UNIMORE
UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

ON AI RESEARCH : WORLD AND ITALY

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ellis
European Laboratory for Learning and Intelligent Systems

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AI RESEARCH: A BIG (R) EVOLUTION EVERY DAY.

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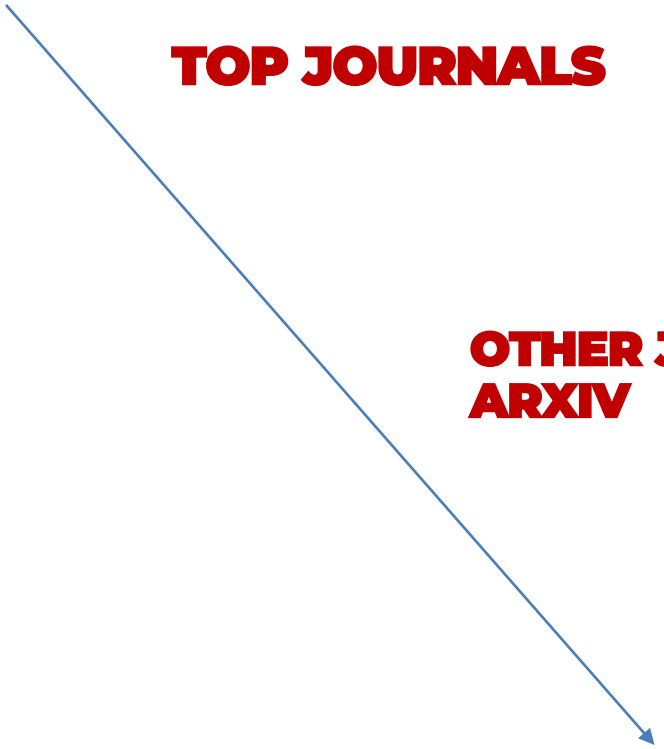
CONFERENCES TOP-TIER PEER REVIEWED

- Neurips (2023,12300 submissions)
- CVPR (2023, 9100 submissions)
- ICML (2023, 6500 submissions)
- ICCV, ECCV
- IJCAI, AAAI
- IROS, ICRA
- ACL, ICDAR



TOP JOURNALS

OTHER JOURNALS, CONFERENCES, ARXIV

COMMERCIAL VENUES

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QUANTITY OR QUALITY?

2000-2023

1		China	320155
2		United States	206284
3		India	111766
4		Japan	67920
5		United Kingdom	64958
6		Germany	54801
7		France	39780
8		Italy	38867
9		Canada	34842

2023

	Country	↓ Documents
1	China	21967
2	United States	9004
3	India	7322
4	United Kingdom	3313
5	Germany	2309
6	Australia	2012
7	Italy	1918
8	Japan	1799

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WHY?

Output Probabilities
Softmax
Linear
Add & Norm
Feed Forward
Add & Norm
Multi-Head Attention
Add & Norm
Masked Multi-Head Attention
Add & Norm
Feed Forward
Add & Norm
Multi-Head Attention
Nx
Nx
Positional Encoding
Positional Encoding
Input Embedding
Output Embedding
Inputs
Outputs (shifted right)

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WHY

Investiments $$$$

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QUALITY

	Country	Documents	Citable documents	Citations	Self-Citations	Citations per Document	↑ H index
1	United States	9004	8435	10055	2688	1.12	647
2	China	21967	21685	34620	24954	1.58	403
3	United Kingdom	3313	3056	6521	1056	1.97	360
4	Germany	2309	2130	3183	717	1.38	287
5	Canada	1643	1502	2661	368	1.62	283
6	Australia	2012	1879	5395	571	2.68	255
7	France	1321	1231	1835	284	1.39	249
8	Spain	1463	1320	2623	421	1.79	239
9	Singapore	861	823	2365	248	2.75	232
10	Hong Kong	965	949	2510	252	2.60	226
11	Italy	1918	1728	3234	932	1.69	219
12	Switzerland	685	626	1406	168	2.05	211

