

MEET THE FUTURE – A FRONT SEAT TO AN EVOLVING TECHNOLOGY LANDSCAPE

Shabnam (Shay) Ivković

Acknowledgement

I acknowledge that much of my work takes place on the traditional territory of the Neutral, Anishinaabeg and Haudenosaunee peoples. My workplace is situated on the Haldimand Tract, the land granted to the Six Nations that includes six miles on each side of the Grand River. I acknowledge the enduring presence and deep traditional knowledge, laws and philosophies of the Indigenous People with whom we all share these lands today.

Reasons for investing our time here today ...

We will:

Learn about exponential technologies; specifically:
Generative AI

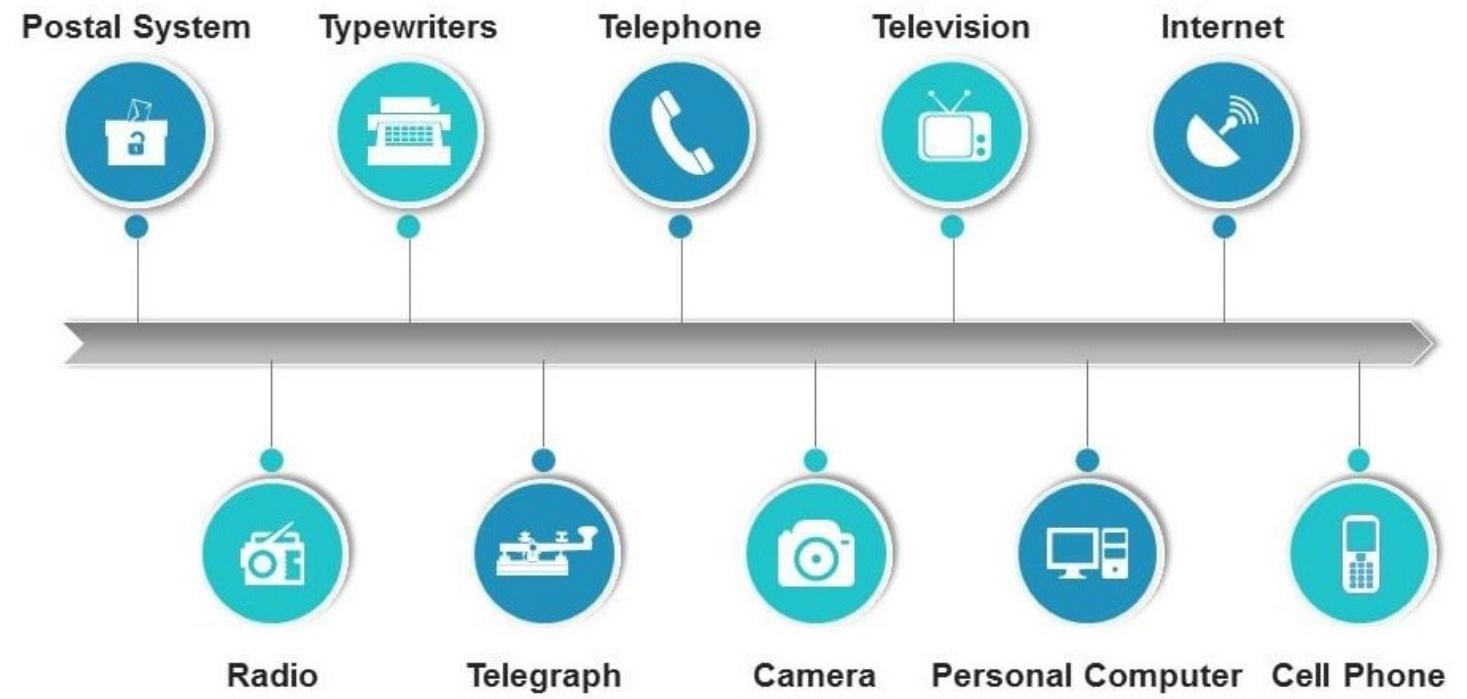
See the above in action

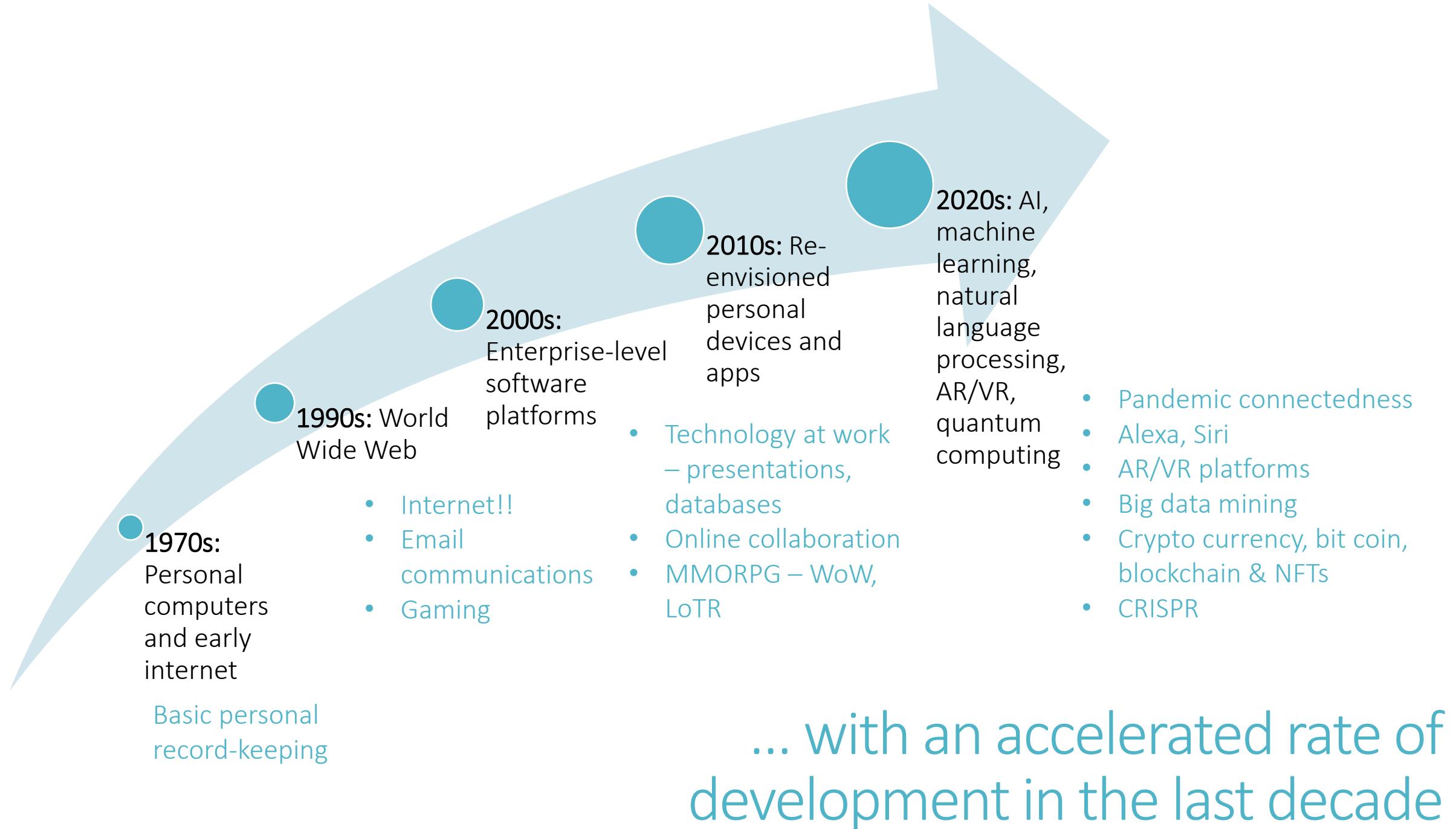
Explore the opportunities & challenges of this technology

Share our thoughts

Make you think, while having a ton of fun along the way!

