AI²: why Artificial Intelligence should be All Inclusive

@WiMLDS_Paris / @MrsCaroline_C

Introduction

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Caroline Therwath-Chavier, **CEO of The Allyance**

Tech Recruiter

Co-Founder of the **Paris WiMLDS meetup**

Passionate about Machine Learning & Ethics

Inclusion & Diversity Co-Chairwoman for the 2019 RecSys Conference

On X : **@MrsCaroline_C**

Why am I here?

I co-founded a meetup group

The mission of WiMLDS is to **support and promote women and gender minorities** who are **practicing, studying** or are **interested in** the fields of **machine learning and data science.**

Our next event

The Paris team

- **Chloé-Agathe Azencott**

- **Caroline Therwath-Chavier**

- **Marie Sacksick**

- **Natalie Cernecka**

- **Jihane Bennis**

- **Juliette Bessagnel**

WiMLDS Global Organization

The WiMLDS Community

We have **103** chapters in **36** countries and more than **73 254** members!

The chapters are in **6 continents**

Largest WiMLDS groups

1 **Bay Area Women in Machine Learning & Data Science**
6,825 Members | San Francisco, USA
Organized by WiMLDS

2 **Paris Women in Machine Learning & Data Science**
5,109 Membres | Paris, France
Organized by WiMLDS

3 **NYC Women in Machine Learning & Data Science**
4,780 Members | New York, USA
Organized by WiMLDS

103 chapters all around the world

North America

Canada

- Calgary, Alberta, Canada
- Edmonton, Alberta, Canada
- Halifax, Nova Scotia, Canada
- Montréal, Québec, Canada
- Ottawa, Ontario, Canada
- Toronto, Ontario, Canada
- Vancouver, British Columbia, Canada

USA

- Atlanta, Georgia, USA
- Austin, Texas, USA
- Baltimore, Maryland, USA
- Bay Area, California, USA
- Boston, Massachusetts, USA
- Boulder, Colorado, USA
- Charlottesville, Virginia, USA
- Chicago, Illinois, USA
- Columbus, Ohio, USA
- Corpus Christi, Texas, USA
- Dallas-Fort Worth, Texas, USA
- Kansas City, Missouri, USA
- Los Angeles, California, USA
- Metro Detroit, Michigan, USA
- Milwaukee, Wisconsin, USA
- Minneapolis, Minnesota, USA
- North Carolina, USA
- New York City, New York, USA
- Omaha, Nebraska, USA
- Philadelphia, Pennsylvania, USA
- Portland, Oregon, USA
- Pittsburgh, Pennsylvania, USA
- Salt Lake City, Utah, USA
- San Antonio, Texas, USA
- Seattle, Washington, USA
- Syracuse, New York, USA
- Vermont, USA
- Washington, DC, USA

South America

- Buenos Aires, Argentina
- Cochabamba, Bolivia
- La Paz, Bolivia
- São Paulo, Brazil

Europe

- Amsterdam, Netherlands
- Berlin, Germany
- Brussels, Belgium
- Bucharest, Romania
- Cambridge, United Kingdom
- Copenhagen, Denmark
- Dresden, Germany
- Dublin, Ireland
- Galicia, Spain
- Helsinki, Finland
- Limassol, Cyprus
- London, United Kingdom
- Madrid, Spain
- Milan, Italy
- Munich, Germany
- Paris, France
- Poznan, Poland
- Sophia-Antipolis, France
- Trojmiasto, Poland
- Zürich, Switzerland

Middle East

- Ankara, Turkey
- Cairo, Egypt
- Istanbul, Turkey
- Riyadh, Saudi Arabia
- Tel Aviv, Israel

Africa

- Abuja, Nigeria
- Accra, Ghana
- Casablanca, Morocco
- Dakar, Senegal
- Gaborone, Botswana
- Eldoret-Kitale, Kenya
- Johannesburg, South Africa
- Lagos, Nigeria
- Nairobi, Kenya
- Kampala, Uganda
- Kigali, Rwanda
- Vacoas-Phoenix, Mauritius
- Kinshasa, Democratic Republic of Congo
- Khartoum, Sudan
- Yaoundé, Cameroon

Asia

- Manila, Philippines
- Singapore, Singapore
- Surabaya, Indonesia
- Tokyo, Japan
- Ulaanbaatar, Mongolia

India

- Amaravati, India
- Bhopal, India
- Bengaluru, India
- Chennai, India
- Delhi, India
- Goa, India
- Hyderabad, India
- Indore, India
- Jaipur, India
- Mumbai, India
- Mysore, India
- Pune, India
- Visakhapatnam, India

Oceania

- Melbourne, Australia
- Sydney, Australia

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Europe has 16 chapters

Europe

- Amsterdam, Netherlands
- Berlin, Germany
- Brussels, Belgium
- Bucharest, Romania
- Cambridge, United Kingdom
- Copenhagen, Denmark
- Dresden, Germany
- Dublin, Ireland
- Galicia, Spain
- Helsinki, Finland
- Limassol, Cyprus
- London, United Kingdom
- Madrid, Spain
- Milan, Italy
- Munich, Germany
- Paris, France
- Poznan, Poland
- Sophia-Antipolis, France
- Trojmiasto, Poland
- Zürich, Switzerland

I am also here because…

TEDx in India

OpenAI changed the game

Something is happening

Source : How We Chose the TIME100 Most Influential People in AI, September 2023

Presentation structure

Presentation structure

1. The deceptive use of "intelligence" in AI
2. The AI Economical Landscape
3. Inclusion in AI
4. Recruitment tips
5. Ecological and political risks