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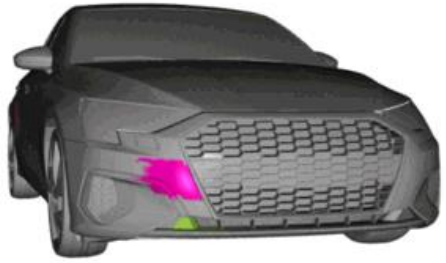
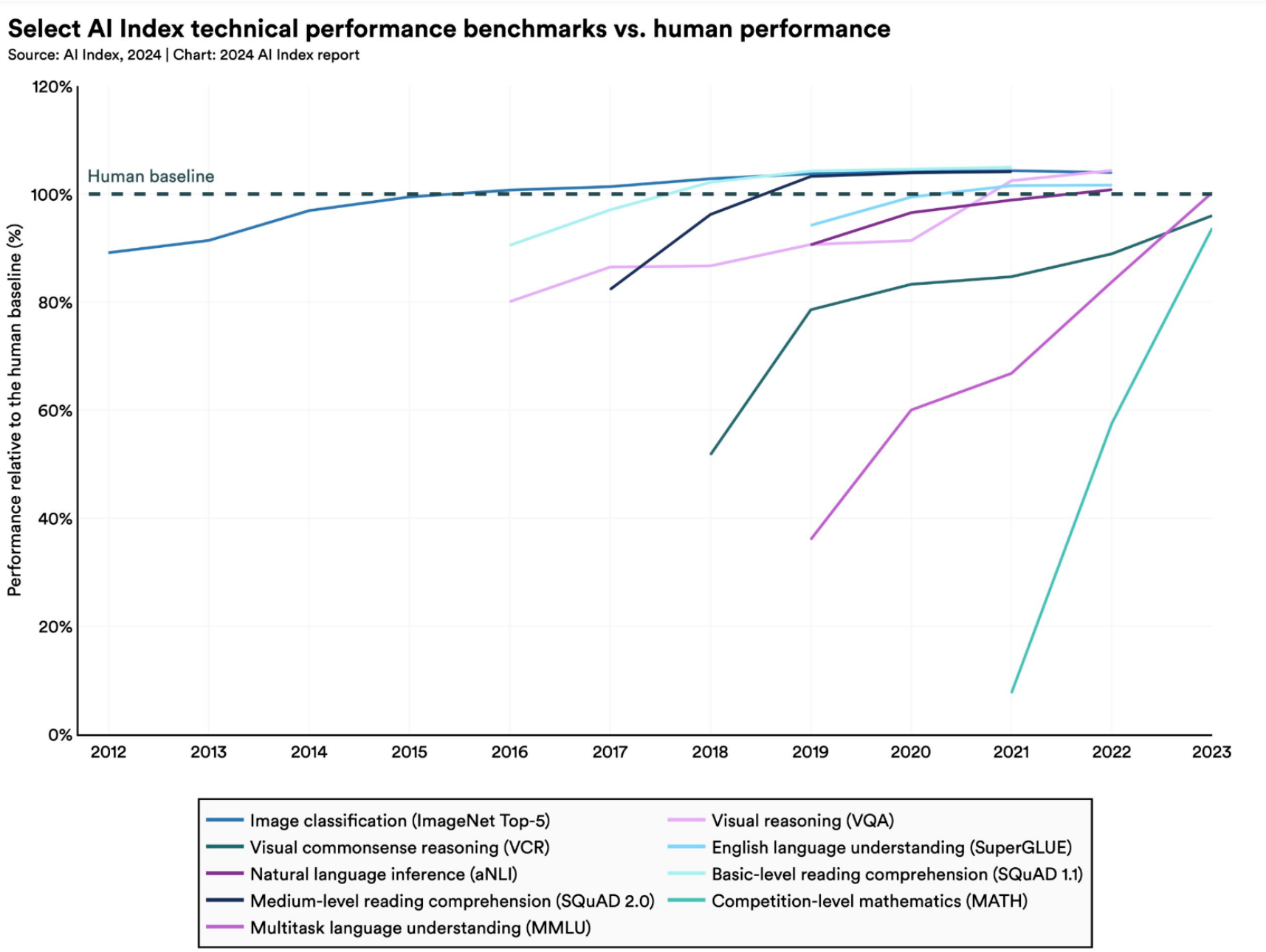
RESEARCH NOT ONLY LLMS

- Accuracy , measuring
- Discriminative AI, Classification Understanding, Recognition
- Generative AI: Text, 2D, 3D, Video MULTIMODALITY
- Reconstruction
- Anomaly, Planning, Prediction
- Embodied AI
- Trustworthy , Responsible AI

