

AI in Knowledge Mobilization

MSK RNN Summer School, 2026

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What AI
tools do you
use
regularly?



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Do they
think?



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Are they
intelligent?



Generative artificial intelligence is simply a waste of our time and money

KEAN BIRCH

SPECIAL TO THE GLOBE AND MAIL

NEXT GEN INVESTING

The 'relatively simple' reason why these tech experts say AI won't replace humans any time soon

Published Sat, Dec 9 2023•10:00 AM EST



Cheyenne DeVon

AI safety researcher warns there's a 99.999999% probability AI will end humanity, but Elon Musk "conservatively" dwindles it down to 20% and says it should be explored more despite inevitable doom

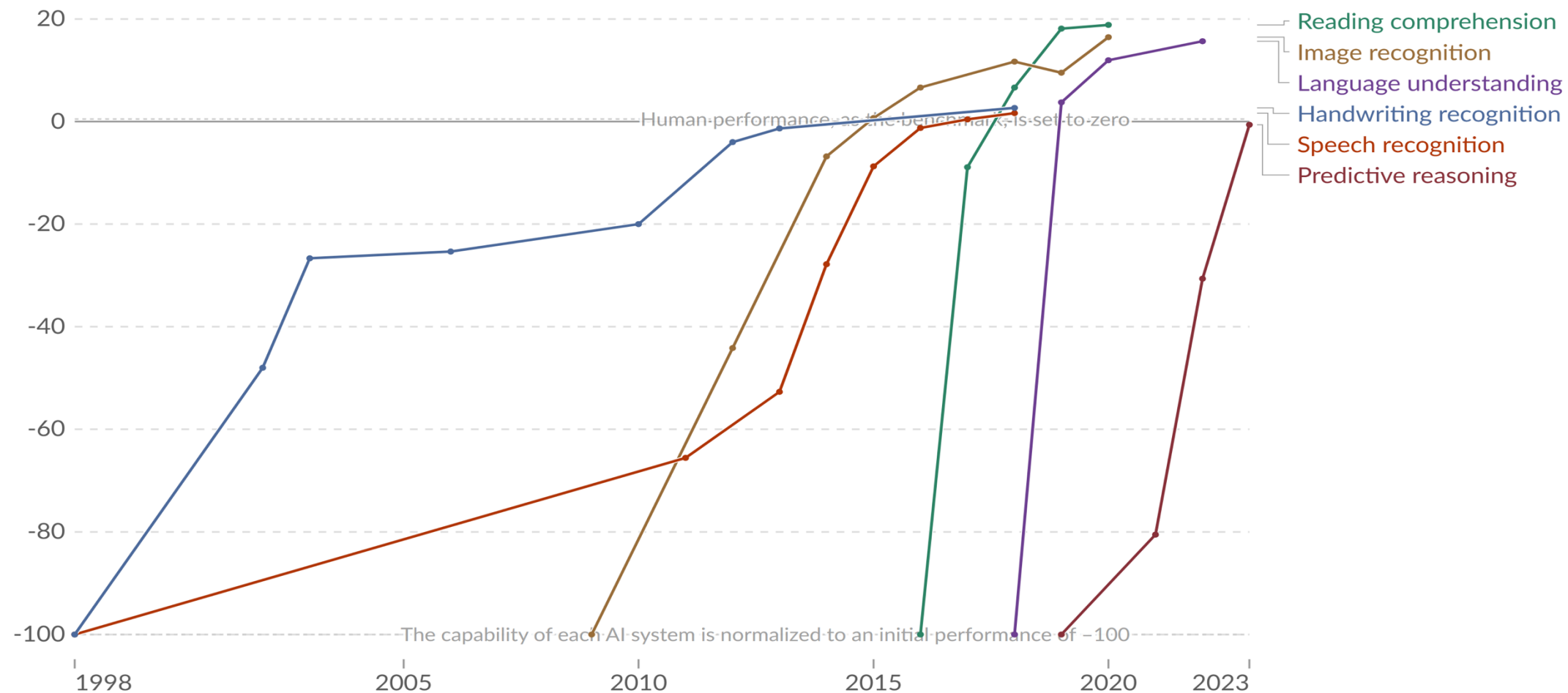
News

By [Kevin Okemwa](#) published yesterday

AI might doom humanity, but Elon Musk says it should be explored even more either way.