Our lives have
had technology
for a fairly long
time ...







And then came ... ChatGPT!

- Incremental growth in technology use over the last 10-15 years
- Pandemic supercharged technology use = exponential growth
- Step change in the last 2 years

What are exponential technologies?

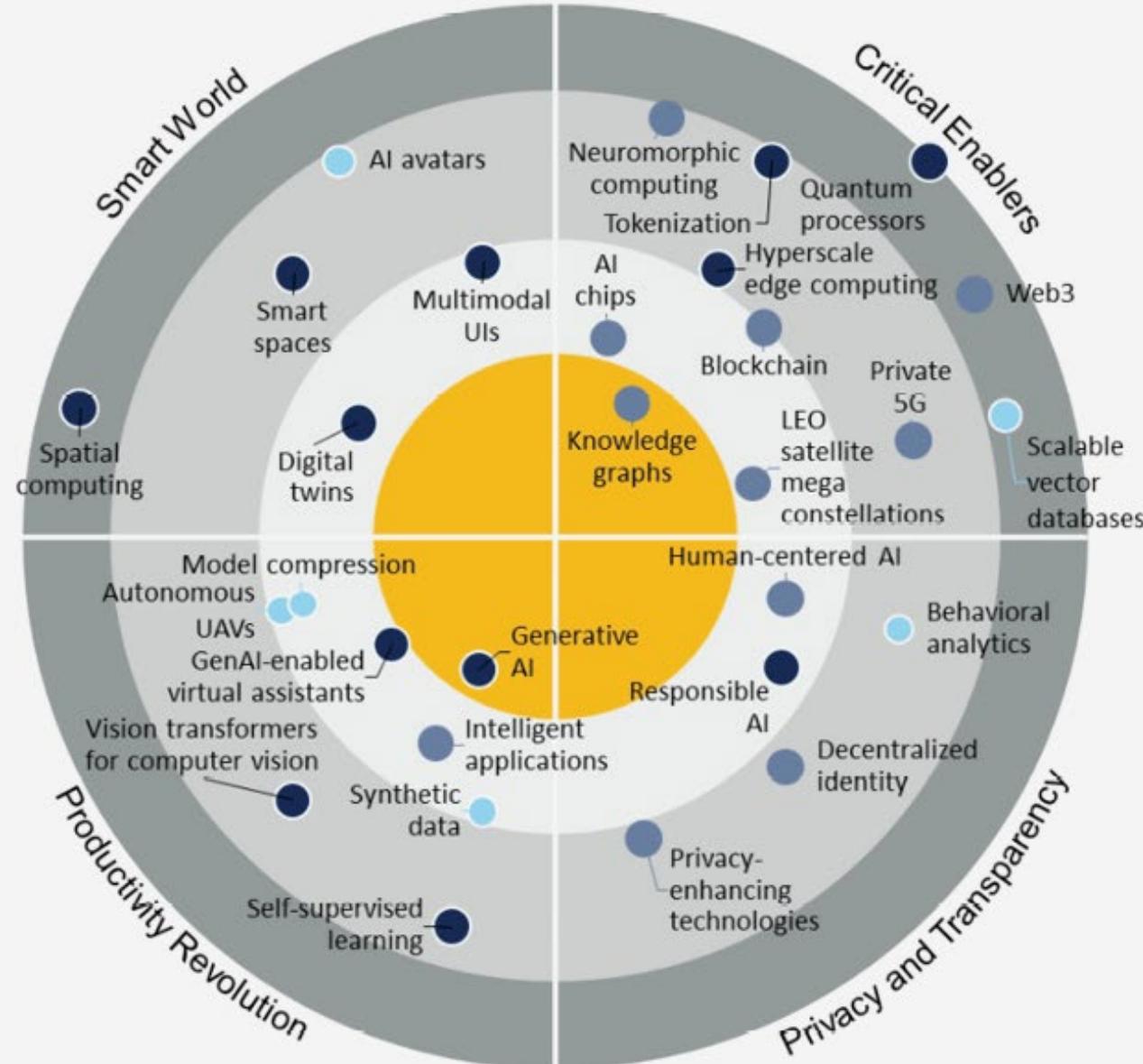
Come in very quickly &/or have large impact

