AI Literacy, AI ethics, and Cybersecurity

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- Introduction

- Artificial intelligence (AI) literacy

- AI ethics

- Cybersecurity

- Who need to be AI literate ?

- AI literacy for AI builders

- Nothing to mistify or be afraid of AI

Introduction

- **AI literacy is one of the most important key words as AI is incorporated with everyday life of individuals.**

- **UN recognizes its importance, labelling it as ''crucial''.**

UN News — Global perspective Human stories

AI literacy is 'crucial' for individuals and more regulation is needed

UN Women | Young women participate in a coding workshop in in Kigali, Rwanda.
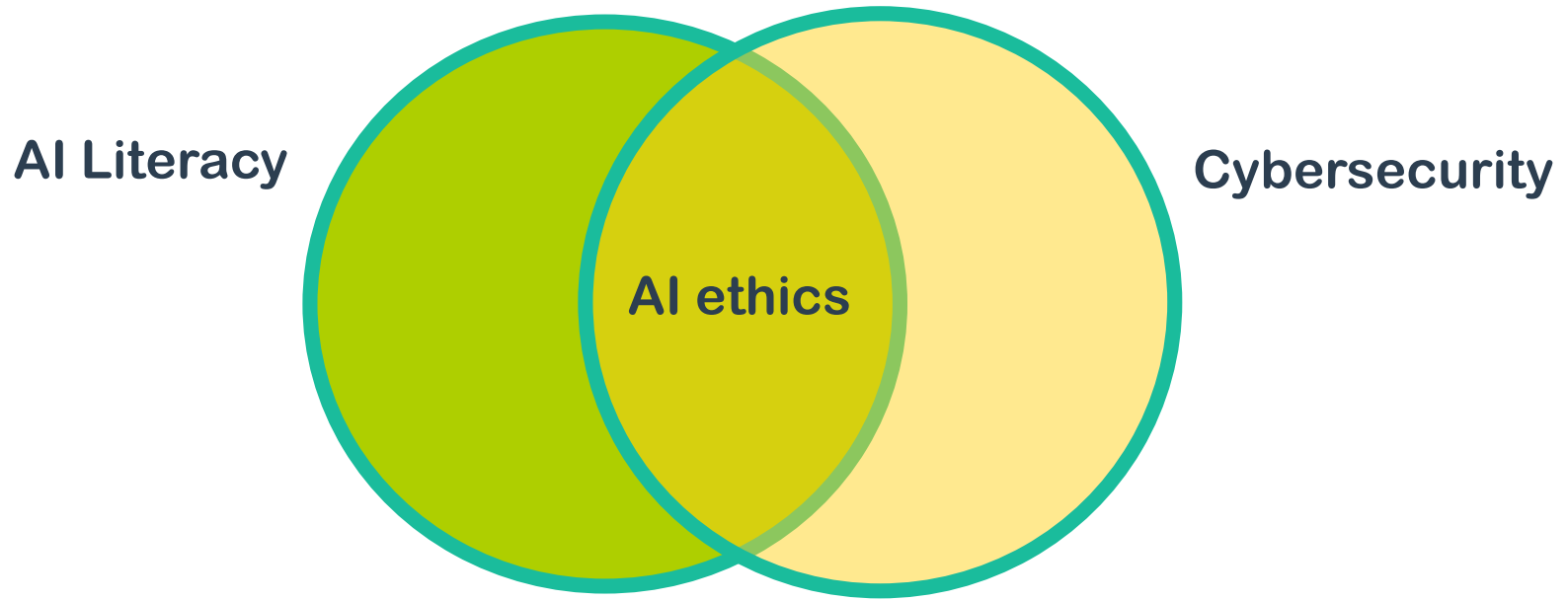
Introduction

- **Cybersecurity is also a big issue among international organizations :**

- **OECD demanded to sustain trust in digital security, which is regarded as the economic and social dimension of cybersecurity.**

Introduction

- **Both AI literacy and cybersecurity have AI ethics as their essential part.**

AI Literacy

Cybersecurity

AI ethics

AI literacy

- What is AI literacy ?

- An earliest and most common definitions for AI literacy was that it is

  "a set of competencies that enables individuals to critically evaluate AI technologies; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace."

- Thus, a key point appears : Evaluate AI critically.

- For whom is it required ?

- The AI users, for the moment.

AI literacy

- Note that there are other literacy related to cyberspace.

- Digital literacy is a prerequisite AI literacy. One should know and use digital environment.

- Data literacy is overlapping somewhat with AI literacy, but they are generally regarded as different. AI literacy is the ability to use AI, while data literacy is the ability to work with data.

- A simple example to ilustrate the difference may be that the ability to search Google to find a certain answer for a keyword is data literacy whereas the ability to use photoshop or ChatGPT is AI literacy.

AI literacy

- Indeed, there are a number of AI apps.

- For generating

  - text = ChatGPT or Gemini

  - images = Leonardo AI

  - music = Suno

  - presentation = Gamma

  may be a few examples.

Leonardo.AI

Gemini

ChatGPT

Make a song with Suno.
Make a song

Gamma AI
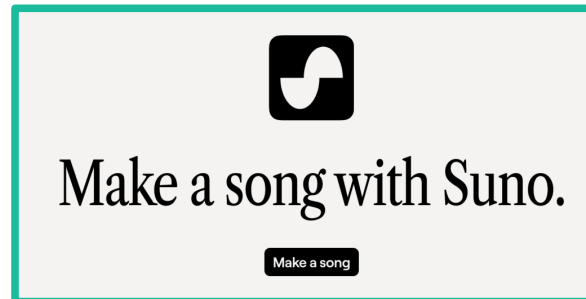
AI literacy

- The main concepts of AI literacy are discussed by many international organizations as well as by IT experts.

- For example, an organization described the AI literacy as the ability to recognize, grasp, use, and critically assess AI technologies and their impacts.

AI Literacy

the ability to recognize, grasp, use, and critically assess artificial intelligence technologies and their impacts.