Who knows Michael Jordan?
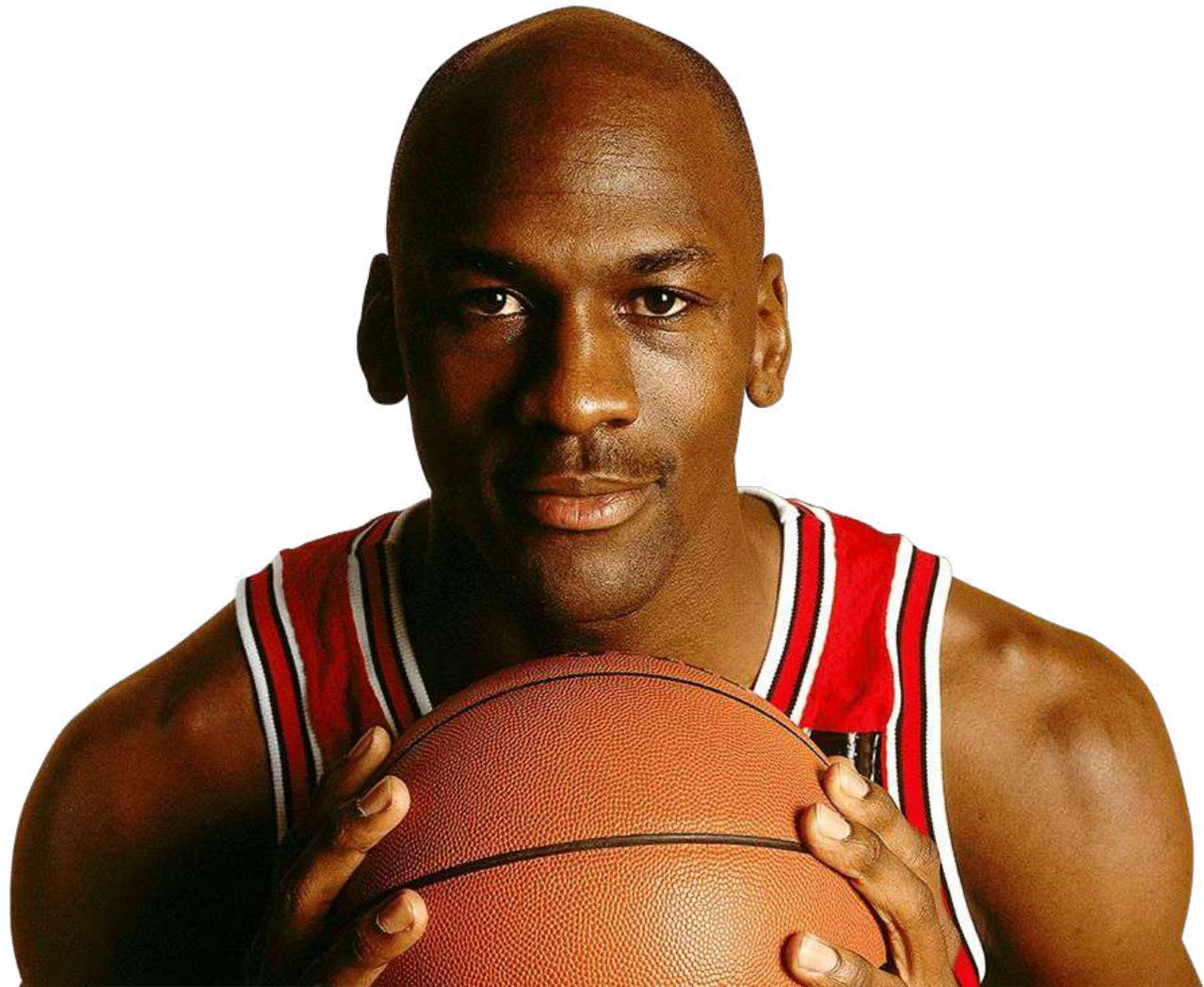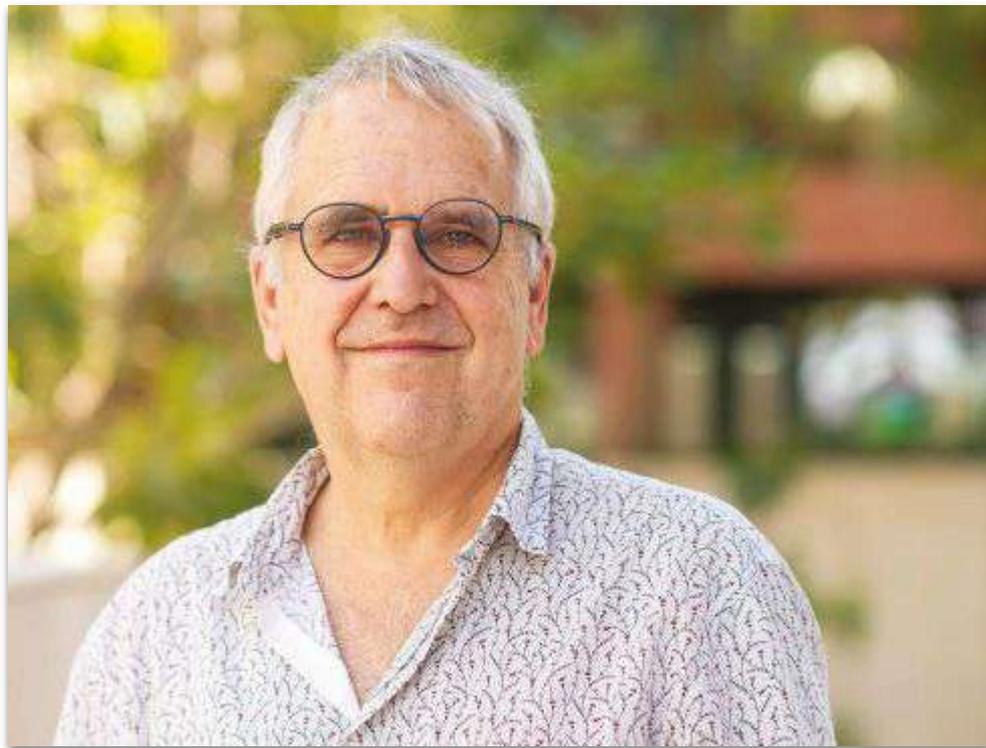
Michael I. Jordan is a Distinguished Professor at the University of California, Berkeley.

