International Federation of Library Associations and Institutions (IFLA). Artificial Intelligence Special Interest Group (AI SIG)

Generative Artificial Intelligence for Library and Information Professionals

Produced by the IFLA Artificial Intelligence Special Interest Group.

In compiling this resource, we are seeking to provide a useful non-technical resource for information library and information professionals. We try to point to authoritative sources which are open to all.

Introduction to Generative Artificial Intelligence

Generative artificial intelligence (AI) refers to systems that can produce new text, images or other media. Generative AI can be differentiated from *descriptive AI* which focuses on improving access to content such as text, images, audio and video by identifying features in them to enhance search.

Resources

Miao, Fengchun, Wayne Holmes, Ronghuai Huang, and Hui Zhang. 2021. *AI and Education? Guidance for Policy-makers.* Paris, UNESCO. https://doi.org/10.54675/PCSP7350. Available in multiple languages.

Miao, Fengchun, and Wayne Holmes. 2023. *Guidance for Generative AI in Education and Research.* Paris: UNESCO, 2023. https://doi.org/10.54675/EWZM9535. Available in multiple languages.

Ortiz, Sabrina. 2023. "What is Generative AI and Why Is It So Popular? Here's Everything You Need to Know." *ZDNet,* April 23, 2024. https://www.zdnet.com/article/what-is-generative-ai-and-why-is-it-so-popular-heres-everything-you-need-to-know/.

Sabzalieva, Emma, and Arianna Valentini. 2023. *ChatGPT and Artificial Intelligence in Higher Education: A Quick-start Guide."* ED/HE/IESALC/IP/2023/12. Paris: UNESCO and UNESCO International Institute for Higher Education in Latin America and the Caribbean (IESALC). https://www.iesalc.unesco.org/wp-content/uploads/2023/04/ChatGPT-and-Artificial-Intelligence-in-higher-education-Quick-Start-guide_EN_FINAL.pdf.

https://doi.org/10.1515/9783111336435-027

1.1 Examples of Generative Artificial Intelligence

GPT has been around for some time. The launch of Chat GPT by OpenAI in November 2022 propelled this form of AI into the headlines probably because it made the use of GPT very user friendly through its chat interface.

- ChatGPT https://openai.com/blog/chatgpt
- The new Bing https://www.bing.com or Copilot https://copilot.microsoft.com/
- Gemini (initially known as BARD) https://gemini.google.com/, and
- HuggingChat https://huggingface.co/chat/.

Image generators:

- Dall-E2 https://openai.com/dall-e-2
- Midjourney https://www.midjourney.com/
- Niji Journey https://nijijourney.com/en/, and
- Stability.ai https://stability.ai/stablediffusion.

The wider proliferation of websites and apps with generative AI embedded can be tracked on websites such as:

- Hugging Face. "Models." https://huggingface.co/models
- Futurepedia. https://www.futurepedia.io/, and
- There's an AI for That https://theresanaiforthat.com/.

Within the research tool space, there are services like scholarlyAI, research buddy, and openread. They are being tracked by Ithaka S+R (Baytas and Ruediger 2024).

Resources

Baytas, Claire, and Dylan Ruediger. 2024." Generative AI in Higher Education: The Product Landscape." *Ithaka S+R. Issue Brief,* March 7, 2024. https://doi.org/10.18665/sr.320394.

1.2 How Generative Artificial Intelligence Works

An important example of generative AI are text generators like GPT. An excellent *Guardian* visual explainer listed in the resources below shows how the text generators work.

Resources

Clarke, Seán, Dan Milmo, and Garry. 2023. "How AI Chatbots Like ChatGPT or Bard Work: Visual Explainer." *The Guardian*, November 1, 2023. https://www.theguardian.com/technology/ng-interactive/2023/nov/01/how-ai-chatbots-like-chatgpt-or-bard-work-visual-explainer.

Colin, Eberhart. 2023. "A Guide to Generative AI Terminology." *Scott Logic [blog].* June 1, 2023. https://blog.scottlogic.com/2023/06/01/generative-terminology.html.

2. Ethical and Informational Issues

Generative AI such as ChatGPT has potential benefits with some uses mentioned below, but reflections on the ethics of AI should always be considered prior to use.

