

The Potential of AI in Global Development

OUTLINE



Artificial intelligence: what does it entail?



Why is it relevant: Practical application of AI in International Development



Limitation & Risks



Next steps in AI

**How many of you
worked with AI or
related technologies?**

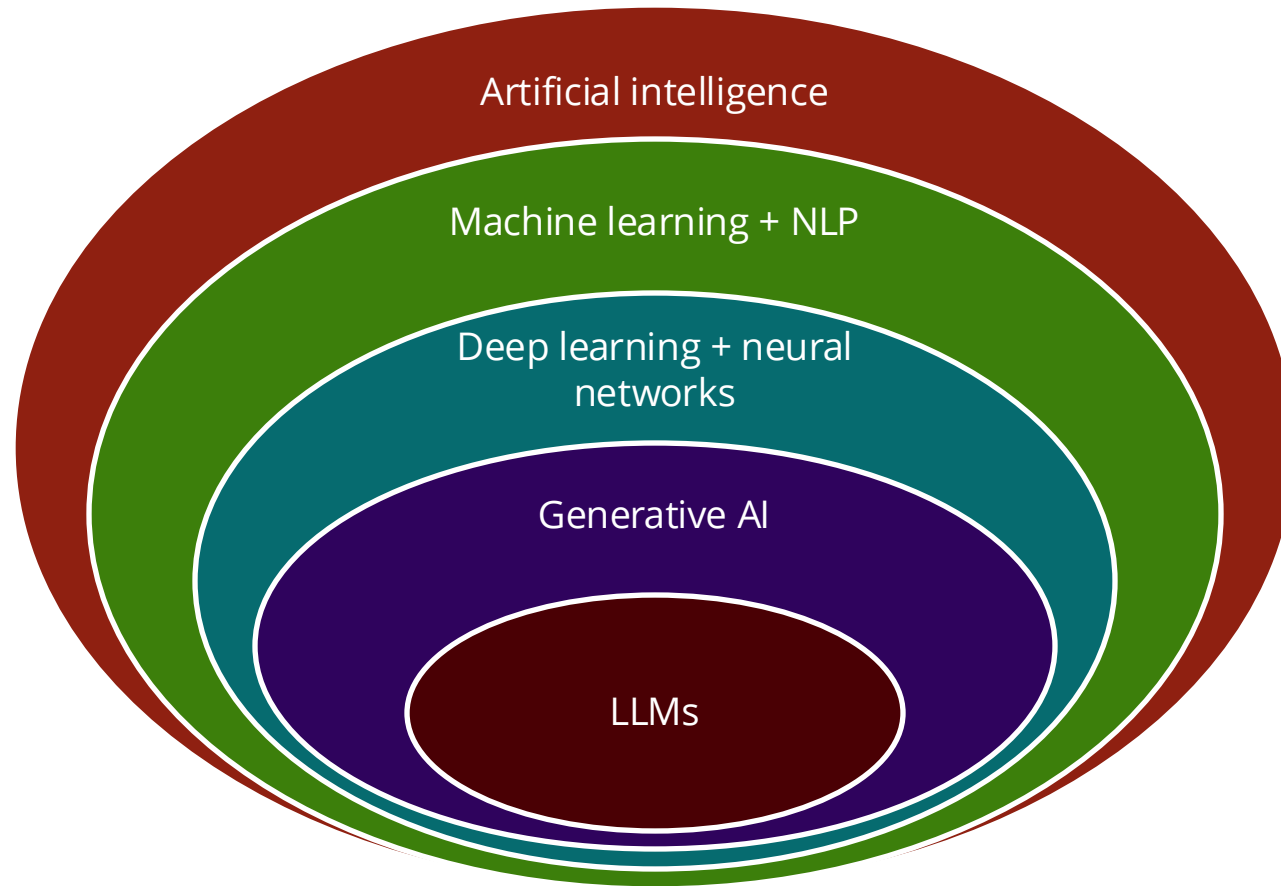
AI: WHAT IS IT?