AI has nothing to do with intelligence.

No one knows how to define human "intelligence", not even the best psychologists.

Disclaimer

Instead of saying Artificial Intelligence, I will mostly use the term **Machine Learning** (ML) which is more accurate.

A lot of people working in the field say AI because it is faster. But, it is a misleading choice of words.

→ The ChatGPT craze

1 million users in 5 days
173 million active users in April 2023

A Survey of Large Language Models, Zhao et al, 2023

→ Emergence of large language models

→Things are moving faster and faster in the research community
(statistics extracted from google scholar)

■ Large language models   ■ Language models
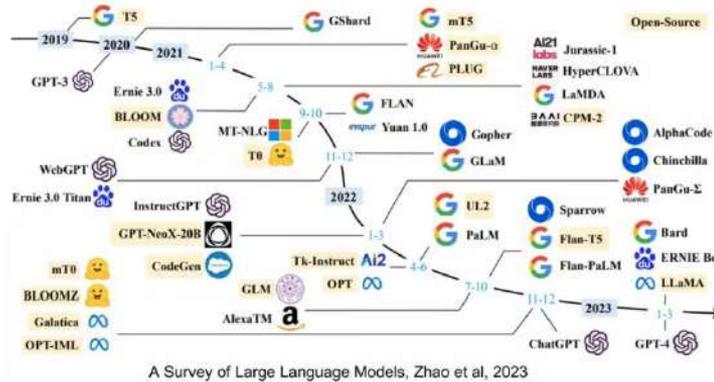
Machine Learning (apprentissage automatique) consists in the creation of computer programs / algorithms which solve problems a human brain cannot solve using large datasets.

Machine Learning

The ability for computers to learn from data without human programming.

Deep Learning

Mimics the human brain using artificial neural networks such as transformers to allow computers to perform complex tasks.

Generative AI

Generates new text, audio, images, video or code based on existing content.

Definition

🪄 Generative AI looks magical because we observe machines create texts that seem to have been written by humans.

Central to this are **Large Language Models** (LLMs), which can generate texts.

Source : ChatGPT is not all you need. A State of the Art Review of large Generative AI models, Roberto Gozalo-Brizuela, Eduardo C. Garrido-Merchan, January 2023
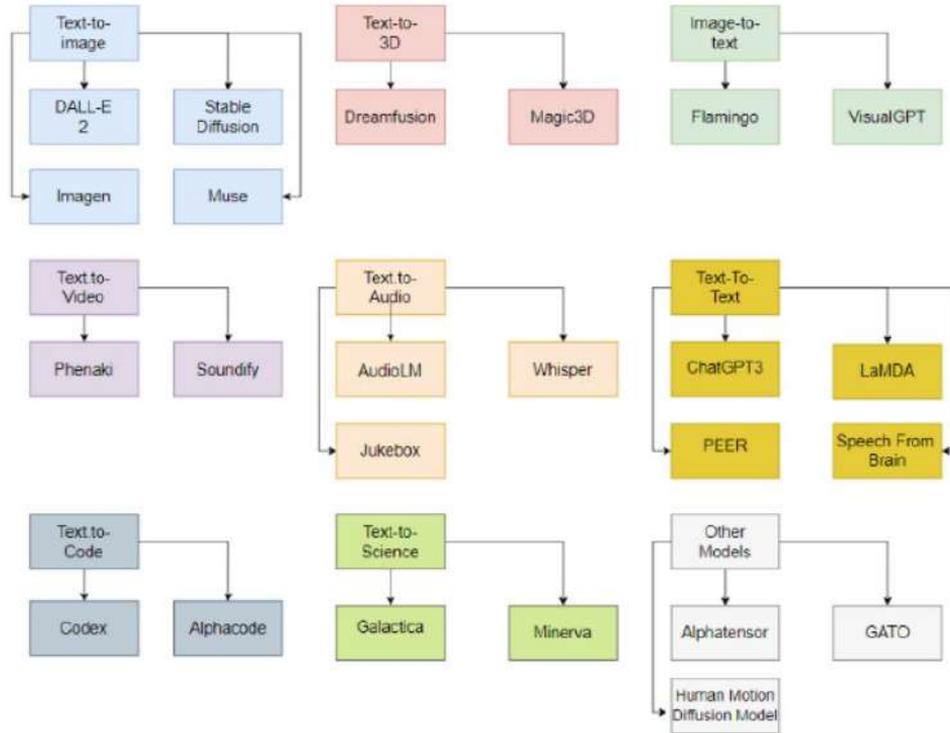
Everyone is trying to board the AI train

AI : A business revolution

AI has the ability to **automate, augment and support business decision-making**.

Leaders can make quicker decisions involving complex data, improving business operations and enhancing the customer experience.

We face new business challenges and opportunities.