The following have been raised as issues with some versions of generative AI, such as ChatGPT. Details of the references are listed in the resources below:

- Makes biased statements because of biases in training data and how the training data was curated. For example, GPT has been shown to be biased about gender and race, amongst other factors (Webb 2023). Trained largely on open web data, GPT is bound to under-represent regions that are under-represented on the web, and areas which are under-represented in AI research (Kommi-noth 2023)
- "Hallucinates" information which is inaccurate, feeds the flow of misinformation, fails to acknowledge sources, often fabricates citations, and is in itself not citable because consistent answers are not currently generated
- Accelerates the content creation explosion leading to even more challenges of information overload
- Fails to be explainable because it is far from open about the basis of training data used or how it works (Burruss 2020)
- Risks invasion of privacy if data is shared, with many companies blocking use due to fear of loss of data. Students at many institutions are advised not to put personal data into such websites
- Appears to be violating intellectual property rights by using copyright information as training data without permission (Mahari, Fjeld, and Epstein 2023).
- Threatens jobs, for example, of journalists, editors and people in marketing. The German publisher Axel Springer has announced its use of AI and bots and potential replacement of some journalists
- Is available in more advanced forms to people with money to subscribe and creates inequities in access to information

- Was developed by exploiting very low paid Kenyan workers to detoxify content (Perrigo 2023)
- May not be environmentally sustainable: GPT models are known to use a lot of computing power (Ludvigsen 2022), and
- Reveals the disruptive power in the hands of the Big Tech companies.

The balance of importance of these factors may vary between contexts. In higher education and universities, the impact on academic integrity is central to the debate; in corporate research the inaccuracy of information is critical. In some contexts, it may be possible to ban some forms of generative AI or procure a localised system. For example, it is possible to run some open-source AI models locally via Python or R without uploading private documents to the cloud. Retrieval Augmented Generation (RAG) is a promising technology that seeks to combine text generation with information quality assurance through trusted sources.

Fundamentally, although generative artificial intelligence has enormous potential for innovation and undeniably has significantly more knowledge than any individual human, it lacks the ability to reason, consciousness and some of the most advanced human qualities.

Concerns raised by ChatGPT, among other factors, re-energised plans to regulate AI, with a notable achievement the European Union's *Artificial Intelligence Act (EU AI Act).* It has been reported that:

> Generative AI, like ChatGPT …will have to comply with transparency requirements and EU copyright law:
> - Disclosing that the content was generated by AI
> - Designing the model to prevent it from generating illegal content
> - Publishing summaries of copyrighted data used for training (European Parliament 2023).

Bommasani et al. (2023) weigh up whether foundation model providers like OpenAI and Google comply with requirements in the draft *EU AI Act*.

Resources

AI, Algorithmic, and Automation Incidents and Controversies (AIAAIC). 2024. "ChatGPT Chatbot." *[AIAAIC Repository].* https://www.aiaaic.org/aiaaic-repository/ai-algorithmic-and-automation-incidents/chatgpt-chatbot.

AI Incident Database (AIID). 2023. "Welcome to the AI Incident Database." https://incidentdatabase.ai/?lang=en.

Bender, Emily M., Timnit Gebru, Angelina McMillan-Major, and Shmargaret Shmitchell. 2021. "On the Dangers of Stochastic Parrots: Can Language Models

Be Too Big?" In *FAccT '21*: *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency,* March 2021, 610–623. New York: Association for Computing Machinery. https://doi.org/10.1145/3442188.3445922.

Bommasani, Rishi, Kevin Klyman, Daniel Zhang, and Percy Liang. 2023? "Do Foundation Model Providers Comply with the Draft EU AI Act?" *Stanford University Center for Research on Foundation Models(CRFM) Human-Centered Artificial Intelligence.* https://crfm.stanford.edu/2023/06/15/eu-ai-act.html.

Burruss, Matthew. 2020. "The (Un)ethical Story of GPT-3: OpenAI's Million Dollar Model." [Blog], July 27, 2020. https://matthewpburruss.com/post/the-unethical-story-of-gpt-3-openais-million-dollar-model/.

European Parliament. 2024. "EU AI Act: First Regulation on Artificial Intelligence." *Topics,* June 8, 2023. Updated June 18, 2024. https://www.europarl.europa.eu/news/en/headlines/society/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence.

Floridi, Luciano. 2023. "AI as *Agency Without Intelligence*: On ChatGPT, Large Language Models, and Other Generative Models: Editorial." *Philosophy and Technology* 36, art.no.15. https://doi.org/10.1007/s13347-023-00621-y. Available at http://dx.doi.org/10.2139/ssrn.4358789.

Komminoth, Leo. 2023. "Chat GTP and the Future of African AI." *African Busines,* January 27, 2023. https://african.business/2023/01/technology-information/chat-gtp-and-the-future-of-african-ai.