- “the science and engineering of making intelligent machines” (McCarthy, 1956)
- Artificial intelligence (AI), in which machines can “learn from experience, adjust to new inputs, and perform human-like tasks” (Duan et al., 2019)
- You might have already interacted with AI in one form or another:
 - *Grammarly, ChatGPT, Bard/Gemini, Co-pilot*
 - *Siri / google assistant, google maps*
 - *Streaming platforms (Netflix, Amazon prime)*
 - *Gaming*

amazon prime



AI OVERVIEW



AI: WHAT ARE LLMS?

- Large language models (LLM) or Generate AI is what technologies like ChatGPT are based on
- Trained on data from the internet to find patterns



chunk of internet



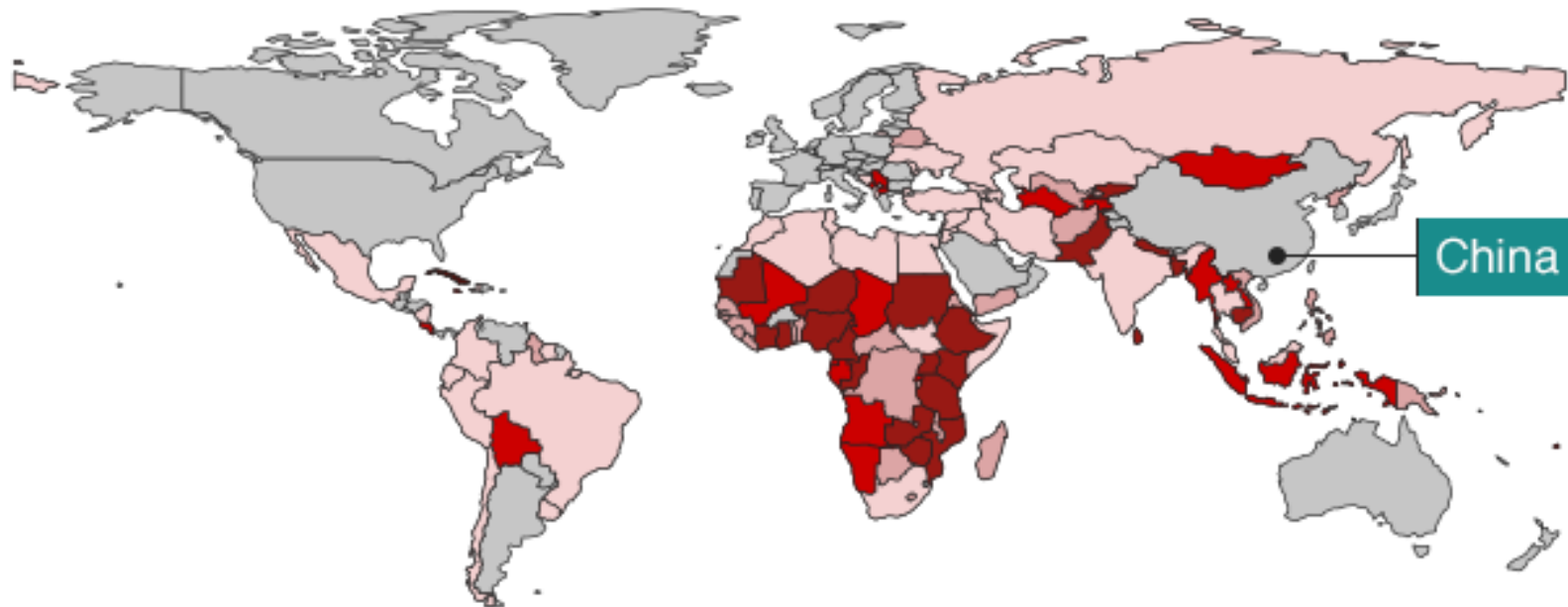
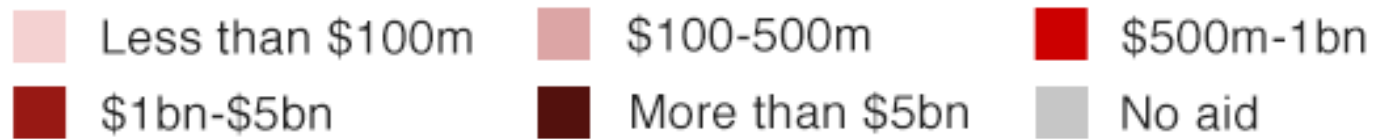
Specialized computers – GPUs