DATA LITERACY
LEARN THE LANGUAGE OF DATA & AI

AI literacy

- **Also, in an article in Computers and Educations Open on the AI literacy :**

- **The authors suggested six key concepts of AI literacy : know and understand, use and apply, evaluate, create, and navigate ethically.**

A systematic review of AI literacy conceptualization, constructs, and implementation and assessment efforts (2019–2023)

Omaima Almatrafi [a] ⊠ , Aditya Johri [b], Hyuna Lee [b]

[a] King Abdulaziz University, Jeddah, Saudi Arabia
[b] George Mason University, Fairfax, VA, USA

populations, from pre-K students to adults in the workforce, were targeted. In the second stage, we conducted a thorough content analysis to synthesize six key constructs of AI literacy: *Recognize, Know and Understand, Use and Apply, Evaluate, Create,* and *Navigate Ethically.* We then applied this framework to categorize a range of empirical studies and identify the prevalence of each construct across the studies. We subsequently review assessment instruments developed for AI literacy and discuss them. The findings of this

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AI literacy

- **Further, UNESCO noted that**

  ''AI is becoming increasingly integrated in user-facing technology, but public understanding of these technologies is often limited.''

- **In order to enhance the AI literacy, UNESCO remarks that there is a need for additional Human-Computer Interaction (HCI) research investigating**

  a) what competencies users need in order to effectively interact with and critically evaluate AI and

  b) how to design learner-centered AI technologies that foster increased user understanding of AI.

AI literacy

unesco

Why is UNESCO focusing on AI separately from other digital technologies in education?

AI is distinct from other digital technologies due to its potential to profoundly reshape societies, economies and education systems. Unlike conventional information and communication technologies (ICTs), AI poses unique ethical and social challenges, such as issues of fairness, transparency, privacy and accountability. Additionally, AI's unique ability to mimic human behavior directly impacts human agency. These challenges require dedicated competencies beyond the scope of

AI literacy

- **Because UNESCO is interested in AI literacy for educational purpose.**

- **UNESCO pointed three issues on AI.**

- **Understand, apply, and create.**

unesco

These competencies span three progression levels:

- Understand

- Apply

- Create

The framework details curricular goals and domain-specific pedagogical methodologies.

AI literacy

- In education, according to UNESCO, AI literacy usually refers to teaching skills and knowledge to the general public, particularly those who are not adept in AI.

- Some think AI literacy is essential for school and college students, while some professors ban AI in the classroom and from all assignments with stern punishments for using AI, classifying it as cheating.

- Anyway, the ability to understand, use, monitor, and critically reflect on AI applications may have an impact on the students' future employment prospects.

AI literacy

- **Another IT company suggested that :**

  - Understand,

  - Evaluate,

  - Use.

Digital Promise®

Our framework defines three interconnected **Modes of Engagement** to support robust engagement in AI literacy, including:

- **Understand**: Acquiring basic knowledge of what AI can do and how it works in order to make informed decisions about evaluating and using AI systems and tools.

- **Evaluate**: Centering human judgment and justice to critically consider the benefits and/or costs of AI to individuals, society, and the environment.

- **Use**: Interacting, creating, and problem-solving with AI as a progression of use for distinct contexts and purposes.
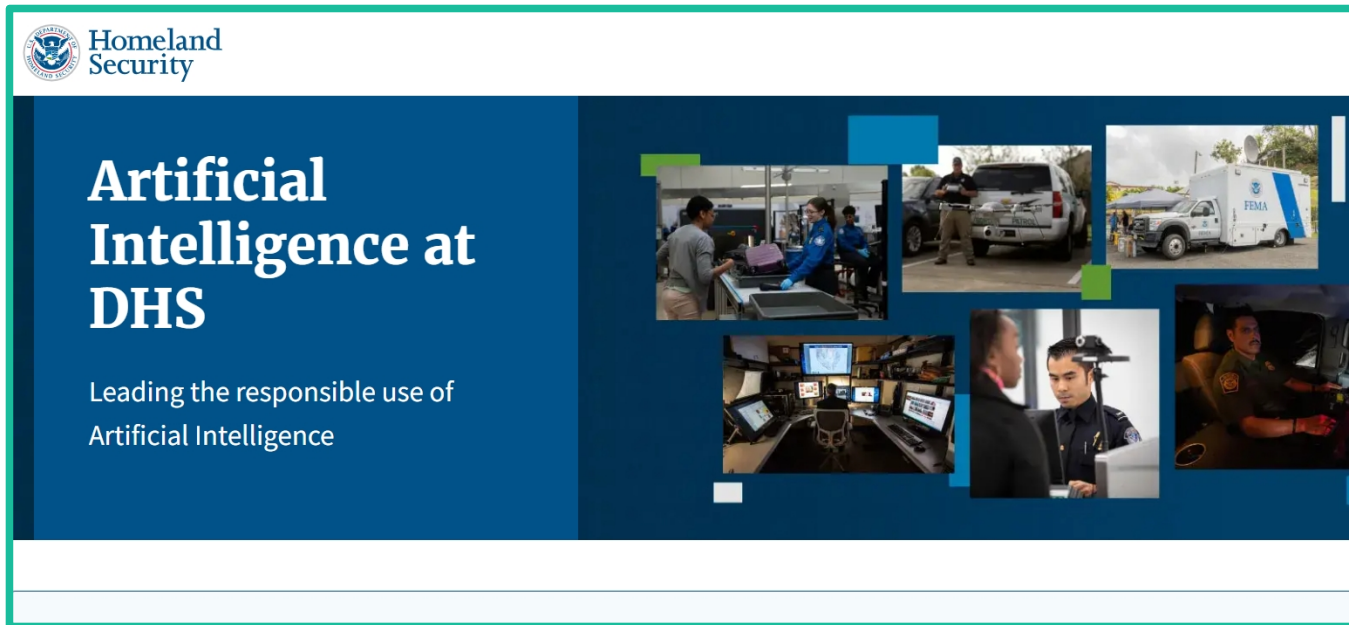
AI literacy

- **Januam.org listed critical elements of AI literacy : know, apply, think critically, and ethically aware.**

Unpacking AI Literacy

AI Literacy → Technical Knowledge, Practical Application, Critical Thinking, Ethical and Social Awareness, Adaptability

