

# Comprehensive Academic Integrity in the Age of Generative Artificial Intelligence (AI)



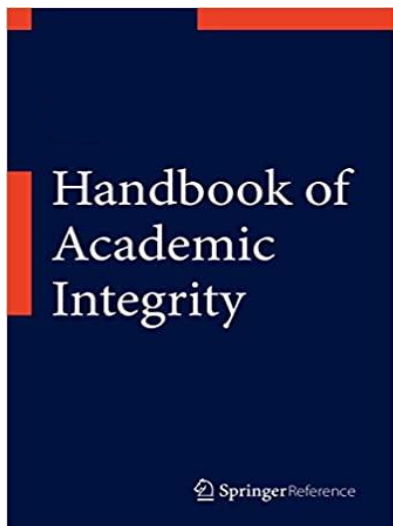
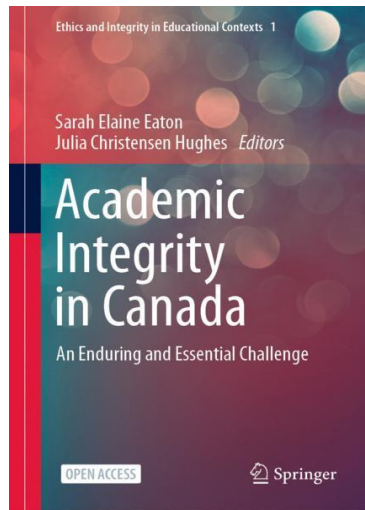
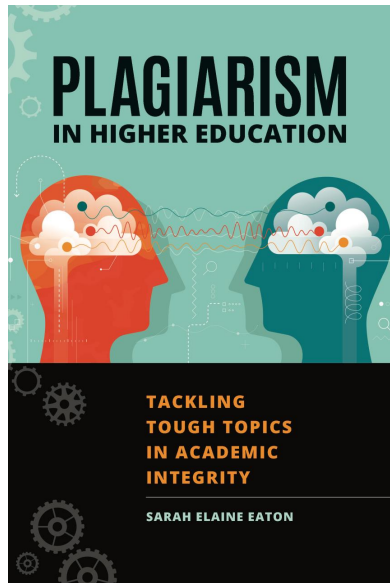
Alberta Association of Academic Libraries  
Spring 2024 Meeting - Red Deer Polytechnic

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Associate Professor  
Werklund School of Education  
University of Calgary  
[Seaton@ucalgary.ca](mailto:Seaton@ucalgary.ca)

May 3, 2024

# Provenance of this work

- *Plagiarism in Higher Education: Tackling Tough Topics in Higher Education* (2021)
- *Academic Integrity in Canada: An Enduring and Essential Challenge* (2022)
- *Handbook of Academic Integrity* (2<sup>nd</sup> ed.) (2023)



# Fundamental Values of Academic Integrity



# Academic Integrity: U.S.-Based Schools of Thought

Eaton & Fishman (2024)

School of thought	Examples of notable US-based contributions to academic integrity scholarship (an incomplete list)
Values and Morality	Bertram Gallant (2008); McCabe (1992, 2006), McCabe et al. (2006); Rettinger (2006)
Skill development	Howard (1995, 1999, 2001); Jamieson (2013); Panning Davies & Howard (2016); Robillard (2008)



# A Teaching and Learning Imperative

Reframe the driving question from

“How do we stop students from cheating?”

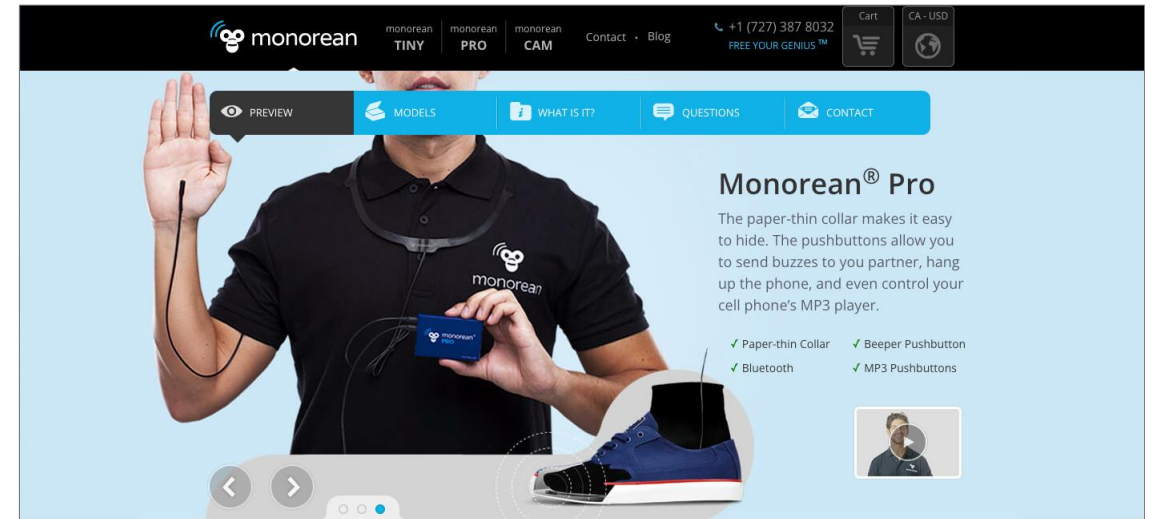
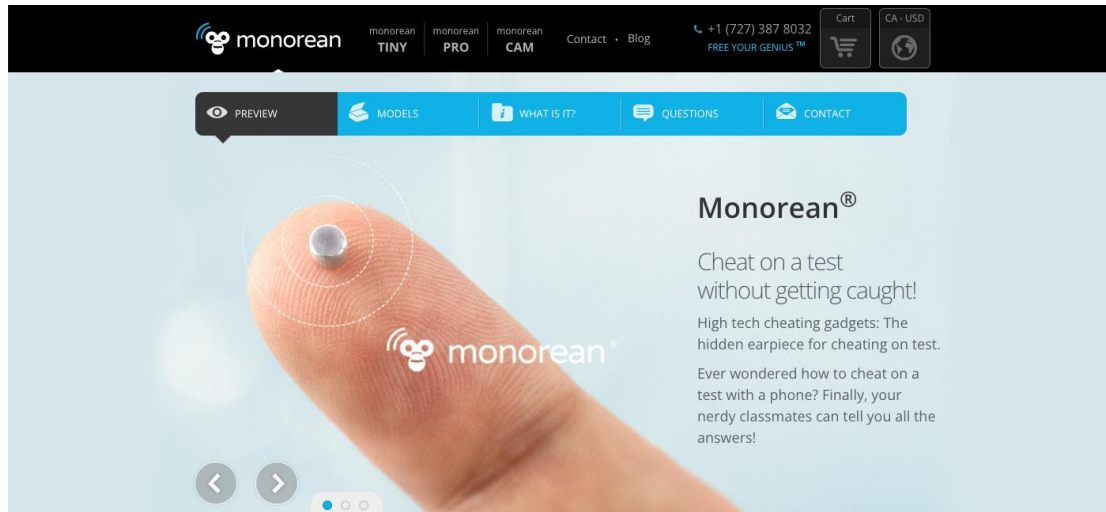
to

**“How do we ensure students are *learning*?”**

(Bertram Gallant, 2008, p. 6)