- LLMs can also make use of other resources just like humans



CHINA'S AID TO OTHER COUNTRIES

Where China sends aid, 2000-2014

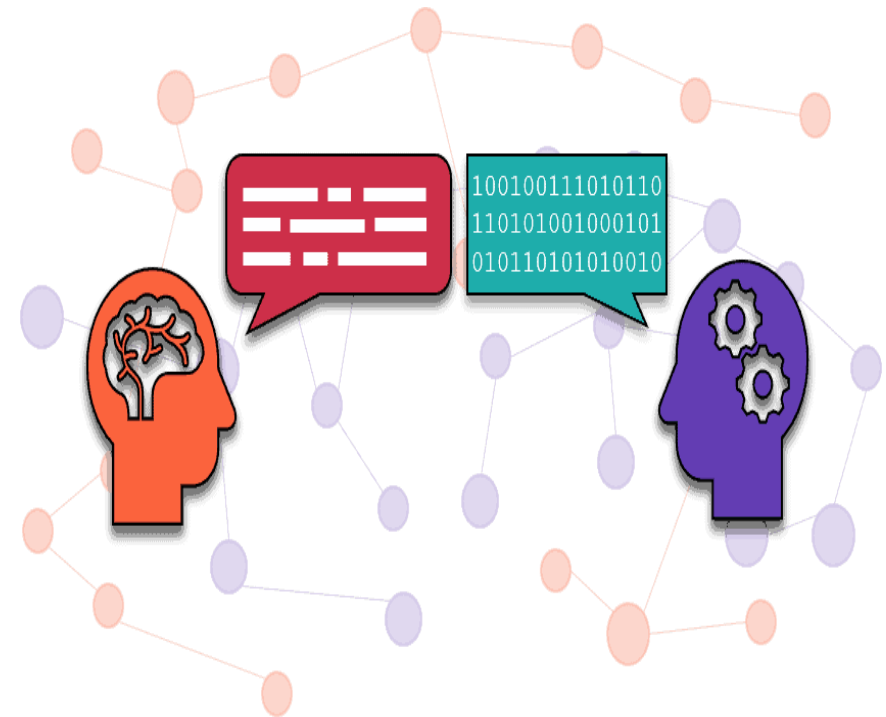


Source: AidData

BBC

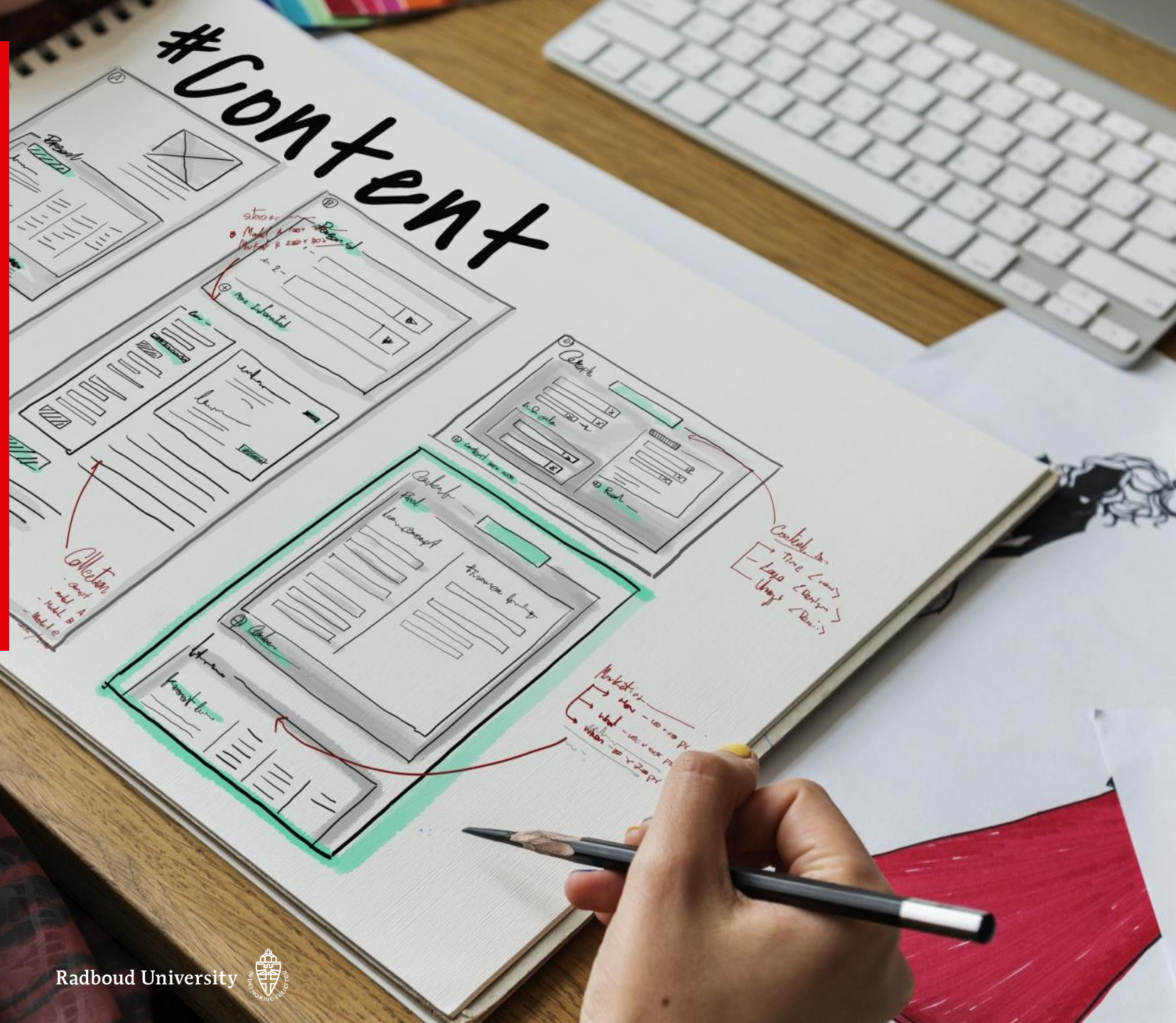
AI: WHAT IS NATURAL LANGUAGE PROCESSING (NLP)

- Using machine learning to determine the structure and meaning of text
- It can be used for information extracting, sentiment analysis, topic analysis,
- You might have already used it in:
 - language translation,
 - text prediction,
 - autocomplete,
 - digital phone calls

