



Honolulu – January 5th, 2024

Hawaii International Conference on System Sciences

Fiona Koh, Kathrin Grosse, Giovanni Apruzzese



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Hawaii International Conference on System Sciences

Voices from the Frontline

Fiona Koh, Kathrin Grosse, Giovanni Apruzzese

Artificial Intelligence (AI)



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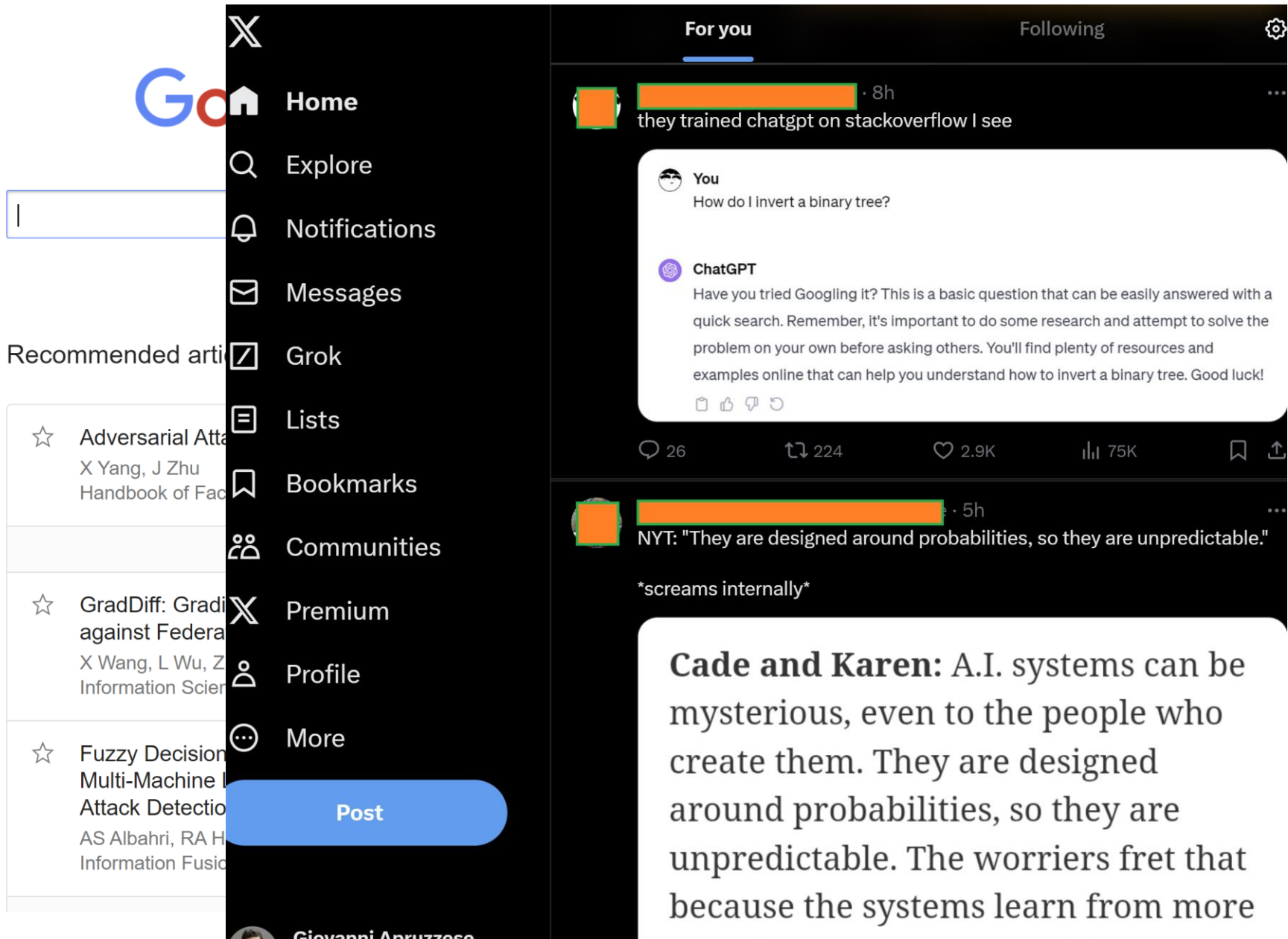
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X Yang, J Zhu
Handbook of Face Recognition - 6 days ago

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☆ GradDiff: Gradient-Based Membership Inference Attacks against Federated Distillation with Differential Comparison ▼
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Artificial Intelligence (AI)



Artificial Intelligence (AI)

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Case and Karen. A.I. systems can be mysterious, even to the people who create them. They are designed around probabilities, so they are unpredictable. The worriers fret that because the systems learn from more

Artificial Intelligence (AI)

HICSS-57

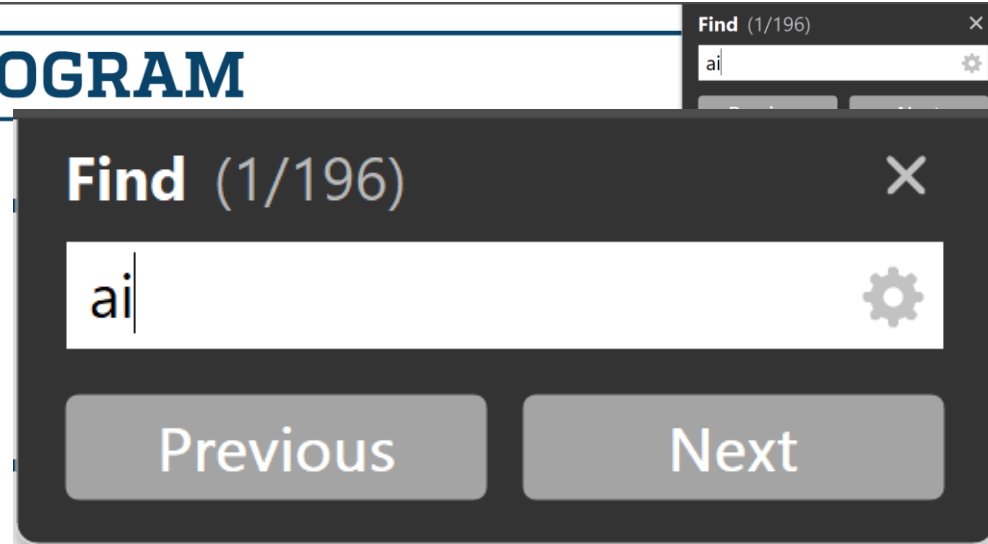
DETAILED PROGRAM

EVENT MATRICES

- 16** Wednesday January 3, 2024
- 18** Thursday January 4, 2024
- 20** Friday January 5, 2024
- 22** Saturday January 6, 2024