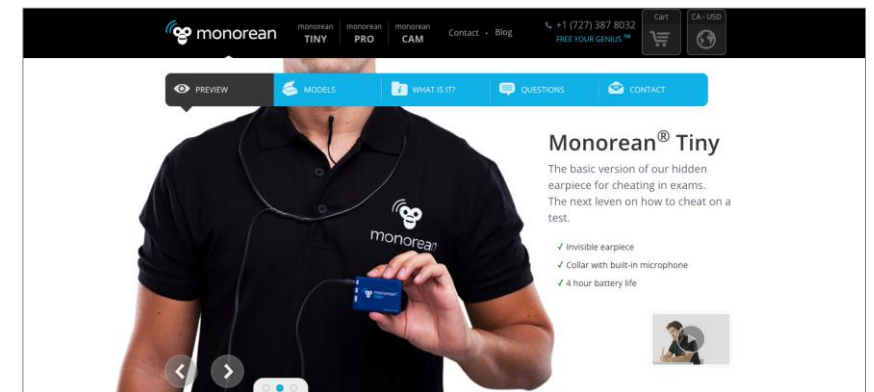


# Current State of Academic Cheating Technology

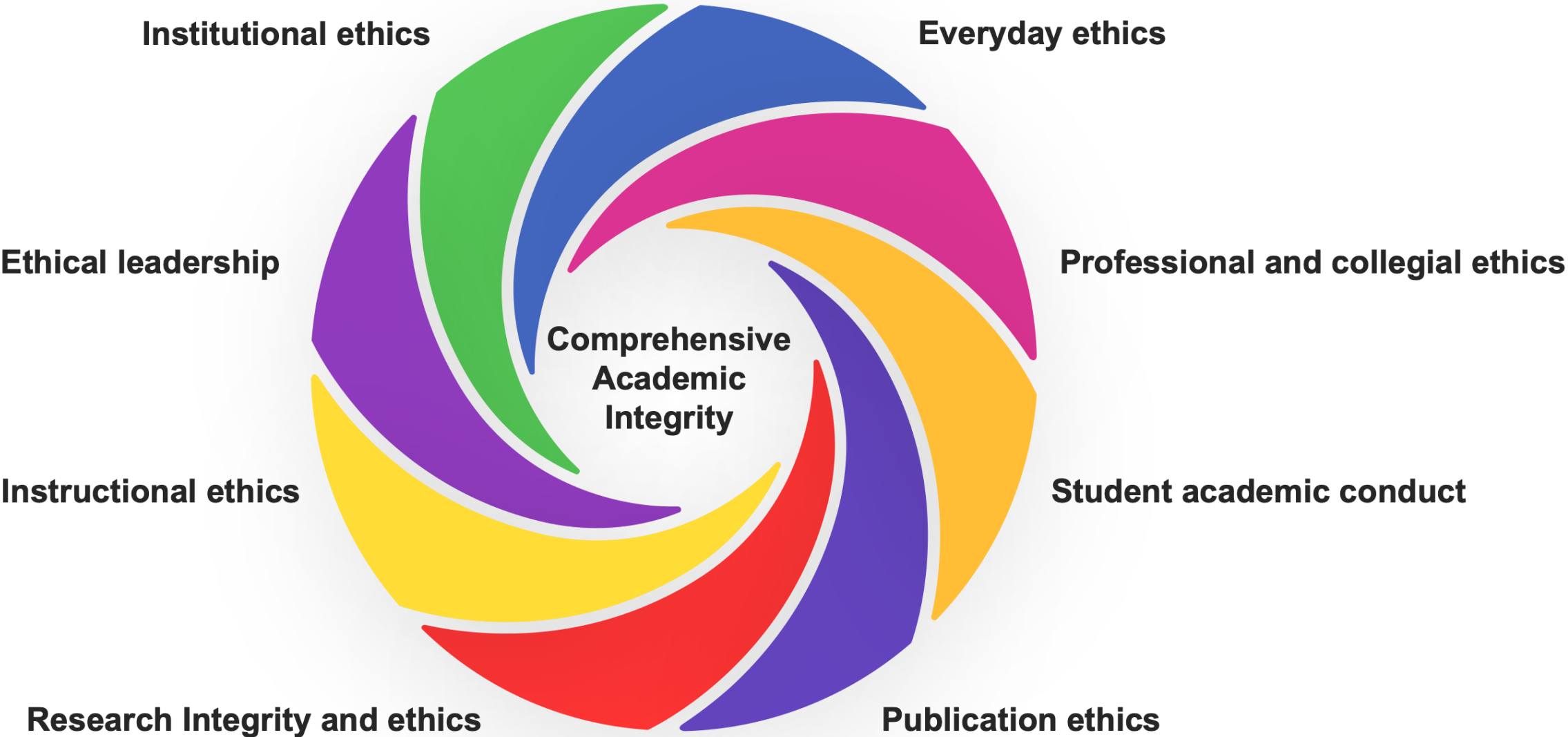


- Prices start at about \$400 USD
- Free shipping
- 1 year warranty

This information is provided for educational purposes only. It is NOT an endorsement!



# Comprehensive Academic Integrity: Looking Beyond Student Conduct



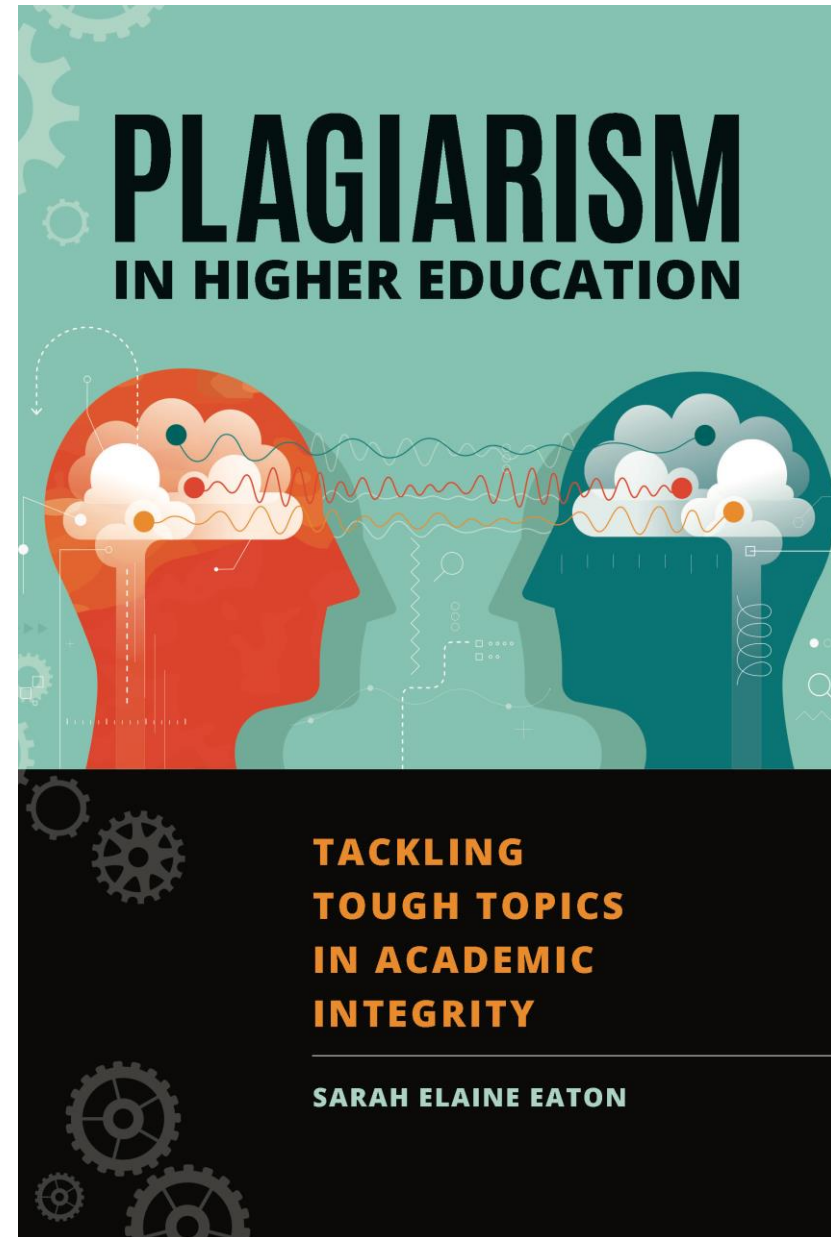
## Key message

Academic integrity  
includes  
***and extends  
beyond*** student  
conduct.



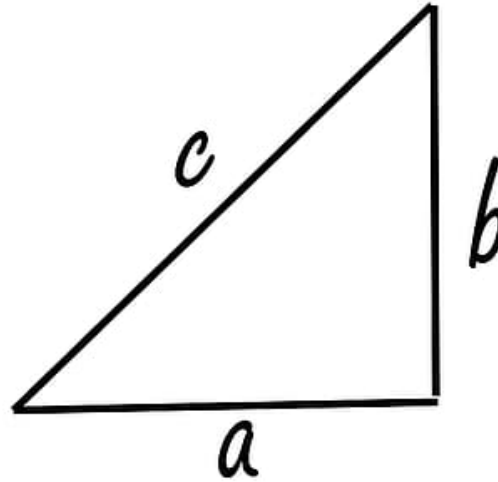


*Plagiarism in  
Higher  
Education:  
Tackling Tough  
Topics in  
Academic  
Integrity  
(2021)*



# Plagiarism: A Brief History

Plagiarism of ideas in Western civilizations can be traced back to the ancient Greeks.



$$a^2 + b^2 = c^2$$



# Impact of the Printing Press

For more than 500 years, our notions of plagiarism have been shaped by technology.





# The Industrial Revolution

- Catalyzed the early massification of education.
- Laid the foundation for modern notions of student conduct.



# Impact of the Internet

Faster and more efficient writing, research, mobilization of knowledge, and misconduct of various kinds.





## New Technology

Excitement, confusion, eagerness, resistance, worry, and other reactions.

## Teaching, Learning (and Cheating)

Teachers and students figure out how to use the new tech for teaching, learning, cheating, and more.

# Academic Integrity Arms Race

Infographic designed by  
Sarah Elaine Eaton  
May, 2023

## Students Find Workarounds

Students find hacks and share ideas about how to beat the anti-cheating technology.

## Anti-Cheating Tech

More tech is developed to catch students using technology to violate academic integrity. Often marketed as a solution to academic misconduct.

## Key message

Neither students  
nor educators can  
win the academic  
integrity arms race.



# 6 Tenets of Postplagiarism: Writing in the Age of Artificial Intelligence

Sarah Elaine Eaton 2023

In [\*Plagiarism in Higher Education: Tackling Tough Topics in Academic Integrity\* \(2021\)](#) I introduced the idea of life in a postplagiarism world. Here, I expand on those ideas.