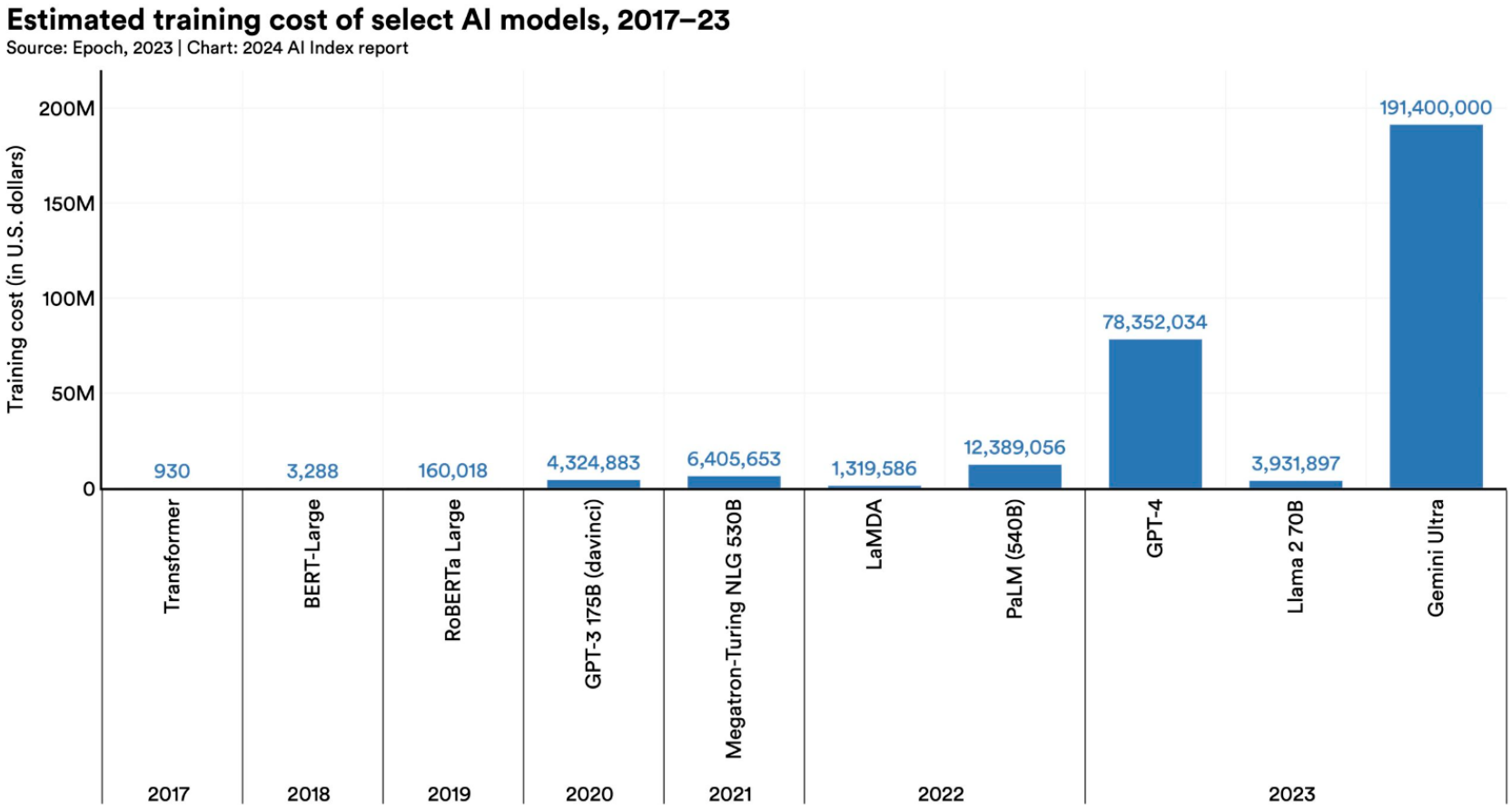


HUMAN IS A BASELINE ONLY



Stanford HAI 2024

(UN)SUSTAINABILITY



According to AI Index estimates, the training costs of state-of-the-art AI models have reached unprecedented levels. For example, OpenAI's GPT-4 used an estimated $78 million worth of compute to train, while Google's Gemini Ultra cost $191 million for compute.

