

Old Lady Yells at Cloud: a consideration of AI in libraries

Toni Hoberecht
Technical Services Librarian
Schusterman Library at OU-Tulsa



Thanks to Emrys Moreau for the illustration!

The OLA Technical Services Roundtable (TSRT) Presents

AI and the Ethical Librarian

When: November 19, 2024, 2:00–4:00 PM

Where: Zoom

Cost: \$24 OLA members; \$48 non-OLA members; \$12 students

CEUs: 2

Description:

Libraries face many challenges with the potential of generative AI and its use and impact on library services. But as we explore these challenges, we must not forget to have ethics at the forefront of our decision-making.

Join us for “A Compendium of Ethical Issues in Generative AI and the Path Forward,” an hour-long presentation by Arjay Romanowski of the University of Rochester. The presentation will be followed by a panel, “Ethical Generative AI and Librarianship: Can They Work Together?” with representatives from academic, public, and school libraries.

This presentation will be recorded and distributed to attendees up to 4 weeks after the event.



A large orange circle on the left side of the slide, partially cut off by the edge.

What to expect in this talk

My qualifications to talk about this

What I mean by AI

Where AI might be useful

Reason 1 why I don't like AI

Reason 2, same

Reason 3, also same

Conclusion

What is AI?

—

“AI refers to a range of technologies and methods that enable machines to exhibit intelligent behavior.”



Generative artificial intelligence

37 languages

Contents

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- > History
- > Modalities
 - Software and hardware
- > Law and regulation
- > Concerns
- See also
- References

Article Talk

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From Wikipedia, the free encyclopedia

Not to be confused with [Artificial general intelligence](#). This page focuses on statistical [machine learning](#) AI. For other topics, see [Algorithmic composition](#), [Algorithm art](#), [Generative art](#), [Procedural generation](#).

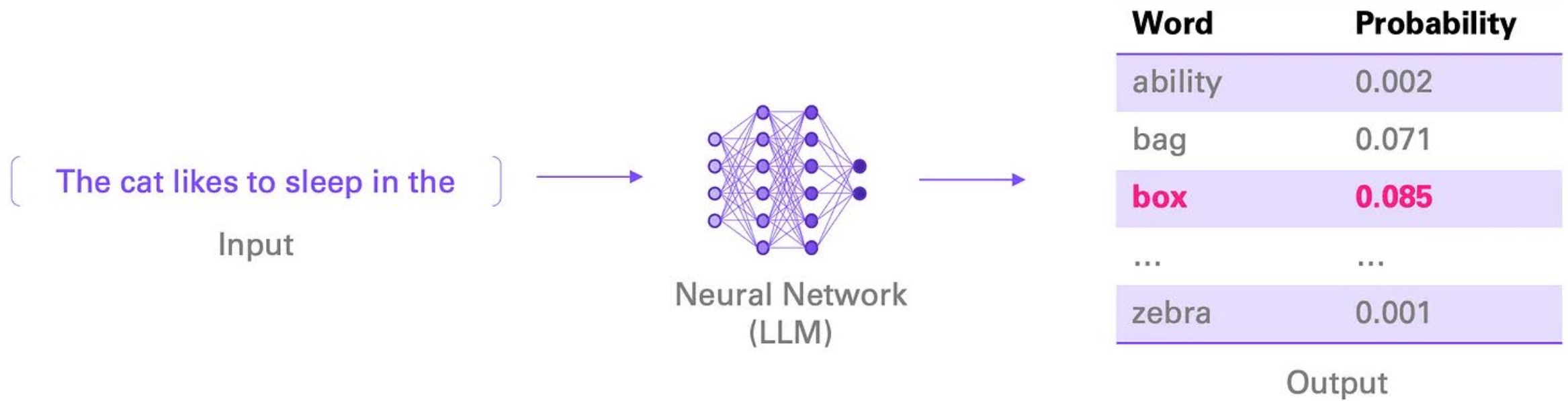
Generative artificial intelligence (**generative AI**, **GenAI**,^[1] or **GAI**) is a subset of [artificial intelligence](#) that uses [generative models](#) to produce text, images, videos, or other forms of data.^[2] These models often generate output in response to specific [prompts](#).^{[3][4]} Generative AI systems [learn](#) the underlying patterns and structures of their [training data](#), enabling them to create new data.^{[5][6]}

Improvements in [transformer](#)-based [deep neural networks](#), particularly [large language models](#) (LLMs), enabled an [AI boom](#) of generative AI systems in the early 2020s. These include [chatbots](#) such as [ChatGPT](#), [Copilot](#), [Gemini](#) and [LLaMA](#), [text-to-image artificial intelligence image generation](#) systems such as [Stable Diffusion](#), [Midjourney](#) and [DALL-E](#), and [text-to-video](#) AI generators such as [Sora](#).^{[7][8][9][10]} Companies such as [OpenAI](#),



Théâtre D'opéra Spatial, an image made using generative artificial intelligence

[The cat likes to sleep in the ____] → What **word** comes next?



“But really,

isn't AI

GREAT? ”



A sonnet about my cat Daisy in the style of Shakespeare *by Microsoft Copilot*

Upon a velvet throne she takes her rest,
A queenly creature, fair and full of grace,
With eyes like emeralds, bright and ever-blest,
She reigns supreme within her cozy space.

Her fur, a silken robe of purest white,
Doth glisten in the gentle morning light,
And in her purrs, a melody so sweet,
A symphony that makes my heart complete.

When shadows fall and night begins to creep,
She curls beside me, soft and warm and deep,
A guardian of dreams, my faithful friend,
In her embrace, all worries find their end.

O Daisy, thou art more than just a pet,
In thee, a love I never shall forget.