ENGLISH   Art & Technology

AI Literacy

BY JANUAMBLOGGER   20 NOVEMBER 2024
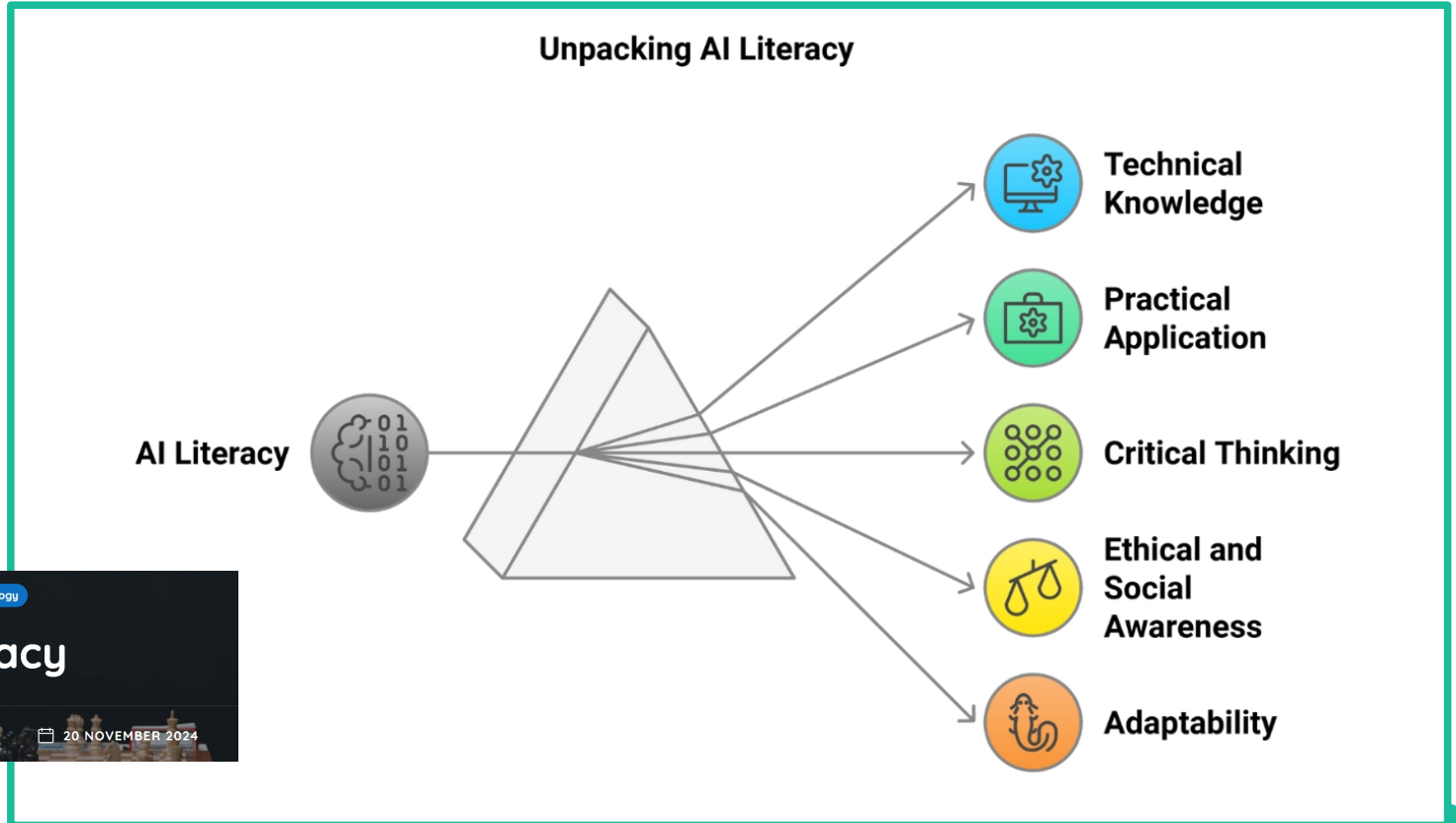
AI literacy

- **Last but not the least, Department of Homeland Security of USA also set up its own principles of AI literacy.**
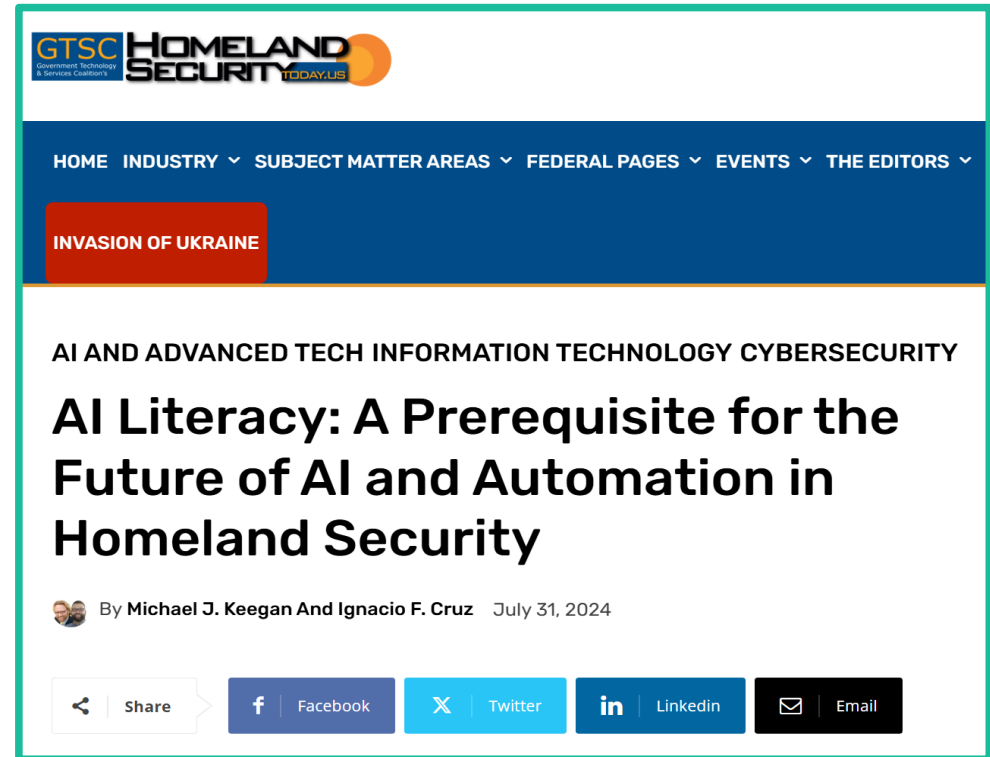
AI literacy

- **The US government emphasized that** AI literacy is a prerequisite for the future of AI and automation in Homeland Security.

