



TEXAS A&M UNIVERSITY

COMMERCE

# Artificial Intelligence 101: Generative AI and Higher Education

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# Definitions: Generative AI & LLM

## Generative AI

- Identifies patterns found in training data & creates new content by following those patterns
- Multiple possible output types:
  - Text
  - Images
  - Video
  - Audio
  - Code
  - Chemical structures

## Large Language Model (LLM)

- Type of generative AI
- Trained on enormous dataset of text (often “scraped” from the Internet)
- Predicts next words in series based on patterns in training data
- “Blurry JPEG” vs Google seeking quotes

**At the current moment, generative AI is not truly “intelligent.”  
There is no understanding of meaning, only the replication of patterns.**

# What is ChatGPT?

## 3.5

- “Research preview” version
- Free to use
- Not connected to the internet
- “Has limited knowledge of world and events after 2021”

(OpenAI FAQ, “[What is ChatGPT?](#)”, accessed 3/11/24)

## 4.0

- Paid subscription model
- Can access the internet if users enable plugins

Chatbots are designed to respond to users’ prompts:

- Background information
  - Sources
  - List
  - Quotations
- Specificity
  - Style
  - Length
  - Role

“Prompt Engineering”

Style Manual	MLA Citation	APA Citation
<b>Author</b>	AI should not be listed as an author	Publisher of the AI tool
<b>Title</b>	Prompt used	Tool/model name
<b>Disclosure of AI Use</b>	“Acknowledge all functional uses of the tool (like editing your prose or translating words) in a note, your text, or another suitable location”	<ul style="list-style-type: none"> <li>• Describe how tool was used in introduction or methodology section</li> <li>• Include the prompt in the text</li> <li>• Consider including full AI responses in an appendix</li> </ul>
<b>Reference/ Works Cited List Example</b>	“In 200 words, describe the symbolism of the green light in The Great Gatsby” follow-up prompt to list sources. ChatGPT, 13 Feb. version 3.5, OpenAI, 9 Mar. 2023, chat.openai.com/chat.	OpenAI. (2023). ChatGPT (Mar 14 version) [Large language model]. <a href="https://chat.openai.com/chat">https://chat.openai.com/chat</a>
<b>More Information</b>	<a href="https://style.mla.org/citing-generative-ai/">https://style.mla.org/citing-generative-ai/</a>	<a href="https://apastyle.apa.org/blog/how-to-cite-chatgpt">https://apastyle.apa.org/blog/how-to-cite-chatgpt</a>

# Academic Integrity

Be clear and specific about what is permitted vs prohibited.

AI doesn't cause cheating, it only streamlines the process.

Students determined to cheat will find a way.