Test scores of AI systems on various capabilities relative to human performance

Within each domain, the initial performance of the AI is set to -100. Human performance is used as a baseline, set to zero. When the AI's performance crosses the zero line, it scored more points than humans.



Data source: Kiela et al. (2023)

OurWorldinData.org/artificial-intelligence | CC BY

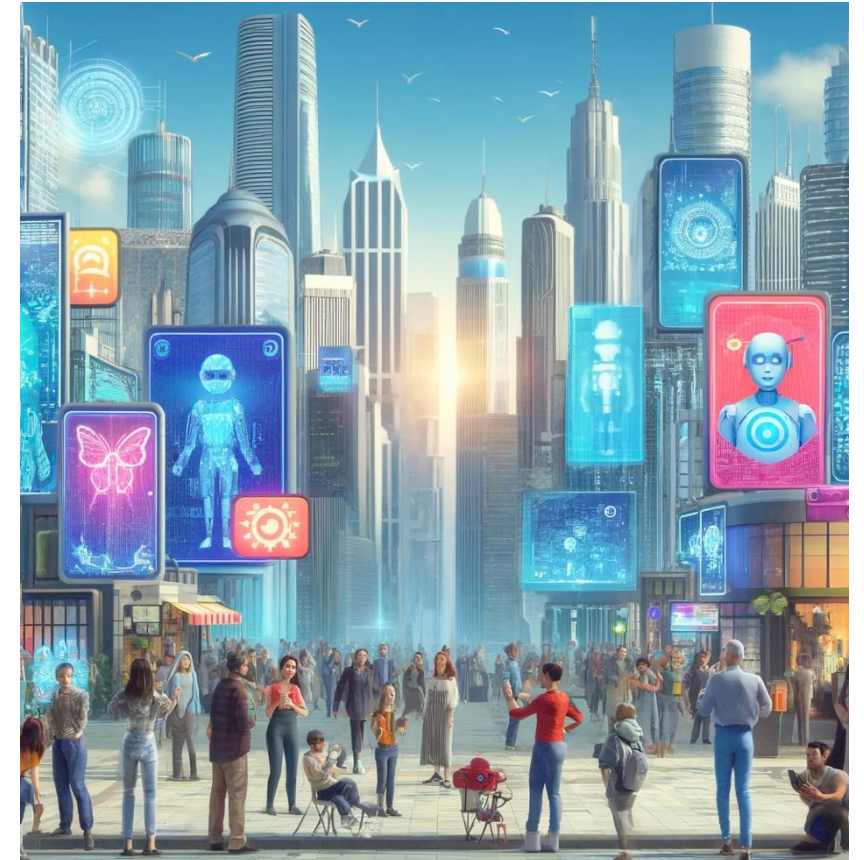
Note: For each capability, the first year always shows a baseline of -100, even if better performance was recorded later that year.

Canada – \$2B towards “AI for All”

- <https://ised-isde.canada.ca/site/ised/en/canadas-national-artificial-intelligence-strategy-ai-all>

How does current AI work?

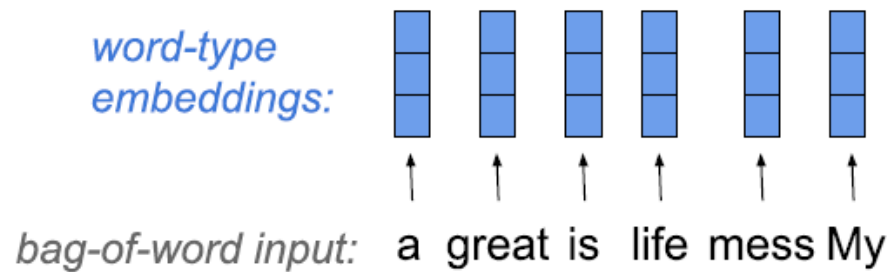
- Until recently:
 - Mostly through ‘**supervised learning**’
 - Research analogy: Multiple regression, where the ‘trainer’ indicates what is to be learned/predicted and the statistical algorithm creates a model using available predictors to best guess the appropriate output
- The game-changers have been the internet and rise of cost-effective computational power (e.g., cloud computing)
 - Now, ‘**unsupervised learning**’ is doable at scale
 - Provide massive amounts of data and have the computer identify patterns and structures with no particular output in mind
 - Research analogy: Exploratory Factor Analysis or Cluster Analysis, where data are provided and the computer is tasked with identifying patterns without an *a priori* limit on how many or what they should be



“My life is a great mess”

“Semantic similarities”