Global Generative AI Market
Size, by Component, 2022-2032 (USD Billion)

■ Software   ■ Services

Year	Value
2022	10.6
2023	13.9
2024	17.7
2025	24.8
2026	33.6
2027	42.7
2028	51.0
2029	67.0
2030	85.3
2031	112.1
2032	151.9
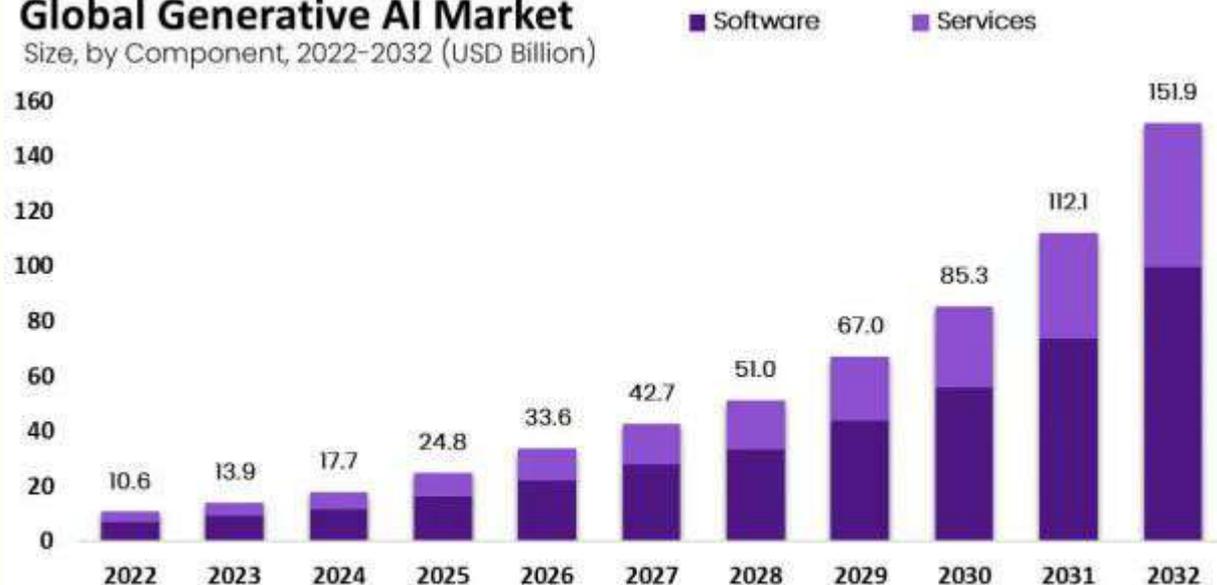
The Market will Grow At the CAGR of: **31.4%**
The forecasted market size for 2032 in USD: **$151.9B**

market.us

Global Artificial Intelligence Market
Share, by End-use, 2023 (%)

GRAND VIEW RESEARCH

$196.6B
Global Market Size, 2023

● Healthcare ● BFSI ● Law ● Retail ● Advertising & Media
● Automotive & Transportation ● Agriculture ● Manufacturing ● Others

Top 50 GenAI Web Products, By Monthly Visits

1. ChatGPT	11. YOU	21. NightCafe	31. GPTGO.ai	41. Fliki
2. character.ai	12. leonardo.	22. Replicate	32. runway	42. pornpen.ai
3. Bard	13. PIXLR	23. Speechify	33. Playground	43. KAPWING
4. Poe	14. VEED.IO	24. IIElevenLabs	34. Kaiber	44. Gamma
5. QuillBot	15. tome	25. lexica	35. Hotpot	45. Looka
6. PhotoRoom	16. AI-Novel	26. VocalRemover	36. Stable Diffusion	46. human or not?
7. CIVITAI	17. cutout.pro	27. Writesonic	37. copy.ai	47. PIXAI
8. Midjourney	18. ForefrontAI	28. CHATPDF	38. ZeroGPT	48. WRITER
9. Hugging Face	19. Clipchamp	29. D-ID	39. Smodin	49. NovelAI
10. Perplexity	20. TheB.AI	30. Chub.ai	40. ZMO.AI	50. DeepSwap

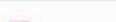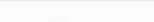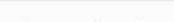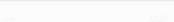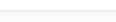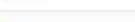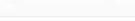Note: This list was generated based on global desktop and mobile web visits with data from SimilarWeb as of June 2023. However, for companies on the list that also have a mobile app, we added an estimate of their app "traffic" (MAUs x sessions per MAU per month), with data from Sensor Tower as of June 2023, alongside web traffic to determine their spot on the list. This list does not include app-only companies, and does not include activity happening within a Discord server.

Charts are for informational purposes only and should not be used for investment decisions. Past performance is not indicative of future results. None of the above should be taken as investment advice; see a16z.com/disclosures for more.

a16z Consumer

Source : Exploring the Top 50 Generative AI Consumer Companies

A paradox

😱😊 AI revives a more than century-old fascination for robots as it can match and even sometimes surpass our abilities.

As such it is both feared and celebrated.

Source : How We Chose the TIME100 Most Influential People in AI, September 2023

Definition

AI's capacity to model itself on human behaviour has become its defining feature.

"Yet behind every advance in machine learning and large language models are, in fact, people — both the often obscured human labor that makes large language models safer to use, and the individuals who make critical decisions on when and how to best use this technology."

Source : How We Chose the TIME100 Most Influential People in AI, September 2023

Any question?

No one must be left behind in the AI revolution

Why we started Paris WiMLDS

According to a report by UNESCO, *"today, only 28% of all of the world's researchers are women."*

We fight against the unconscious bias that artificial intelligence is a male field.

We create role models.

50% of our speakers presented their work for the first time.