## Hybrid Human-AI Writing Will Become Normal

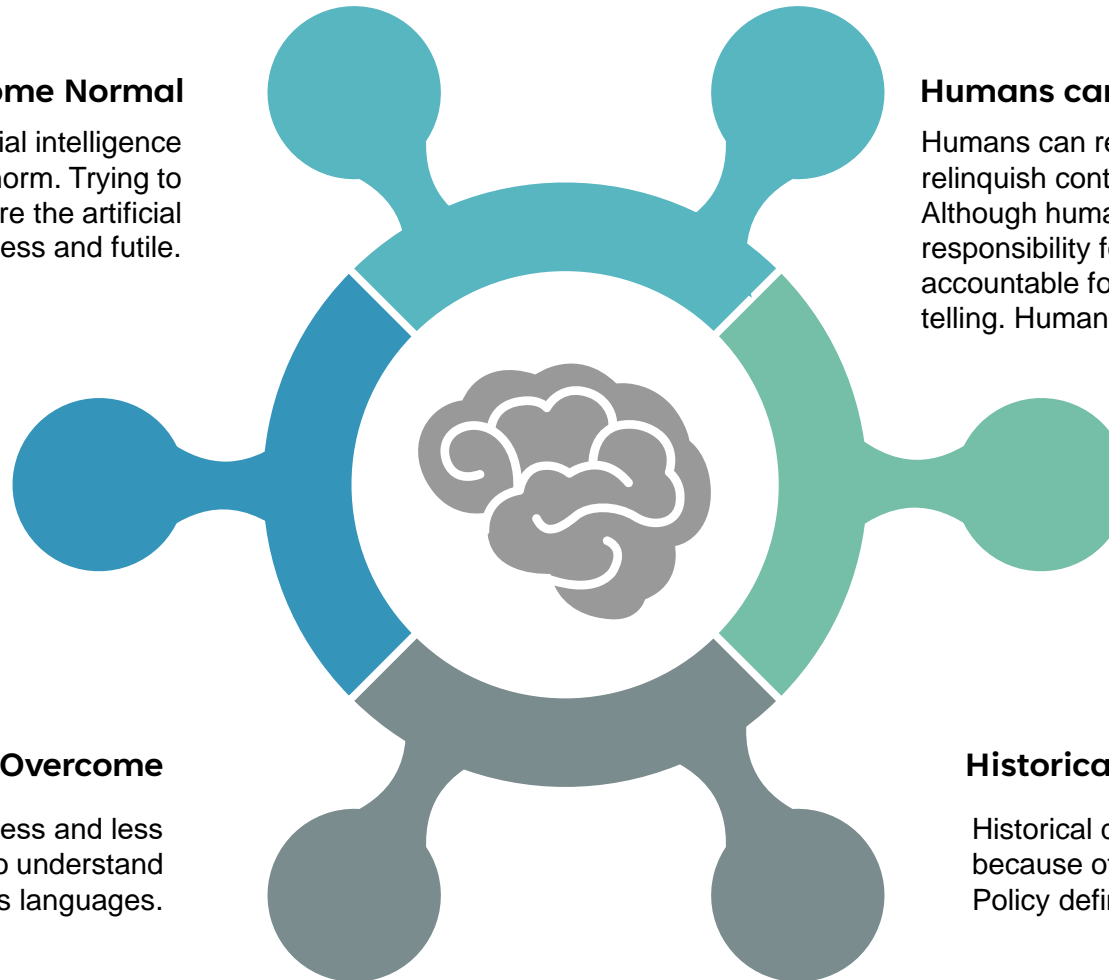
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## Human Creativity is Enhanced

Human creativity is enhanced, not threatened by artificial intelligence. Humans can be inspired and inspire others. Humans may even be inspired by artificial intelligence, but our ability to imagine, inspire, and create remains boundless and inexhaustible.

## Language Barriers Overcome

One's first language will begin to matter less and less as tools become available for humans to understand each other in countless languages.



## Humans can Relinquish Control, but not Responsibility

Humans can retain control over what they write, but they can also relinquish control to artificial intelligence tools if they choose. Although humans can relinquish control, they do not relinquish responsibility for what is written. Humans can – and must – remain accountable for fact-checking, verification procedures, and truth-telling. Humans are also responsible for how AI-tools are developed.

## Attribution Remains Important

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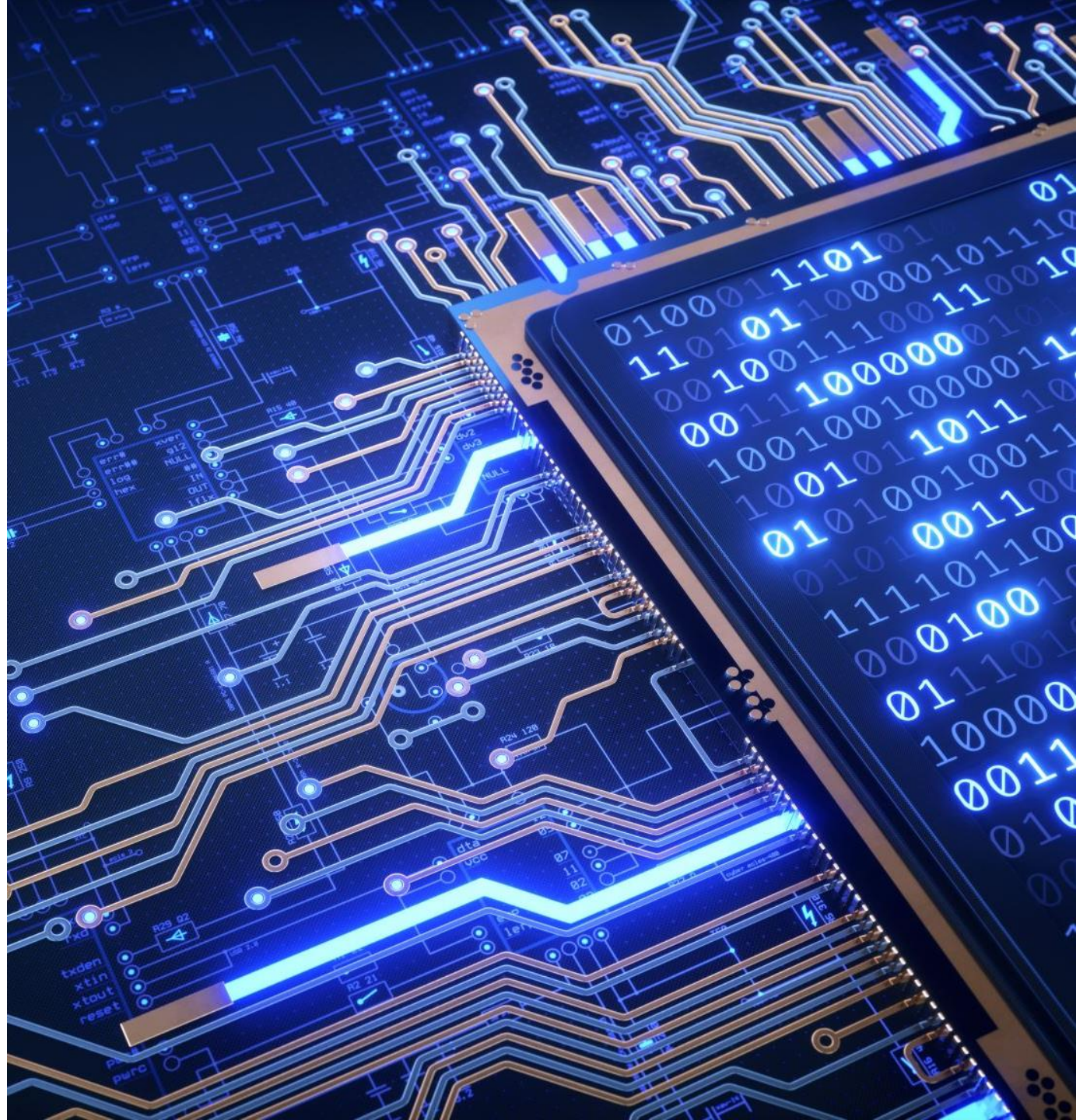
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# Postplagiarism

Postplagiarism refers to an era in human society in which advanced technologies are a normal part of life, including how we teach, learn, and interact daily.

Postplagiarism heralds a new era of intellectual engagement in the age of advanced technology.