A haiku about metadata

by Microsoft Copilot

Hidden in plain sight,
Data about data's life,
Silent guide, so bright.





ai generated images



All

Images

News

Videos

Forums

Shopping

Web

More

Tools



Dream



Ai artwork



Artificial intelligence



Landscape



Person



Weird



Machine learning



Love



New Atlas
2016: The year AI got creative



StatusNeo
How AI-Generated Image...



Gravitec.net
How to Use AI-Generated Images in ...



Medium
Are AI-generated images perpetuating ...



gHacks
U.S judge says A...



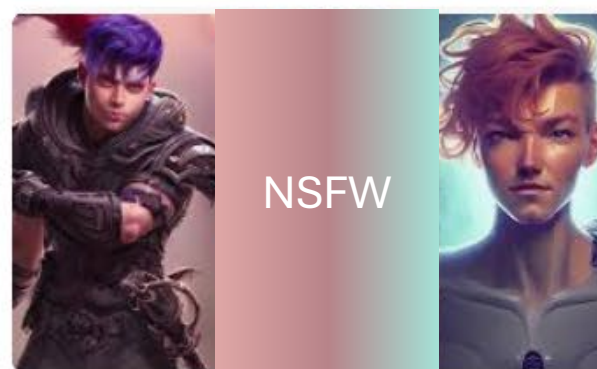
KunstLoft
AI Art: The Fascinating Wo...



The New York Times
We Asked A.I. to Create the Joker. It ...



Climate Outreach
What does AI imagery me...



Mashable ME
AI-generated images have taken over the ...



CBC
Why those AI-generated p...

February 25, 2024

**Get
Started**

As the scope, depth and complexity of cataloging standards evolve and grow, [Ex Libris](#), part of Clarivate, has been building a community to build innovative solutions that ensure content quality, at scale. To this end, Ex Libris is proud to announce an AI-based metadata generator for select Bibliographic records in the [Alma Community Zone](#) that will improve metadata quality, making them more discoverable and accessible for all who use the [library management system](#).

<https://exlibrisgroup.com/announcement/ai-enrichment-metadata-generator/>



Libraries across the world, as well as content providers and aggregators, are managing vast volumes of new and changing content, at a scale that is almost humanly difficult to maintain. At the same time, metadata quality is a critical piece in collection management and collection development, and therefore a necessity for all libraries. Using AI technology enables us – Ex Libris and

Reason 1

What is the energy cost of . . .



Building a data center



Running a data center



Multiple data centers



Training AI



Training multiple instances of AI



Day to day use of AI

<https://arstechnica.com/information-technology/2015/02/the-big-deal-about-big-data-your-guide-to-what-the-heck-it-actually-means/>



What is the energy cost of . . .



Building a data center



Running a data center



Multiple data centers



Training AI

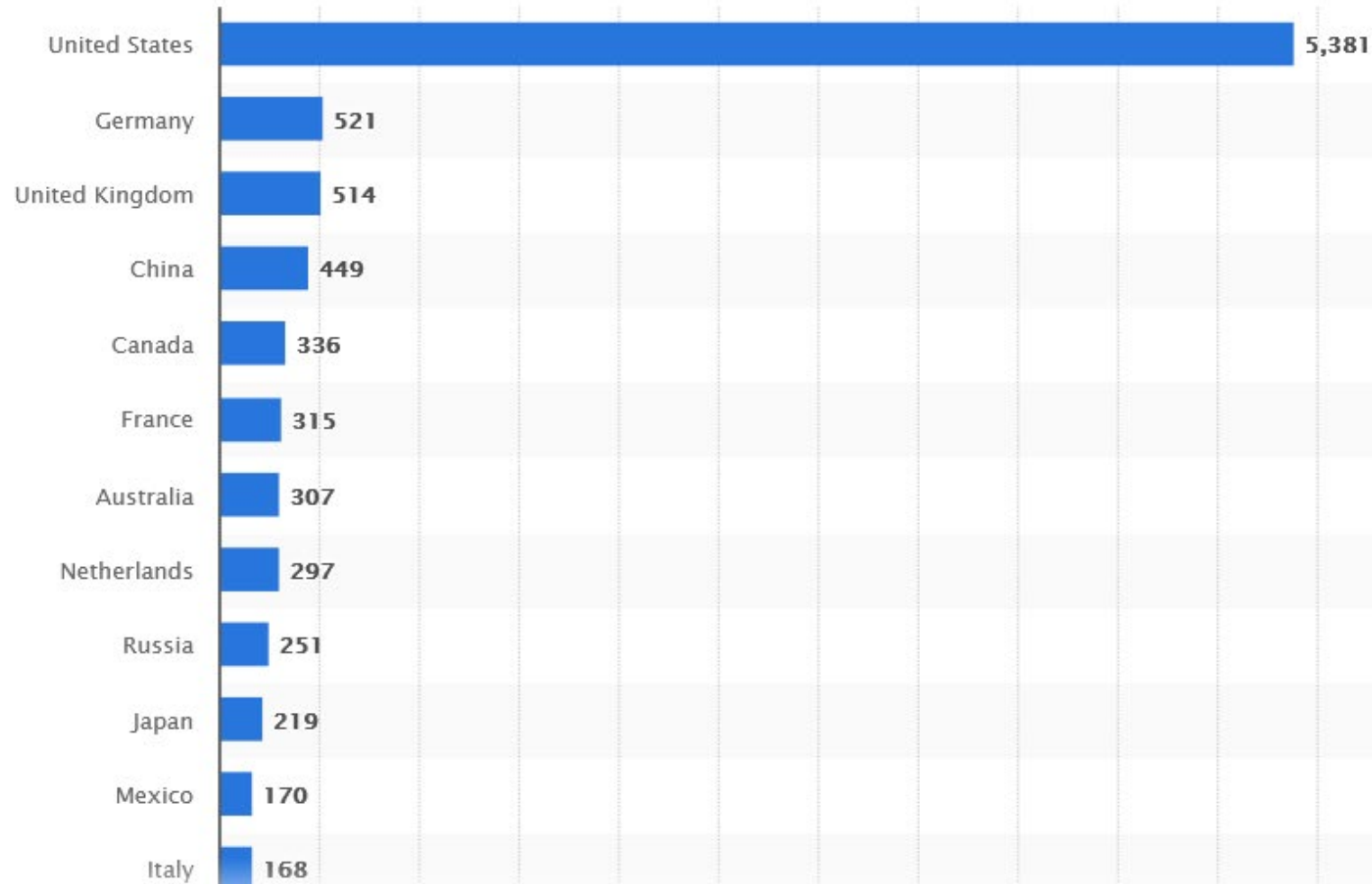


Training multiple instances of AI



Day to day use of AI

Leading countries by number of data centers as of March 2024



What is the energy cost of . . .