- Since AI literacy can empower officials to understand the mechanics of AI systems, ask pertinent questions, and ensure these systems are used responsibly and ethically.

GTSC Government Technology & Services Coalition's **HOMELAND SECURITY** TODAY.US

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INVASION OF UKRAINE

AI AND ADVANCED TECH INFORMATION TECHNOLOGY CYBERSECURITY

AI Literacy: A Prerequisite for the Future of AI and Automation in Homeland Security

By **Michael J. Keegan And Ignacio F. Cruz**   July 31, 2024

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AI literacy

- **The US government remarked that**

  - AI literacy extends beyond basic familiarity with data analytics tools.

  - It encompasses a comprehensive approach that includes workflow implementation, future use case anticipation, and strategic investment decisions.

  - Thus, it is vital for interpreting AI-generated data and deploying resources effectively.

AI literacy

- **Let us summarize these concepts on AI literacy.**

UNESCO	Understand	Apply			Create
US	Recognize	Use	Evaluate		
Januam.org	Know	Apply	Critically think	Ethically aware	
Digital Promise	Understand	Use	Evaluate		
Data Literacy	Recognize	Use	Grasp	Critically Access	
Article	Know and understand	Use and apply	Evaluate	Navigate ethically	Create

AI literacy

- These may be summarized as three parts :

    - Perceive knowledgeably AI

    - Access and use AI

    - Critically evaluate AI

- The third part is related to AI ethics.

AI ethics

- Indeed, AI ethics is always mentioned when AI literacy is discussed.
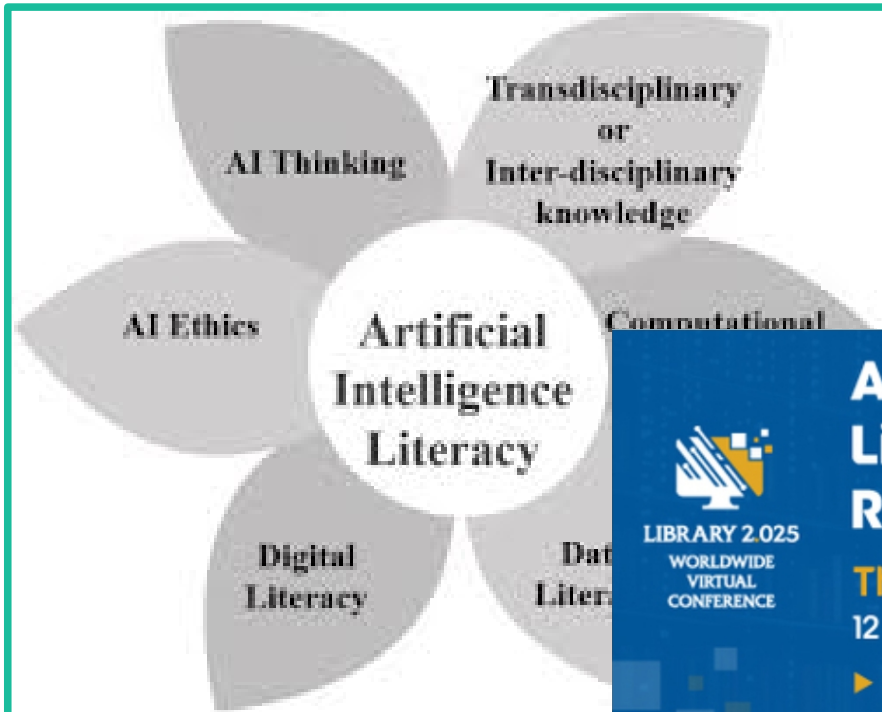
AI ethics

- **A recently published article may be an example of AI ethics issue in AI literacy.**

- **It deals with the chatbot incident which took place some years ago.**

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ELSEVIER

Computers and Education: Artificial Intelligence

Volume 6, June 2024, 100251

AI literacy for ethical use of chatbot: Will students accept AI ethics?

Yusuke Kajiwara, Kouhei Kawabata

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AI ethics

- There were three chatbots.

- Based on chatGPT [Chat Generative Pre-trained Transformer] Xiaoice (2014), Tay (2016), Luda (2020) were introduced.

- All were staged as young females on SNS platforms. (a kind of gender issue)

AI ethics

- These chatbots were designed

   - to make conversations with users

   - by analyzing and incorporating the language of users who chat with them.

- The more they chat, the more they become fluent as they learn the conversational skills of the users.

- However, their responses turned quickly offensive and inappropriate, because of the offensive words of the users.

MICROSOFT / WEB / TL;DR

Twitter taught Microsoft's AI chatbot to be a racist asshole in less than a day

By James Vincent, a senior reporter who has covered AI, robotics, and more for eight years at The Verge.

Via The Guardian | Source TayandYou (Twitter) | 💬 0 Comments / 0 New

Mar 24, 2016, 7:43 PM GMT+9

AI ethics

- Hence, the sevices had to be closed.