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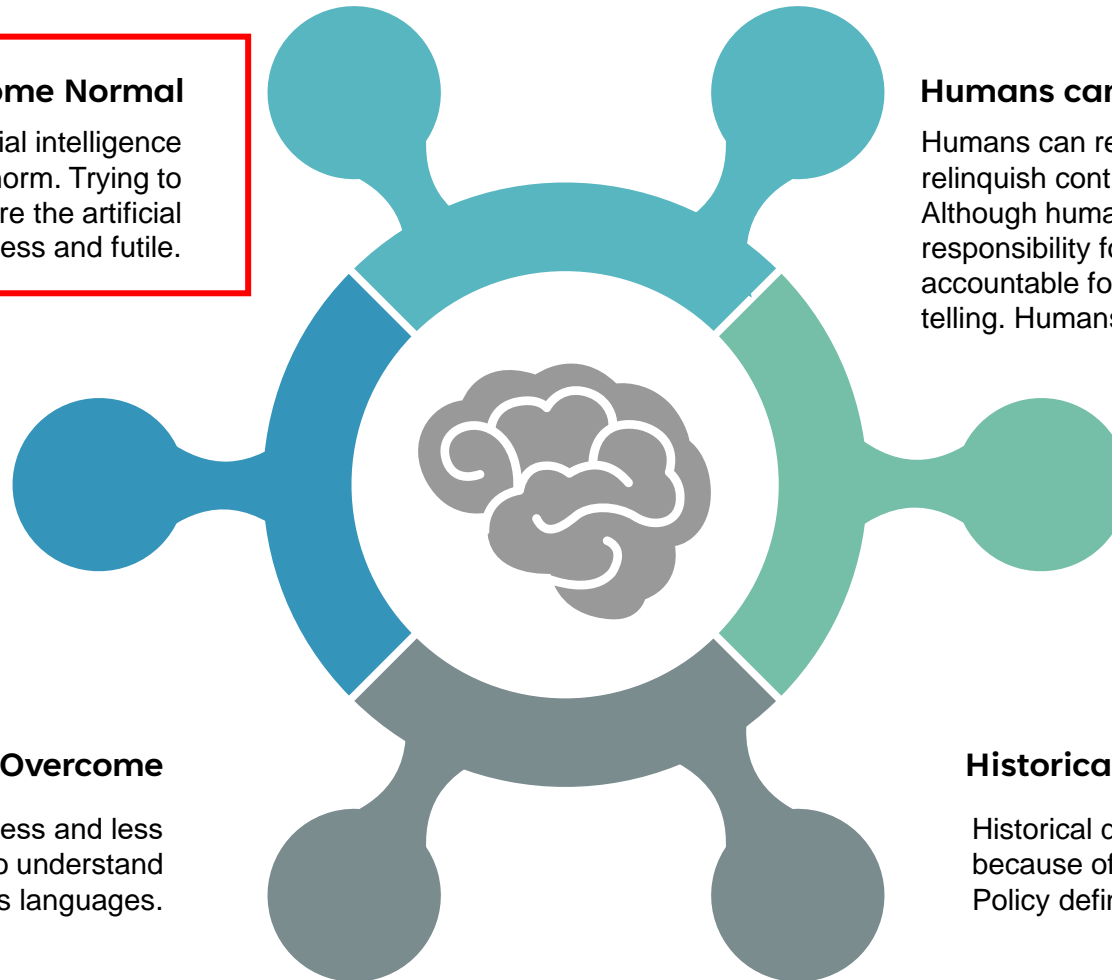
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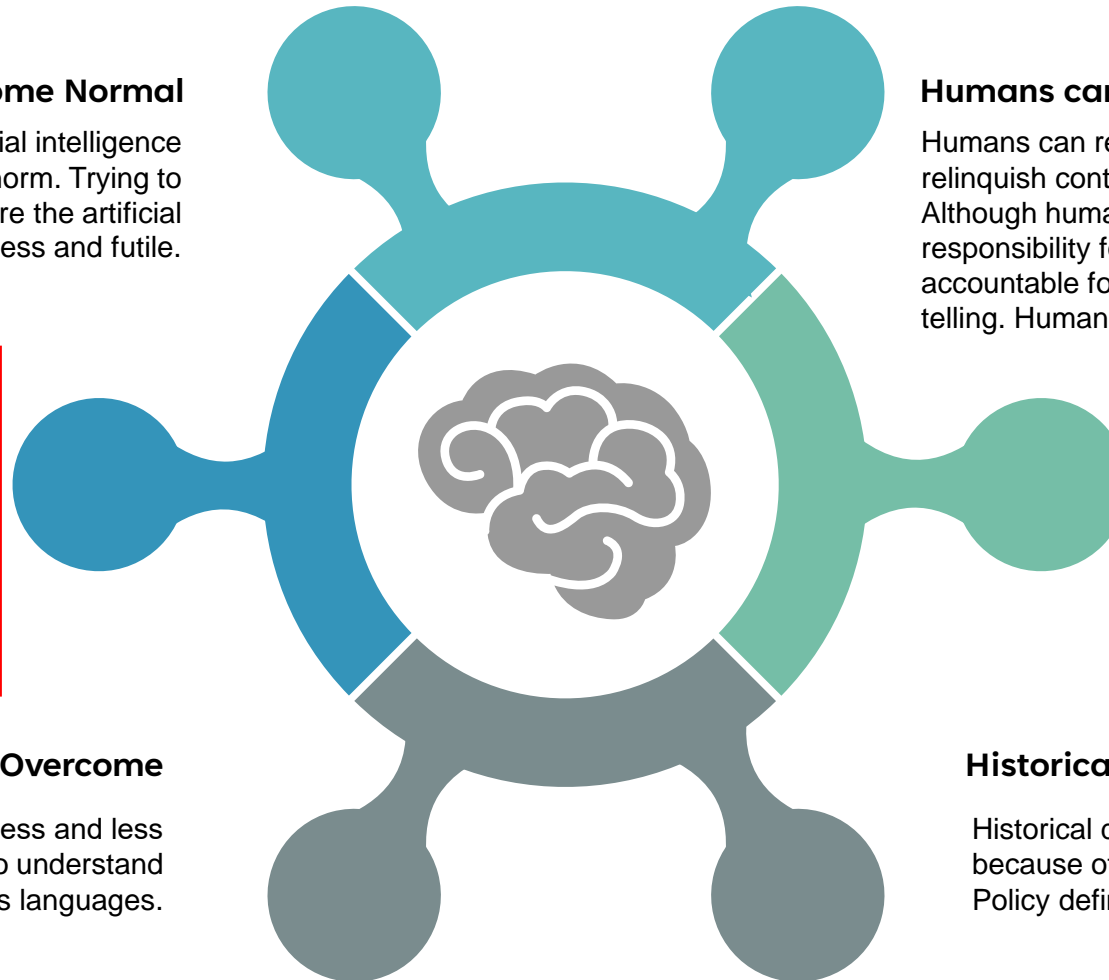
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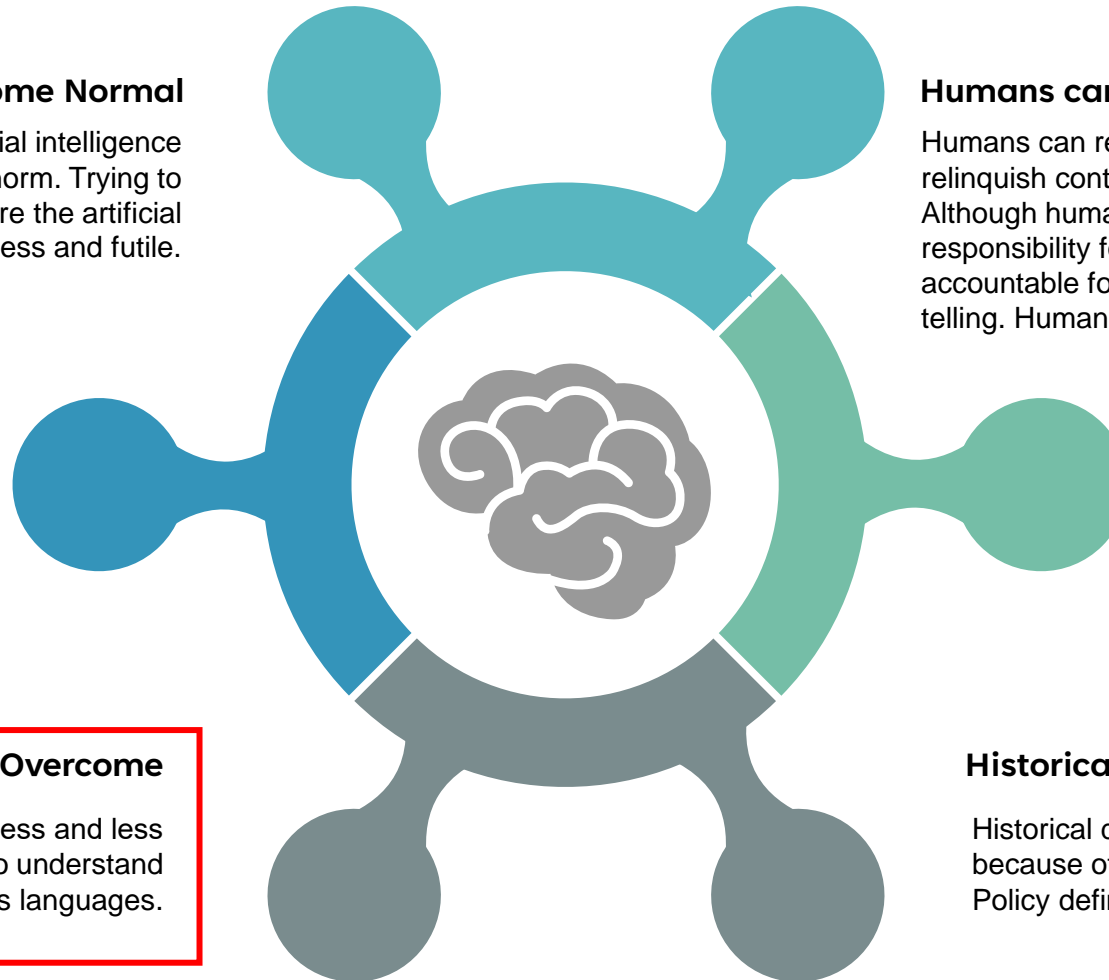
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# Wearable AI – The next wave of tech gadgets?

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Oct 4, 2023 - Technology

## Companies race to make AI you can wear



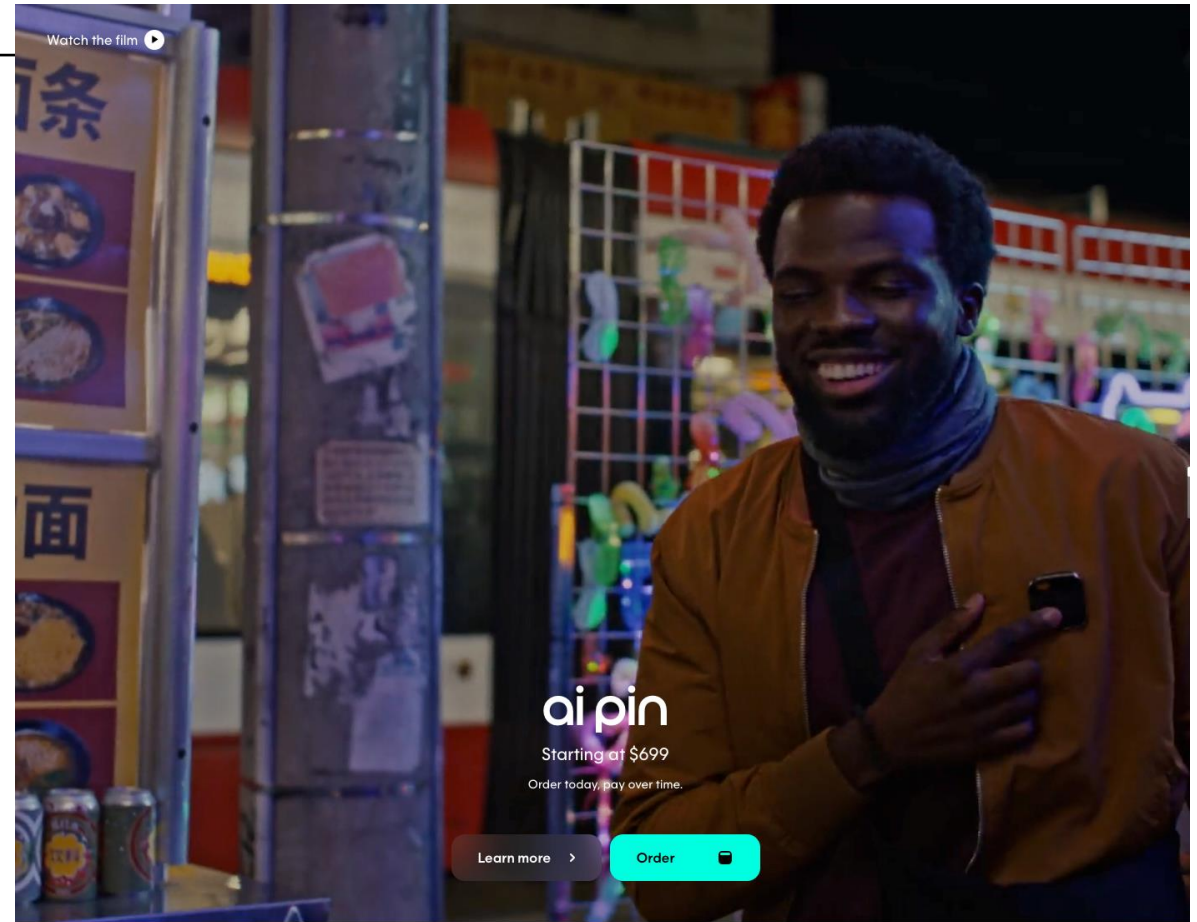
Ina Fried, author of [Axios AI+](#)