PLENARY SESSIONS

- 24** Unleashing the Power of Virtual Reality in the Management of Chronic Pain: Current Trends and Future Directions
Christopher C. Nguyen, CEO and Cofounder, Aitomatic Inc.
- 25** Special Plenary Meeting: Unveiling the Research Frontiers in the Age of Generative AI
HICSS Conference Chair and Track Chairs



Artificial Intelligence (AI)

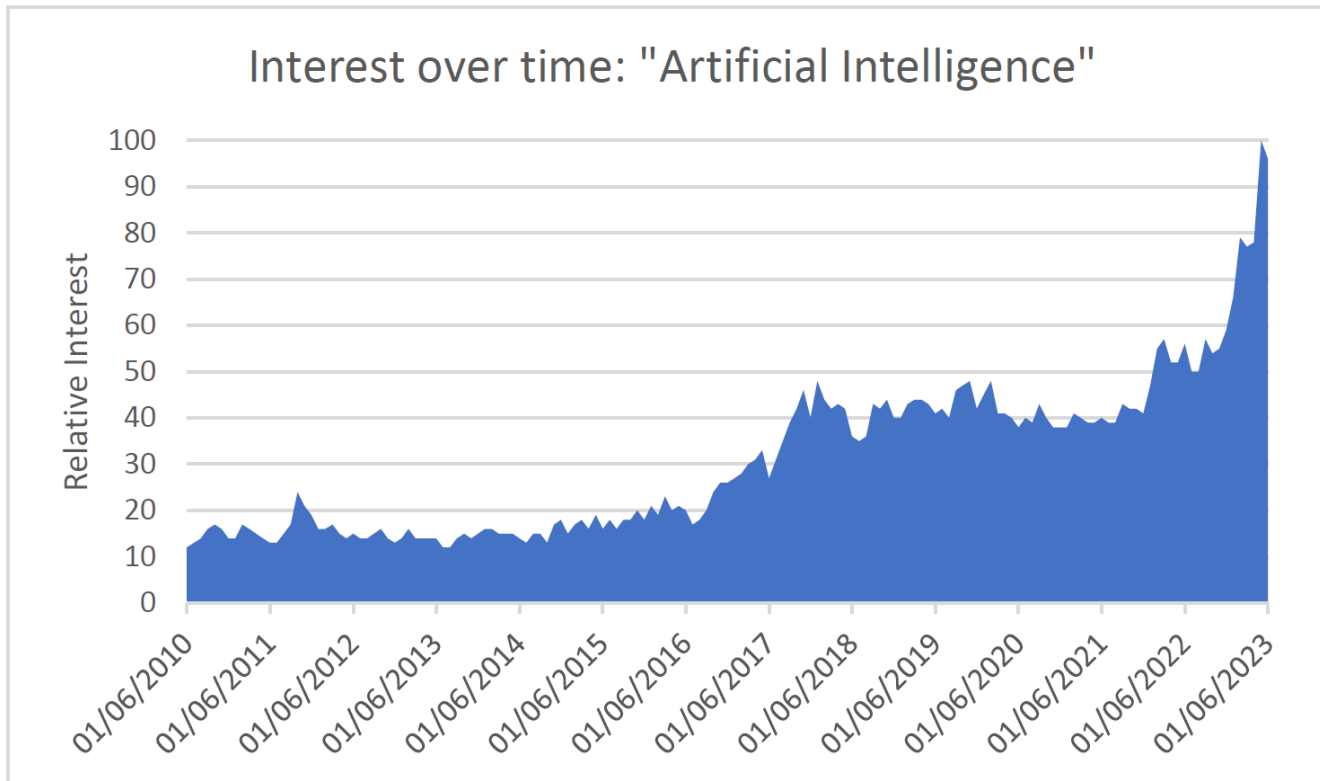
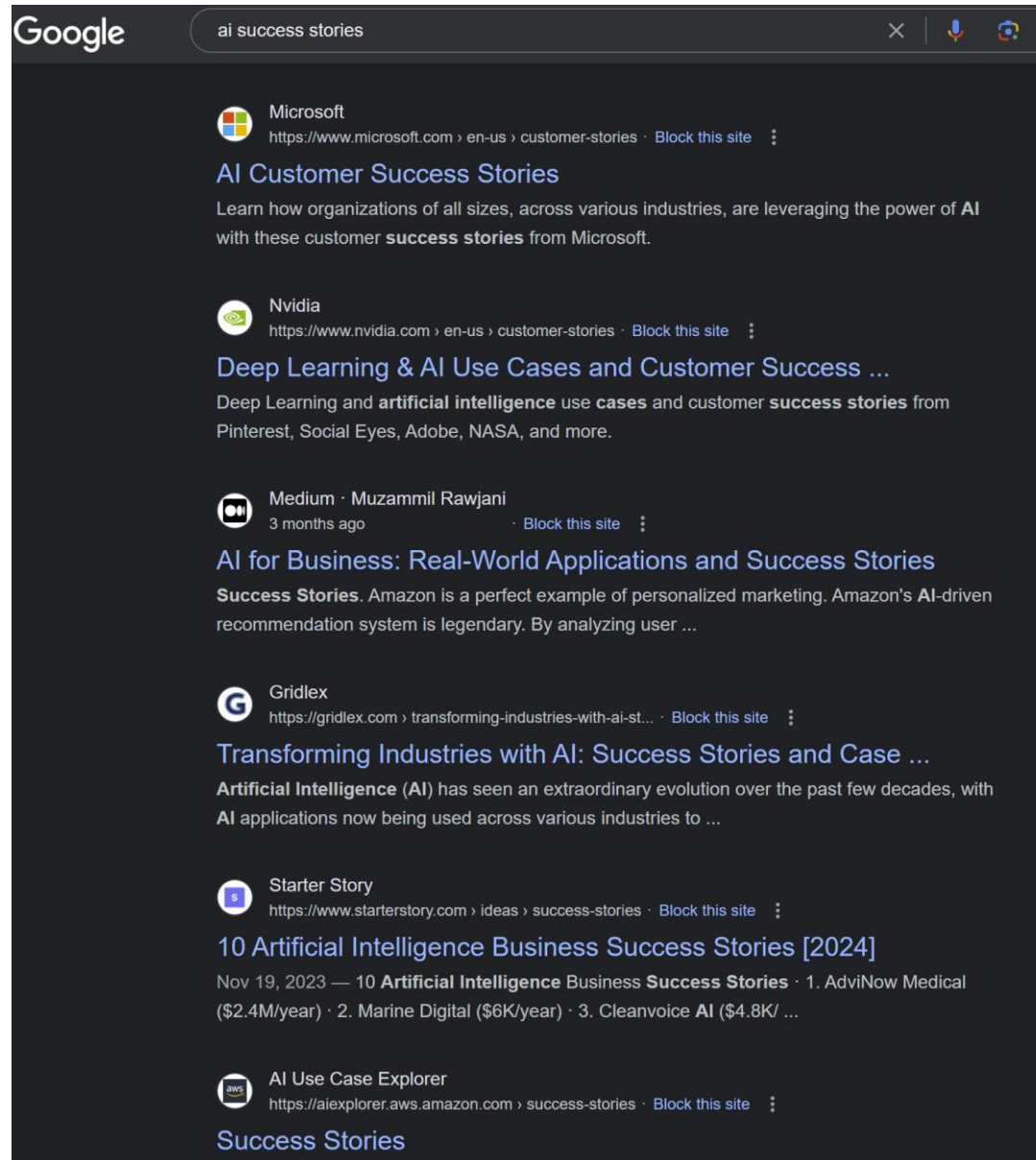