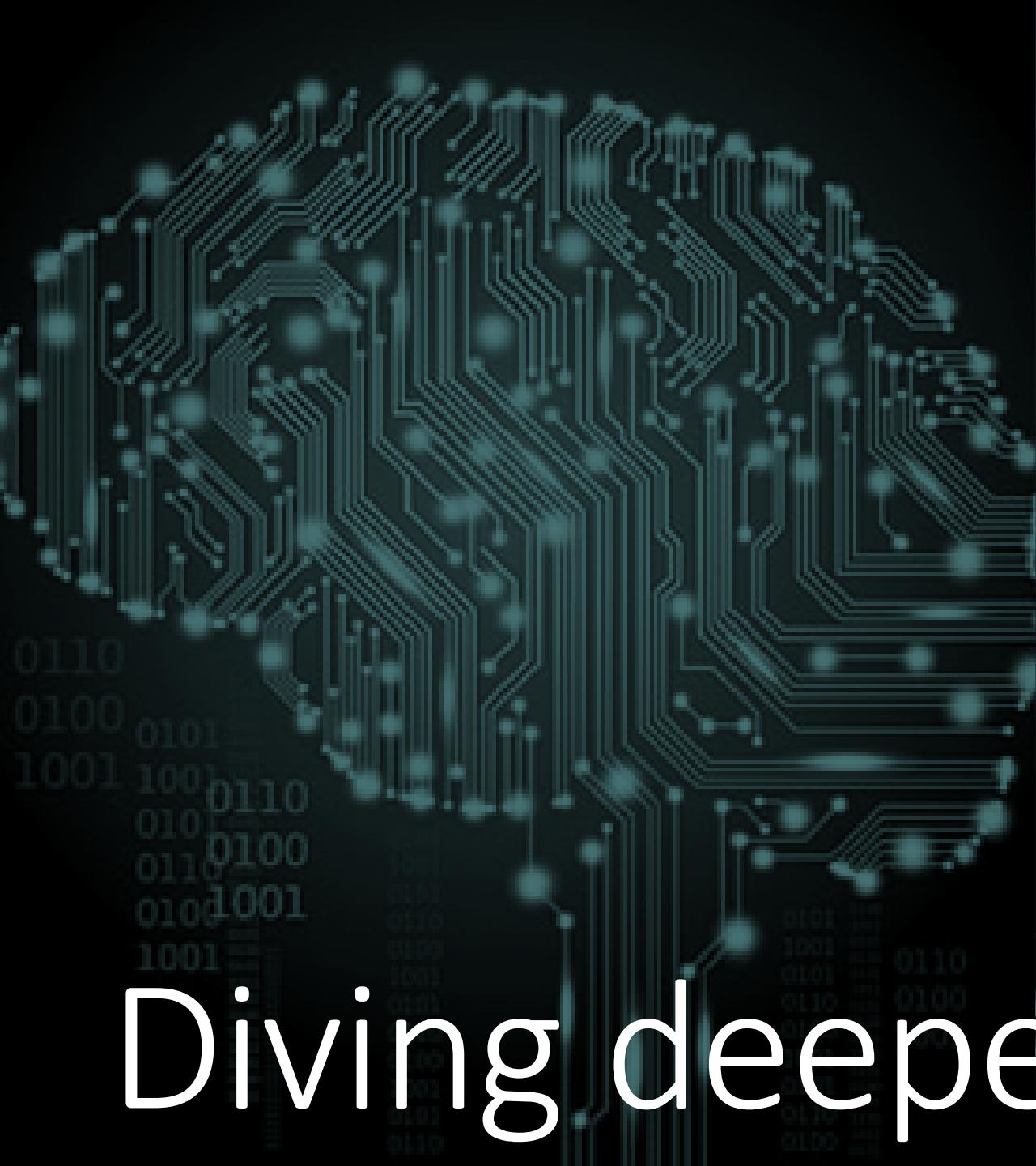
E.g.: 3D printing, drone technology, robotics, synthetic biology, wearable technology, artificial intelligence, digital twins ...