Building a data center



Running a data center



Multiple data centers



Training AI



Training multiple instances of AI



Day to day use of AI

REASON 2

How many r's in Strawberry? Why is this a very difficult question for the AI?

Discussion

I've gave this question GPT4o, Claude 3.5, and even Meta's AI. None of them will tell you that it's 3 R's. Instead they give you explanations like these:

GPT4o: There are two "r's" in "strawberry." The word "strawberry" is composed of two parts: "straw" and "berry." The first "r" appears in "straw" and the second "r" appears in "berry." That's why there are two "r's" in the word.

Claude 3.5: There are 2 "r"s in "strawberry". The word "strawberry" is spelled S-T-R-A-W-B-E-R-R-Y. The first "r" appears after the initial "st" at the beginning of the word. The second "r" is part of the "-rry" ending.

Meta: There are no R's in "Strawberry". The correct letters are S-T-R-A-W-B-E-R-R-Y, and there are 2 R's in the word "Strawberry".

(https://www.reddit.com/r/singularity/comments/1enqk04/how_many_rs_in_strawberry_why_is_this_a_very/)



You

How many r's in Strawberry?



Copilot

The word "Strawberry" contains **two** "r"s. 🍓

Is there anything else you'd like to know?



1 of 30 responses

AI-generated content may be incorrect



<https://mitadmissions.org/blogs/entry/how-i-feel-about-ai-generated-art/>

Prompt: Please provide citations for seminal articles in Information Literacy.

Certainly! Here are some seminal articles on information literacy that have significantly contributed to the field:

1. **“Information Literacy as a Liberal Art” by Jeremy J. Shapiro and Shelley K. Hughes (1996)** - This article discusses the concept of information literacy as an essential skill for the 21st century, akin to traditional liberal arts ¹.
2. **“The Seven Faces of Information Literacy” by Christine Bruce (1997)** - Bruce’s work identifies seven different conceptions of information literacy, providing a comprehensive framework for understanding the concept ².
3. **“Critical Information Literacy: Implications for Instructional Practice” by James Elmborg (2006)** - This article explores the role of critical pedagogy in information literacy instruction, emphasizing the development of critical consciousness among students ³.
4. **“The Information Literacy Framework for Higher Education” by the Association of College and Research Libraries (ACRL) (2015)** - This framework outlines key concepts and practices for information literacy in higher education, replacing the earlier ACRL standards ⁴.
5. **“Approaches to Information Literacy Conceptualisation in Primary, Secondary, and Higher Education Contexts: A Review of Current Scholarly Literature” by Caitlin Taylor and Daniela DiGiacomo (2023)** - This review examines contemporary approaches to information literacy across different educational levels.

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Learning Communities Research and Practice

Volume 4 | Issue 1

Article 5

5-24-2016

What's the VALUE of Information Literacy? Comparing Learning Community and Non- Learning Community Student Learning Outcomes

Marcia E. Rapchak

Duquesne University, rapchakm@duq.edu

Allison B. Brungard

Duquesne University, brungard@duq.edu

Theodore W. Bergfelt

Duquesne University, bergfeltt@duq.edu

2. "The Seven Faces of Information Literacy" by Christine Bruce (1997) - Bruce's work identifies seven different conceptions of information literacy, providing a comprehensive framework for understanding the concept^[2].