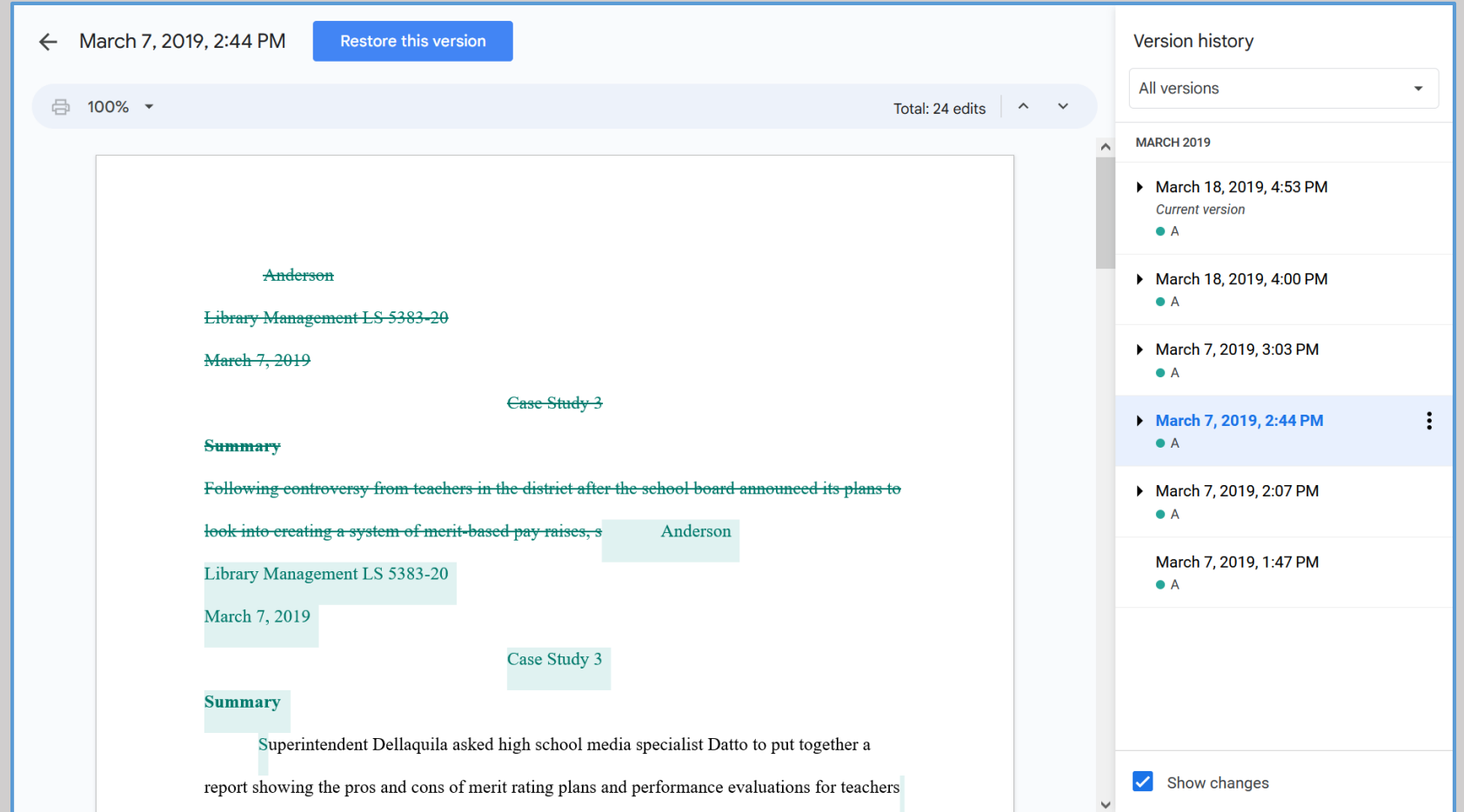
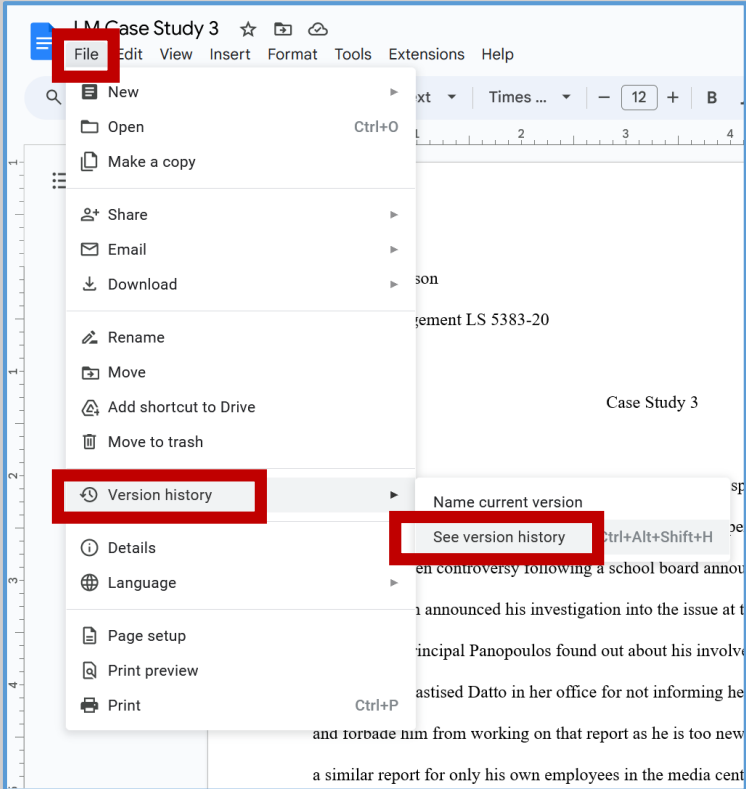
## Consider types of AI tools beyond ChatGPT:

- Grammarly
- Integrated AI in Google Docs/Word
- AI research tools like Semantic Scholar
- AI-generated images as part of presentations or reports

## Different uses of AI:

- Brainstorming
- Summarizing for understanding
- Polishing grammar and tone
- Translation help
- Creating presentations

# Version History: Google Docs



# AI Detectors

- Risk of false positives and false negatives
- Cheating accusations can be very disruptive to students
- Not foolproof: based on pattern detection, not evidence
  - May be biased against nonnative English speakers and neurodivergent writers
  - Often cite formulaic writing as evidence of AI assistance
- OpenAI created its own AI detector tool but shut it down in July 2023 “due to its low rate of accuracy.”
- Privacy & IP concerns related to AI detector tools themselves when uploading student work

# “Hallucination”

ChatGPT and similar chat bots are not research tools. *They are not search engines.* They can:

- ➔ Create output to match users’ prompts
- ➔ Deliver false information with the same confidence as real facts
- ➔ **Generate reference lists citing nonexistent papers**

Many AI tools are adding citation features and are attempting to retrain the tools for better accuracy, but it is up to users to verify all information & sources

## Meta’s Llama 2 answers “Can you vote via text in California”:

“In California, you can vote via SMS (text messaging) using a service called Vote by Text. This service allows you to cast your vote using a secure and easy-to-use system that is accessible from any mobile device.” (Burke, 2024)

Tell me how dinosaurs successfully built a civilization in the Cretaceous and how we are already able to prove it today.