Ludvigsen, Kasper Groes Albin. 2022. "The Carbon Footprint of Chat GPT." *Medium,* December 22, 2022. Updated March 20, 2023. Published in *Towards Data Science*. https://towardsdatascience.com/the-carbon-footprint-of-chatgpt-66932314627d.

Mahari, Robert, Jessica Fjeld, and Ziv Epstein. 2023. "Generative AI is a Minefield for Copyright Law." *The Conversation,* June 26, 2023. https://theconversation.com/generative-ai-is-a-minefield-for-copyright-law-207473.

Perrigo, Billy. 2023. "Exclusive: OpenAI Used Kenyan Workers on Less Than $2 Per Hour to Make ChatGPT Less Toxic." *Time,* January 18, 2023. https://time.com/6247678/openai-chatgpt-kenya-workers/.

Webb, Michael. 2023. "Exploring the Potential for Bias in Chat GPT." *JISC Artificial Intelligence,* January 26, 2023. https://nationalcentreforai.jiscinvolve.org/wp/2023/01/26/exploring-the-potential-for-bias-in-chatgpt/.

3. Uses

3.1 Uses for Information Professionals

Large language models (LLMs) have immense potential for information work. Many of the problems of specific services such as ChatGPT are more about how it has been implemented than about the underlying technology.

Text-based generative AI can be used in one of its current versions for:

- Summarisation of texts, for example lay summaries of academic papers
- Generating draft metadata to describe material, and
- General uses such as drafting documents and communications, for example policy documents, and targeted marketing.

3.2 Guiding Users to Safe Uses

This section summarises how an information literate user should be trained to approach generative AI tools to evaluate how to use them effectively and to understand critically the wider context of how platforms work to shape information experiences and is presented as a set of prompts.

1. Learn how to use generative AI effectively, by experiment and reading reviews:
    a. How should the tool be conceived? A clever writing assistant or a single point of truth?
    b. For what tasks might it be helpful? Brainstorming, drafting, editing, writing in different styles, summarisation?
    c. Is it trustworthy as a source of information? Is the information supplied accurate and are sources given?
    d. Are there systematic inaccuracies in the material produced? Any biases?
    e. How can questions be formulated to get the best answer? (Sometimes referred to as prompt engineering)
        i. Define style and/or audience
        ii. Repeat the request and synthesise answers
        iii. Ask for sources that can be checked
    f. Are there alternatives that might be better for certain tasks?
    g. Keep on learning: the tools are evolving rapidly
2. Use generative AI to improve how you learn and be reflective about the type of use:
    a. Is it helping to improve your learning or just making things too easy?
    b. How does using the tool make you feel?

   c. Is it making you feel less connected to people?
3. Protect your own privacy:
   a. What type of information is it safe to share?
4. Ask who owns, develops and profits from it and the wider related system of information discovery on the platforms you use:
   a. Is it owned by commercially driven corporations so that use feeds their power and control?
      i. Is the system open about how it works? Is recommendation narrowing access to information as a form of filter bubble?
   b. Was it created exploitatively by using low paid labour or by mining information without permission?
   c. Does it have a negative environmental impact?
   d. Does everyone have equal access or is using it give some an unfair advantage?
5. Use it ethically, acknowledging the use:
   a. What are appropriate uses in any particular context? Such as for assessment tasks in learning or in an organisational setting.
   b. Acknowledge use appropriately for the context. There are citation guides https://apastyle.apa.org/blog/how-to-cite-chatgpt.

A model of generative AI literacy has been published by Zhao, Cox, and Cai (2024).

Resources

Zhao, Xin, Andrew Cox, and Liang Cai. 2024. "ChatGPT and the Digitisation of Writing." *Humanities and Social Sciences Communications* 11, article no. 482. https://doi.org/10.1057/s41599-024-02904-x.

3.3 Guiding Researchers

It remains unclear what uses of generative AI will be determined to be legitimate. There are many open questions about how Generative AI might be used in science (Birhane et al. 2023).

Questions important to researchers include:

- What uses of AI in the research process are permitted? Transcription, simulation of data or writing papers?
- Which journals or publishers allow which types of use?

Resources

Birhane, Abebe, Atoosa Kasirzadeh, David Leslie, and Sandra Wachter. 2023. "Science in the Age of Large Language Models." *Nature Reviews Physics* 5, 277–280. https://doi.org/10.1038/s42254-023-00581-4.

This list is based on the list available on the IFLA SIG website, Version 04 01 2024.