Journal of Information Literacy

ISSN 1750-5968

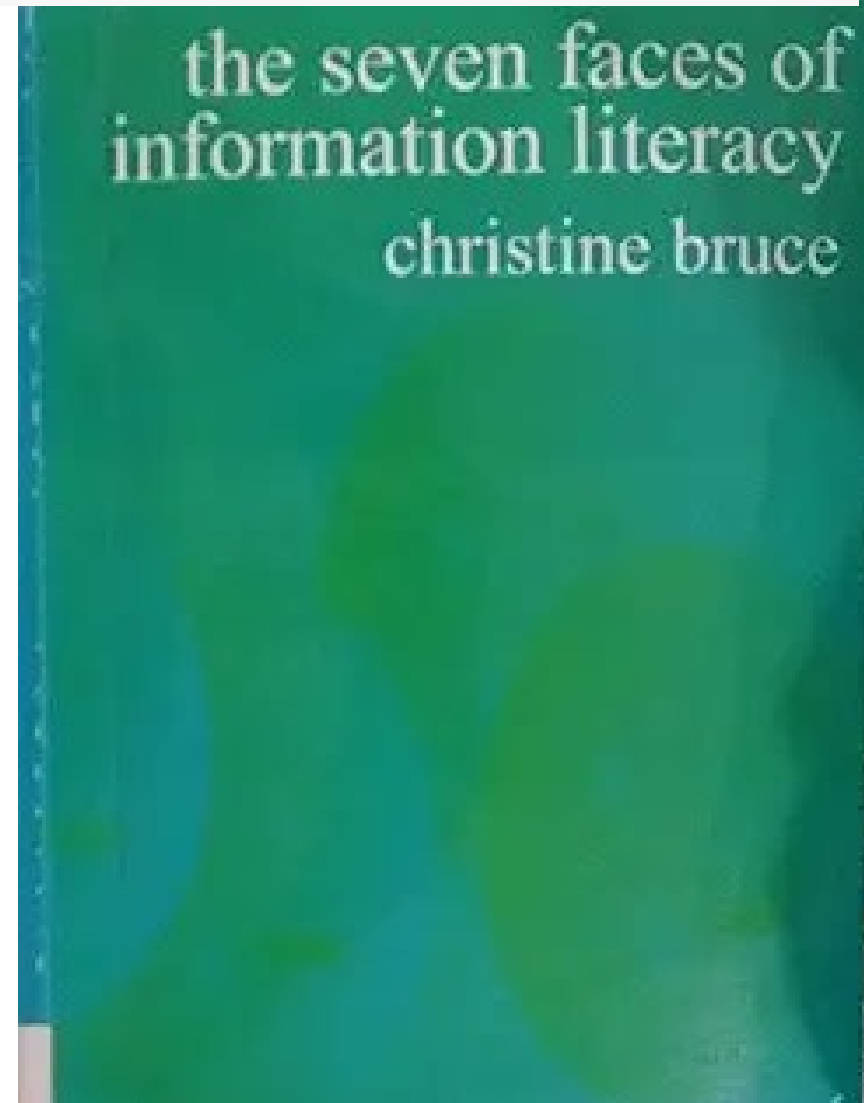
Volume 17 Issue 1

June 2023

Article

Taylor, C., & DiGiacomo, D. 2023. Approaches to information literacy conceptualisation in primary, secondary, and higher education contexts: A review of current scholarly literature. *Journal of Information Literacy*, 17(1), pp. 89–104.

<http://dx.doi.org/10.11645/17.1.3258>



3. “Critical Information Literacy: Implications for Instructional Practice” by James Elmborg (2006) - This article explores the role of critical pedagogy in information literacy instruction, emphasizing the development of critical consciousness among students ³.

Perspectives on the Framework

Karin Heffernan

Loaded questions

The Framework for Information Literacy through a DEI lens

Karin Heffernan is a research and learning librarian at Southern New Hampshire University, email: k.heffernan@snhu.edu

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Just after our university published its Diversity, Equity & Inclusion (DEI) Strategic Plan, I found myself driving home from the “Engaging with the ACRL Framework” Roadshow. My head was full of converting knowledge practices into learning outcomes¹ when the frames began to emerge through a DEI lens, and threshold concepts became questions. The very asking of a question inherently invites diverse, individual perspectives.

4. “The Information Literacy Framework for Higher Education” by the Association of College and Research Libraries (ACRL) (2015) - This framework outlines key concepts and practices for information literacy in higher education, replacing the earlier ACRL standards⁴.

[Home](#) > [Scientometrics](#) > Article

Evolution and diffusion of information literacy topics

Published: 12 March 2021

Volume 126, pages 4195–4224, (2021) [Cite this article](#)

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[Yating Li](#), [Ye Chen](#)  & [Qiyu Wang](#)

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Abstract

Investigation of the topic of information literacy and its changes can be informative for researchers and provide a better understanding of the corresponding domains. This study conducted a topic model dynamic analysis of the articles on information literacy studies in



5. **“Approaches to Information Literacy Conceptualisation in Primary, Secondary, and Higher Education Contexts: A Review of Current Scholarly Literature” by Caitlin Taylor and Daniela DiGiacomo (2023)** - This review examines contemporary approaches to information literacy across different educational levels.

2. "The Seven Faces of Information Literacy" by Christine Bruce (1997) - Bruce's work identifies seven different conceptions of information literacy, providing a comprehensive framework for understanding the concept².