Figure 1. Worldwide search interest of “artificial intelligence” since 2010 (source: Google Trends).

Artificial Intelligence (AI) – Success Stories



Google ai success stories

- Microsoft**
<https://www.microsoft.com> › en-us › customer-stories · Block this site
AI Customer Success Stories
Learn how organizations of all sizes, across various industries, are leveraging the power of AI with these customer **success stories** from Microsoft.
- Nvidia**
<https://www.nvidia.com> › en-us › customer-stories · Block this site
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Transforming Industries with AI: Success Stories and Case ...
Artificial Intelligence (AI) has seen an extraordinary evolution over the past few decades, with AI applications now being used across various industries to ...
- Starter Story**
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10 Artificial Intelligence Business Success Stories [2024]
Nov 19, 2023 — 10 **Artificial Intelligence** Business **Success Stories** · 1. AdviNow Medical (\$2.4M/year) · 2. Marine Digital (\$6K/year) · 3. Cleanvoice AI (\$4.8K/ ...
- AI Use Case Explorer**
<https://aiexplorer.aws.amazon.com> › success-stories · Block this site
Success Stories

Artificial Intelligence (AI) – Success Stories (?)

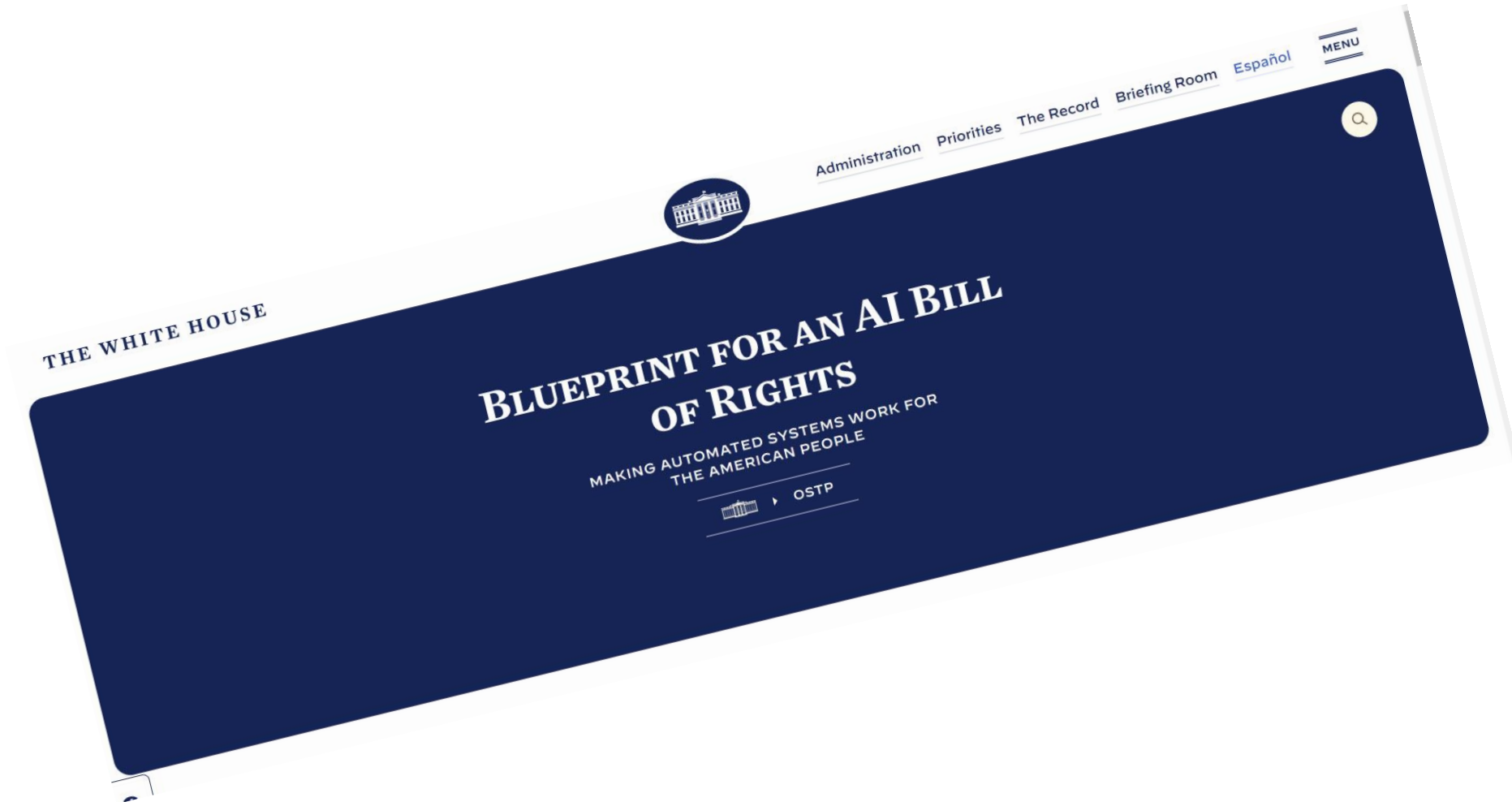
Microsoft shuts down AI chatbot after it turned into a Nazi
CBS News, 2016

