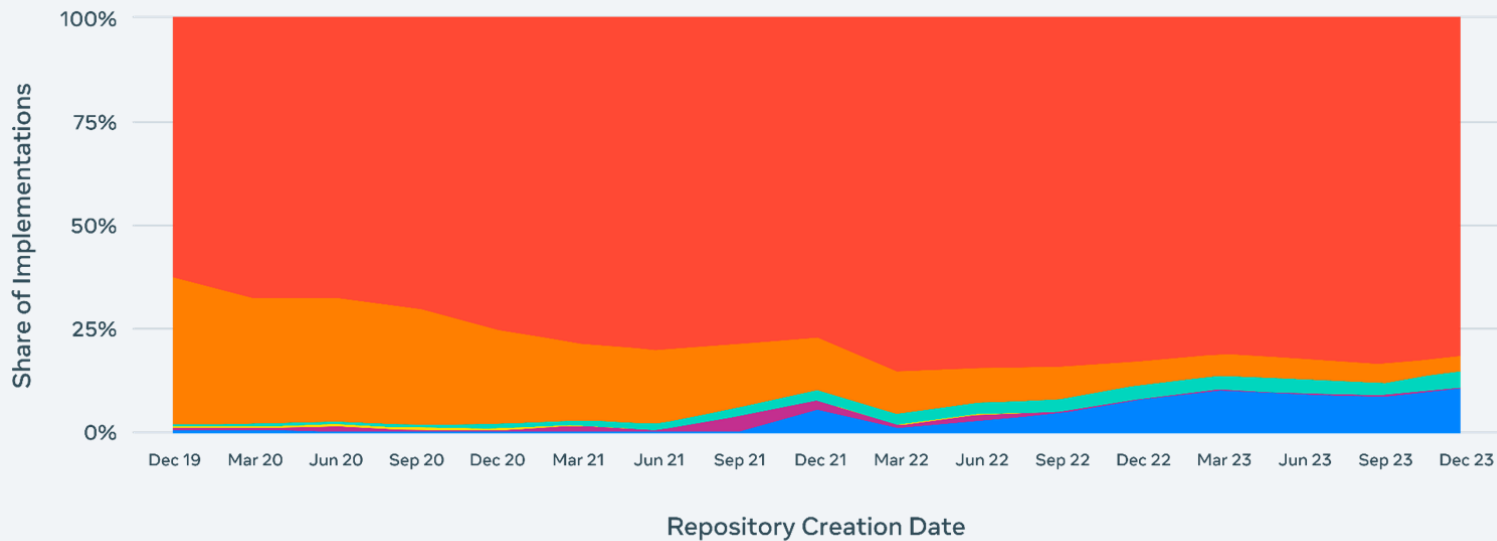
Text-to-Speech • Updated Dec 8, 2023 • 3.05k • 42

facebook/hf-seamless-m4t-medium

Text-to-Speech • Updated Dec 8, 2023 • 11.6k • 20

facebook/seamless-m4t-large

# Pytorch Adoption



# Benefits of an open approach



Broader accessibility accelerates innovation, leading to economic growth



Quick discovery and mitigation of potential risks leads to safer models.



Increased autonomy to run locally, control data and security, adapt to specific needs.



Start every project  
with the intent to  
open source...

...land every project  
leaving this world a  
little better.



# Llama

FEB 2023

For research use

7B/13B/33B/65B pretrained models

Fine-tuned models released by researchers from Stanford and Berkeley

# 10K

Requests for access



**Alpaca**  
Stanford  
University



**Koala**  
Berkeley



**+ Others**



# Llama 2

JULY 2023

---

For research and commercial use

---

7B/13B/70B family of models:

- Pretrained and fine-tuned
- CodeLlama, PurpleLlama

# 160M+

Downloads (Llama family)

INTRODUCING

# Meta Llama 3

The most performant open models now available in 8B and 70B pretrained and instruction fine-tuned versions to support a wide range of applications.

8B

70B

Trust and  
safety

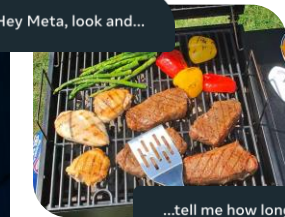
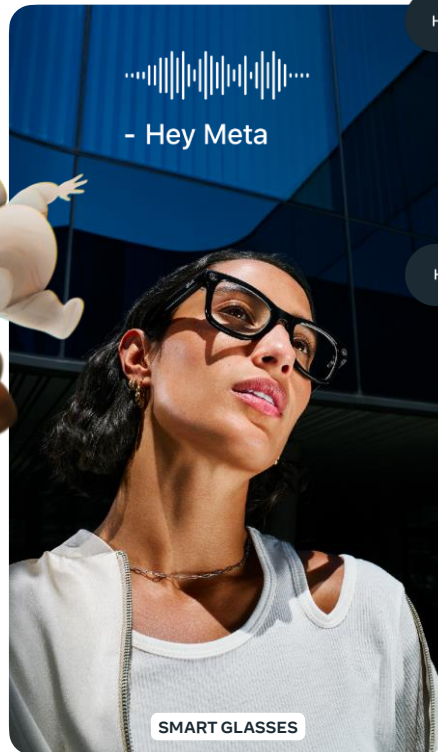
# Meta AI