WOMEN ARE A SMALL MINORITY
IN MACHINE-LEARNING RESEARCH

12% WOMEN

88% MEN
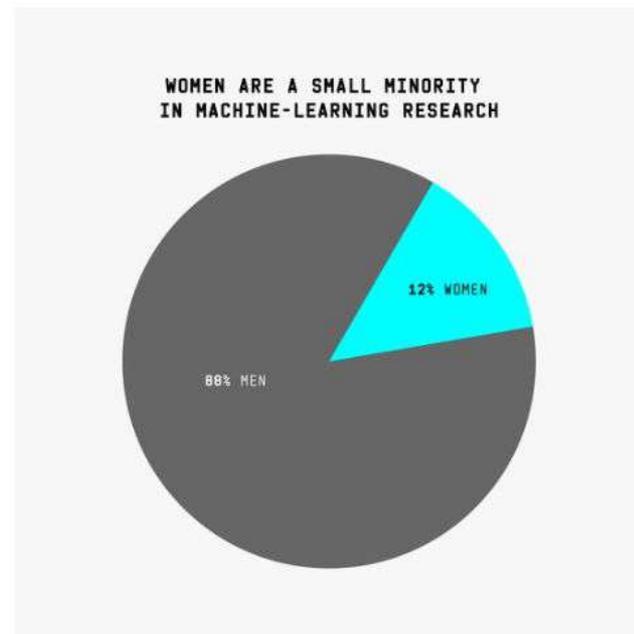
Percent of men and women who contributed work to three leading machine learning conferences in 2017. Source: Element AI   HOTLITTLEPOTATO

Gender imbalance in education and science

Figure 3.1: **The leaky pipeline: share of women in higher education and research, 2013 (%)**

Female bachelor's graduates — 53
Female master's graduates — 53
Female PhD graduates — 43
Female researchers — 28
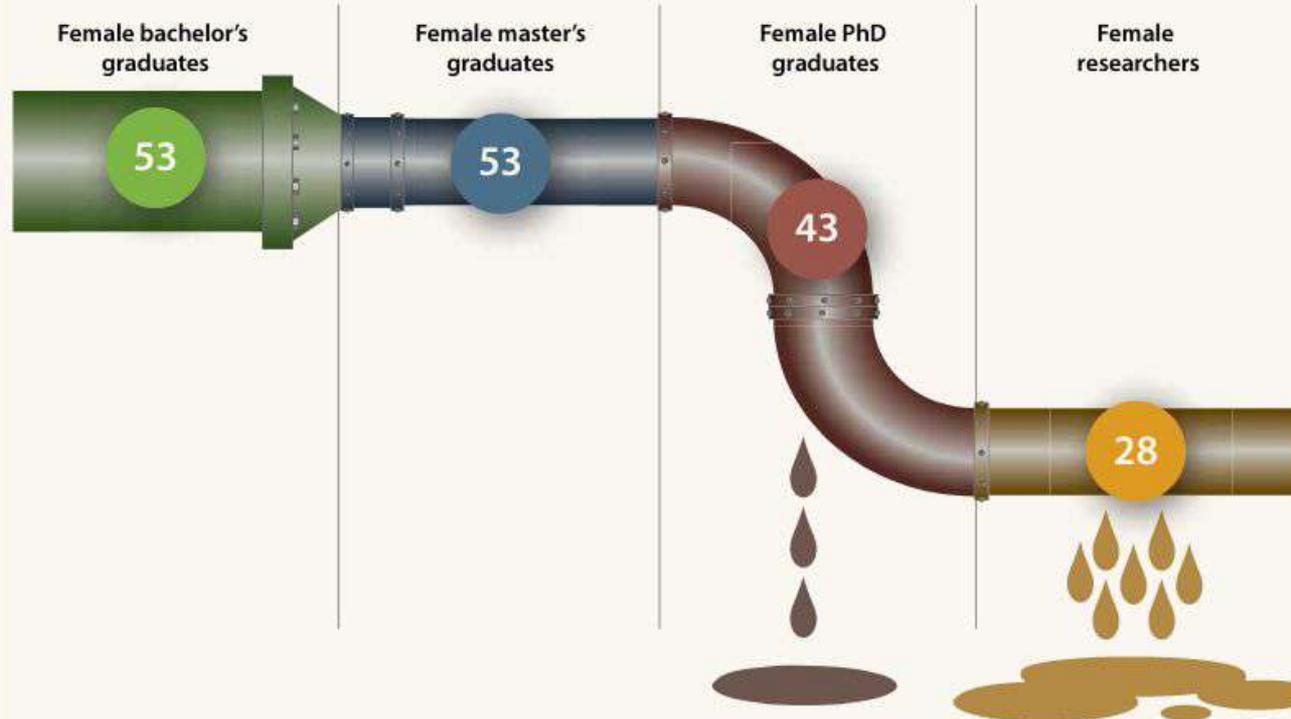
Source: UNESCO Institute for Statistics estimates based on data from its database, July 2015

Gender imbalance in AI

The Gender Imbalance in AI Research Across 23 Countries

	♂ % MEN		TOTAL AVERAGE ♂ 88% MEN	♀ % WOMEN
Taiwan	73.91%			26.09%
Netherlands	79.17%			20.83%
France	85.12%			14.88%
Denmark	85.29%			14.71%
Austria	85.71%			14.29%
Japan	85.71%			14.29%
China	85.93%			14.07%
USA	86.57%			15.43%
Singapore	87.88%			12.12%
South Korea	87.93%			12.07%
Russia	89.47%			10.53%
Canada	89.61%			10.39%
Italy	90.00%			10.00%
Switzerland	90.28%			9.72%
Spain	91.30%			8.70%
Israel	91.80%			8.20%
United Kingdom	91.81%			8.19%
Germany	92.42%			7.58%
Australia	92.50%			7.50%
Belgium	92.86%			7.14%
India	94.44%			5.56%
Finland	95.65%			4.35%
Sweden	100.00%			0.00%

ELEMENT^AI

*Among 4000 researchers who have been published at the leading conferences NIPS, ICML or ICLR in 2017

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Gender Imbalance in AI

Figure 1. Gender gap among AI professionals in the EU (%)

NB: The EU aggregate is for the EU-28 and includes the United Kingdom because during the reference period for the research the United Kingdom was a Member State.
Source: LinkedIn (2019).

According to a 2020 World Economic Forum report, **women** constitute only about **22 % of AI professionals globally**.