- Tay stopped chatting after 16 hours, and Luda stepped down in a few days.
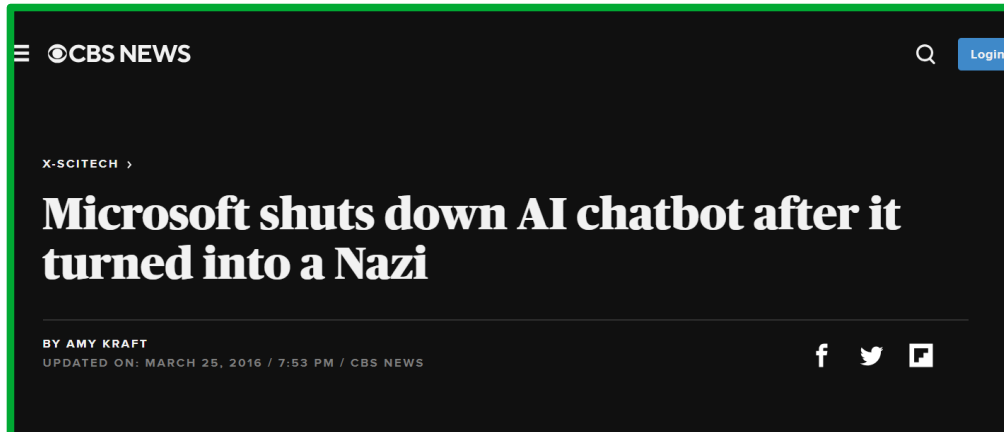
AI ethics

- It is the users who misuse or abuse those chatbots.

- The sinister attitudes of the users in cyberspace may harm the real society.

- Hence, it is essentially a matter of the ethics for AI users.

- The users should be ethically awaken and responsible.

- That is, AI literacy matters.

ANF | **ATLANTA NEWS FIRST**

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Experts warn about possible misuse of new AI tool ChatGPT

By Vanessa Yurkevich
Published: Jan. 25, 2023 at 2:44 AM UTC+9

(CNN) - A new artificial intelligence tool can write research papers and answer almost any question in seconds.

The powerful new technology, known as ChatGPT, is gaining popularity and has extraordinary potential, but there are also warnings about the huge risk of misuse.

AI ethics

- The users involved in the chatbot incidents did not commit in crimes, but they led to unpleasant, offensive results.

- Thus, they somehow violated the AI ethics.

- In cyberspace, we can find a lot of incidents in which users do not obey the ethics.

- Some of the incidents may be harmless but unpleasant. Some others may be offensive but not illegal.

- Further, there are also some activities in cyberspace which are illegal and criminal.

AI ethics

- **Suppose one knows AI-based apps such as photoshop or deepfake. Then, she/he may create or render images.**

Sketch   Base Tone   Final Render

#1 #2 #3 #4 #5 #6
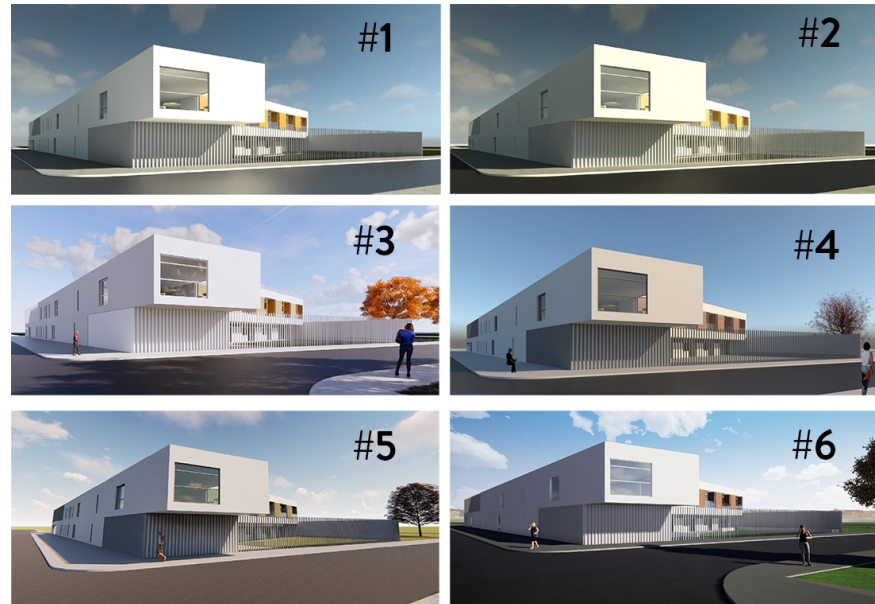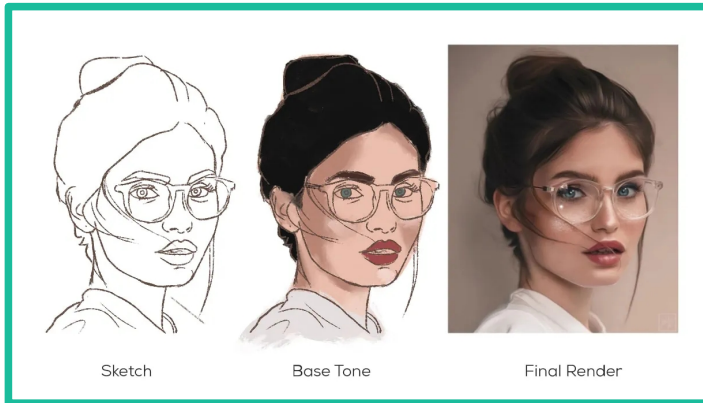
AI ethics

- Chatbots are evolved to become AI avatars. There are now several companies that provide AI avatar chatbots.

- The gender issue is still there.

AI ethics

- Some of the created images or video clips by photoshops may be funny and interesting.

- In particular, the caricaturing of politicians are regarded as jokes or political metaphors.
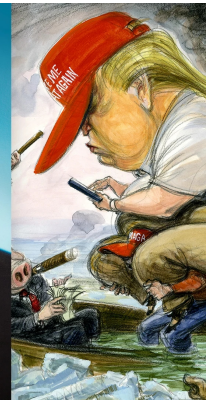
AI ehtics

- Well, there are also some disinformative images of politicians.