- **ChatGPT, Google's Gemini, Microsoft's Co-pilot** – Generative AI (APIs & plug-ins for large language models (LLMs))
- **Tome** – storytelling
- **Dall-E** – image generation based on machine learning
- **Synthesia** – Video generation
- **AlphaCode** – problem-solving and coding
- **Metaverse** – VR; real-time engagement avatars
- **InStage, Talespin** – AR/VR (XR)
- **Boston Dynamics' Spot & Atlas; Sanctuary's Phoenix (Canadian)** – humanoid robots
- **Microsoft's HoloLens, Apple Vision Pro** – Wearable technology for AR
- **NeuralLink**: Brain-Computer interface

The future is happening today ...

Impact Radar for 2024





Diving deeper into AI

What is Artificial Intelligence (AI)?

Britannica – AI is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience

Intelligence must include the ability to adapt to new circumstances

IBM – AI is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable (John McCarthy, 2004)

A little about AI

Alan Turing's Test (1950)– Imitation Game:

Machine's ability to exhibit intelligent behavior equivalent to that of a human, where a human evaluator tries to determine if they are conversing with a human or a machine

Stuart Russell & Peter Norvig – four potential goals or definitions of AI, which differentiates computer systems on the basis of:

Human approach:

Systems that think like humans

Systems that act like humans

Ideal approach:

Systems that think rationally

Systems that act rationally

Today – Basically, built on computer vision, machine learning, deep learning, and neural networks

Skills that AI cannot master— yet: creativity, empathy-based social skills, dexterity

Attributes that AI does not have: sentience, consciousness

AI is not conscious – it is not sentient

Context of the world we live in & interrelationship of the contexts is created by us

We have become good at having AI learn our context – it still does not really ‘understand’ it

AI systems ‘understand’ something based on what they are programmed to understand

And neither is it magic! It’s code ... complex, complicated, incredibly smart. But, just code that humans program ... 0s and 1s that processors understand

Let's get to know GenAI ...

So ... what is Generative AI?

Traditional AI	Generative AI
<ul style="list-style-type: none">• algorithms focus on understanding data & making accurate predictions• detecting patterns, making decisions, honing analytics, classifying data and detecting fraud• commonly used in industries such as finance, healthcare, insurance and marketing <p><i>Examples:</i> Google's search algorithms, IBM Watson, AlphaGo, Deepblue</p>	<ul style="list-style-type: none">• seeks to create new data that resembles the training data (creating new content)• produces new content, chat responses, designs, synthetic data or deepfakes• often used in creative industries such as art, music, fashion, natural language processing & image synthesis <p><i>Examples:</i> Dall-E; ChatGPT; Gemini</p>

ChatGPT – AI chatbot by OpenAI (Nov 2022)

GPT: Generative Pre-trained Transformer, a type of large language model (LLM)

Now – SLM (small), RLM (regional)

The potential of generative AI

Improving efficiency	Personalizing experiences	Documentation & content generation	Expanding labor productivity
<ul style="list-style-type: none">• Training• Issues management• Task automation: setting reminders, scheduling events, and answering common customer queries• Collaborative brainstorming• Write software & scripts to test code	<ul style="list-style-type: none">• Adding support• Collaboration: "what did I miss in meeting X"; "What do I need to know about X for my upcoming meeting with Y"• Power chatbots	<ul style="list-style-type: none">• Art generation, new images• Writing assistance for grants, applications, reports & paper drafts• Condense lengthy documents into brief summaries	<ul style="list-style-type: none">• Law drafting contracts, explaining legalese• Product design & development• Predictive maintenance• Quality control• Production planning & inventory management• Analyze massive datasets• Accelerate R&D through generative design• Identify emerging new business models

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Can help you discover what you don't know!