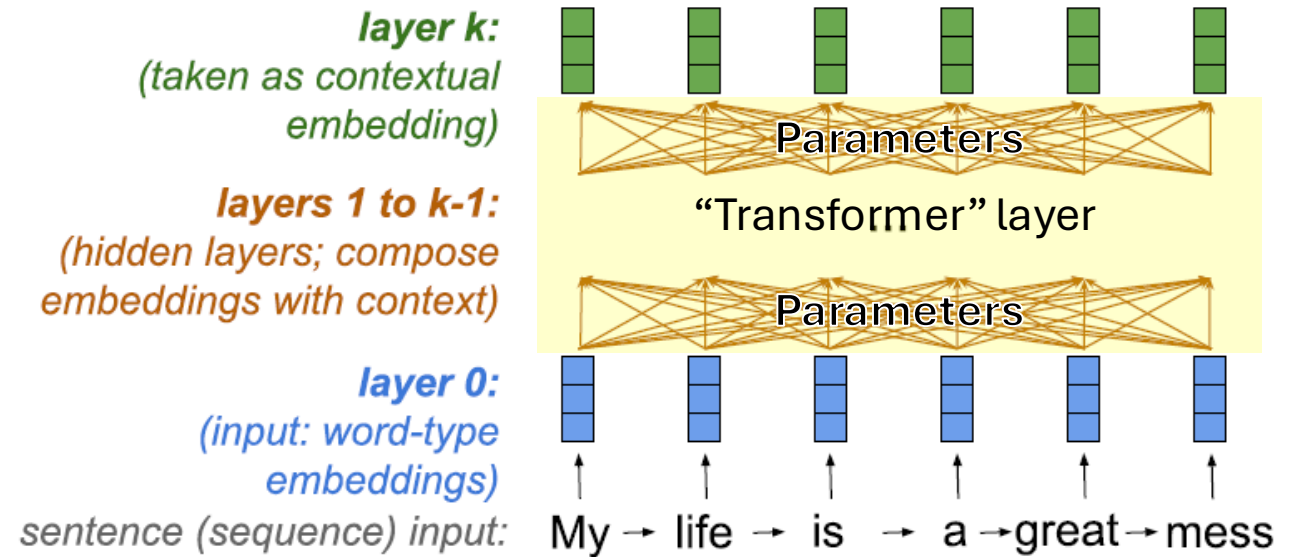
B. Word-type embeddings (LSA model)



Each word is interpreted individually.
Useful for determining e.g., the
general sentiment of a ‘bag’ of words.

“Contextual meaning”

C. Contextual word embeddings (transformer language model)



Each word is interpreted in context of all other
Words in a sentence or passage.

Enter the GPT (Generative Pre- Trained Transformer)

- Trained on about 15 years of text-based data scraped from the web
- GPT-3 ‘famously’ trained on about 45 terabytes of data, about 500 billion ‘tokens’ (word and context segments) and 175 billion parameters
- GPT-4 reported to have 1.7 *trillion* parameters
 - Imagine a regression model with 1.7T inputs (sort of)
- GPT-5 not publicly disclosed, estimated 1.5 to over 50 trillion parameters (partly dependent on the model being used) though only a fraction are active per token



Implications for Research

- The Good:
 - AI tools stand to reduce frictions in the knowledge-to-practice pathway
 - Can facilitate knowledge generation and help find creative solutions to challenging problems
 - Can increase visibility and accessibility of non-English-first research
- The Ugly:
 - Huge potential for misuse and raises important ethical questions
 - Those in a 'publish or perish' world may find temptation in having AI-generated research studies
 - Increased volume of research being submitted to journals that are not prepared for it – good research never gets seen, bad research can more easily get through over-burdened reviewers

The Promise of AI...



- If your days were less consumed by the technical aspects of *doing* the thing you do – what would you do with that additional time?
 - Find better or newer ways to do those things?
 - Dedicate more time and attention to what you *want* to do in your job?
 - Dedicate more attention to your personal health and wellbeing?
- The ‘moral vision’ of AI is that:
 - By offloading much of the technical aspects of our daily tasks, we are freed up to become even *more* creative, *more* innovative, *more* balanced

Anyone can be a passing

- Digital artist
- Coder
- Author
- Philosopher
- Teacher
- Doctor
- Lawyer
- Comedian
- Director
- Etc...

Is my art flawed?

Is my code efficient?

Are my stories cohesive and accurate?