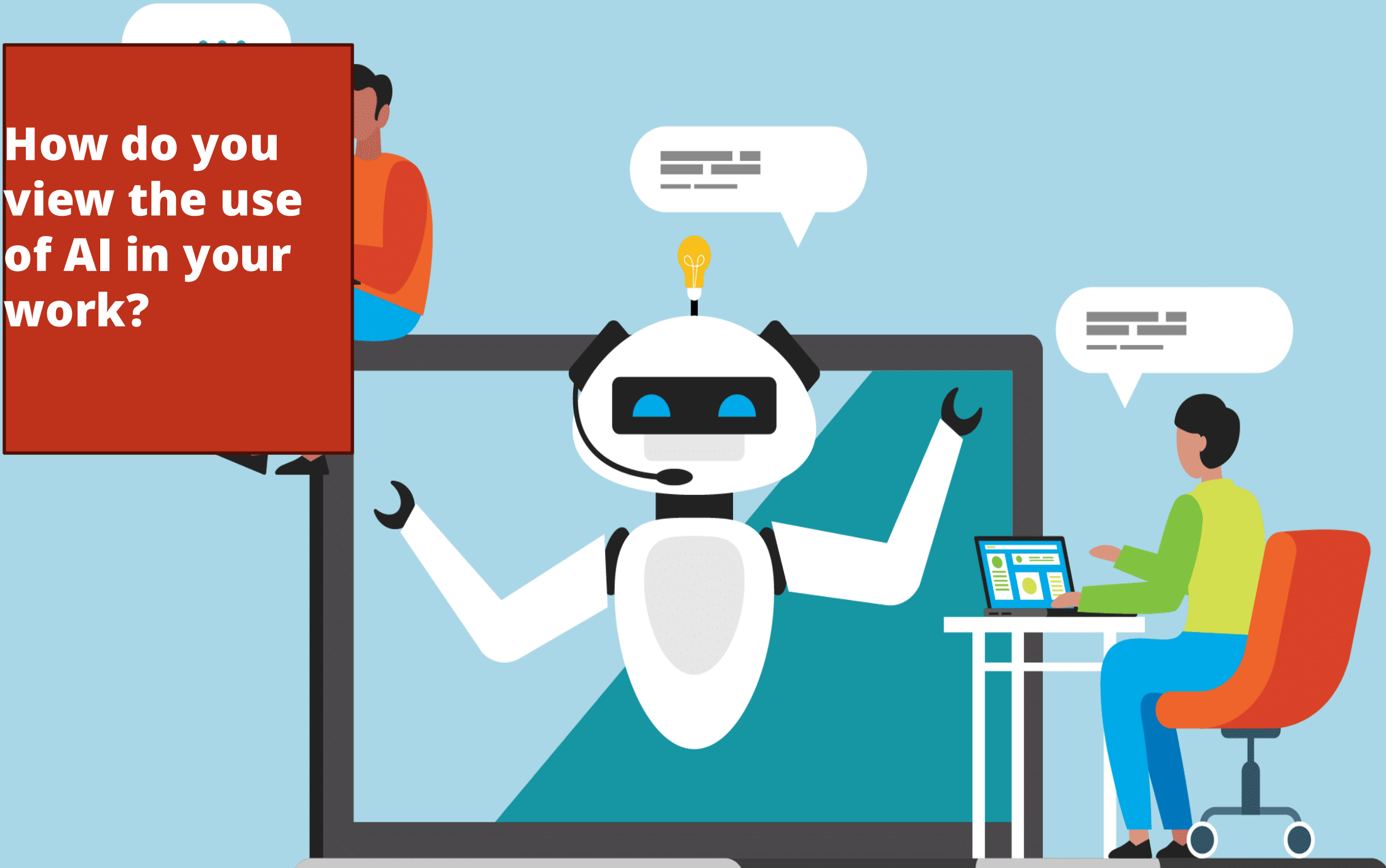


WHY IS AI RELEVANT?

What AI or
algorithmic tools
are being used at
your work?