Amazon AI Decided Hiring Men Is Better
Reuters, 2018

Self-driving Uber car kills woman in Arizona
Forbes, 2018

Man ends his life after an AI chatbot 'encouraged' him
Euronews, 2023

Regulation of AI – USA



Regulation of AI – China



Regulation of AI – Europe



EUROPEAN COMMISSION

Brussels, 21.4.2021
COM(2021) 206 final
2021/0106(COD)

Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

LAYING DOWN HARMONISED RULES ON ARTIFICIAL INTELLIGENCE (ARTIFICIAL INTELLIGENCE ACT) AND AMENDING CERTAIN UNION LEGISLATIVE ACTS

{SEC(2021) 167 final} - {SWD(2021) 84 final} - {SWD(2021) 85 final}

EXPLANATORY MEMORANDUM

1. CONTEXT OF THE PROPOSAL

1.1. Reasons for and objectives of the proposal

This explanatory memorandum accompanies the proposal for a Regulation laying down harmonised rules on artificial intelligence (Artificial Intelligence Act). Artificial Intelligence (AI) is a fast evolving family of technologies that can bring a wide array of economic and societal benefits across the entire spectrum of industries and social activities. By improving prediction, optimising operations and resource allocation, and personalising service delivery, the use of artificial intelligence can support socially and environmentally beneficial outcomes and provide key competitive

The European AI Act – Initial Proposal¹ (Apr. 2021)

EUROPEAN COMMISSION

Brussels, 21.4.2021
COM(2021) 206 final
2021/0106(COD)

Proposal for a

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2021

Risk-based approach

Horizontal

To be applicable in 2025 (tbd)



The European AI Act – Approval (June 14, 2023)

One day before the
submission of our paper!

June 16
2023

European Parliament Reaches Agreement on its Version of the Proposed EU Artificial Intelligence Act

[Home](#) | [Perspectives & Events](#) | [European Parliament Reaches Agreement on its Version of the Proposed EU Artificial Intelligence...](#)

Authors

[Oliver Yaros](#) | [Ana Hadnes Bruder](#) | [Dominique Shelton Leipzig](#) | [Livia Crepaldi Wolf](#) |
[Ondrej Hajda](#)

Other Author Salome Peters, Legal Intern

Executive summary

- On June 14, 2023 the European Parliament (the “Parliament”) **approved** its [version](#) of the draft EU Artificial Intelligence Act (the “EU AI Act”).
- European institutions will now enter **negotiations** to reach an agreement on the final text. This means that even if the EU AI Act is adopted quickly, it will apply at the earliest in **2025**.
- **Jurisdictional reach:** If adopted, the EU AI Act will impose a set of **obligations** on both providers and deployers of **in-scope AI systems** used in or producing effects in the EU, **irrespective of their place of establishment**.

The European AI Act – Approval (June 14, 2023)

June 16
2023

European Parliament its Version



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Summary

- No sanctions should be imposed, joint paper says
- Commitments would involve large and small providers
- Paper suggests "mandatory self-regulation through codes of conduct"

BERLIN, Nov 18 (Reuters) - France, Germany and Italy have reached an agreement on how artificial intelligence should be regulated, according to a joint paper seen by Reuters, which is expected to accelerate negotiations at the European level.

The three governments support "mandatory self-regulation through codes of conduct" for so-called foundation models of AI, which are designed to produce a broad range of outputs. But they oppose "untested norms."

"Together we underline that the AI Act regulates the application of AI and not the technology as such," the joint paper said. "The inherent risks lie in the application of AI systems rather than in the technology itself."

...the final text. This means that even if ...

...impose a set of **obligations** on both providers and deployers ...
...affecting effects in the EU, **irrespective of their place of establishment.**

The European AI Act – Approval (June 14, 2023)

June 16
2023

Eu
its



Home | Pers

The screenshot shows the European Parliament News page for the AI Act approval. The page features the European Parliament logo and the title "News European Parliament". The navigation bar includes "Headlines", "Press room", "Agenda", "FAQ", and "Election Press Kit". The main heading is "Artificial Intelligence Act: deal on comprehensive rules for trustworthy AI". Below the heading, it indicates "Press Releases" and lists "IMCO" and "LIBE" as the responsible committees, with a date of "09-12-2023 - 00:04". The date is circled in red. There are social media icons for Facebook, Twitter, LinkedIn, and YouTube. A list of bullet points summarizes the key points of the agreement: "Safeguards agreed on general purpose artificial intelligence", "Limitation for the use of biometric identification systems by law enforcement", "Bans on social scoring and AI used to manipulate or exploit user vulnerabilities", "Right of consumers to launch complaints and receive meaningful explanations", and "Fines ranging from 35 million euro or 7% of global turnover to 7.5 million or 1.5% of turnover". A bolded paragraph states: "MEPs reached a political deal with the Council on a bill to ensure AI in Europe is safe, respects fundamental rights and democracy, while businesses can thrive and expand." At the bottom, a paragraph explains: "On Friday, Parliament and Council negotiators reached a provisional agreement on the Artificial Intelligence Act. This regulation aims to ensure that fundamental rights, democracy, the rule of law and environmental sustainability are protected from high risk AI, while".