Journal of Information Literacy

ISSN 1750-5968

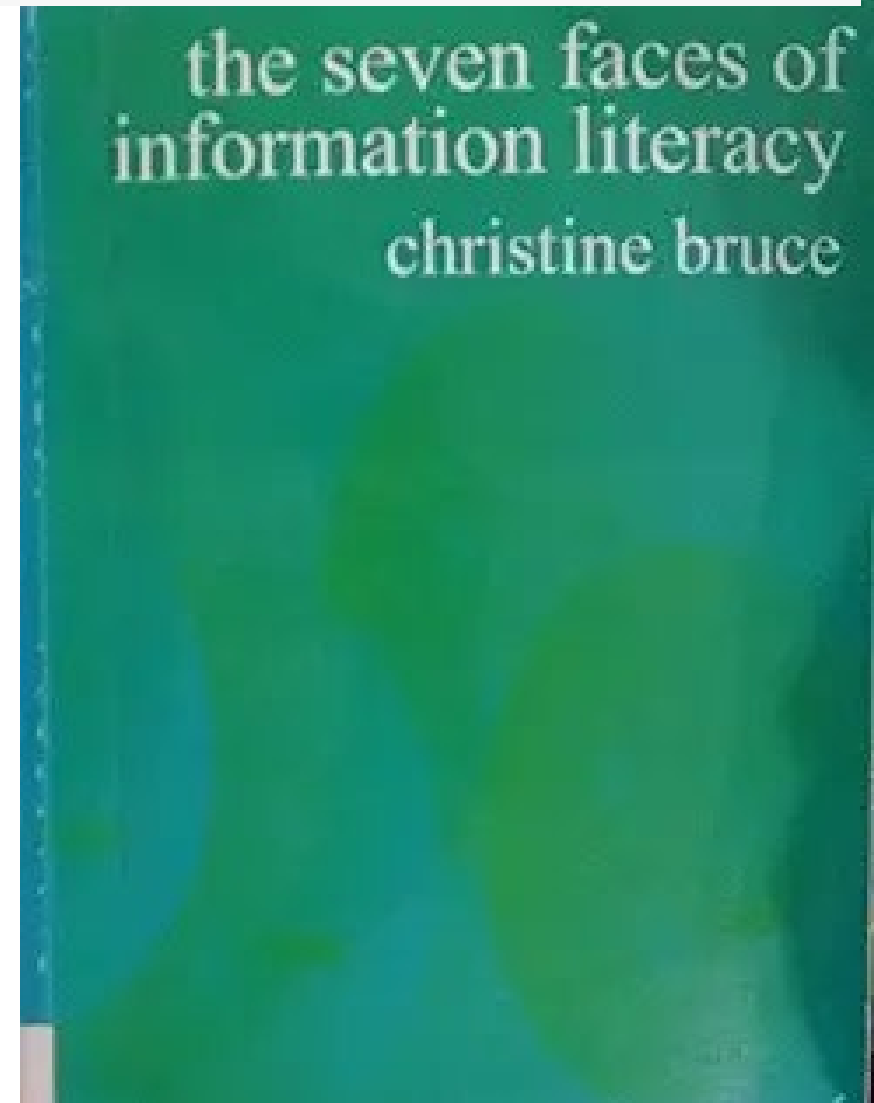
Volume 17 Issue 1

June 2023

Article

Taylor, C., & DiGiacomo, D. 2023. Approaches to information literacy conceptualisation in primary, secondary, and higher education contexts: A review of current scholarly literature. *Journal of Information Literacy*, 17(1), pp. 89–104.

<http://dx.doi.org/10.11645/17.1.3258>



Please provide citations for seminal articles in Information Literacy



All

Images

Videos

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Maps

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Assist



Chat



Always private ▾

All regions ▾

Safe search: moderate ▾

Any time ▾



<https://www.tandfonline.com> › doi › full › 10.1080 › 09523987.2023.2324584



Full article: Digital competence and information literacy: clarifying ...

Mar 5, 2024 · 2. Methodology. A systematic literature review was conducted based on the guidelines of leading authors (Brizola & Fantin, **Citation** 2016; Snyder, **Citation** 2019), on the conceptualisation of DC and IL in a doctoral context. This section presents the methodological assumptions considered in...



<https://www.sciencedirect.com> › science › article › pii › B9780081006733000010



Information Literacy and Critical Thinking: Context and Practice

The central theme of this volume is "**information literacy** and communities of practice." The conception underlying this phrase is that **information** literacy—the ability to retrieve, evaluate, and appropriately apply information—is not a decontextualized set of skills that is independent of the purpose and...



<https://www.tandfonline.com> › doi › full › 10.1080 › 24750158.2019.1649795



Full article: Information Literacy, Young Learners and the Role of th...

The Australian School Library Association (**Citation** 2004), and the Australian Curriculum, Assessment and Reporting Authority (**Citation** 2019b), **provide** guidelines for teacher librarians to promote **information literacy** within the school curriculum. Knowledge and practical application of how...

Here are the APA citations for the articles you requested:

1. DOI goes to wrong article — 1. Shapiro, J. J., & Hughes, S. K. (1996). Information literacy as a liberal art? *Educom Review*, 31(2), 31-35. <https://doi.org/10.1353/lib.2006.0050>
2. DOI does not exist — 2. Association of College and Research Libraries. (2000). Information literacy competency standards for higher education. *College & Research Libraries News*, 61(3), 207-215. <https://doi.org/10.5860/crl.61.3.207>
3. DOI Does not exist — 3. Bruce, C. (1997). *The seven faces of information literacy*. Auslib Press. <https://doi.org/10.1108/00220410410560586>
4. Correct DOI — 4. Elmborg, J. (2006). Critical information literacy: Implications for instructional practice. *The Journal of Academic Librarianship*, 32(2), 192-199. <https://doi.org/10.1016/j.acalib.2005.12.004>
5. Correct DOI — 5. Taylor, C., & DiGiacomo, D. (2023). Approaches to information literacy conceptualization in primary, secondary, and higher education contexts: A review of current scholarly literature. *Journal of Information Literacy*, 17(1), 12-38. <https://doi.org/10.11645/17.1.3258>

"Infliximab"[Mesh] OR infliximab* OR infliksimab*
OR 170277-31-3 OR abp-710 OR abp710 OR avakine
OR avsola OR ca2 OR centnf OR flammegis OR flixabi
OR gp-1111 OR gp1111 OR inflectra OR ixifi OR pf-
06438179 OR pf-6438179 OR pf06438179 OR
pf6438179 OR remicade OR remsima OR renflexis OR
revellex OR ta-650 OR ta650 OR zessly

Prompt:

Please provide a PubMed search strategy using MeSH terms for the drug infliximab

Prompt:

Please provide search terms for a PubMed search using MeSH terms for the drug infliximab

PubMed Search Strategy

1.Start with the MeSH term for infliximab:

- Infliximab [MeSH]

2.Combine with relevant conditions or diseases:

- For example, if you’re interested in inflammatory bowel disease:
 - Inflammatory Bowel Diseases [MeSH]
 - Crohn Disease [MeSH]
 - Colitis, Ulcerative [MeSH]

3.Include pharmacological actions if needed:

- Tumor Necrosis Factor Inhibitors [MeSH]

4.Combine terms using Boolean operators:

- To find articles on infliximab and its use in Crohn’s disease:

Infliximab [MeSH] AND Crohn Disease [MeSH]

5.Add subheadings to refine your search:

- For specific aspects like adverse effects or therapeutic use:

Infliximab [MeSH] AND Crohn Disease [MeSH] AND "adverse effects" [Subheading]

6.Example of a comprehensive search string:

Infliximab [MeSH] AND (Inflammatory Bowel Diseases [MeSH] OR Crohn Disease [MeSH] OR Colitis, Ulcerative [MeSH]) AND "adverse effects" [Subheading]

Here are some MeSH (Medical Subject Headings) terms you can use for a PubMed search on infliximab:

- 1.Infliximab
- 2.Tumor Necrosis Factor-alpha/antagonists & inhibitors
- 3.Monoclonal Antibodies
- 4.Rheumatoid Arthritis/drug therapy
- 5.Crohn Disease/drug therapy
- 6.Ulcerative Colitis/drug therapy
- 7.Psoriasis/drug therapy
- 8.Ankylosing Spondylitis/drug therapy
- 9.Drug Hypersensitivity
- 10.Infusion Reactions

Results for the search hedge



emicade OR remsima OR renflexis OR revellex OR ta-650 OR ta650 OR zessly



Search

[Advanced](#) [Create alert](#) [Create RSS](#)

[User Guide](#)

Save

Email

Send to

Sort by:

Best match



Display options

MY CUSTOM FILTERS

249,524 results



Page

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of 24,953



RESULTS BY YEAR



1956

2025



The following terms were not found in PubMed: centnf, flammegis, gp-1111, pf-6438179, pf6438179, revellex, ta-650, ta650



1

Cite

Share



Psoriasis.