Built with Meta Llama 3, Meta AI is one of the world's leading AI assistants, already on your phone, in your pocket for free. And it's starting to go global with more features. You can use Meta AI on Facebook, Instagram, WhatsApp, Messenger, and on the web at meta.ai to get things done, learn, create and connect with the things that matter to you.



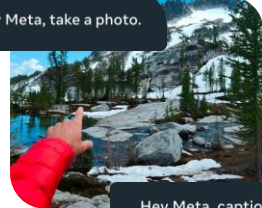
# Meta AI on Ray-Ban Meta Smart Glasses

We're expanding Multimodal AI in beta to everyone with Ray-Ban Meta smart glasses in the US and Canada



...tell me how long to grill this.

Hey Meta, take a photo.



Hey Meta, caption that photo.





# Responsible AI



Legal and privacy reviews

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External safety benchmarks

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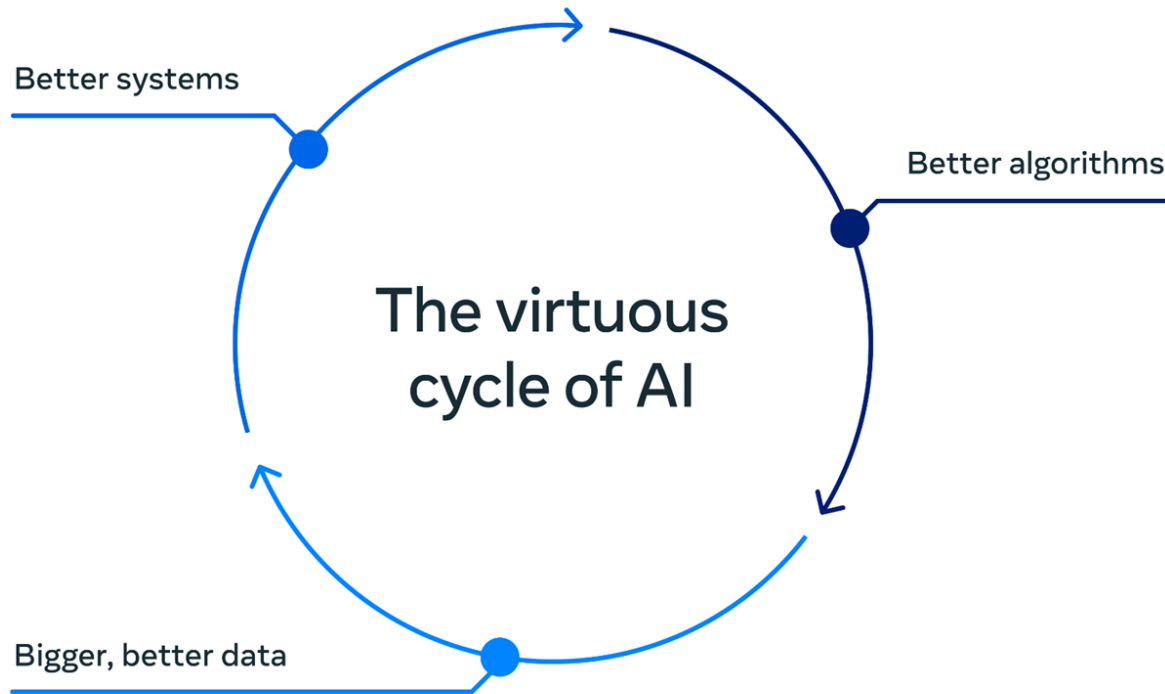