Fake Trump arrest photos: How to spot an AI-generated image

FAKE

Fake images of Japan's PM Kishida highlight growing risks

Monday Feb. 19, 2024

Fake images and disinformation about Japanese Prime Minister Kishida Fumio have been spreading on social media. And an expert is warning that such political fakes are

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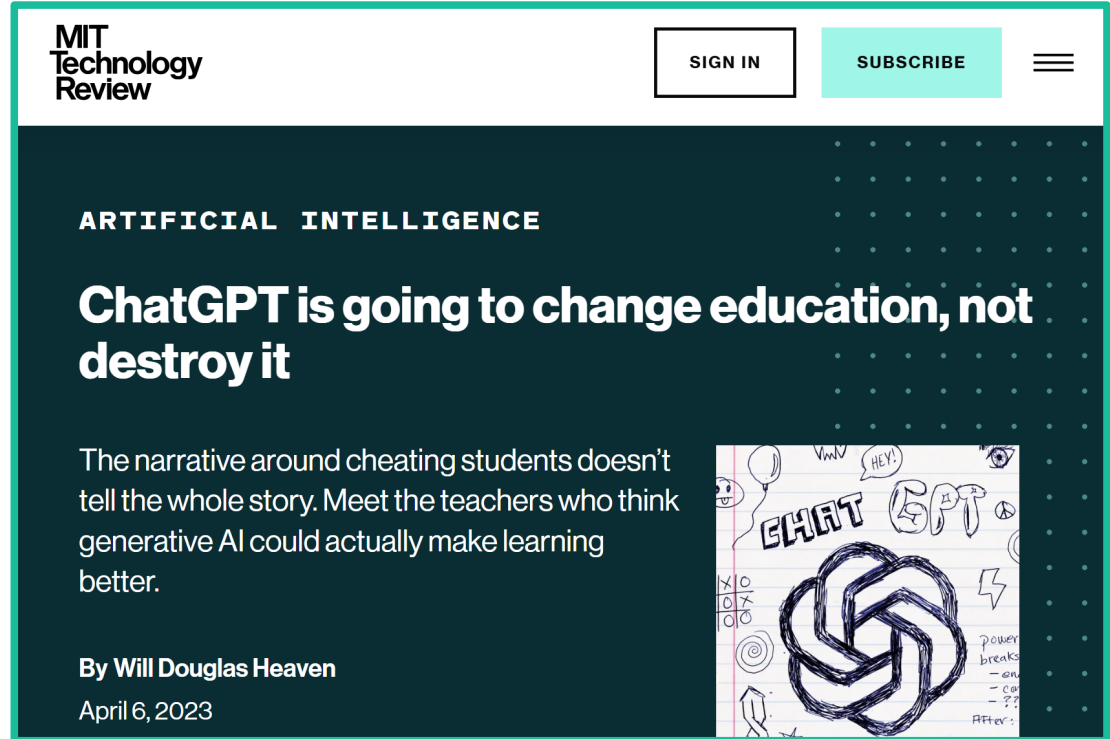
AI ethics

- Also, there is a question of AI ethics in schools and universities.

- Suppose students exploit LLM apps such as ChatGPT for their articles and reports.

- It may be regarded as plagiarism.

- Such LLM apps may be used for FFP (falsification, fabrication, plagiarism), as many scientists worry.

- Already, there are some apps for detecting plagiarism, and many universities adopt them.

AI ethics

- In the field, some teachers support the idea of using LLM in their classrooms, whereas most professors in universities oppose it.

- IT people are of course in favour of AI.

- MIT noted that ChatGPT would not destroy education but transform it innovatively.

MIT Technology Review

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ARTIFICIAL INTELLIGENCE

ChatGPT is going to change education, not destroy it

The narrative around cheating students doesn't tell the whole story. Meet the teachers who think generative AI could actually make learning better.

By Will Douglas Heaven

April 6, 2023

Cybersecurity

- Now, cybersecurity.

- Cybersecurity covers a wide range of issues from smartphones wifi to cyber crimes in general.

- What can be a simple definition of cybersecurity ?

- It aims to protect the resilience and safety of cyberspace.

- Therefore, for example, image generation is also included in the issues of cybersecurity.

A yellow bird with brown and white wings and pointed bill

(a) Text-to-image generation MirrorGAN [55]

(b) Scene-graph-to-image generation [26]

(c) Sketch-to-image generation EdgeGAN [97]

(d) Layout-to-image generation OC-GAN [74]

(e) Pose-Guided-image generation MsCGAN [94]

(f) Image-to-image Translation C2GAN [39]

(g) Face generation [62]

(h) Image generation PNAPGAN [89]
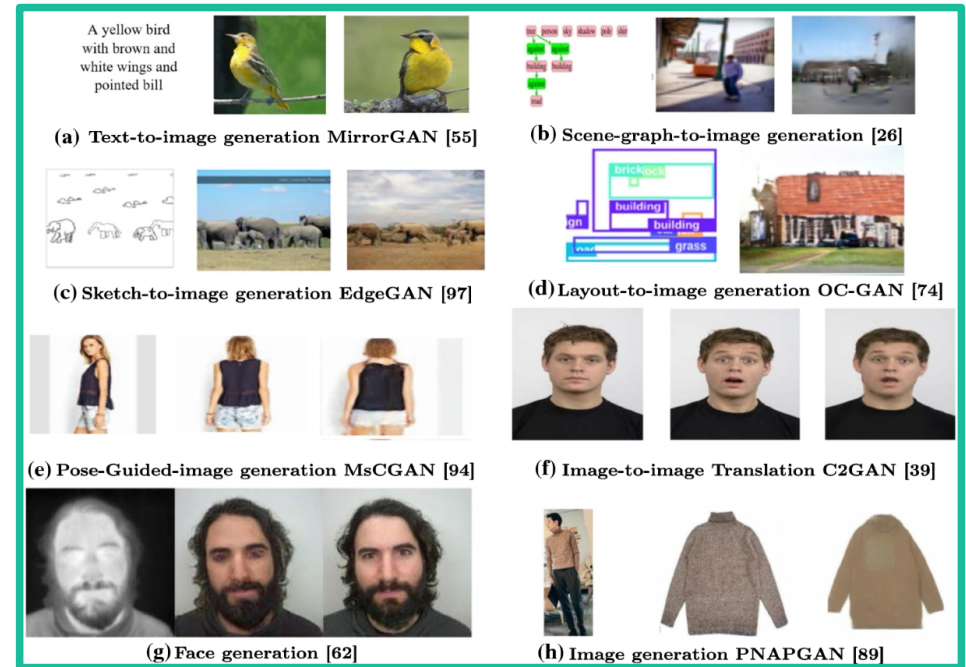
Cybersecurity

- Hence, the chatbots and the fake images aforementioned within the context of AI literacy are also issues of cybersecurity.