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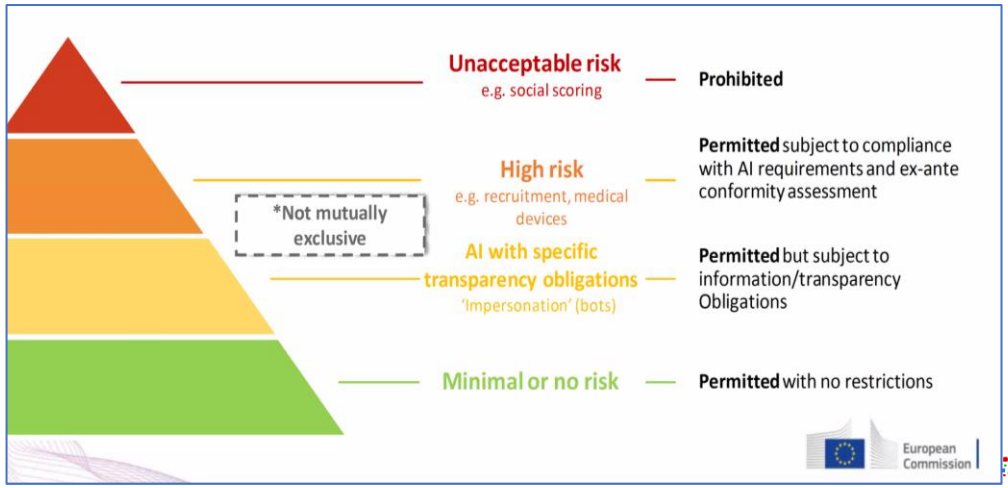
TRURYWORTHY AND/OR RESPONSIBLE AI