Human evaluation

---



Internal and external red teaming





オムレツを作る



cuisiner une omelette



cooking an omelette



आमलट  
पकाना



cocinar una tortilla





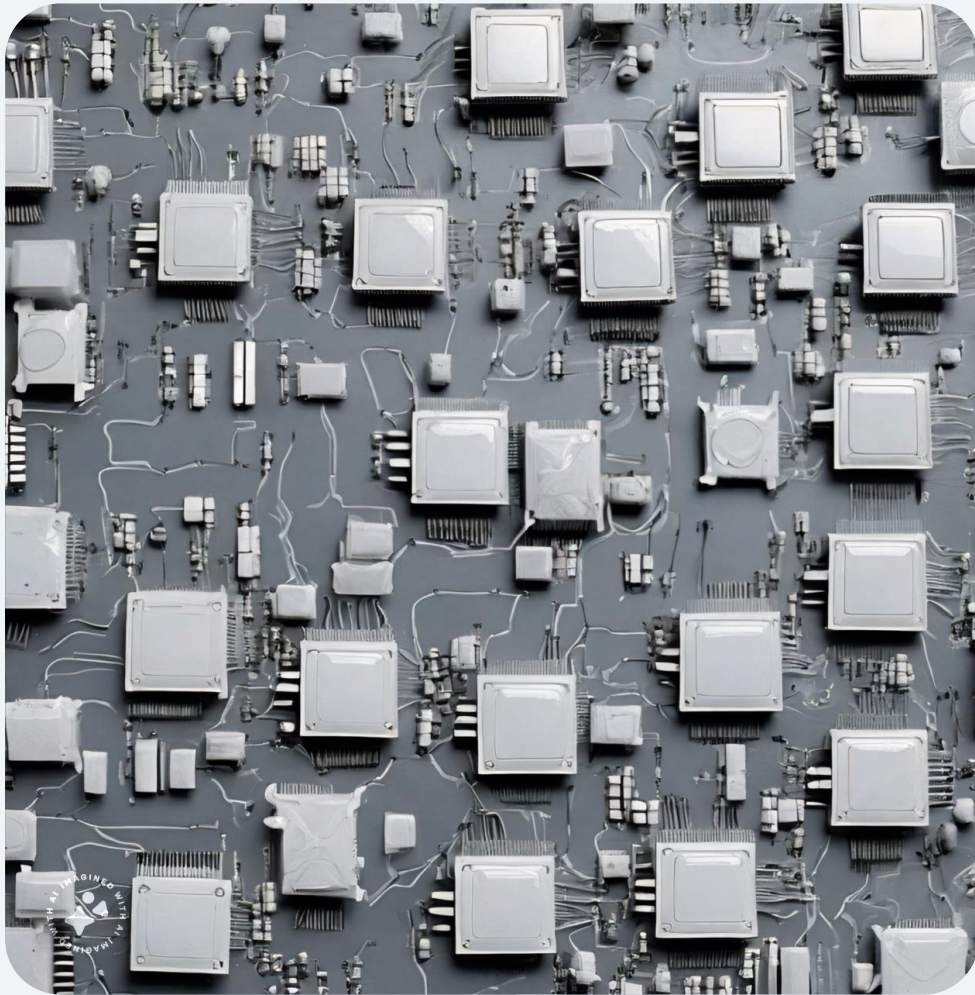
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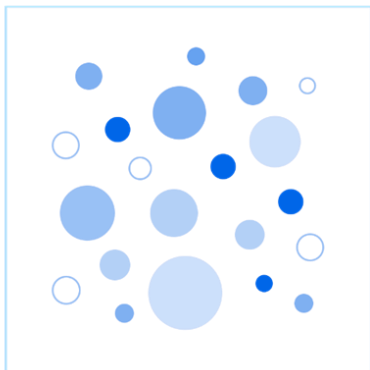
How we'll get there