**How do you
view the use
of AI in your
work?**



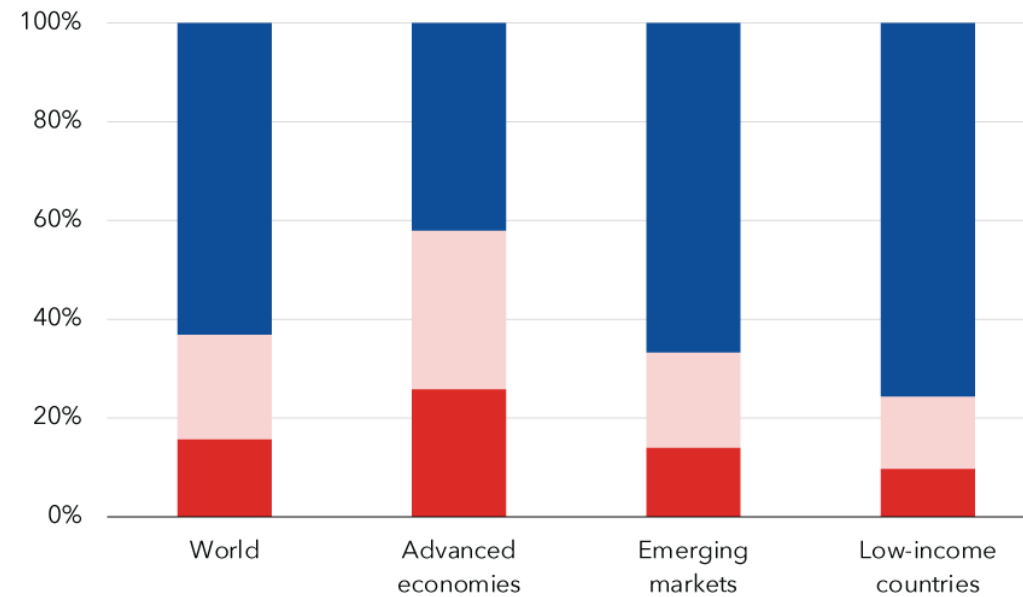
IMPACT ON JOB

AI's impact on jobs

Most jobs are exposed to AI in advanced economies, with smaller shares in emerging markets and low-income countries.

Employment shares by AI exposure and complementarity

■ High exposure, high complementarity ■ High exposure, low complementarity
■ Low exposure



Source: International Labour Organization (ILO) and IMF staff calculations

Note: Share of employment within each country group is calculated as the working-age-population-weighted average.

IMF

AI RELEVANCE FOR DEVELOPMENT PROJECTS

AI use in development sector	Examples
Learning from evaluations	Text mining
Selecting interventions areas	Geo-coding & imaging
Monitoring & Evaluation	Geo-coding, Predictive & Generative AI
Predicting risks/escalation of issues	Predictive AI
Fundraising/ marketing	Automatic telemarketing through NLP Text writing using Generative AI

AI APPLICATIONS – SECTORAL EXAMPLES

Sectors	AI examples
Health	<u>Aajoh</u> , Nigerian product, is developing an AI system for remote medical diagnosis to deal with a massive shortage of doctors in the country UNICEF is working on a facial recognition system to <u>detect malnutrition</u> in children around the world
Education	<u>Geekie</u> , an adaptive learning start-up in Brazil, is using AI to provide tailored virtual tutoring to students
Agriculture	South African start-up <u>Aerobotics</u> uses drones and satellite images to help farmers optimize crop yields in Malawi, Zimbabwe, and Mozambique <u>mCrops</u> is using image processing tools to help farmers in Uganda diagnose crop disease

Sectors	AI examples
Rule of Law	The World Wildlife Fund is using AI-powered drones in Kenya to <u>apprehend wildlife poachers</u>
Humanitarian response	The United Nations is using natural language processing to <u>analyze radio content</u> in Uganda and gain insight into public opinion and the effectiveness of UN programs
Finance	<u>Kudi.ai</u> , a Nigerian chatbot system, allows people to make payments and send money via messaging
Infrastructure	IBM has committed \$100 million as part of its <u>Project Lucy</u> to help improve infrastructure across Africa. It is currently using AI to help farmers improve crop yields.

IMPLICATIONS OF AI IN DEVELOPMENT



EFFECTIVE
PROGRAMING



BETTER LEARNING &
DECISION MAKING



LOWER COSTS (IN THE
LONG RUN)



BETTER REPORTING &
COMMUNITY
ENGAGEMENT

LIMITATION & RISKS

DATA BIAS, INCOMPLETENESS & INEQUALITY



ChatGPT 3.5 ▾



You

Do Israel have a right to freedom?



ChatGPT

Yes, Israel, like any other sovereign nation, has the right to freedom and self-determination. Israel was established as a Jewish state in 1948, following the United Nations' partition plan for British Mandate Palestine. The State of Israel was founded to provide a national homeland for the Jewish people, who had faced centuries of persecution culminating in the Holocaust during World War II.

Israel's right to exist and its right to defend itself are recognized by numerous countries and international organizations. These rights are enshrined in international law, including the principles of self-determination and the Charter of the United Nations.