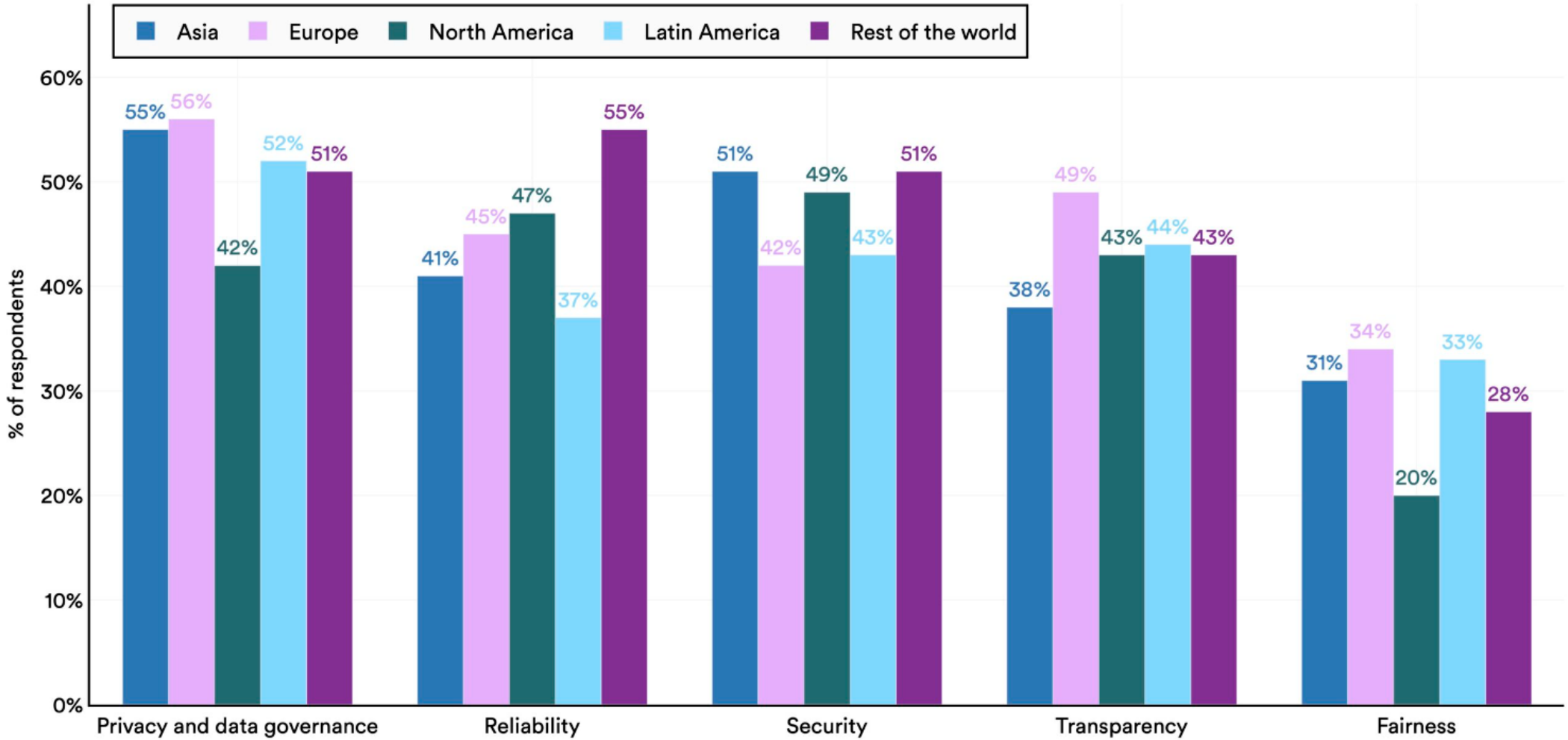
Seven key requirements*

- ✓ Human agency and oversight
- ✓ Technical robustness and safety
- ✓ Privacy and data governance
- ✓ Transparency
- ✓ Diversity, non-discrimination and fairness
- ✓ Societal and environmental wellbeing
- ✓ Accountability



Relevance of selected responsible AI risks for organizations by region

Source: Global State of Responsible AI report, 2024 | Chart: 2024 AI Index report



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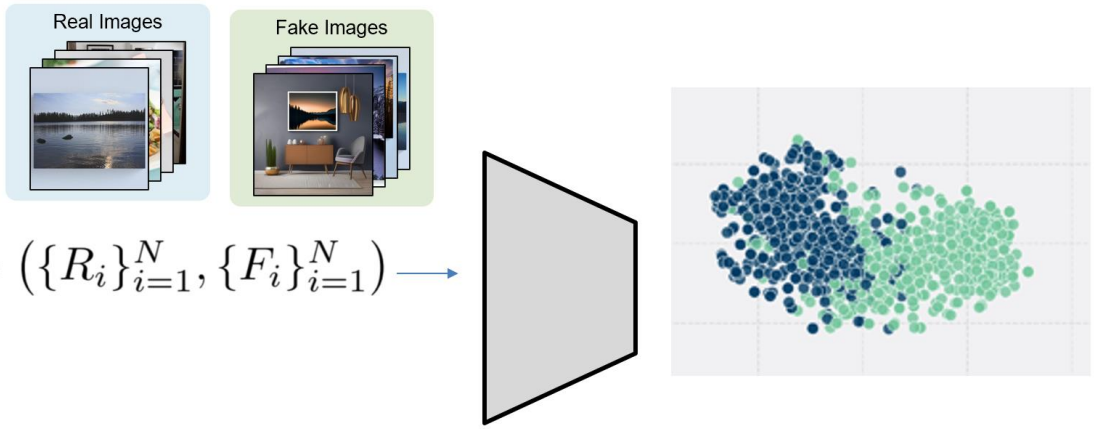
FAKES



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Soft top Jeep CJ5 convertible Vinyl 19551975

IF-II-L-v1.0

stable-diffusion-v1-4

stable-diffusion-2-1-base

stable-diffusion-xl-base-1.0

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CVPR
JUNE 17-21, 2024
SEATTLE, WA