The gender gap is particularly significant in **leadership roles within AI companies and research labs**.

The Fourth Industrial Revolution is happening now.

It certainly cannot - and should not - happen without minorities and women.

Diversity: what for?

What does diversity mean to the AI field? The **inclusion of individuals from various demographic, cultural, and socio-economic backgrounds in the development, deployment, and use of AI technologies**.

I will dwell on some key aspects of diversity in AI, namely the challenges and benefits it brings, and the ongoing efforts to promote inclusion.

Challenges

Bias and Fairness: AI systems can inherit and perpetuate biases present in training data, leading to unfair outcomes for underrepresented groups.

Lack of Representation: The AI industry has historically been dominated by certain demographic groups - generally white able-bodied men -, resulting in a lack of diverse perspectives in decision-making processes.

Accessibility: Limited access to education and opportunities in AI can create barriers for individuals from marginalized communities to enter the field.

It's not a joke (and it's not funny)

Launch of Kyutai - Europe's first independent lab dedicated to AI Open Science, November 2023

Benefits

Avoiding Biases: Diverse teams are better equipped to identify and mitigate biases in AI systems, promoting fairness and preventing discriminatory outcomes.

Improved Innovation: A variety of perspectives fosters creativity and innovation, leading to the development of more robust and effective AI solutions.

Broad User Understanding: AI systems designed by diverse teams are more likely to understand and address the needs of a diverse user base.

Ethical considerations

Accountability: Diverse teams contribute to accountability in AI development by preventing the concentration of power and decision-making.

Transparency and trust: Open communication about the development process and potential biases in AI systems helps build trust with users.

Evolving standards: The development of industry-wide standards for ethical AI practices will play a key role in promoting diversity and fairness.

Women are being erased from AI history…

Source : [Who's Who Behind the Dawn of the Modern Artificial Intelligence Movement](link), J. Edward Moreno, The New York Times December 2023

… but it is women who built AI systems (ironic much)

Source : 3 reasons why the future of AI relies on women, Cindy Gallop, Fast Company, December 2023

Only **1.7% of all venture capital went to female founders in 2022 in the USA**.

"The powerful, wealthy men currently dominating AI have no intention of **welcoming, listening to, funding, and working with women leaders, founders, technologists, and scientists** whose views are not completely aligned with and preferably subordinate to theirs."

Source : 3 reasons why the future of AI relies on women, Cindy Gallop, Fast Company, December 2023

Women built AI systems

"The young white male founders of the giant tech platforms that dominate our lives today are not the primary targets (online or offline) of harassment, abuse, racism, sexual assault, violence, rape, revenge porn.

*So they didn't, and they don't, proactively design for the prevention of any of those things. Those of us who are at risk every single day—**women, Black people, people of color, LGBTQ, disabled**—design safe spaces, and safe experiences."*

The future of AI depends on women

Women bring safety.

Women build use cases the world embraces.

Women enable AI to make more money.

Source : 3 reasons why the future of AI relies on women, Cindy Gallop, Fast Company, December 2023

Examples

Where there is a will, there is a way

Source : How We Chose the TIME100 Most Influential People in AI, September 2023

Recruitment Tips

How you can prepare to interview

Interviewing

👋🏼 **An interview is a conversation**

An interview is not an evaluation : it's not a professor / student relationship

Interviewing is also an ability for you to **extend your knowledge**

🤙🏼 Interviewers want to know more about your background and expectations

Your resume

📄 There are cultural differences depending on the countries where you apply.

⚠️ There is no universal and perfect resume.

A recruiter takes **a-6-second-look** at a resume in average 🔽

"The length of the resume does not matter as long as relevant information about your skills are featured"

👉🏻 We should all relax! Write a complete resume displaying all your experiences in order to be able to personalize it to a specific job.

Personal projects / Academic papers

💻 You are part of an NGO? You wrote a technical blog post? You teach people how to code? You developed an app on your personal time to learn a new coding language?

It deserves to be featured in your resume!

💎 It's always smart to highlight what you do (and not just at work) !

Introvert people can shine and show their true colors via the projects they worked on.

The right questions

What are your **goals**?

Where are the **experts** in the field?

Do you want to work in a company?

What kind of **technologies**?

List some questions and ask them around
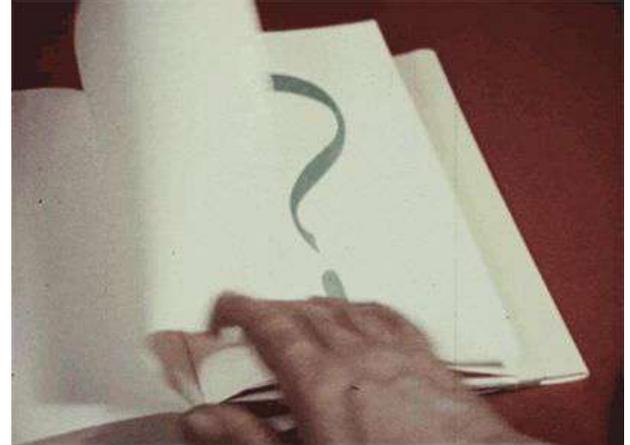
Build an application strategy

💡 *"Once you know what you want, know your value, you should **define a strategy**."*

🎯 **Update** your Github / Linkedin / Personal website / Google Scholar

🎯 Make sure you feature the **right keywords** : LLM, Python …etc

🎯 If you don't know how to introduce yourself, ask a friend or a colleague

🎯 Look at the Linkedin profile of the people working in your dream companies…

Analyze the vocabulary

📍 Before applying to job offers, **understand the characteristics of the job** you target or the differences between the jobs.

The same job title might not mean the same in different companies : talk to professionals who do the job you target ?

👍🏼 You will **speak the same language** as the recruiters / hiring managers.