Images of three new AI wearables from Rewind, Meta and Humane. Photos courtesy Rewind.ai, Meta, and Justin Shin/Getty Images

<https://www.axios.com/2023/10/04/ai-wearables-meta-humane-tab-rewind>

# Wearable AI is Already Available



Humane - <https://hu.ma.ne/>  
Launched in November 2023  
Example provided for information only.  
This is not as an endorsement.

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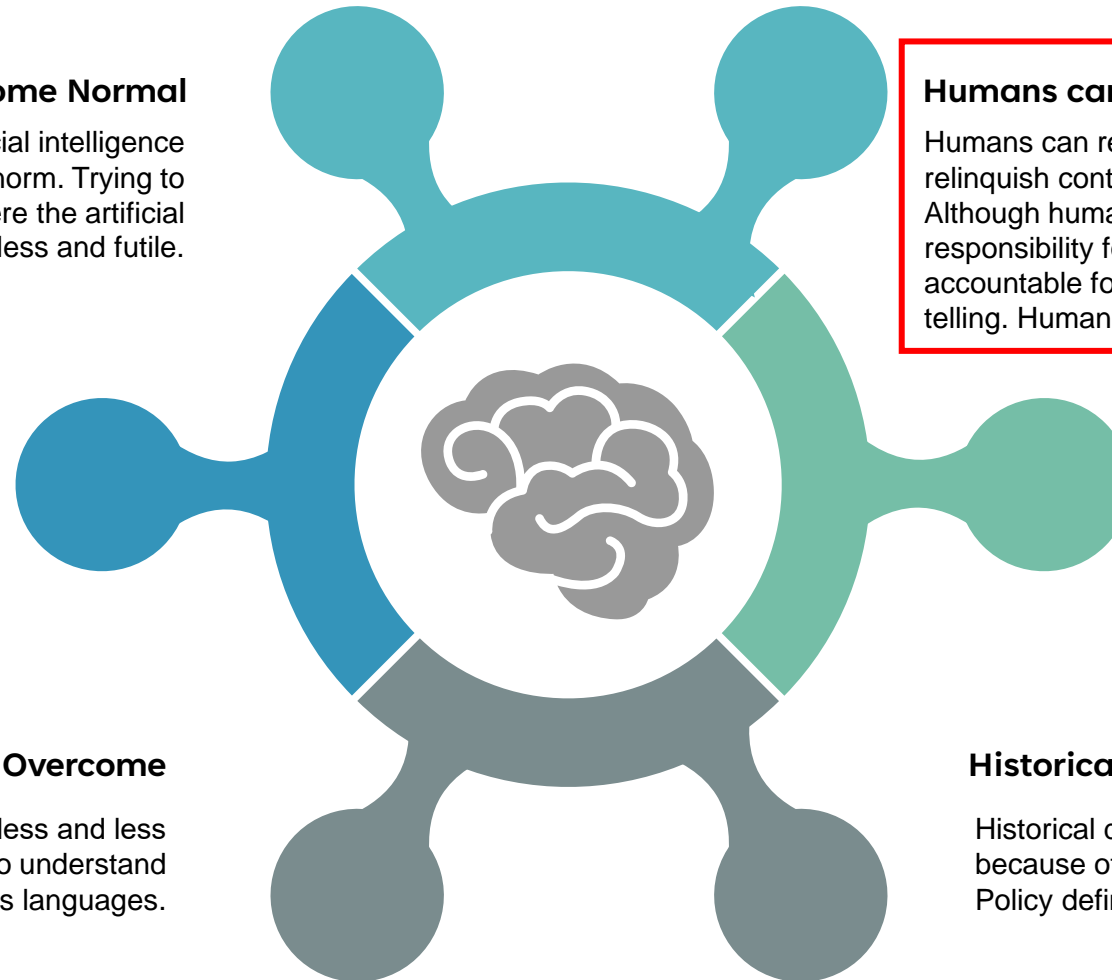
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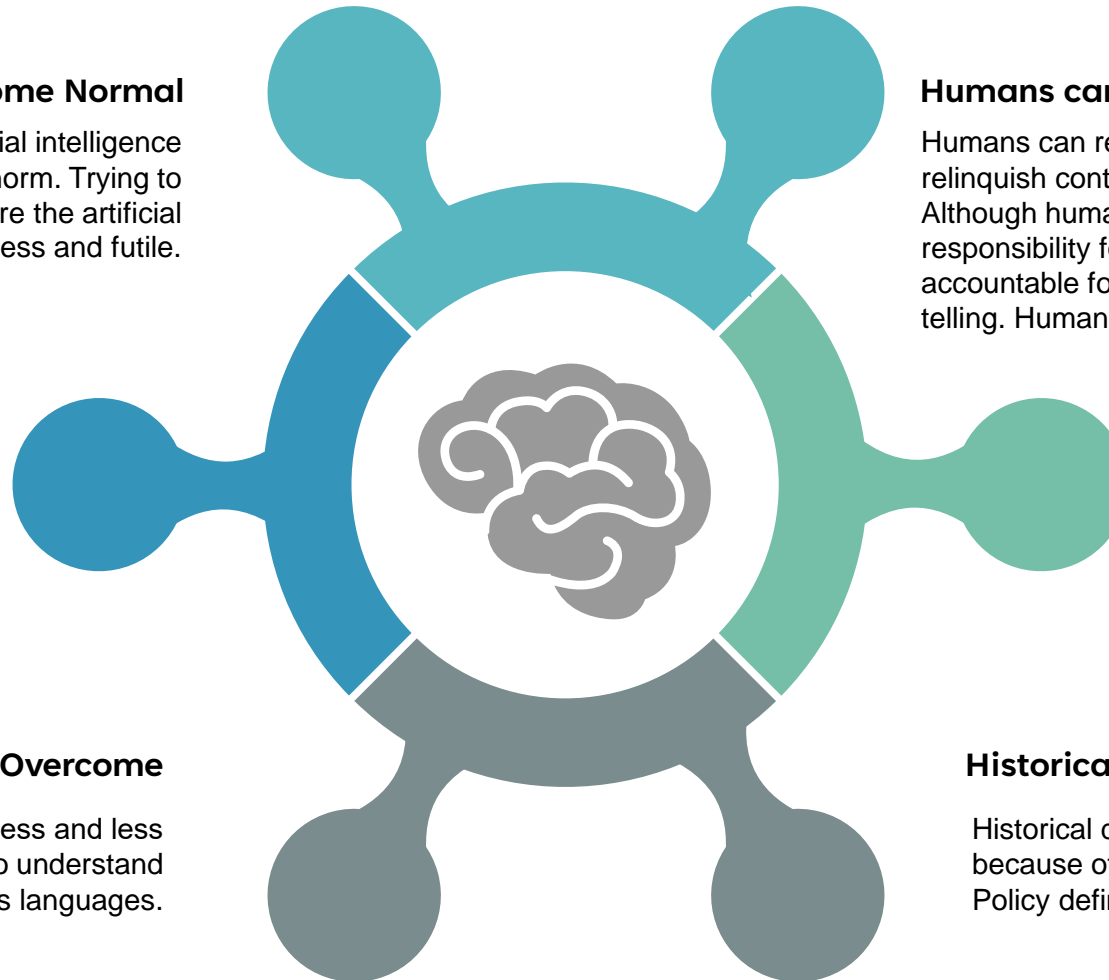
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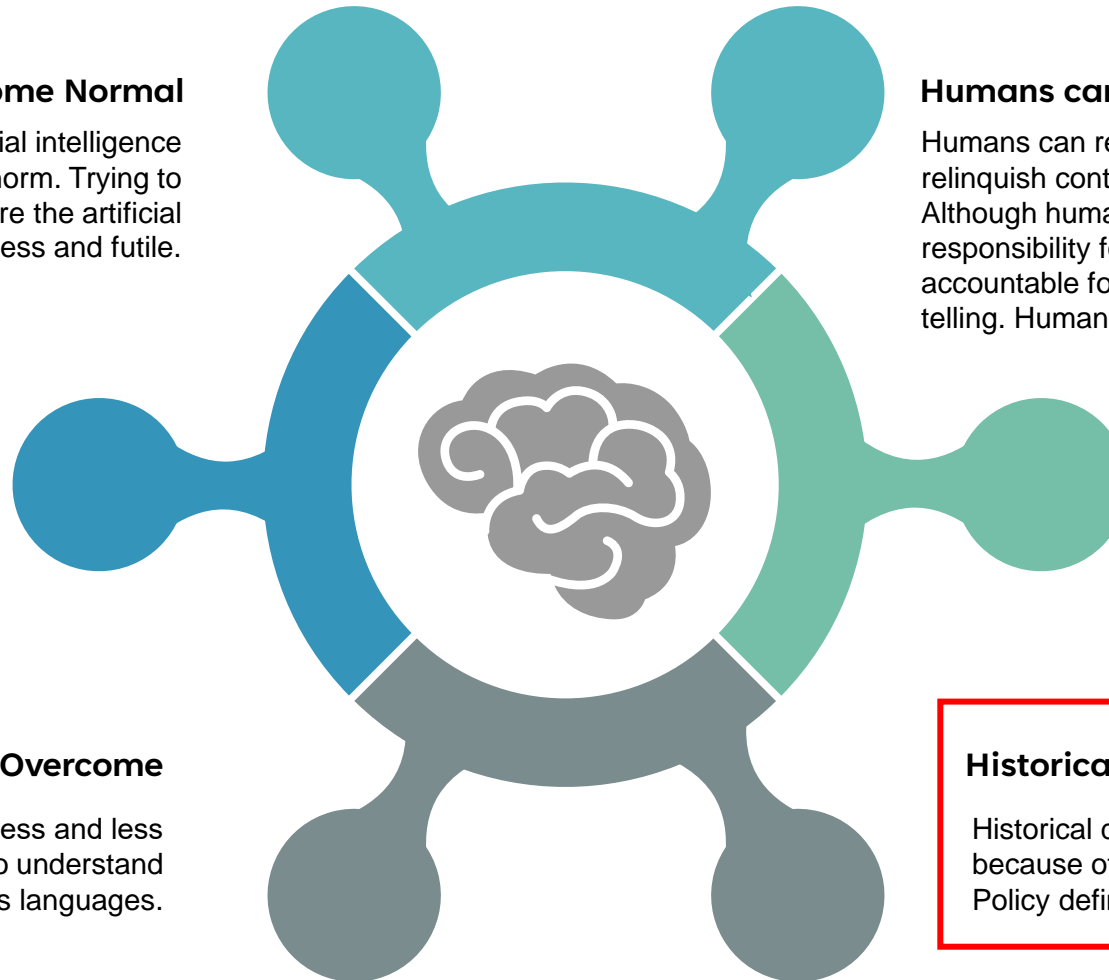
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## Key Message