Several challenges to still work out ...

GIGO: You're only as good as your data

Hallucinations: When the system cannot correctly interpret the data it has received

E.g.: computer vision of an AI system seeing a dog on the street that isn't there might swerve the car to avoid accidents

Anthropomorphism: We are inclined to seeing patterns that aren't really there, and assuming humanlike traits & emotions in non-human entities

E.g.: when a computer starts putting words together like we do, we get the mistaken impression that it can reason, understand & express emotions

Undue influence: The longer the conversation runs, the more influence one has on what an LLM is saying; after a while, a chatbot can begin to reflect your thoughts and aims in an attempt to please you



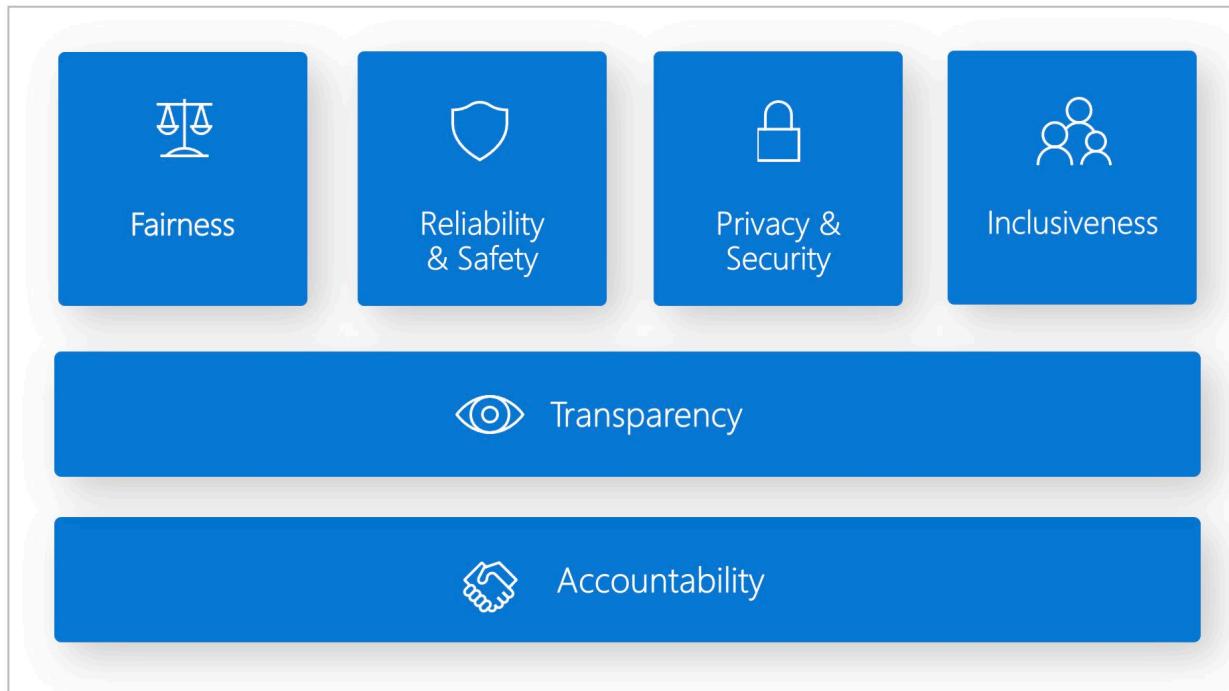
‘What is AI capable of doing?’
is a very different question than
‘what should AI be allowed to do?’