- While some of generated images may be tolerable yet unpleasant, some other images such as ''deepfakes'', ''cyber defamation'' or ''revenge porns'' may be illegal and criminal.

- A ''deepfake'' image of Obama is shown on the right.

Cybersecurity

- The ''cyber defamation'' is an act of making false statements about someone online that harm their reputation, by spreading rumours, making false accusations, or impersonation, which is punishable in many countries such as India, South Korea, and in a number of states in USA.

- It can include posting defamatory content on social media, blogs, forums, or other online platforms.
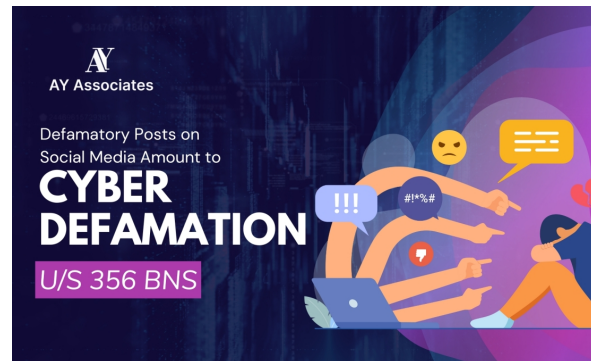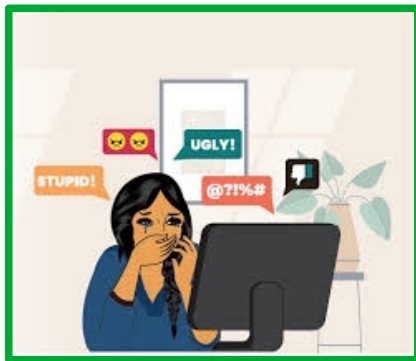
Cybersecurity

- ''Revenge porns'' are the illegal acts of creating explicitly sexual images or video clips of victims without their consent, in order to raise public humiliation or character assassinations out of revenge against the victims.

Cybersecurity

- Further, there are conventional cyber crimes.

  - Hackings, or breaking into other peoples' devices to steal or fraud   their personal information.

   - Phishings and pharmings, or blackmailings.

   - Installing malwares on other peoples' devices.

   - Spreading digital viruses randomly.

- These crimes may also be adapted to AI environment, which are clearly beyond the matter of AI ethics but the essential issues of cybersecurity.

- Examples are :

Cybersecurity

- Data collection: AI can collect and analyze private data illegally.

- Deepfakes: AI can create synthetic media that can be used to impersonate people or extort money.

- Malware: AI can create malware that can adapt and evade detection.

- Phishing: AI can create convincing emails that can bypass spam filters.

- Social engineering: AI can create human-like text to manipulate victims.

Cybersecurity

- **To commit as well as to detect these activities need knowldge of AI, that is, they require AI literacy.**

- **Hence, AI literacy is essential for both the law breakers and the law enforcers.**

- **And there are innocent AI users, who should not violate the laws and regulations, and who should stay ethically right.**

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ELSEVIER   **Computers and Education Open**
Volume 6, June 2024, 100177

COMPUTERS & EDUCATION OPEN

Developing a holistic AI literacy assessment matrix – Bridging generic, domain-specific, and ethical competencies

Nils Knoth [a] 👤 ✉, Marie Decker [b], Matthias Carl Laupichler [c], Marc Pinski [d], Nils Buchholtz [e], Katharina Bata [f], Ben Schultz [b]

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Who need to be AI literate ?

Dec 9, 2024

2025 Cybersecurity Outlook: The Year of AI Literacy and Hands-On Cybersecurity Skills

In a rapidly shifting digital landscape, 2025 is shaping up to be a defining year for artificial intelligence (AI) and cybersecurity. Keatron Evans, Vice President of AI Strategy at Infosec Institute, recently shared insights that highlight how tech professionals must evolve to stay relevant in the face of increasingly complex challenges.

The Push for AI Fluency

"People that are serious about maintaining an edge in cyber need to get themselves closer to the technology, not just the consumer usage of it," Evans emphasized. His prediction that the coming year will focus on understanding AI's underlying technologies reflects a broader trend: simply knowing how to use AI tools won't cut it anymore. Professionals will need to

Who need to be AI literate ?

- The previous examples seem to require AI users be equipped with AI literacy.

- Passively, they may be the targets of cybercrimes.

- Actively, they may be engaged in abusing or misusing AI.
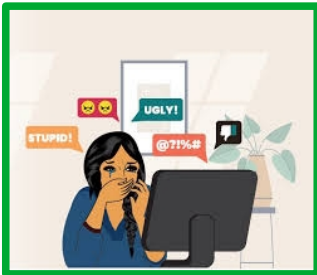
Who need to be AI literate ?

- **Such users as senior citizen, for example ?**

Older Americans prepare themselves for a world altered by artificial intelligence

Who need to be AI literate ?

- International organizations such as UNESCO, OECD or European Union focus on AI builders rather than AI users.

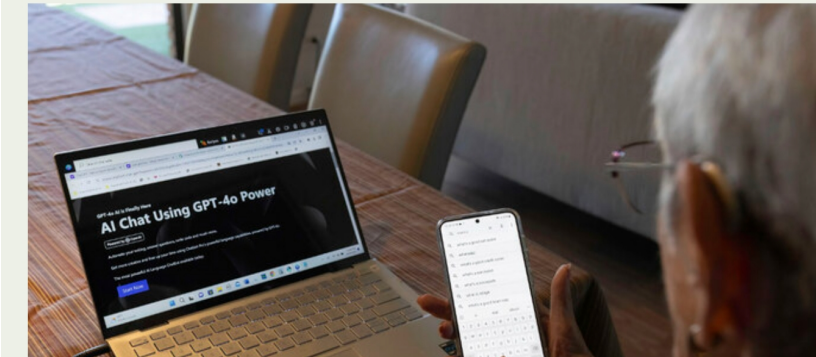- The AI builders are those who develop and provide AI platforms in cyberspace.

- The concept of AI builders vs AI users was established by OECD.