Historical definitions of plagiarism and misconduct may require questioning and reconsideration.

# Current research

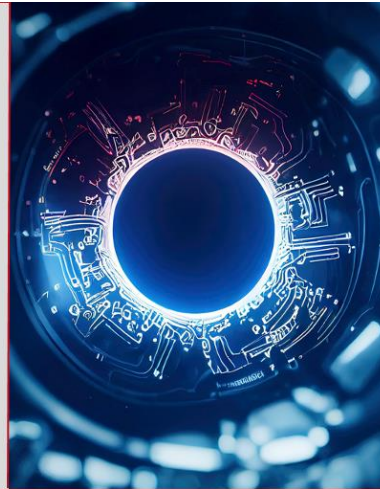
## Understanding the Impact of Artificial Intelligence on Higher Education

Public Lightning Talks

University of Calgary

June 8, 2023

9:30 AM – 3:00 PM (MDT)



Social Sciences and Humanities  
Research Council of Canada

Conseil de recherches en  
sciences humaines du Canada

Canada

## Artificial Intelligence & Academic Integrity

The Ethics of Teaching and Learning with  
Algorithmic Writing Technologies



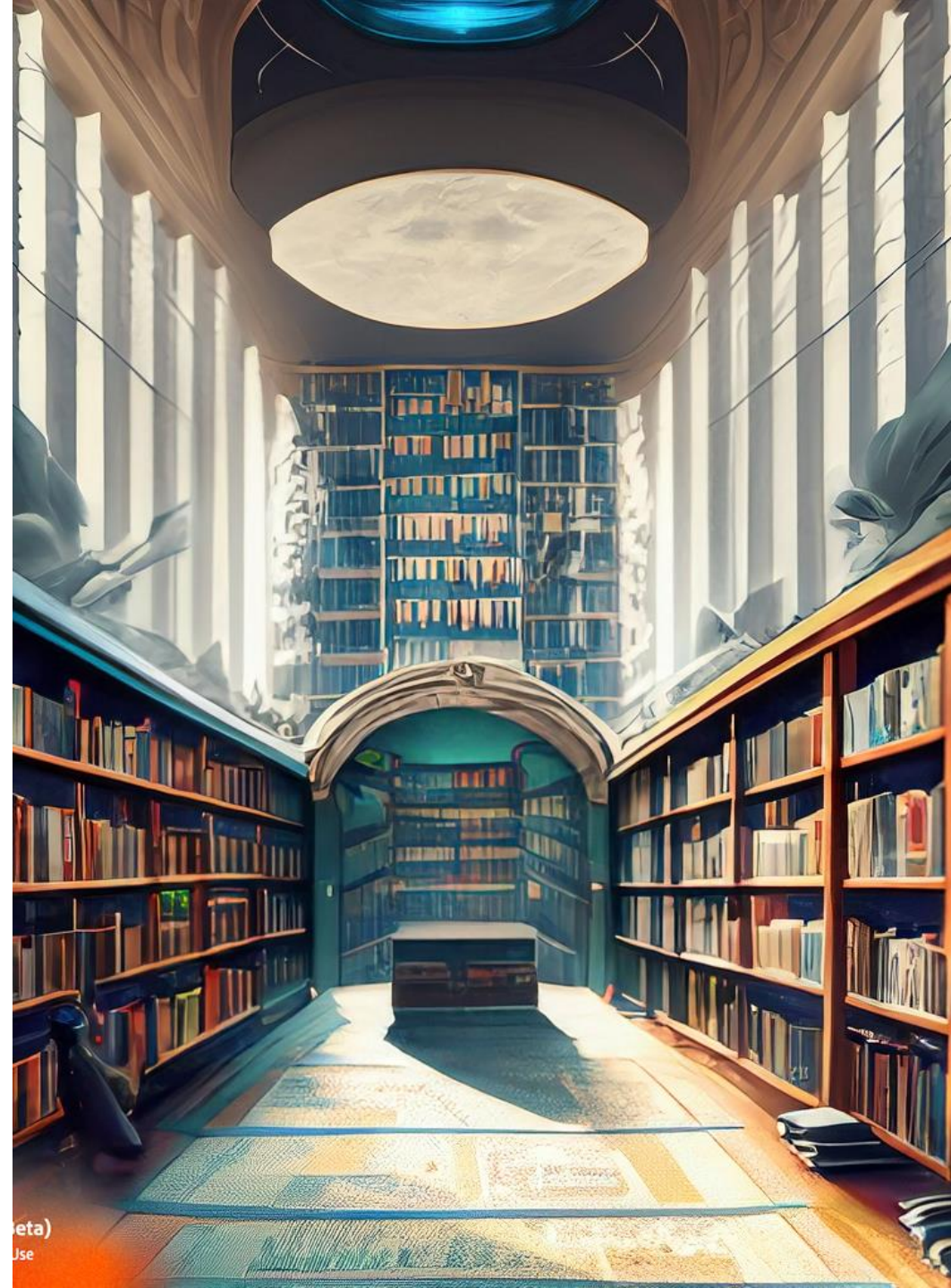
Funded by the University of  
Calgary Teaching and Learning Grants

For more information contact:  
Sarah Elaine Eaton, PhD, [seaton@ucalgary.ca](mailto:seaton@ucalgary.ca)



# Research Question

What are the ethical implications of artificial intelligence technologies for teaching, learning, and assessment?





# ChatGPT is like Kleenex

Since November 2022, we've come to use the word "ChatGPT" like we use the word "Kleenex".

ChatGPT a product name that has become synonymous with artificial intelligence tools.



Find the best plugin using our ChatGPT Plugins List!