Prepare your interview

Recruiters are not dumb.

Look at the team **publications** to understand the challenges they tackle.

Try to identify the **parallels** between your background and what they work on.

Get ready **to talk** about your work.

List the questions you want to ask.
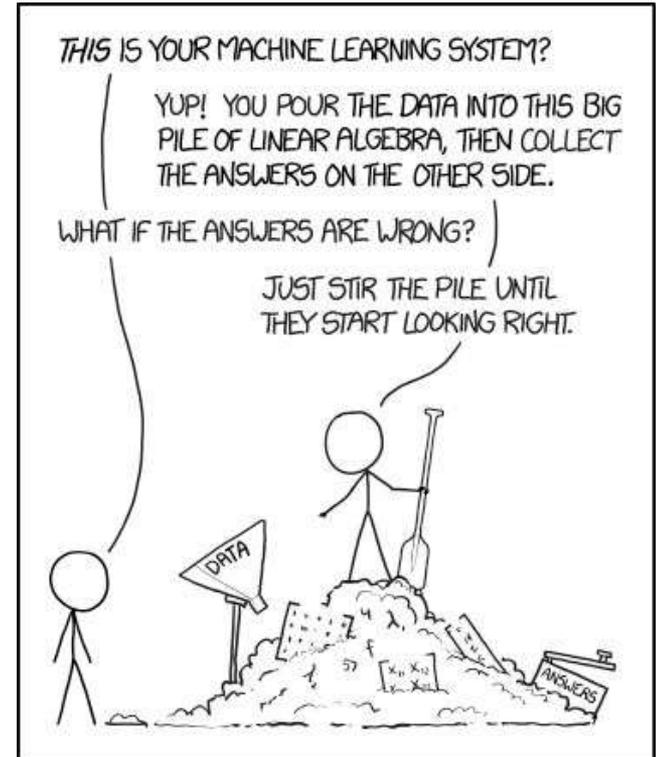
General pieces of advice

You got the power

🌷 **You are a valuable asset**! You have skills that are scarce and needed by companies.

🗣️ If you work or want to join the tech industry, candidates choose their company… companies are not the one having full power anymore.

🌸 **You will be the ONE** selecting your next move !

We should relax 💙

We are not dealing with the situation in the same way and it's fine.

It is an opportunity to **plan**, to **be creative**, to **optimize future opportunities**.

You can :

🔍 **Source opportunities & network online** (Linkedin, Twitter, Discord, Facebook...etc)

🔍 Book discussions with peers, professors and professionals.

🔍 Reach out to recruiters

🔍 Have fun : HackerRank, watch documentaries, read books...

If you are having a hard time

Connect with a support group : WiMLDS, WWC, RLadies, Ladies of Code…

Read the news and updates from your company / school / lab

Reach out to your boss, professor or a HR professional to understand what is happening and what the next steps will be : extended deadline, internship postponed?

⭐ **Do not assume, always probe**

⭐ **Knowledge is power**

There is always a solution, someone to help and tomorrow is a brighter day!

Interviewing regularly is healthy

🤯 As candidates, **interviewing is a job**.

🏋️ Have at least 3 interviews per year even if you don't intend to leave your company.

It is healthy to **keep a foot in the job-interview-world**, forcing yourself out of your comfort zone, knowing your own shortcomings and to feel ready when trying to reach for your next position.

🔷 Practice for interviews on a regular basis. **Self discipline** will get you anywhere!

Any question?

Beyond business : ecological and political risks

Lack of sources or explainability

Diffusion of incorrect information

Considerable environmental impact

Source : Intelligence artificielle et éducation Apports de la recherche et enjeux pour les politiques publiques, Ministère de l'Education Nationale, Avril 2023

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Risks

Inaccuracy, cybersecurity, and intellectual-property infringement are the most-cited risks of generative AI adoption.

Generative AI–related risks that organizations consider relevant and are working to mitigate, % of respondents[1]

	Organization considers risk relevant	Organization working to mitigate risk
Inaccuracy	56	32
Cybersecurity	53	38
Intellectual-property infringement	46	25
Regulatory compliance	45	28
Explainability	39	18
Personal/individual privacy	39	20
Workforce/labor displacement	34	13
Equity and fairness	31	16
Organizational reputation	29	16
National security	14	4
Physical safety	11	6
Environmental impact	11	5
Political stability	10	2
None of the above	1	8

[1]Asked only of respondents whose organizations have adopted AI in at least 1 function. For both risks considered relevant and risks mitigated, n = 913.
Source: McKinsey Global Survey on AI, 1,684 participants at all levels of the organization, April 11–21, 2023

McKinsey & Company

Source : The state of AI in 2023: Generative AI's breakout year, August 2023, McKinsey & Company
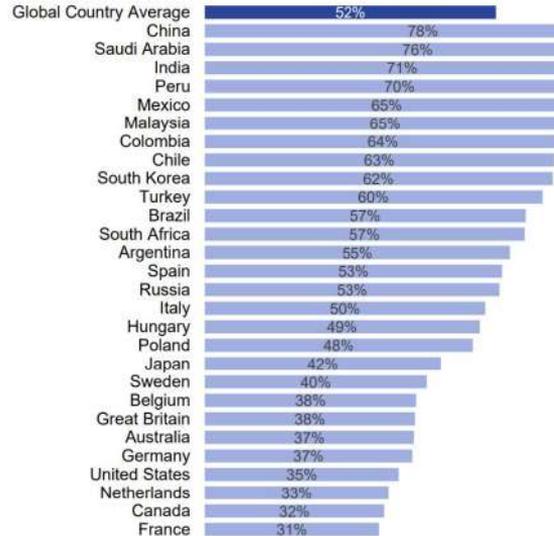
Who does AI benefit?