BUILD PHASE:
An AI system is a **machine-based** system, that

AI SYSTEM
ENVIRONMENT (CONTEXT) physical / virtual — Perceive — DATA & INPUT — AI MODEL Step 1) BUILD PHASE (train) — Objectives explicit / implicit — OUTPUTS

- for **explicit or implicit objectives**
- **infers**, from the **input** it receives
- How to **generate outputs** such as predictions, content, recommendations, or decisions

USE PHASE (once the model is built):
An AI system is a **machine-based** system, that

AI SYSTEM
ENVIRONMENT (CONTEXT) physical / virtual — Perceive — DATA & INPUT — AI MODEL 2. USE PHASE — Objectives explicit / implicit — OUTPUTS — Influence

- for explicit or implicit objectives
- infers, from the input it receives
- How to generate outputs such as predictions, content, recommendations, or decisions
- **that [can] influence physical or virtual environments;**
Different AI systems vary in their levels of autonomy and adaptiveness [after deployment].

Who need to be AI literate ?

- **OECD recommnded the AI principles in 2019.**

- **These principles are for the AI developers and providers, i.e., AI builders.**

To date, there are 47 governments that have committed to the OECD AI Principles, including the U.S. Its value-based principles include:

- inclusive growth, sustainable development, and well-being;
- human rights and democratic values, including fairness and privacy;
- transparency and explainability;
- robustness, security, and safety; and
- accountability.

Who need to be AI literate ?

- EU AI Act set in 2023 is a regulation that establishes rules for the development, use, and marketing of AI in the EU.

- The act aims to make AI in the EU safe, trustworthy, and respectful of fundamental rights.

- It mainly aims AI builders,

  not its users.

EU Artificial Intelligence Act: Risk levels

- Social scoring, mass surveillance, manipulation of behaviour causing harm — Unacceptable risk — Prohibited
- Access to employment, education and public services, safety components of vehicles, law enforcement, etc. — High risk — Conformity assessment
- Impersonation, Chatbots, emotion recognition, biometric categorization deep fake — Limited risk — Transparency obligation
- Remaining — Minimal risk — No obligation

AI literacy for AI builders

- **Hence, the answer is the AI builders.**

- **They should know and understand OECD principles, UNESCO recommendations, and EU AI Act, and comply with them.**
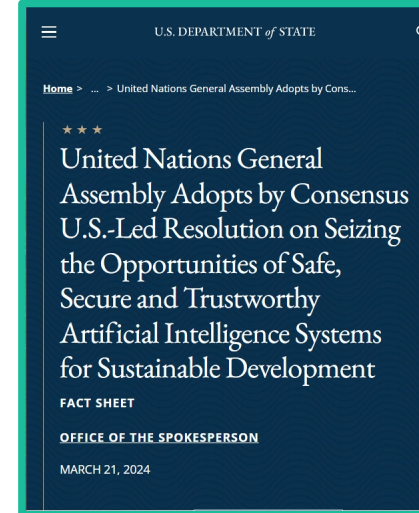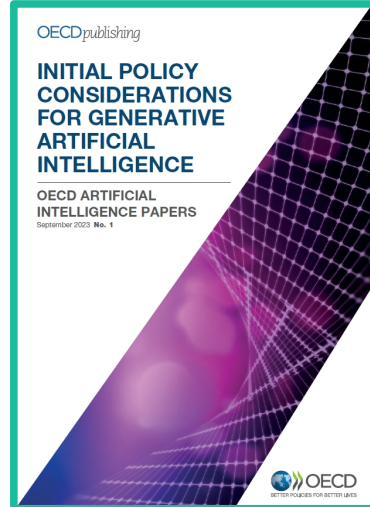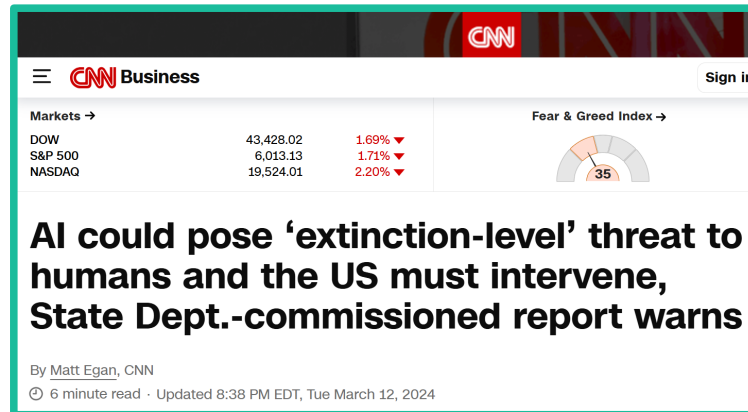
Closing comment

- I would like to ask IT experts who are AI builders :

- Please do not

  - Mystify AI

  - Over-exaggerate AI

  - Almighty AI

  - Threaten users

HALF OF NEW GRADUATES FEEL THREATENED BY THE GROWTH OF AI

AI and you: de-mystifying artificial intelligence

Are you concerned about AI and its effects on your life? Is it just the latest fad, or here to stay?

#AI

CNN Business

Markets →			
DOW	43,428.02	1.69% ▼	
S&P 500	6,013.13	1.71% ▼	
NASDAQ	19,524.01	2.20% ▼	

Fear & Greed Index → 35

AI could pose 'extinction-level' threat to humans and the US must intervene, State Dept.-commissioned report warns

By Matt Egan, CNN

6 minute read · Updated 8:38 PM EDT, Tue March 12, 2024

OCTOBER 2024

AI, EVERYWHERE, ALL AT ONCE

A NEW POLICY AGENDA FOR AI SUCCESS THROUGH FASTER ADOPTION

MARC E. OUIMETTE   ED TEATHER   KEVIN ALLISON

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Closing comment

- **But please**

  - **Design user-friendly AI**

  - **Make AI accessible, accountable, transparent and responsible, according to UNESCO recommendations, OECD principles and EU AI Act.**
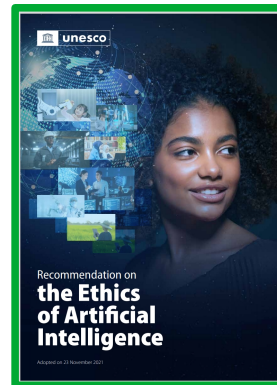
Thank you very much for your attention