Greb JE, Goldminz AM, Elder JT, Lebwohl MG, Gladman DD, Wu JJ, Mehta NN, Finlay AY, Gottlieb AB.

Nat Rev Dis Primers. 2016 Nov 24;2:16082. doi: 10.1038/nrdp.2016.82.

6.Example of a comprehensive search string:
Infliximab [MeSH] AND (Inflammatory Bowel Diseases [MeSH] OR Crohn Disease [MeSH] OR Colitis, Ulcerative [MeSH]) AND "adverse effects" [Subheading]



se [MeSH] OR Colitis, Ulcerative [MeSH]) AND "adverse effects" [Subheading]

×

Search

Advanced

Create alert

Create RSS

User Guide

Save

Email

Send to

Sort by:

Best match

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Display options 

MY CUSTOM FILTERS 

1,743 results

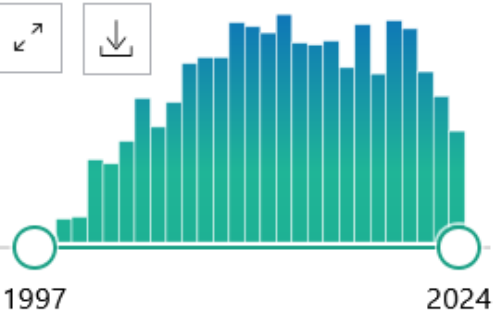
⏪ < Page

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RESULTS BY YEAR





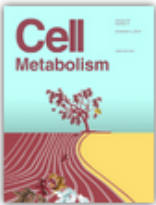
19972024

☐

1

Cite

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TNF compromises intestinal bile-acid tolerance dictating colitis progression and limited infliximab response.

Zheng M, Zhai Y, Yu Y, Shen J, Chu S, Focaccia E, Tian W, Wang S, Liu X, Yuan X, Wang Y, Li L, Feng B, Li Z, Guo X, Qiu J, Zhang C, Hou J, Sun Y, Yang X, Zuo X, Heikenwalder M, Li Y, Yuan D, Li S.

Cell Metab. 2024 Sep 3;36(9):2086-2103.e9. doi: 10.1016/j.cmet.2024.06.008. Epub 2024 Jul 5.

PMID: 38971153

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Reason 3



List of datasets for machine-learning research

[3 languages](#)

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From Wikipedia, the free encyclopedia

This article contains [dynamic lists](#) that may never be able to satisfy particular standards for completeness. You can help by [adding missing items](#) with [reliable sources](#).

These [datasets](#) are used in [machine learning \(ML\)](#) research and have been cited in [peer-reviewed academic journals](#). Datasets are an integral part of the field of machine learning. Major advances in this field can result from advances in learning [algorithms](#) (such as [deep learning](#)), [computer hardware](#), and, less-intuitively, the availability of high-quality training datasets.^[1] High-quality labeled training datasets for [supervised](#) and [semi-supervised](#) machine learning [algorithms](#) are usually difficult and expensive to produce because of the large amount of time needed to label the data. Although they do not need to be labeled, high-quality datasets for [unsupervised](#) learning can also be difficult and costly to produce.^{[2][3][4]}

Many organizations, including governments, publish and share their [datasets](#). The datasets are classified, based on the licenses, as [Open data](#) and [Non-Open data](#).

The datasets from various [governmental-bodies](#) are presented in [List of open government data sites](#). The datasets are ported on [open data portals](#). They

Part of a series on

Machine learning and data mining

[Paradigms](#) [\[show\]](#)

[Problems](#) [\[show\]](#)

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([classification](#) • [regression](#))

[Clustering](#) [\[show\]](#)

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[Structured prediction](#) [\[show\]](#)

[Anomaly detection](#) [\[show\]](#)

[Artificial neural network](#) [\[show\]](#)

[Reinforcement learning](#) [\[show\]](#)

[Learning with humans](#) [\[show\]](#)

[Model diagnostics](#) [\[show\]](#)

How Tech Giants Cut Corners to Harvest Data for A.I.

OpenAI, Google and Meta ignored corporate policies, altered their own rules and discussed skirting copyright law as they sought online information to train their newest artificial intelligence systems.

Researchers at OpenAI's office in San Francisco developed a tool to transcribe YouTube videos to amass conversational text for A.I. development. Jason Henry for The New York Times

Read full article



535

- <https://www.nytimes.com/2024/04/06/technology/tech-giants-harvest-data-artificial-intelligence.html>



Is the potential for copyright violation of generative AI data
a problem for librarians?