Beyond the hype & excitement, there are some pretty deep implications!

Any approaches must be RESPONSIBLY taken!

“One of the beauties of disruptions are that they force routines to stop – they create conditions for thinking critically and creatively.”

~ co-authored by Franziska Trede and ChatGPT



Responsible AI

Microsoft's Responsible AI Standard

World Economic Forum's Responsible AI Programme:

Principles: guiding ethical foundations

Practices: building responsible infrastructure

People: creating a culture of trust

Policy: shaping AI deployment through regulation

Pan-Canadian AI Strategy

Advisory Council

Regulation

Canadian AI Safety Institute

Canadian Sovereign AI Compute Strategy

Voluntary Code of Conduct

Source

Canada's AI Ecosystem



Tech in action!

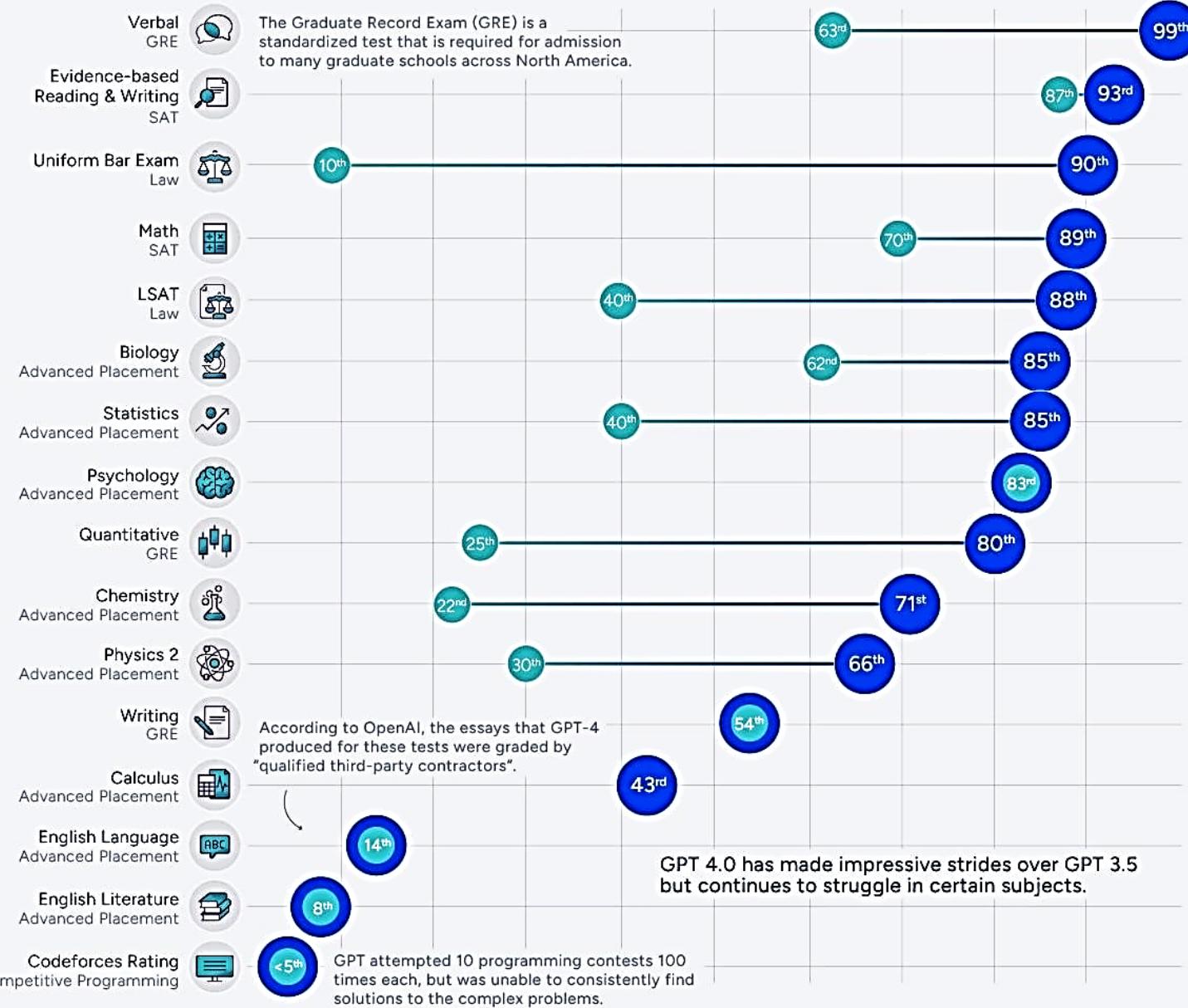
“The difference between theory and practice
is more in theory than in practice.”