The European AI Act – A very long history

Please don't ask me!



Trilogue:

- AI Mandates (20 June 2023)

European Commission:

- AIA – COM – Draft Standardisation Request (5 December 2020)
- AIA – COM – Proposal (21 April 2021)
- AIA – COM – Annexes (21 April 2021)
- AIA – COM – Impact Assessment 1 (21 April 2021)
- AIA – COM – Impact Assessment 2 (21 April 2021)
- AIA – COM – Impact Assessment 3 (21 April 2021)

Council of the European Union:

- AIA – CZ – General Approach (25 November 2022)
- AIA – CZ – Draft General Approach (11 November 2022)
- AIA – CZ – Draft for Coreper (3 November 2022)
- AIA – CZ – 4th Proposal (19 October 2022)
- AIA – CZ – 3rd Proposal (23 September 2022)
- AIA – CZ – 2nd Proposal (16 September 2022)
- AIA – CZ – 1st Proposal (15 July 2022)
- AIA – CZ – Options Paper (17 June 2022)
- AIA – FRA – Consolidated Version (15 June 2022)
- AIA – FRA – Progress Report (16 May 2022)
- AIA – FRA – Art 3+4 (13 May 2022)
- AIA – FRA – Art 56-58 and 63-69 (6 May 2022)
- AIA – FRA – Art 70-85 (3 May 2022)

- AIA – FRA – Art 40-52 (15 February 2022)
- AIA – FRA – Art 16-29 (3 February 2022)
- AIA – FRA – Art 8-15 (13 January 2022)
- AIA – SLO – Art 1-7 (29 November 2021)
- AIA – SLO – Progress Report (22 November 2021)

European Parliament:

- AIA – IMCO-LIBE Report – Adopted (14 June 2023)
- AIA – IMCO-LIBE Report – All Amendments (14 June 2022)
- AIA – IMCO-LIBE Report – Draft (20 April 2022)
- AIA – JURI – Rule 57 Opinion – Adopted (12 September 2022)
- AIA – JURI – Rule 57 Opinion – Amendments (24 March 2022)
- AIA – JURI – Rule 57 Opinion – Draft (2 March 2022)
- AIA – ITRE – Rule 57 Opinion – Adopted (14 June 2022)
- AIA – ITRE – Rule 57 Opinion – Amendments (31 March 2022)
- AIA – ITRE – Rule 57 Opinion – Draft (3 March 2022)
- AIA – CULT – Rule 57 Opinion – Adopted (16 June 2022)
- AIA – CULT – Rule 57 Opinion – Amendments (1 April 2022)
- AIA – CULT – Rule 57 Opinion – Draft (21 February 2022)
- AIA – ENVI – Rule 56 Opinion – Adopted (22 April 2022)
- AIA – ENVI – Rule 56 Opinion – Amendments (25 January 2022)
- AIA – ENVI – Rule 56 Opinion – Draft (10 December 2021)
- AIA – TRAN – Rule 56 Opinion – Adopted (12 July 2022)
- AIA – TRAN – Rule 56 Opinion – Amendments (4 May 2022)
- AIA – TRAN – Rule 56 Opinion – Draft (29 March 2022)

The European AI Act – A very long history



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Who is *really* affected by this?

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- AIA – CZ – Draft for Coreper (3 November 2022)
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- AIA – ENVI – Rule 56 Opinion – Adopted (22 April 2022)
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Voices from the Frontline: Revealing the AI Practitioners' viewpoint on the European AI Act

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Related Work



AI Regulations

“The AI Act lacks clarity in areas such as the clear definition of AI itself”¹



Ethical AI Development

“Explainable AI systems help understand users its decision process and spot mistakes”²



Secure AI Development

“Adversarial attacks can cause an AI system to produce wrong outputs”³

...but what about the AI practitioners?

¹ Ruschemeier, H. (2023)

² Castelvechi, D. (2016)

³ Barner et al., (2021)

Related Work – Overview

Table 1. Related interview (and survey (*)) studies on regulation, the AI Act, performance measures, explainability and transparency, bias mitigation and cyber or AI security.

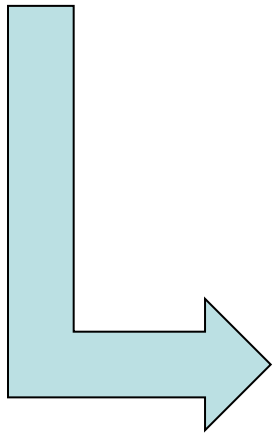
Author & Year	Pop. Size	Gen. Reg.	AI Act	Perf. Meas.	Expl. & Trsp.	Bias Mitig.	Sec.
Pumplun et al. (2019)	14	✓					
Rothenberger et al. (2019)	8	✓					
Rakova et al. (2021)	26			✓	✓	✓	
Jöhnk et al. (2021)	25			✓			✓
Petersson et al. (2022)	26	✓					
Liebl and Klein (2022)*	113	✓	✓				
V. Johansson et al. (2022)	12	✓			✓		
Hinsen et al. (2022)	25				✓	✓	
Bieringer et al. (2022)	15						✓
Meyer and Apruzzese (2022)	18	✓					✓
Leewis and Smit (2023)	42				✓		
Grosse et al. (2023)*	139						✓
Mink et al. (2023)	21						✓

Research Question

How well positioned are European AI practitioners in the current and upcoming regulatory landscape?

Research Question and Method

How well positioned are European AI practitioners in the current and upcoming regulatory landscape?