In conclusion

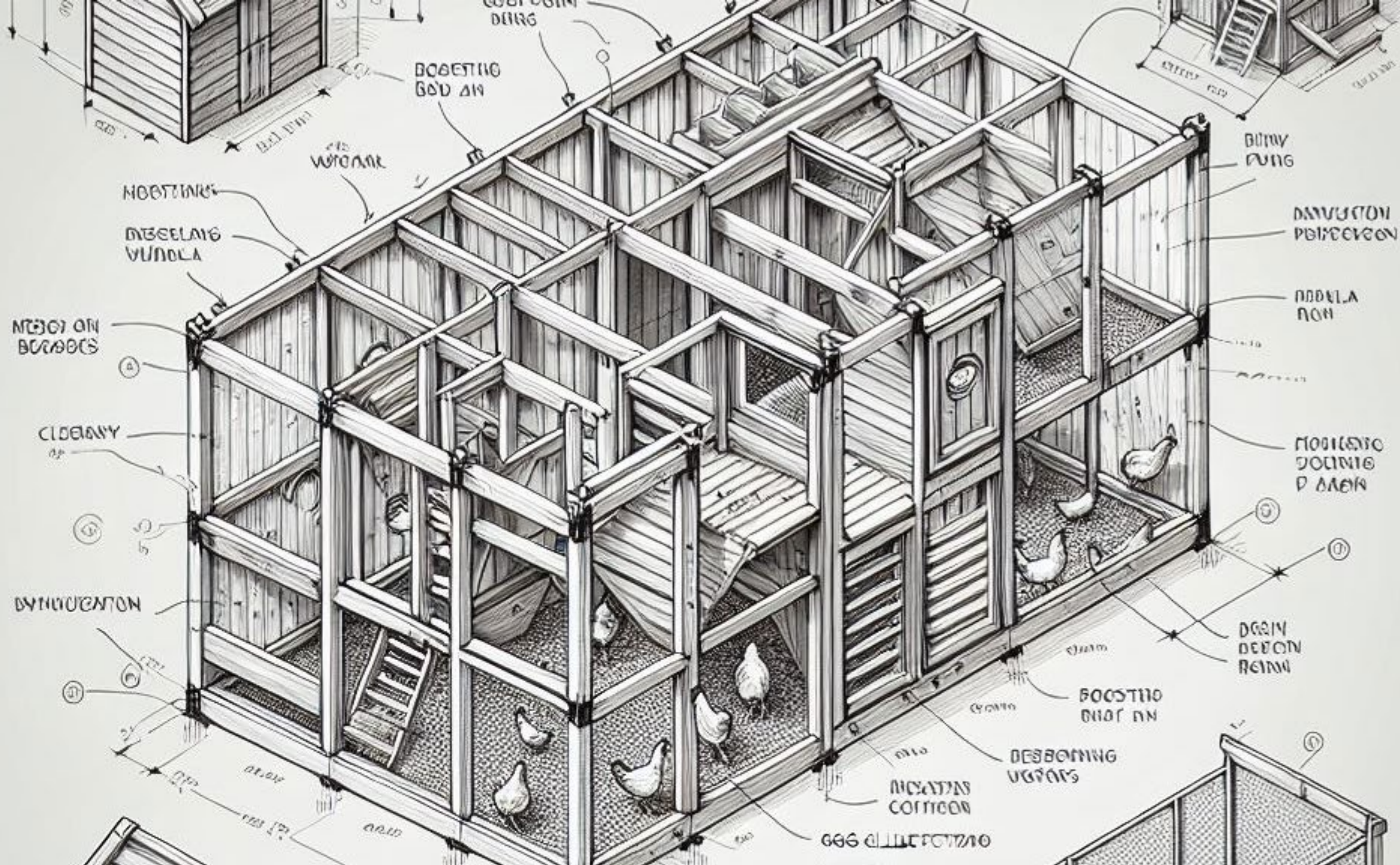
Reason 1: AI's appetite for energy is unsustainable and contributes to climate problems.

Reason 2: AI's inaccuracies lead to more work for librarians

Reason 3: AI's use of data sure looks like it's violating copyright laws.

“prose consists less and less of words chosen for the sake of their meaning, and more and more of phrases tacked together like the sections of a prefabricated hen-house.”

“... modern writing at its worst does not consist in picking out words for the sake of their meaning and inventing images in order to make the meaning clearer. It consists in gumming together long strips of words which have already been set in order by someone else, and making the results presentable by sheer humbug.”



Sources Consulted

All Large Language Models. <https://llmmodels.org/>

How many servers does a data center have? (September 23, 2020). *Rack Solutions*. <https://www.racksolutions.com/news/blog/how-many-servers-does-a-data-center-have/>

Alattas, R. (July 19, 2023). The Data Controversy: Google Sued for Allegedly Stealing User Data to Train AI Models. *Medium*. <https://medium.com/reemtech/the-data-controversy-google-sued-for-allegedly-stealing-user-data-to-train-ai-models-fcaba548fa11>

American Library Association. *Copyright for Libraries: First Sale Doctrine*. Retrieved November 13, 2024 from <https://libguides.ala.org/copyright/firstsale>

American Library Association. *Copyright for Libraries: General Information*. Retrieved November 13, 2024 from <https://libguides.ala.org/copyright>

Birhane, A., & McGann, M. (2024). Large models of what? Mistaking engineering achievements for human linguistic agency. *Language Sciences*, 106, 101672. <https://doi.org/https://doi.org/10.1016/j.langsci.2024.101672>

Calvert, B. (March 28, 2024). AI already uses as much energy as a small country. It's only the beginning. *Vox*. <https://www.vox.com/climate/2024/3/28/24111721/climate-ai-tech-energy-demand-rising>

Coldewey, D. (July 25, 2023). OpenAI scuttles AI-written text detector over 'low rate of accuracy'. *TechCrunch*. <https://techcrunch.com/2023/07/25/openai-scuttles-ai-written-text-detector-over-low-rate-of-accuracy/>

Crawford, K. Generative AI's environmental costs are soaring — and mostly secret. *Nature*(626), 693. <https://doi.org/10.1038/d41586-024-00478-x>

Sources Consulted (continued)

Crownhart, C. AI is an energy hog. This is what it means for climate change. *MIT Technology Review*.