 150K+

 350K+

 Deals

# FUTUREPEDIA

THE LARGEST AI TOOLS DIRECTORY, UPDATED DAILY



Tools Added Today

26



News Added Today

5

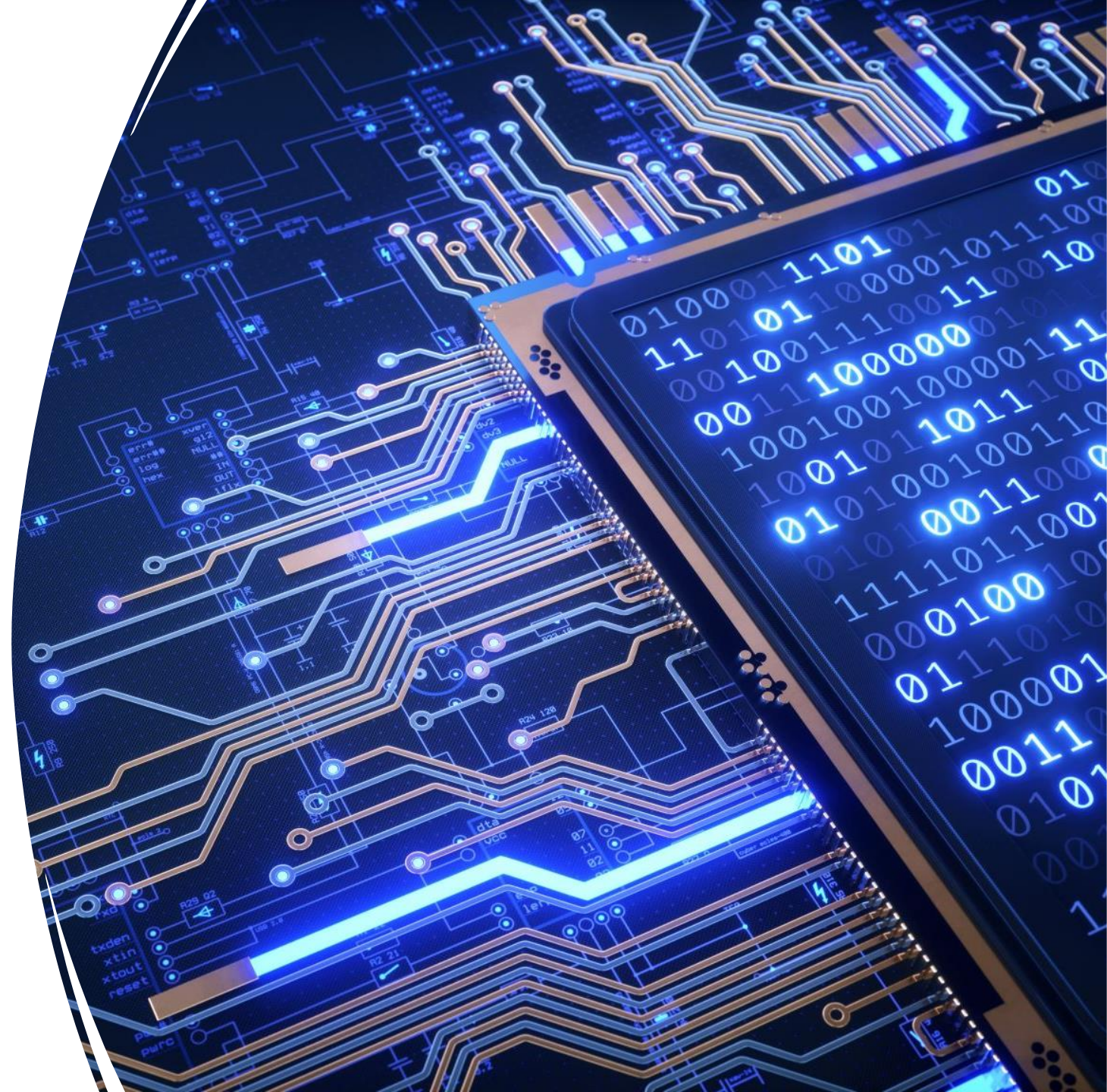
**Thousands of AI  
apps available  
to the public...**

- <https://www.futurepedia.io/>
- This directory has ~5000 apps listed.



# Artificial Intelligence is here to stay

If we want students to be workforce ready when they graduate, we must teach ethical use of artificial intelligence across the curriculum.

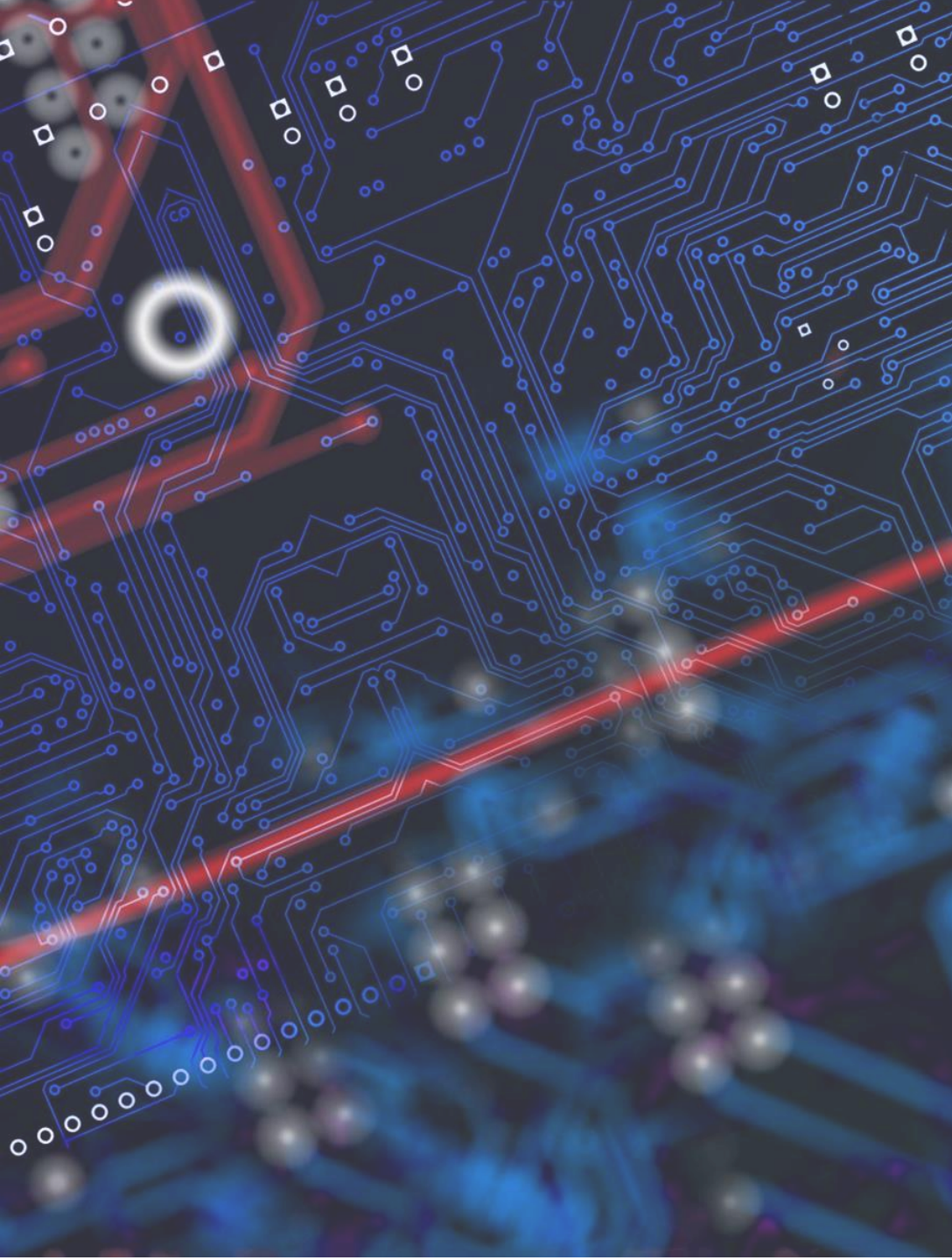




# Precursor to GPT: Predictive Text

The predictive text tools that have become embedded into everyday technologies such as instant messaging apps and word processing programs were originally designed in the 1980s to help persons with disabilities. (Swiffin et al., 1987)





## Key Message

Technology can help  
to level the playing  
field for equity-  
deserving people.





# Thinking beyond today...

Children who are 5 years old or younger will never know school without artificial intelligence...

The current generation of children who started school this year will graduate from high school in or around the year 2041.

Let's think about their future...

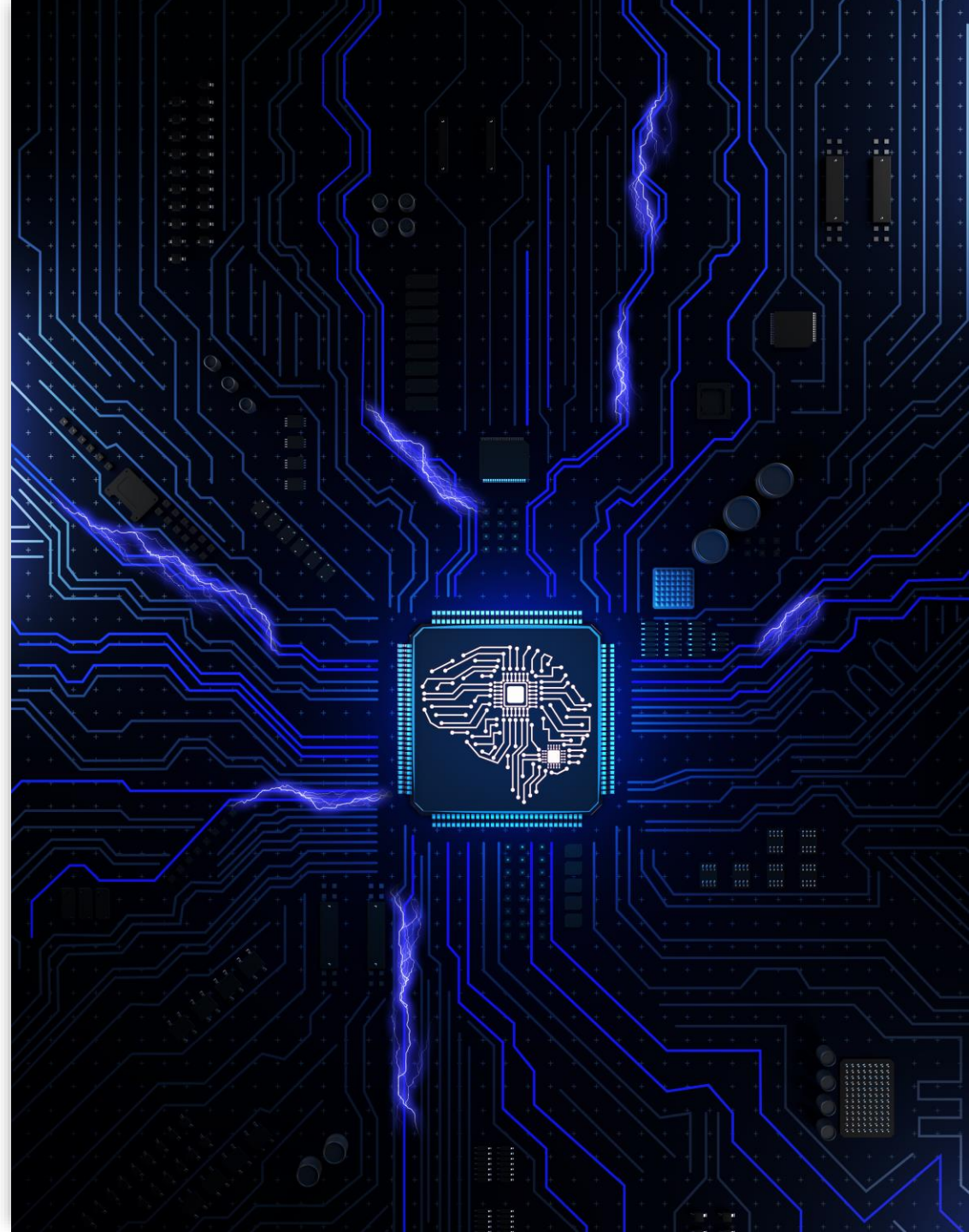
# Neurotechnology: The Next Big Challenge?