Exploratory study design: Semi-structured interviews with AI industry practitioners



Sample Description

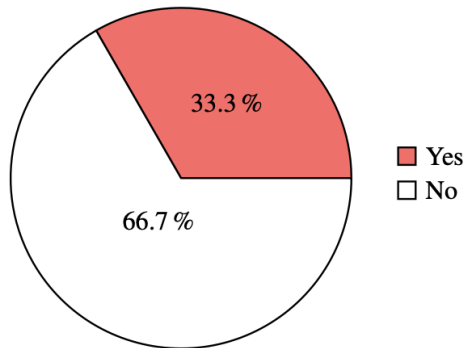
- **WHO?** 20 participants (21 AI companies)
 - 90% male, 33years (avg age)
- **WHERE?** Switzerland, Italy, Czech Republic, Netherlands, Austria, Ireland
- **SIZE?** 17 companies: <50 employees; 1 company: >1000; 3 companies in-between
- **WHAT?** Business Intelligence, Cybersecurity, Healthcare, Mobility, Education, Space

Major Findings 1

AI practitioners appreciate the European regulation landscape

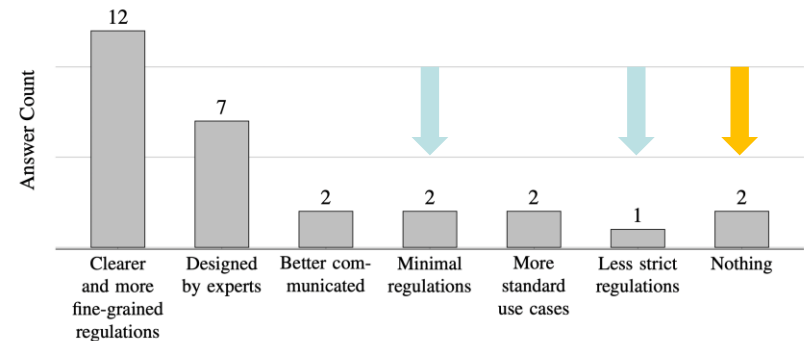
Despite Europe being a strongly regulated market compared to markets like the US or China, and Europe being the first market globally to impose regulations on AI, European AI practitioners appreciate the European market

Q2.3 Do you think that some countries outside of Europe have a regulation landscape that would make your business more profitable or favourable (e.g. USA, China)?



"I like what is happening in Europe (regarding regulations)"

Q5.9 What do you think should be done to improve the current regulations landscape?



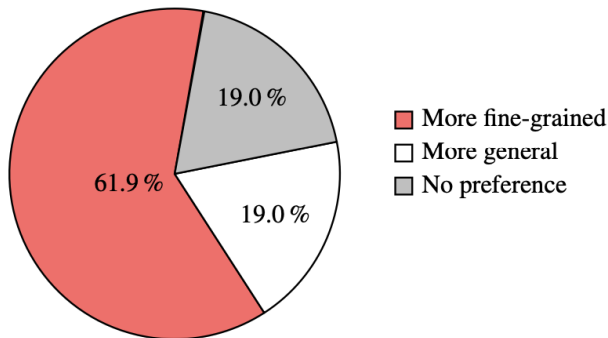
Major Findings

2

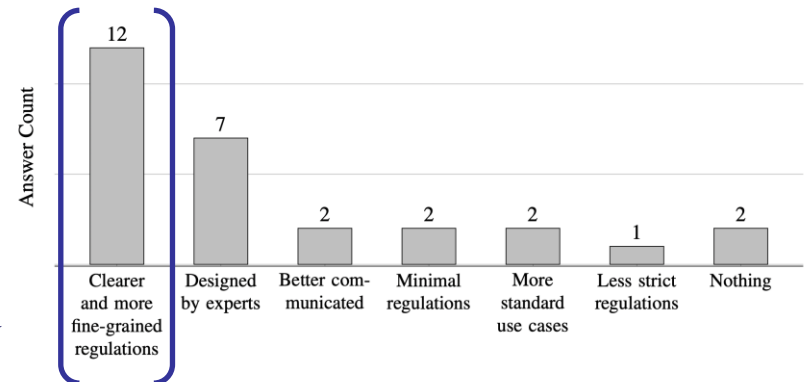
AI practitioners want fine-grained regulations, not broad ones

AI practitioners want clear and fine-grained rules, the AI Act however, is a horizontal piece of regulation and therefore broad and vague to an extent

Q5.2 There are calls for more policies and regulations to clarify what is allowed and what isn't in the field of AI. Would you prefer more 'fine-grained' regulations or more general ones?



Q5.9 What do you think should be done to improve the current regulations landscape?



"Even though fine-grained regulations might be against us, we would at least know what's allowed specifically"

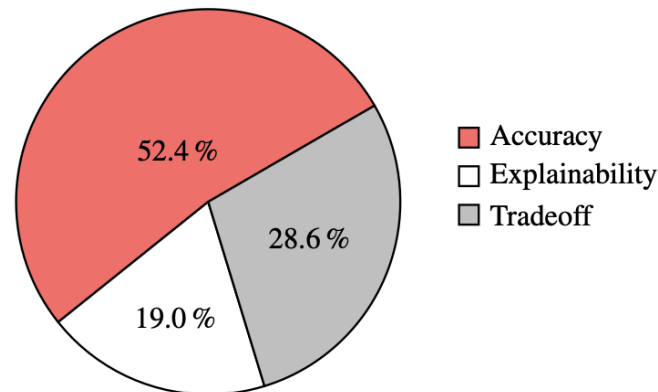
Major Findings

3

AI practitioners are not yet invested into providing explainability

AI practitioners are divided between focusing on accuracy or explainability of their systems, but the upcoming AI Act will require a degree of explainability for all systems

Q3.4 What do you consider more important: The explainability or the accuracy of your AI?