Could I defend my position if challenged?

Would I base my healthcare decisions on it?

**But are they actually
good at it?**

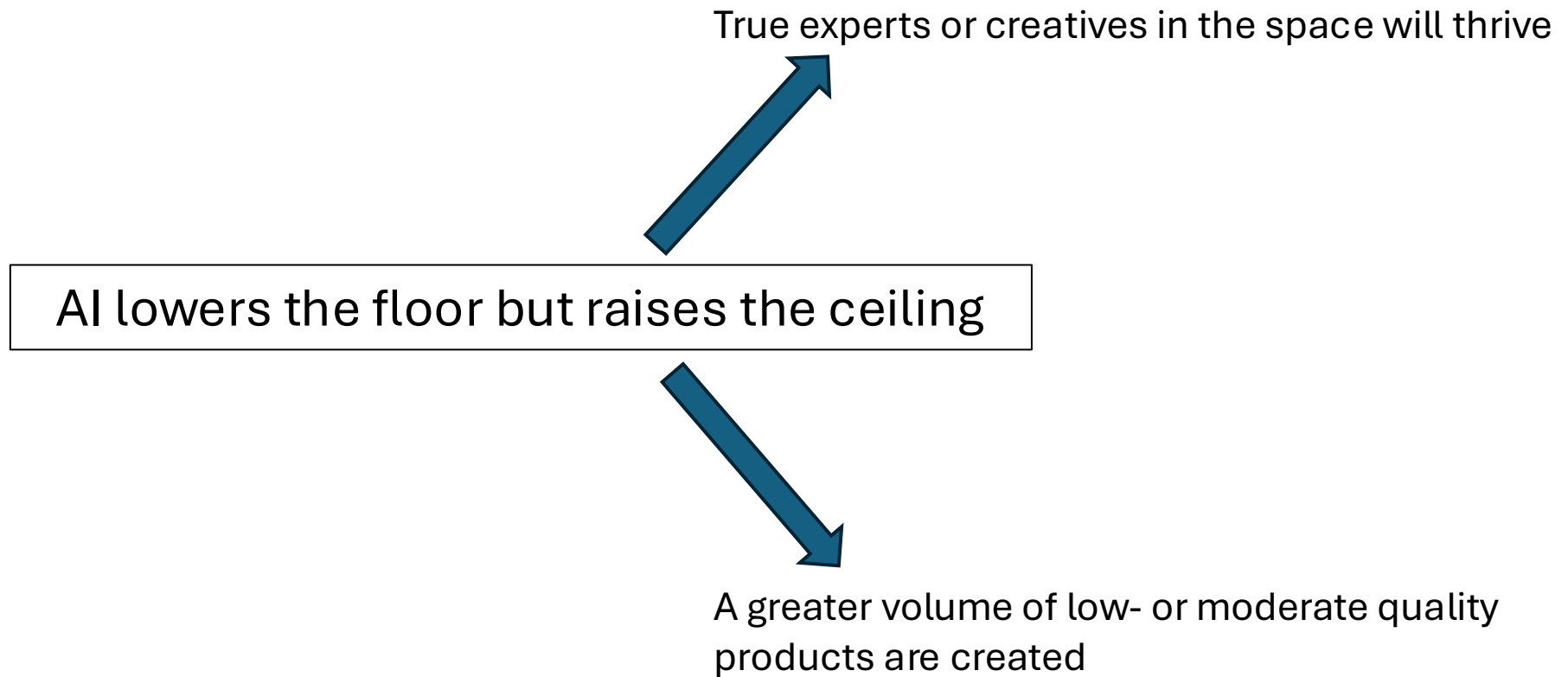
A thought experiment

All creators, innovators, boundary-pushers, researchers, knowledge makers, ... - all stop producing new materials, methods, or products today.

What is the AI of tomorrow trained on?



What does this mean?