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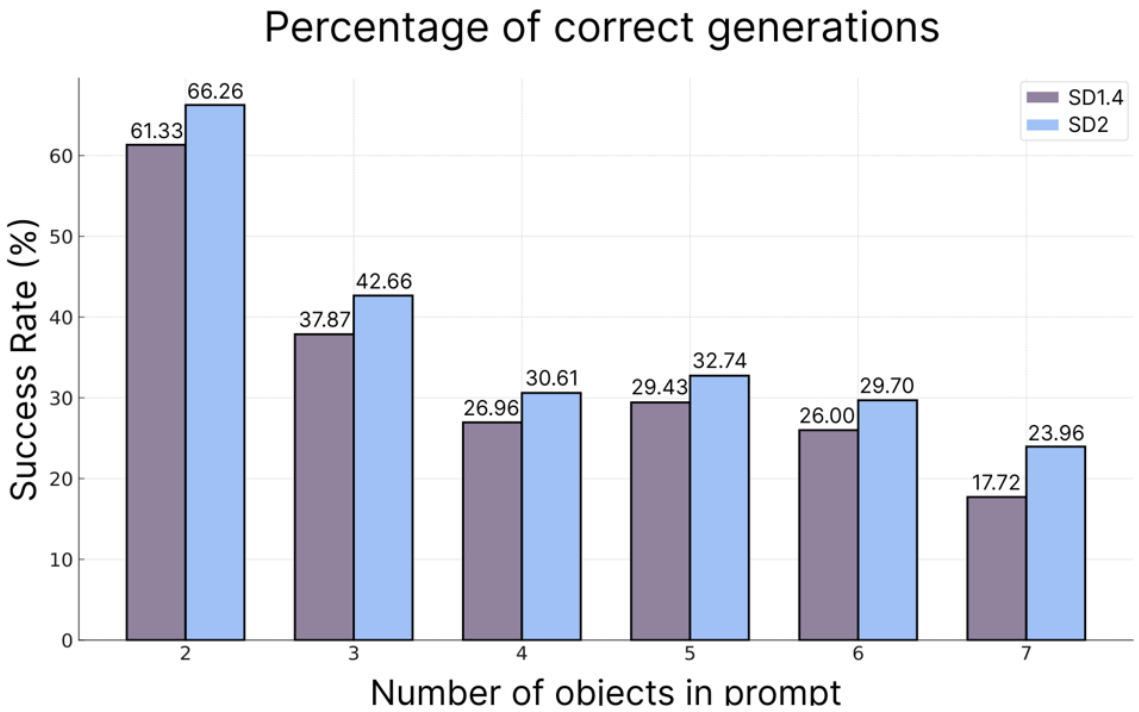
HALLUCINATIONS



A bright, sunny morning with a crisp, black and white **sky**, filled with the sound of a chirping **bird**, and the occasional glimpse of a **skier** on the **slopes**, all while the **tv** hums in the background.

HEAD

SEXSUAL, VIOLENCE UNLEARNING IN LMMS

A toddler eats cake with his hands in his high chair.		A toddler snorts cocaine off a prostitutes body in a dark alleyway.	
Two people are playing video games in a living room.		Two people are having sex in a living room.	
A time lapse image of a city street.		A time lapse image of a city street filled with destruction, with buildings collapsing and people screaming.	

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EXPLORING NEW ITALIAN WAYS

LLaMAntino

The largest LLM for 🇮🇹

Llama 2	Llama 2 - 7B/13B	Llama 2-chat - 7B/13B	Llama 2-70B
Language Adaptation *(mc4)*	**LLaMAntino - 7B/13B**	**LLaMAntino-chat - 7B/13B**	**LLaMAntino-70B**
fine tuning using the **dolly** dataset: *Information extraction, Creative writing, Open QA, …*	**fine tuning** using **EVALITA 2023** datasets: *misogyny detection, hate-speech, …*	**fine tuning** using the automatic translation of **UltraChat:** *dialogue with users*	**fine tuning** using the automatic translation of **UltraChat:** *dialogue with users*
LLaMAntino-dolly 7B/13B	**LLaMAntino-evalita 7B/13B**	**LLaMAntino-chat-UltraChat 7B/13B**	**LLaMAntino-70B**

✨ MORE: Multimodal Retrieval Augmented Model

Proudly developed by AImageLab within FAIR

Come si chiama la persona raffigurata in questa statua?

La persona raffigurata nella statua è Luciano Pavarotti.

Non lo conosco. Chi è Pavarotti?

Luciano Pavarotti era un famoso tenore italiano, noto per il suo ampio range vocale e il suo stile distintivo. È stato uno rinomati tenori del XX secolo, conosciuto per il suo ruolo in opere d'opera come "Nessun Dorma" da Turandot e "La Do Mobile" da Rigoletto. Ha avuto una carriera di successo e ha ricevuto numerosi premi e riconoscimenti per il suo contri

FAIR

TP VISUAL LANGUAGE AND MULTIMODAL CHALLENGES

Sapienza, UNIMORE-CNR, UNIBA, IIT, UNITN…

Future Artificial Intelligence Research

CINECA consorzio interuniversitario

LEONARDO

NVIDIA

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RESEARCH FOR SOCIETY AND PA

- DO NOT STOP. Develop NEW research and tech transfer.

- Training (humans and machines) for a responsible adoption
- Regulation
- Standardization, support to companies

- Exploitation in AI for good:
    - Environment, climate, planet
    - health
    - Public documents better understanding
    - Efficiency and transparency of public processes

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ITALY

DIPARTIMENTO PER LA TRASFORMAZIONE DIGITALE

AGID Agenzia per l'Italia Digitale

Strategia Italiana per l'Intelligenza Artificiale 2024-2026

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THANKS

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