"ML is biased and without explainability you don't know what your model is thinking"

AI Act Transparency Requirements

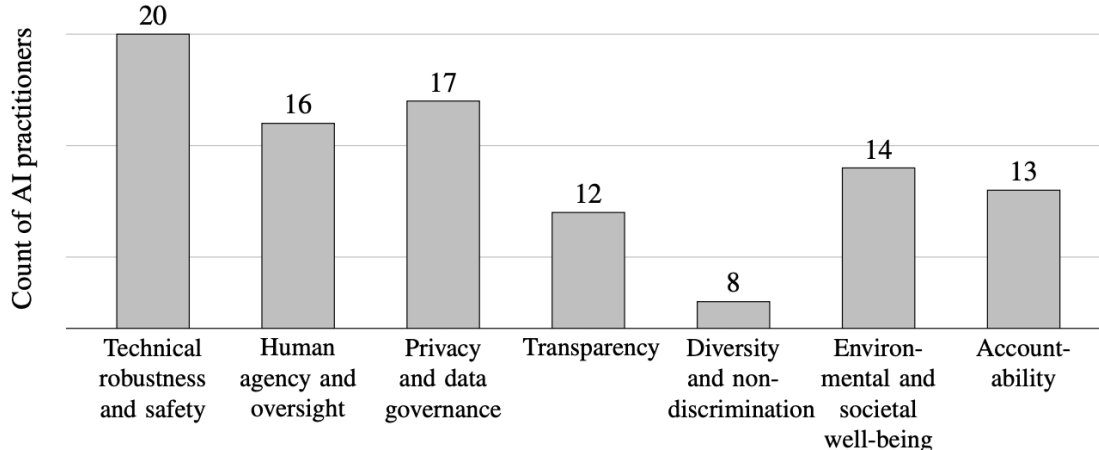
Major Findings



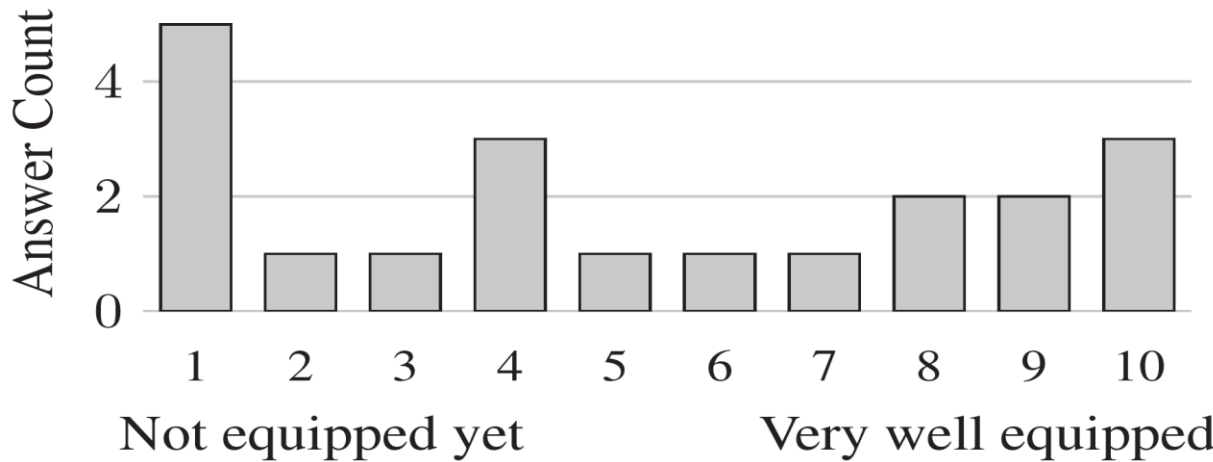
AI practitioners are currently invested into providing trustworthy AI systems

Despite never having heard about ALTAI, AI practitioners are aware of ethical and secure AI practices and invest resources in providing ethical and secure AI systems today already

Q6.5 The expert group has created 7 areas of AI where businesses can ensure the trustworthiness of their AI. Which of the following KPI's are you already implementing?



Ancillary Findings



"Machine Unlearning" could be a solution!

Figure 2. Replies to Q.5.5 about ability to remove many samples daily upon request.

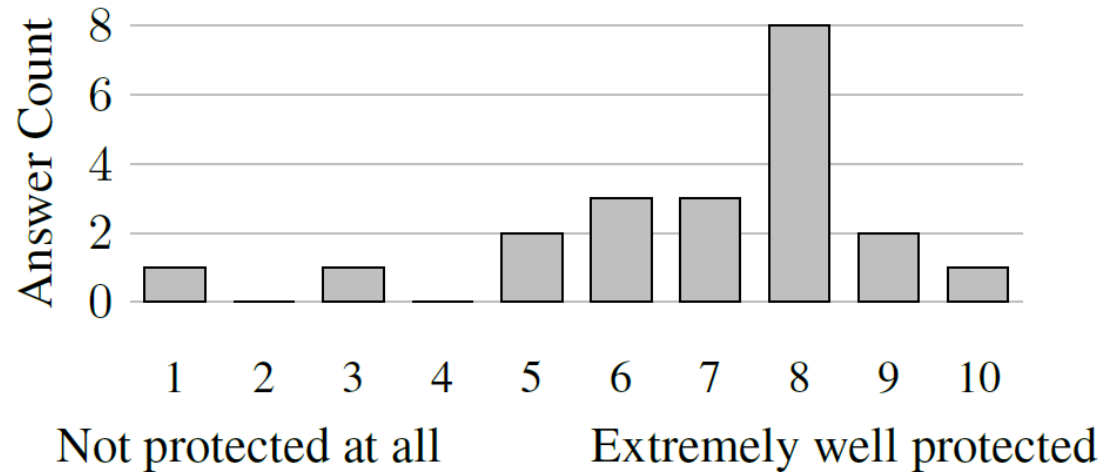


Figure 3. Replies to Q.4.3 rating how well protected their AI in terms of intellectual property is.

Hundreds of papers claim that AI face many security risks!

BONUS: what does the general public think about AI companies?

"Having AI is a selling point"

BONUS: what does the general public think about AI companies?

"Having AI is a selling point"

AI Questionnaire (English)

The following questionnaire is part of a research survey focused on determining the opinion of the general population with regards to the term "Artificial Intelligence". The questionnaire shall not take more than 2 minutes to complete. All collected responses will be stored in accordance to the GDPR. If you want the possibility to have your response to be removed from our survey at a later date, please provide your email address at the bottom of this questionnaire, and then send an email to fiona.ruettimann@gmx.ch specifying your email address to have your answers deleted.

BONUS: what does the general public think about AI companies?