By the time the first generative pre-trained transformers (GPT) was introduced in 2017, Elon Musk was working on [Neuralink](#), a brain-computer interface that is “fully implantable, cosmetically invisible, and designed to let you control a computer or mobile device anywhere you go” (Neuralink, 2023).



# What is neurotechnology?

- Neurotechnology is technology that provides direct access to the neural circuits of the central nervous system, for the purposes of recording neural circuit activity (also called ‘reading’) or altering neural activity (also called ‘writing’); as such, neurotechnology has “the potential to register and alter the inner workings of human mentality” (Goering et al., 2021, p. 378).
- A subset of neurotechnology is brain-computer interfaces (BCIs), which have existed for years for medical purposes (Marsh, 2018, Ienca et al., 2018).





# UNESCO Report (2023)

Neurotechnology “has broken into the market leading to an increased availability of direct-to-consumer products that may be used for recreational and mental augmentation purposes. However, the effects of these technologies are still unclear and their unregulated use entail unprecedented risks for human rights related to freedom of thought, mental integrity and to some of its underlying pre-conditions such as dignity, identity or human agency.” (p. 3)

## **THE RISKS AND CHALLENGES OF NEUROTECHNOLOGIES FOR HUMAN RIGHTS**

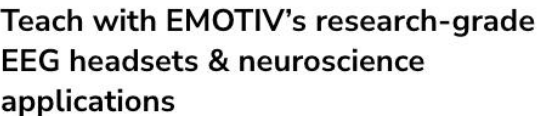




## Key Message

The rate of development  
for direct-to-consumer  
advanced technology is outpacing  
what most educators  
are currently keeping up with.

## Example: Emotive.com



**Learn more**

NB: This is information, not an endorsement.

# Expensive, but available

Prices currently start at about \$6800 USD for two headsets.

<https://www.emotiv.com/eeg-headsets-for-education/>

NB: This is information, not an endorsement.

## Packages

EMOTIV Starter & Standard Education Packages serve every size classroom. Find the right package for your program.

Starter Kit : \$6,799 USD



**2 Insight Headsets**

5 Channel Wireless EEG Headsets

Standard Kit : \$15,350 USD



**5 Insight Headsets**

5 Channel Wireless EEG Headsets



**1 Epoc X Headset**

14 Channel Wireless EEG Headsets



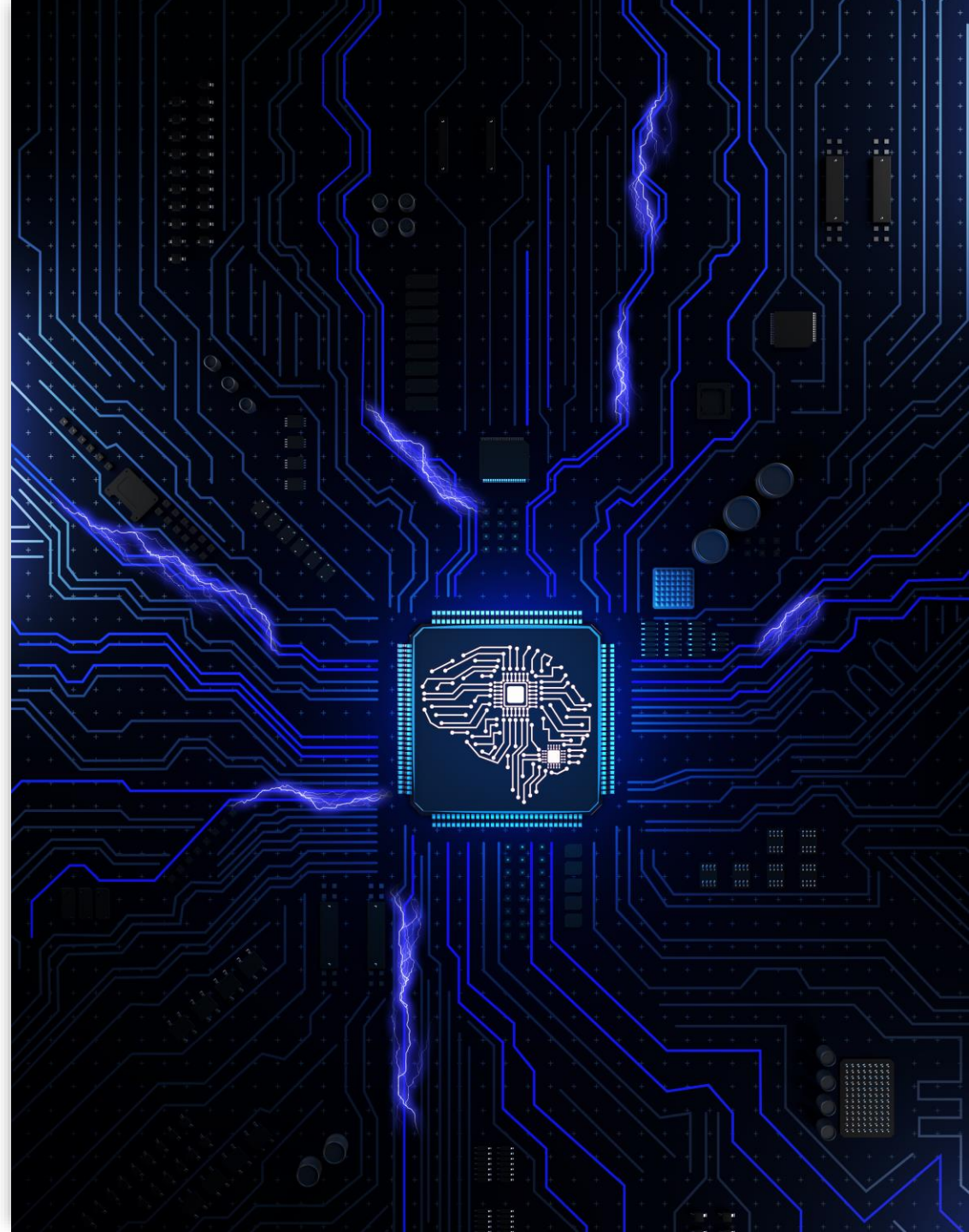
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14 Channel Wireless EEG Headsets

# Ridiculous or rational?

Neurotechnology is not currently on the radar of most classroom educators, yet it is already available to consumers...

Organizations such as UNESCO are paying attention to the ethical implications of direct-to-consumer neurotech -- And so should we.





# Elon Musk's Neuralink

## Neuralink, Elon Musk's brain implant startup, quietly raises an additional \$43M

Kyle Wiggers @kyle\_l\_wiggers / 9:25 AM MST • November 25, 2023

Comment



November 2023: Raising capital

## Post



Elon Musk ✓  
@elonmusk

Subscribe



The first human received an implant from @Neuralink yesterday and is recovering well.

Initial results show promising neuron spike detection.

3:37 PM · Jan 29, 2024 · 55.5M Views

25K

47K

238K

10K



January 2024: Implanting tech

# Key message

Advanced technologies will continue to be a pervasive ethical challenge in education and research.

Thinking about the impact and ethical implications of neurotechnology that is widely commercially available is ***pre-emptive, rather than speculative.***



Children starting kindergarten today are likely to have easy access to commercially available neurotechnology before they graduate from high school.

***What will this mean for school counsellors in the next five to 15 years?***





# Closing message

Ethics and integrity matter  
because people matter.





 **BMC** Part of Springer Nature Search 🔍

## International Journal for Educational Integrity

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Editorial | [Open access](#) | [Published: 12 October 2023](#)

### Postplagiarism: transdisciplinary ethics and integrity in the age of artificial intelligence and neurotechnology

[Sarah Elaine Eaton](#) 

*International Journal for Educational Integrity* **19**, Article number: 23 (2023) | [Cite this article](#)

**2265** Accesses | **32** Altmetric | [Metrics](#)

Read more about postplagiarism here:

<https://doi.org/10.1007/s40979-023-00144-1>

# Recap of Key Messages



Academic integrity includes ***and extends beyond*** student conduct.



Historical definitions of plagiarism and misconduct require questioning and reconsideration.



Neither students nor educators can win in an academic integrity arms race.



The rate of development of direct-to-consumer advanced technologies is currently outpacing what most educators are keeping up with.



Ethics and integrity matter because people matter.

# Calls to Action: Our PACT with students

Prioritize	Prioritize integrity as a <i><b>pedagogical</b></i> imperative.
Advocate	Advocate for <b>ethical</b> use of technology to prepare students for a future with artificial intelligence and neurotechnology.
Commit	Commit to leaving the education system better than we found it.
Teach	Be a teacher above all else. Regardless of technological advances, students still need great teachers. Students still need us!

# Connect with me

- Sarah Elaine Eaton
- [Seaton@ucalgary.ca](mailto:Seaton@ucalgary.ca)
- Twitter / X: @DrSarahEaton
- LinkedIn: <https://www.linkedin.com/in/drsaraheaton/>