"PRODUCTS AND SERVICES USING ARTIFICIAL INTELLIGENCE HAVE MORE BENEFITS THAN DRAWBACKS" – AGREEMENT BY COUNTRY

Q. Let's now talk about products and services using artificial intelligence (AI). Artificial intelligence refers to computers and robots doing things that traditionally require using human intelligence. How much do you agree or disagree with the following?

"Products and services using artificial intelligence have more benefits than drawbacks"

% "Agree"

Base: 19,504 online adults aged 16-74 across 28 countries, Nov.–Dec. 2021
Online samples in Brazil, Chile, mainland China, Colombia, India, Malaysia, Mexico, Peru, Russia, Saudi Arabia, South Africa, and Turkey tend to be more urban, educated, and/or affluent than the general population.
The "Global Country Average" reflects the average result for all the countries and markets where the survey was conducted. It has not been adjusted to the population size of each country or market and is not intended to suggest a total result.

© Ipsos - Global Opinions and Expectations about AI - January 2022

| Country	% Agree
Global Country Average	52%
China	78%
Saudi Arabia	76%
India	71%
Peru	70%
Mexico	65%
Malaysia	65%
Colombia	64%
Chile	63%
South Korea	62%
Turkey	60%
Brazil	57%
South Africa	57%
Argentina	55%
Spain	53%
Russia	53%
Italy	50%
Hungary	49%
Poland	48%
Japan	42%
Sweden	40%
Belgium	38%
Great Britain	38%
Australia	37%
Germany	37%
United States	35%
Netherlands	33%
Canada	32%
France	31%

Ipsos

Conclusion

Diversity in AI is essential for building inclusive, **unbiased**, and **effective technologies** that benefit all members of society.

Efforts to promote diversity should be **multifaceted**, addressing challenges in education, representation, and biases, while fostering ethical practices in AI development.

Any question?
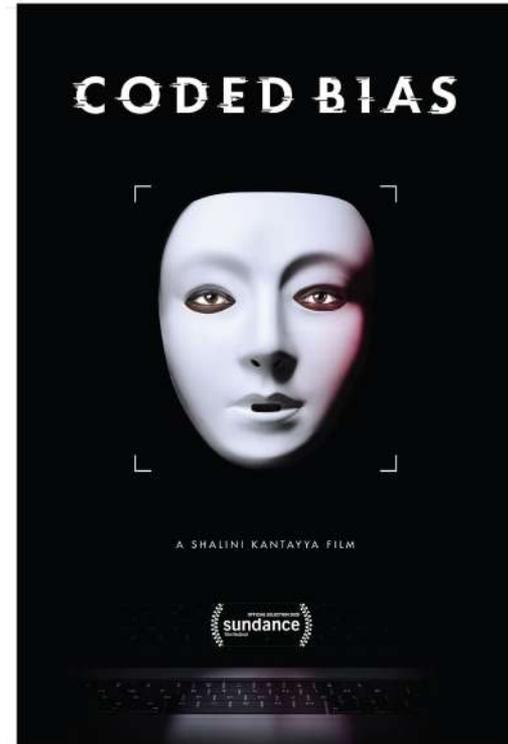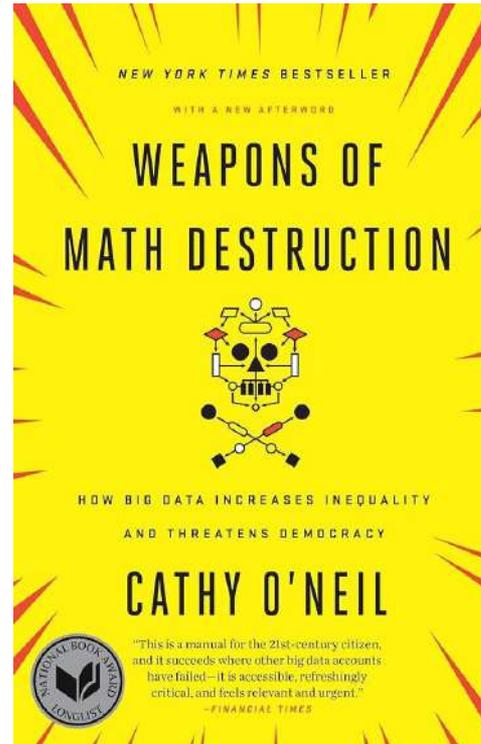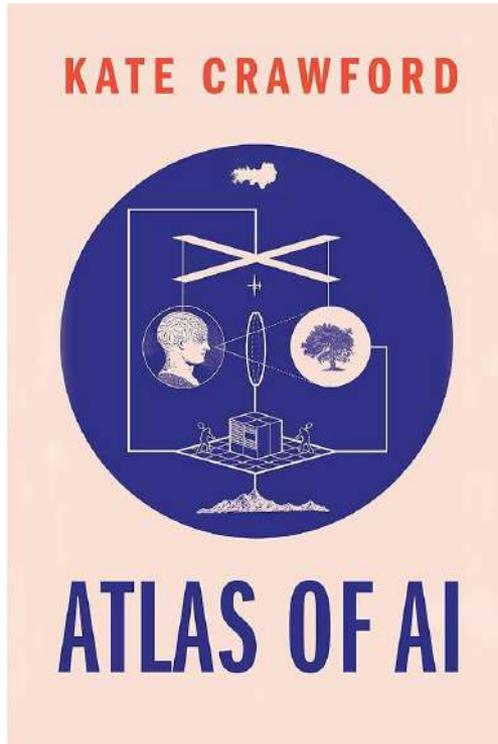
Some references

[📜] [If you think women in tech is just a pipeline problem, you haven't been paying attention](#) by Rachel Thomas

[📜] [AI is The Future—But Were Are The Women?](#) by Tom Simonite

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Let's keep in touch

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