However, it's important to note that the concept of Israel's freedom is intertwined with complex geopolitical realities and the Israeli-Palestinian conflict. The issue of Palestinian statehood and the rights of Palestinians living in the occupied territories are central to discussions surrounding

ChatGPT 3.5 ▾



You

Do Palestine have a right to freedom?



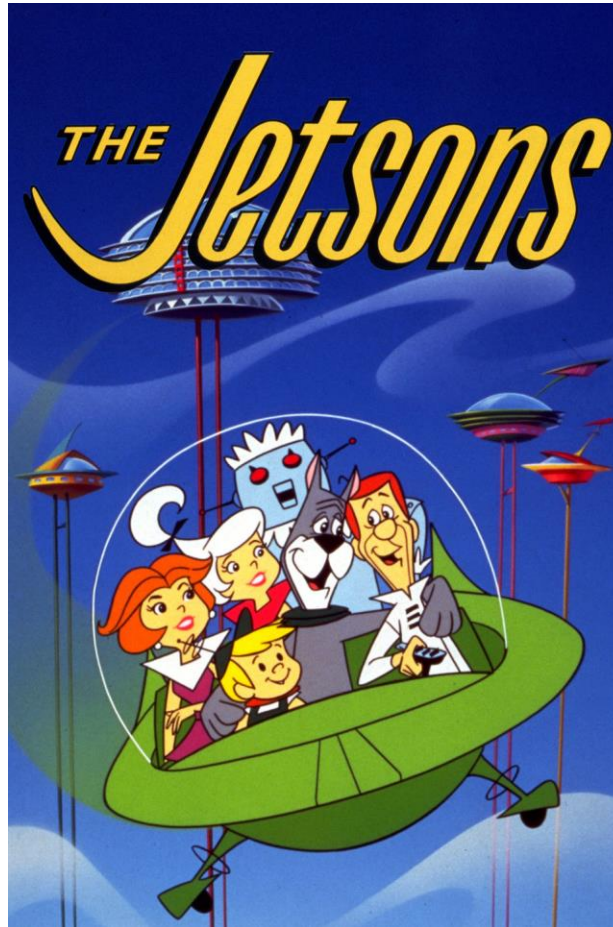
ChatGPT

The question of whether Palestine has a right to freedom is a complex and contentious issue deeply rooted in history, politics, and international law.

Palestinians have long asserted their right to self-determination and freedom from occupation, primarily in the context of the Israeli-Palestinian conflict. The issue revolves around the establishment of a sovereign Palestinian state alongside Israel, with borders based on pre-1967 lines, known as the two-state solution. This solution has been endorsed by numerous international bodies and resolutions, including United Nations Security Council Resolution 242.

However, the path to achieving Palestinian freedom has been hindered by a range of factors, including ongoing Israeli occupation of Palestinian territories, settlement expansion, disputes over borders and resources, security concerns, and the lack of a comprehensive peace

GENDER BIAS



PRIVACY ISSUES & PLAGIARISM



- Generative and predictive AI makes use of data – raising privacy concerns
- Since generative AI and LLMs rewrite information available on internet – raises concerns about plagiarism

ETHICAL CONCERNS



- OECD incidence monitor (AIM) developed as a tool to determine the progress and problems related to AI for comprehensive policy making in development cooperation

ENVIRONMENTAL & SUSTAINABILITY CONCERNS

- High operational costs
- High carbon footprint of GPUs
- Require a lot of energy to run
- Need rare earth metals for manufacturing of graphic cards



ENVIRONMENTAL CONCERNS

BERT

- Google, 2019
- Parameters: 300 million
- Training on a GPU is roughly equivalent to a trans-American flight (284 tons of CO₂)

BLOOM

- Hugging Face, 2022
- Training: 25 tons of CO₂ (30 flights between London and New York)
- Less than equivalent LLMs because of nuclear energy

GPT-3

- Open AI, 2020
- Parameters: 175 billion
- Training: 500 tons of CO₂ (600 flights)