<https://www.technologyreview.com/2024/05/23/1092777/ai-is-an-energy-hog-this-is-what-it-means-for-climate-change/>

Edwards, B. (July 26, 2023). OpenAI discontinues its AI writing detector due to “low rate of accuracy.” *Ars Technica*. <https://arstechnica.com/information-technology/2023/07/openai-discontinues-its-ai-writing-detector-due-to-low-rate-of-accuracy/>

Edwards, B. (July 14, 2023). Why AI writing detectors don’t work. *Ars Technica*. <https://arstechnica.com/information-technology/2023/07/why-ai-detectors-think-the-us-constitution-was-written-by-ai/>

Erdenesanaa, D. (2023). A.I. Could Soon Need as Much Electricity as an Entire Country. *New York Times (Online)*.

<https://www.nytimes.com/2023/10/10/climate/ai-could-soon-need-as-much-electricity-as-an-entire-country.html>

Gelles, D. (2024). A.I.’s Insatiable Appetite for Energy. *New York Times (Online)*. <https://www.nytimes.com/2024/07/11/climate/artificial-intelligence-energy-usage.html>

Heidt, A. Intellectual property and data privacy: the hidden risks of AI. *Nature, Nature Career Guide: Faculty*. <https://www.nature.com/articles/d41586-024-02838-z>

Sources Consulted (continued)

Hutchinson, L. The big deal about “big data”—your guide to what the heck it actually means *Ars Technica*. <https://arstechnica.com/information-technology/2015/02/the-big-deal-about-big-data-your-guide-to-what-the-heck-it-actually-means/>

Leffer, L. (October 13, 2023). The AI Boom Could Use a Shocking Amount of Electricity. *Scientific American*. <https://www.scientificamerican.com/article/the-ai-boom-could-use-a-shocking-amount-of-electricity/>

Luccioni, S., Trevelin, B., & Mitchell, M. (November 14, 2024). The Environmental Impacts of AI -- Primer *Hugging Face*. <https://huggingface.co/blog/sasha/ai-environment-primer>

Merchant, B. (August 16, 2023). Column: These apps and websites use your data to train AI. You’re probably using one right now. *Los Angeles Times*. <https://www.latimes.com/business/technology/story/2023-08-16/column-its-not-just-zoom-how-websites-and-apps-harvest-your-data-to-build-ai>

Metz, C. (October 23, 2024). Former OpenAI Researcher Says the Company Broke Copyright Law. *New York Times*. <https://www.nytimes.com/2024/10/23/technology/openai-copyright-law.html>

Metz, C., Kang, C., Frenkel, S., Thompson, S. A., & Grant, N. (April 6, 2024). How Tech Giants Cut Corners to Harvest Data for A.I. *New York Times*. <https://www.nytimes.com/2024/04/06/technology/tech-giants-harvest-data-artificial-intelligence.html>

Mitchell, M. Large Language Models. *Open Encyclopedia of Cognitive Science*. <https://doi.org/10.21428/e2759450.2bb20e3c>

Sources Consulted (continued)

Ouyang, A. (January 20, 2023). MIT researchers develop an AI model that can detect future lung cancer risk. *MIT News*. <https://news.mit.edu/2023/ai-model-can-detect-future-lung-cancer-0120>

Pollard, J. (September 3, 2024). Spotlight on Big Tech's Power and Water Use Amid AI Surge. *Asia Financial*. <https://www.asiafinancial.com/spotlight-on-big-techs-power-and-water-use-amid-ai-surge>

Riedl, M. (April 13, 2023). A Very Gentle Introduction to Large Language Models without the Hype. *Medium*. <https://mark-riedl.medium.com/a-very-gentle-introduction-to-large-language-models-without-the-hype-5f67941fa59e>

Roose, K. (July 19, 2024). The Data That Powers A.I. Is Disappearing Fast. *New York Times*. <https://www.nytimes.com/2024/07/19/technology/ai-data-restrictions.html>

Ryan, B. (October 16, 2024). Why Big Tech is turning to nuclear to power its energy-intensive AI ambitions. *CNBC*. <https://www.cnbc.com/2024/10/15/big-tech-turns-to-nuclear-energy-to-fuel-power-intensive-ai-ambitions.html>

Sergin, B. (2024). How many r's in Strawberry? Why is this a very difficult question for the AI? . *Reddit*. https://www.reddit.com/r/singularity/comments/1enqk04/how_many_rs_in_strawberry_why_is_this_a_very/

Sharwood, S. (September 19, 2024). LinkedIn started harvesting people's posts for training AI without asking for opt-in. *The Register*. https://www.theregister.com/2024/09/19/linkedin_ai_data_access/

Sources Consulted (continued)

Vincent, J. (February 16, 2024). How much electricity does AI consume? *The Verge*. <https://www.theverge.com/24066646/ai-electricity-energy-watts-generative-consumption>

Wang, R. (June 11, 2023). how i feel about ai-generated art *MIT Admissions*. <https://mitadmissions.org/blogs/entry/how-i-feel-about-ai-generated-art/>

Weatherbed, J. (July 5, 2023). Google confirms it's training Bard on scraped web data, too. *The Verge*. <https://www.theverge.com/2023/7/5/23784257/google-ai-bard-privacy-policy-train-web-scraping>

Wikipedia. *List of datasets for machine-learning research*. Retrieved November 13, 2024 from https://en.wikipedia.org/wiki/List_of_datasets_for_machine-learning_research#Internet

Wu, C.-J., Raghavendra, R., Gupta, U., Acun, B., Ardalani, N., Maeng, K., Chang, G., Behram, F. A., Huang, J., Bai, C., Gschwind, M., Gupta, A., Ott, M., Melnikov, A., Candido, S., Brook, D., Chauhan, G., Lee, B., Lee, H.-H. S.,...Hazelwood, K. (2022). Sustainable AI: Environmental Implications, Challenges and Opportunities. *arXiv*, 2111.00364. <https://arxiv.org/abs/2111.00364>