Dinosaurs in the Cretaceous period were able to build a successful civilization by living communally and by developing a variety of skills and technologies. Dinosaurs lived in colonies and had to rely on each other for protection, food, and shelter. They had learned to use tools and artefacts, to communicate, and to build structures. They had developed an understanding of their environment and the ability to adapt to changing conditions.

Evidence of their civilization can be found in fossil remains of their dwellings, tools, and other artefacts. Dinosaurs may have built complex structures such as nests, burrows, and shelters, which have been preserved in the fossil record. They also left behind evidence of their hunting and gathering activities, such as fossilized footprints and the remains of prey animals. Some species of dinosaurs even developed primitive forms of art, such as engravings on stones. Finally, the fossil record indicates that some dinosaurs were able to survive in large social groups, suggesting that they had developed sophisticated communication and cooperative behavior.



# Bias

## Pre-existing bias is built into the tools & replicated as output

- ↻ Assumptions and biases in labeling
  - ↻ AI doesn't "know" anything. Humans must assign meaning before the tool can learn patterns.
- ↻ Perspectives that deviate from the mainstream are often excluded from the pattern & output
- ↻ AI tools sometimes learn patterns other than the ones we expect, which can reinforce biases in ways that are difficult to predict
  - ↻ Ex: Medical AI can learn that photographs of skin lesions that contain rulers are likely malignant

Avoiding biased output is not always as simple as telling a tool not to create biased output

- ↻ Ex: Google's Gemini generating images of ethnically diverse WWII German soldiers (O'Brien 2024)

## What groups are represented in the training data? Who is left out? Who built the tool?

- ↻ Language & geography
- ↻ Income level & access to technology
- ↻ Demographics in image databases
  - ↻ Was this facial recognition software trained on a dataset that included enough people with dark skin?
  - ↻ Was this self-driving car trained to recognize wheelchair users as pedestrians?
- ↻ Is simple or easily accessed data used as a stand-in to predict more complex issues?
  - ↻ Treating health care spending \$ as a predictor of health care need

# Copyright & Ownership

The legal status of AI generated works is currently unclear

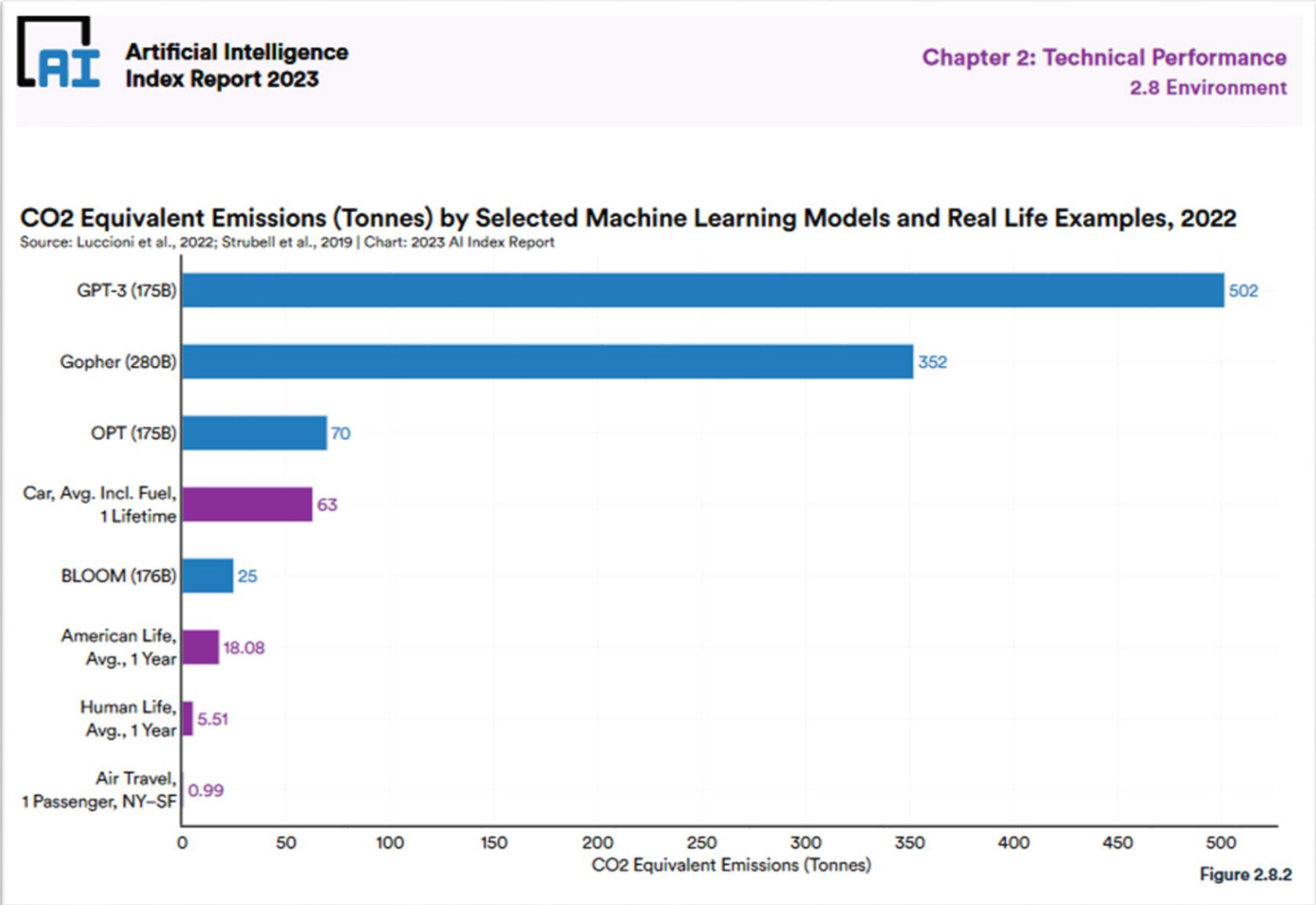
Multiple court cases are in progress to establish:

- ➔ Who (if anyone) owns the generated output of an AI tool
- ➔ Whether scraping content from the Internet violated creators' intellectual property rights

- ➔ U.S. Copyright Office: [Copyright and Artificial Intelligence](#)
  - ➔ Human authorship required to register works, copyright status of partially AI generated works determined on a case-by-case basis ([USCO 2023](#))
- ➔ U.S. Federal Trade Commission: [Artificial Intelligence](#) (cases and proceedings, press releases, statements, etc.)

# Environmental Impact

Maslej, N., Fattorini, L., Brynjolfsson, E., Etchemendy, J., Ligett, K., Lyons, T., Maniyka, J., Ngo, H., Niebles, J. C., Parli, V., Shoham, Y., Wald, R., Clark, J., & Perrault, R. (2023 April). "CO2 Equivalent Emissions (Tonnes) by Selected Machine Learning Models and Real Life Examples, 2022." The AI Index 2023 Annual Report. *AI Index Steering Committee, Institute for Human Centered AI, Stanford University*, 121. [https://aiindex.stanford.edu/wp-content/uploads/2023/04/HAI\\_AI-Index-Report\\_2023.pdf](https://aiindex.stanford.edu/wp-content/uploads/2023/04/HAI_AI-Index-Report_2023.pdf)



# Other Considerations

## Internet scraping to build datasets

- Dubious, outdated, or malicious sources are incorporated into the pattern
- Difficulty knowing what is part of a dataset

## Privacy and security

- Who can access input & output? How long is it stored? Will it be used to train?

## Human labor issues – Microlabor

- Data labeling is done by various groups: volunteers, gig economy workers, workers in low-wage countries, refugees, prison inmates (Meaker, 2023).
- Content moderation work can be traumatic and workers are often not given mental health support (Perrigo, 2023).

# Technology Will Change

## Snapshot as of March 2024

- ➔ New tools are emerging, current tools are improving, some tools may fall out of use
- ➔ Copyright and IP law decisions will shape the tech and its uses
- ➔ Governments may require AI tech to comply with privacy and data transparency laws

## Essential skills: critical thinking, information literacy, and AI literacy

Limitations and abilities of tech will shift and change over time

- ➔ Traits that mark content as AI-generated (fingers/teeth in AI art, obvious hallucination in AI text) may disappear as models train
- ➔ What is “undetectable” now may be detectable in future (another reason to disclose what content is AI created)

# The Bottom Line

- Ignoring AI tools won't help us (or our students) adjust to the ways our world is changing
- Learning about AI helps us make informed choices about how, when, and if we want to use these tools, as well as how we handle the issues in our world that are reflected and magnified by AI
- Acknowledging drawbacks and limitations of AI helps us avoid misinformation and critically engage with AI-generated content

# Acknowledgements

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- Anna Mills, College of Marin, “AI + OER or What Do We Tell Students About ChatGPT”
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- A. P. Anderson, Texas A&M University-Commerce, “Academic Research @ Velma K. Waters Library” and “Generative AI in the Classroom”

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