COST EFFECTIVENESS





0.7 million USD spent on running ChatGPT 3.5 per day

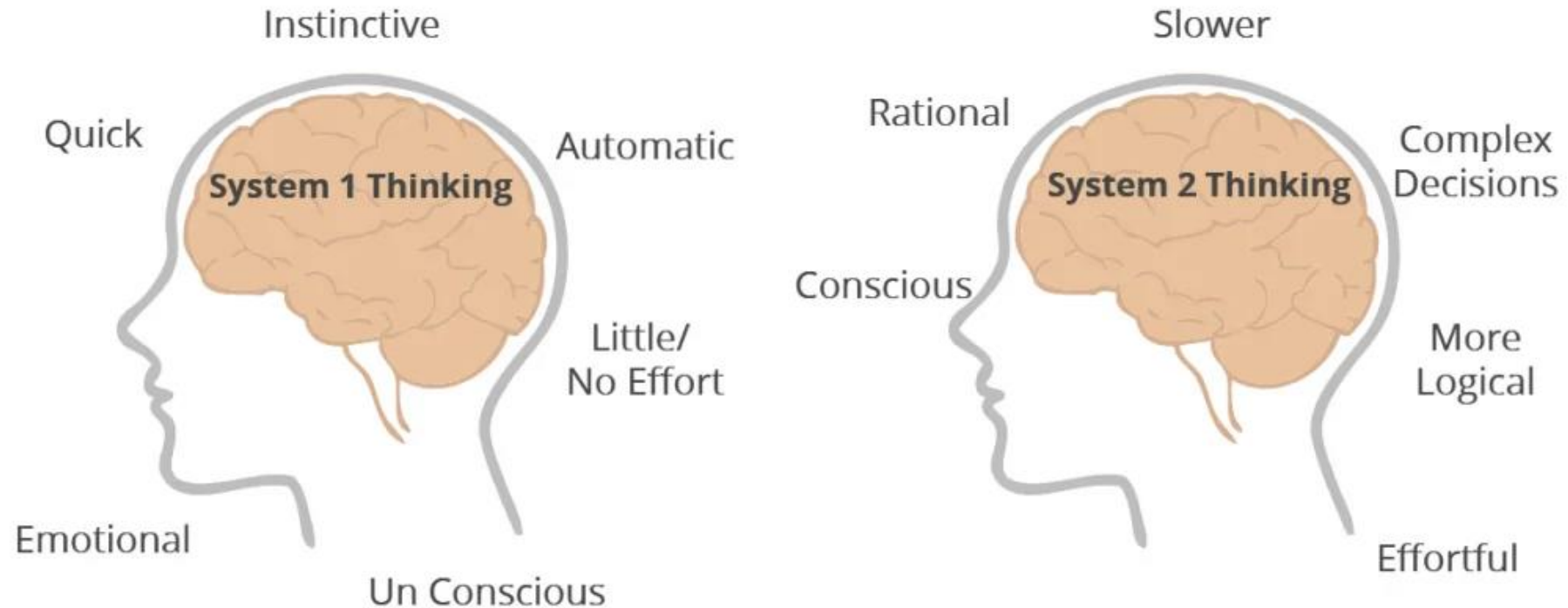


10 million queries per day

NEXT STEPS FOR AI

THINKING 1 AND THINKING 2

DANIEL KAHNEMAN'S SYSTEMS OF THINKING



Source: Andrej Karpathy, 2023; Yao et al., 2023

SELF IMPROVEMENT

- Until now generative AI learns by imitating humans and the training data that is made available
- The next step for LLMs would be that they are able to function beyond the input provided to them by the human labelers
- For smaller games in a sandbox (for example AlphaGo), it already works
- However, tricky to make it work for language models that lack reward functions
- Open question among researchers and industry specialized in LLMs



CUSTOMIZATION ACCORDING TO BUSINESS NEEDS

- Customization of generative AI according to business needs
 - Co-pilot/ Grammarly is a start
 - GPT has its own app store

Source: <https://www.imf.org/en/Blogs/Articles/2024/01/14/ai-will-transform-the-global-economy-lets-make-sure-it-benefits-humanity#:~:text=Roughly%20half%20the%20exposed%20jobs,of%20these%20jobs%20may%20disappear.>