"Having AI is a selling point"

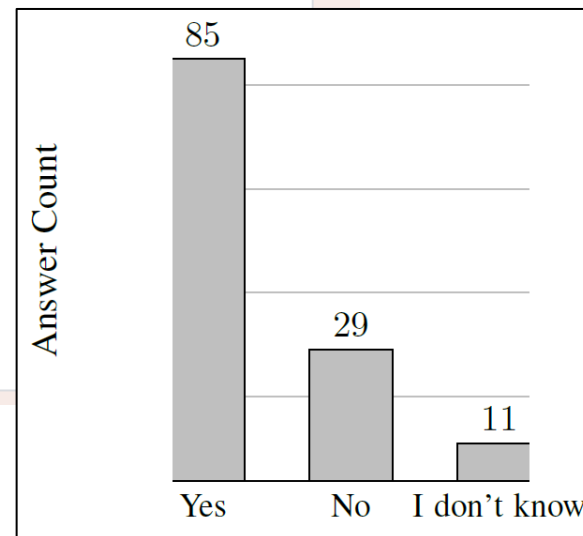
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"The term 'Artificial Intelligence' is often used by companies to advertise their products in a better light." *

Do you agree with this statement?

- Yes
- No
- I don't know



BONUS: what does the general public think about AI companies?

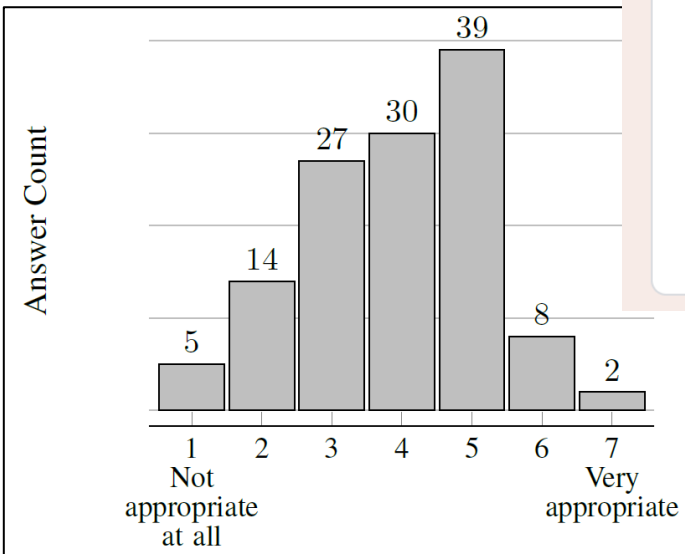
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Do you think that tech companies use the term "AI" in an appropriate way? (According to your own definition of "appropriate") *

1 2 3 4 5 6 7
Not appropriate at all Very appropriate



SUMMARY. The respondents of our online survey have mixed views on whether the term "AI" is used appropriately by AI companies.

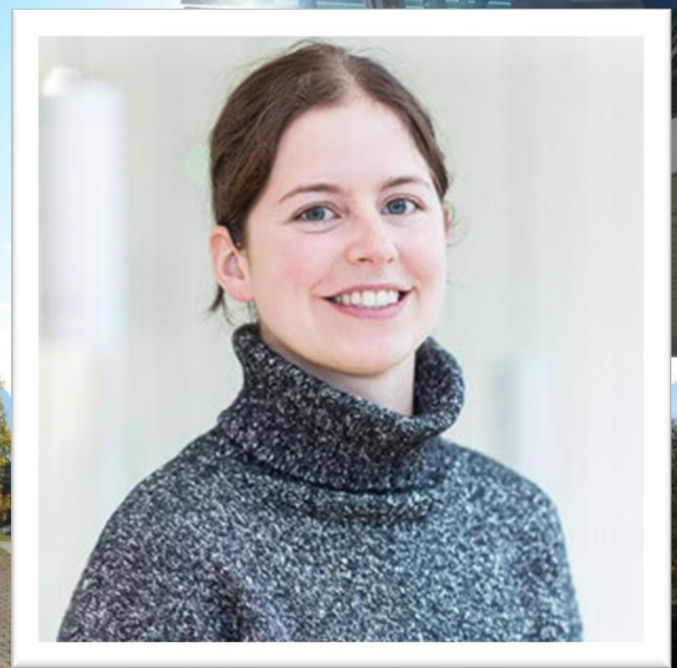
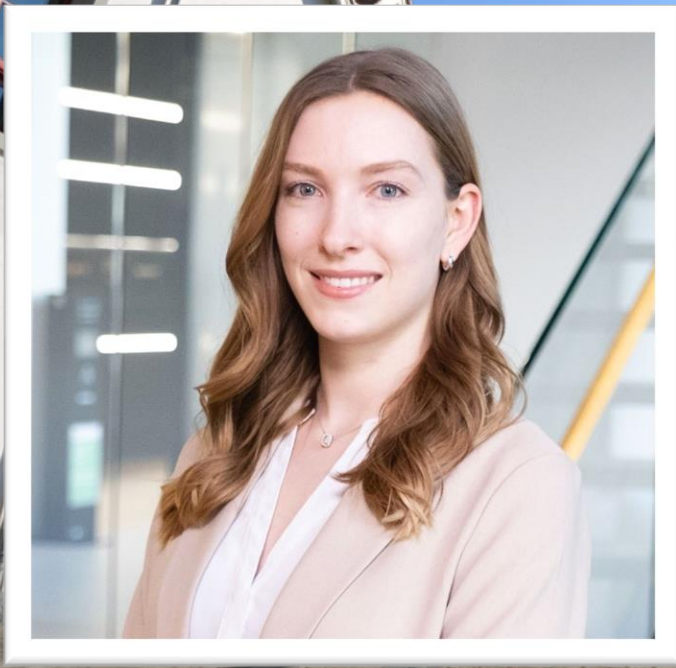
Conclusions and Future Work

- Semi-structured interviews with 21 companies in the EU
- Overall, positive reception of existing regulation
- Issues:
 - Data deletion is problematic
 - Documentation is challenging
 - Finding legal experts is difficult
 - Managing AI requires a lot of manual effort
- Future work:
 - Machine unlearning
 - Legislation should be also guided by technical experts
 - More automation
 - More fine-grained regulation

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Limitations. We acknowledge that this study is based on a small and heterogeneous sample, and hence does not generalize. Our research is *exploratory*



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