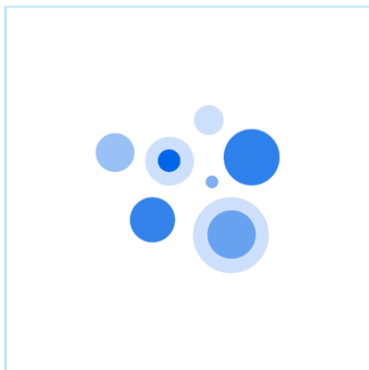
ARTIFICIAL GENERAL INTELLIGENCE

The ability for AI to exhibit human-like cognitive abilities

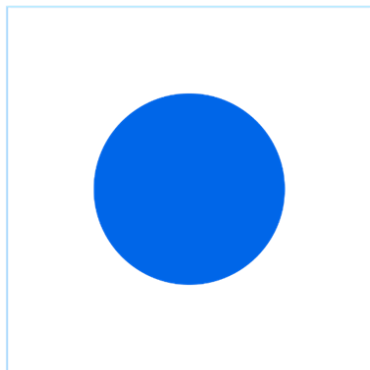
Controllability / Value to People



One model for each task



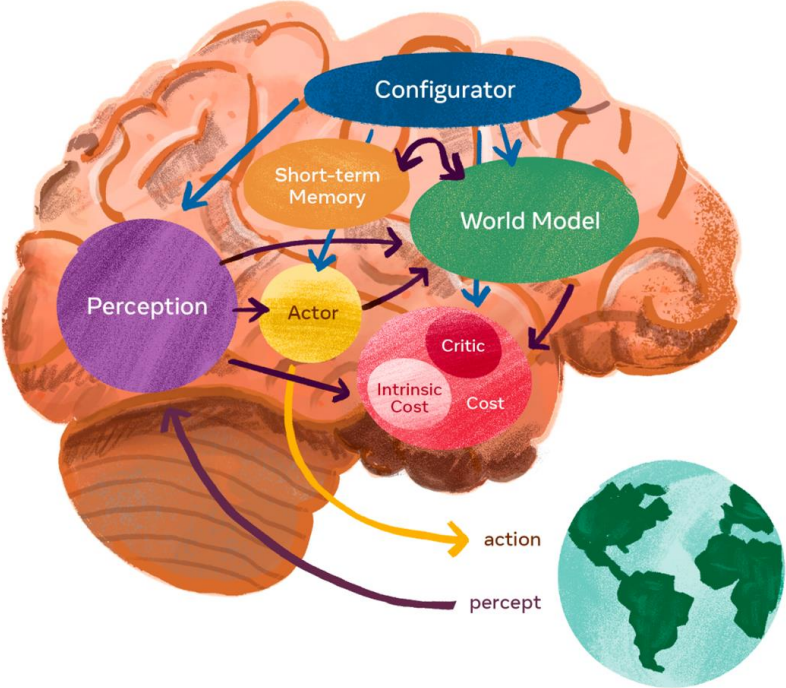
Few models for many tasks

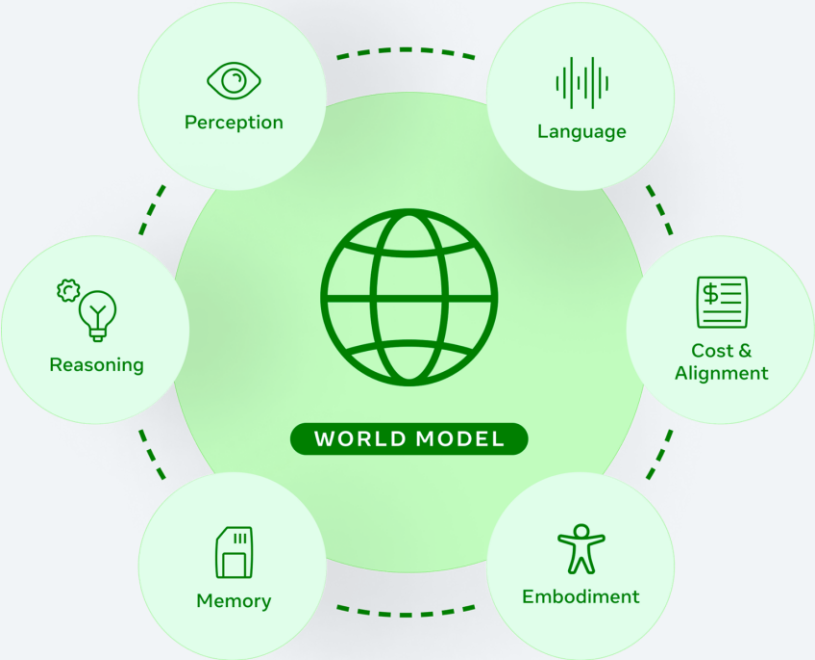
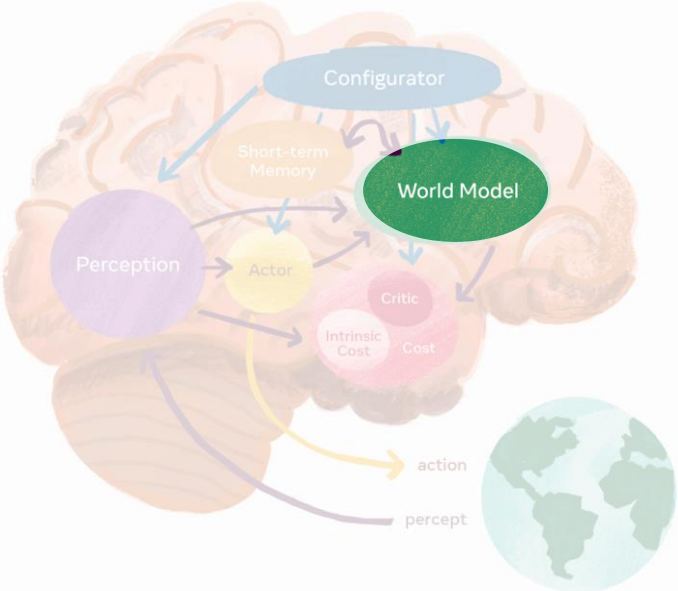


One World model for all tasks



Intelligence / Generality





# THANK YOU