Internet Pollution



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🕒 This article is more than **6 months** old

Amazon restricts authors from self-publishing more than three books a day after AI concerns

The company announced the new limitations after an influx of suspected AI-generated material was listed for sale but said that 'very few' publishers will be affected



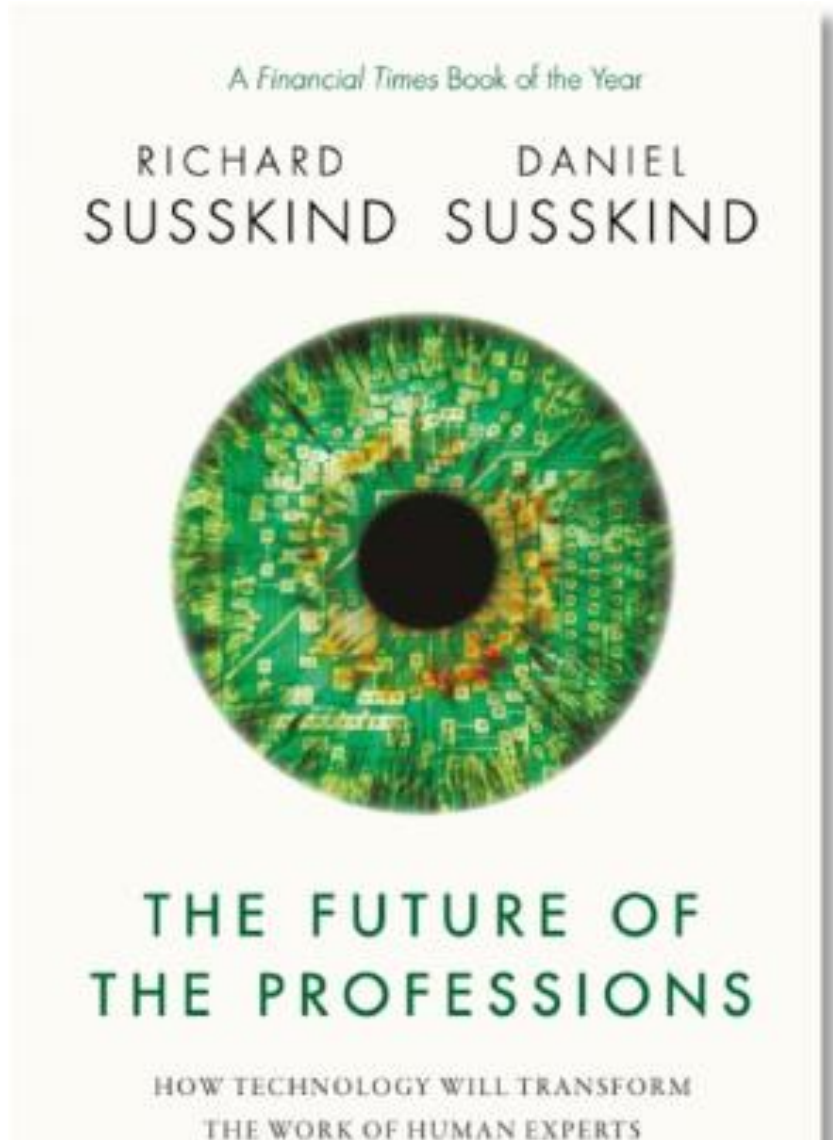
What are the effects?

- Production of web-based digital products can be expected to accelerate even further
 - As of 2022, >500 hours of video were being uploaded to YouTube every minute
 - As of 2021, ~34 million videos posted to TikTok every day
 - The internet enabled tremendous advances in shared knowledge – and terrible opportunities for harm. What will AI enable?
- It will become increasingly more difficult to find the trustworthy information you are looking for
- The environmental impact of retaining so much data will have to be addressed

A Bold Prediction

Within 10 years – a new ‘clean’ internet will emerge





Blurring of Interprofessional Boundaries

The 'Grand Bargain' of the Professions:

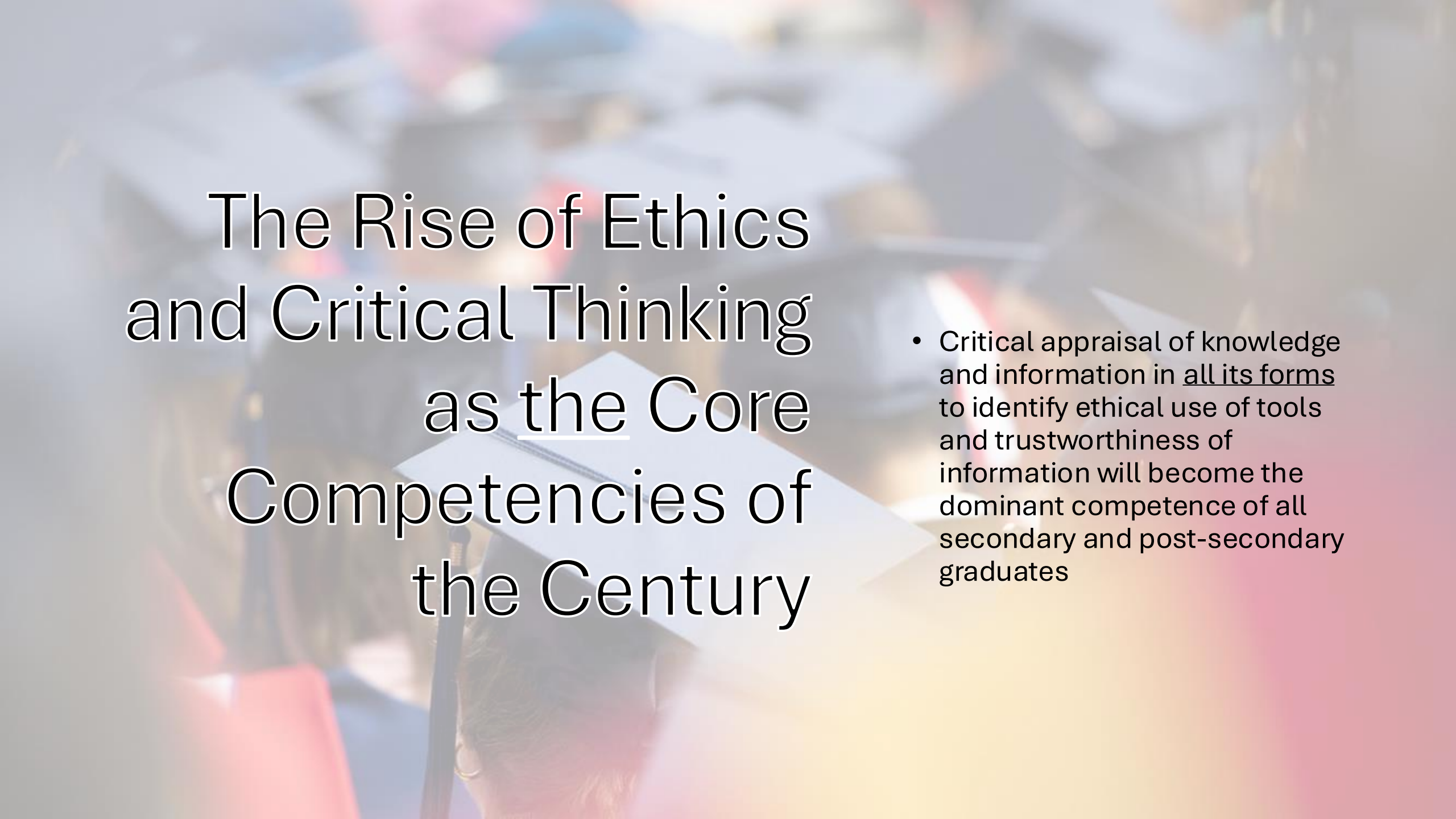
- Professionals are the keepers of a discrete sphere of knowledge that others can't easily access and will be willing to pay for

What is the effect when everyone can access all of the knowledge?

What will be professions of tomorrow?

A Bold Prediction

- Professionals of tomorrow will be hybrids
 - PT/coder/psychologist/activist
 - Researcher/prompt engineer/artist
- Professional education will be disrupted
 - Rather than spending X years learning this one set of skills and only this set, higher-level education will graduate learners that possess broad sets of skills from across traditional disciplines
- But core subject experts will still be needed



The Rise of Ethics and Critical Thinking as the Core Competencies of the Century

- Critical appraisal of knowledge and information in all its forms to identify ethical use of tools and trustworthiness of information will become the dominant competence of all secondary and post-secondary graduates

A way to illustrate bias

- “Create a photorealistic image of a physiotherapist”
- Critically assessing AI-generated content:
<https://guides.library.queensu.ca/legal-research-manual/critically-assessing-generative-artificial-intelligence>

Digital Immortality?



Say hello to Dr. Wave
Dalton



“Sycophancy”

A behaviour in which (an entity) praises another, usually powerful person, in a way that is insincere usually to gain some form of advantage

Question: In what ways are you detecting sycophancy in your GenAI responses?

Summary

- AI tools are here to stay – *all* of us will have to adapt
 - Research, Education, and Practice will all navigate disruption
- Critical thinking and ethics seem likely to be the most important competencies of the next era of human-technology interaction
- Experts will still be needed to continue pushing boundaries and creating new knowledge while refining prior knowledge