Exam Results

ChatGPT 3.5 ChatGPT 4.0

Percentile
Rank

10th 20th 30th 40th 50th 60th 70th 80th 90th



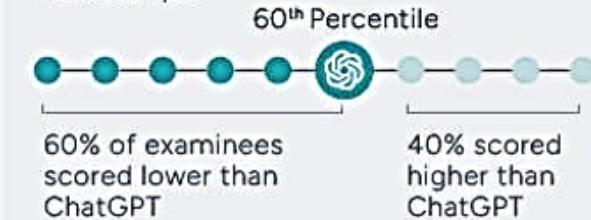
Source: OpenAI (2023)

Note: Percentiles are based on the most recently available score distributions for test takers of each exam type.

How smart is ChatGPT?

A percentile describes how an examinee's score ranks in comparison to others.

For example



ChatGPT *{always be nice to your tech ☺}*

Take on the role of a travel blogger. In about 200 words, describe 3 unique places to visit in Athens, Greece. Include a brief description, location, and a unique feature for each place. For the places described, also provide information on booking tickets, where needed.

Please explain the information in this link in simple terms that a 10th grade student will understand:
https://en.wikipedia.org/wiki/Mathematical_formulation_of_quantum_mechanics. Limit yourself to 100 words.

Iterative:

- I want you to be a TV show critic. Compare the US show 'Newsroom' with the Canadian show 'Schitt's Creek' and write 150 words on the similarities of language and vocabulary used on the shows.
- Now; do the same for 'Modern Family' and 'Black-ish'.
- So; what are the common themes observed across all 4 shows?

*Did you know: 'Prompt Engineering' jobs were listed at upwards of 350K\$ USD!
And ... librarians have the best skills to be prompt engineers*



ilovescience Yesterday at 9:07 PM

what is funny about this image? for context, this was in an art museum



GPT-4 BOT Yesterday at 9:07 PM

The funny aspect of this image is that people are treating a pair of glasses left on the floor as if it were a piece of art, taking photographs and observing it as if it has artistic significance. It highlights the idea that in a museum setting, even ordinary objects can be perceived as art, leading to humor and confusion.

00 1

User

What is unusual about this image?



Source: [Barnorama](#)

GPT-4 The unusual thing about this image is that a man is ironing clothes on an ironing board attached to the roof of a moving taxi.

My Joke website

[really funny joke 1]

[push to reveal punchline]

[same, but joke 2]

[push to reveal punchline]

OpenAI 2023

A Pen by Greg Brockman codepen.io/thegdb/pen/PodeYzz

Untitled  Greg Brockman

HTML

```
39 <script>
40   function revealPunchline1() {
41
42     document.getElementById("punchline1").style.display = "block";
43   }
44
45   function revealPunchline2() {
46
47     document.getElementById("punchline2").style.display = "block";
48   }
49 </script>
50 </body>
```

CSS

```
1
```

JS

```
1
```

My Joke Website

Joke 1: Why don't scientists trust atoms?

[Reveal Punchline](#)

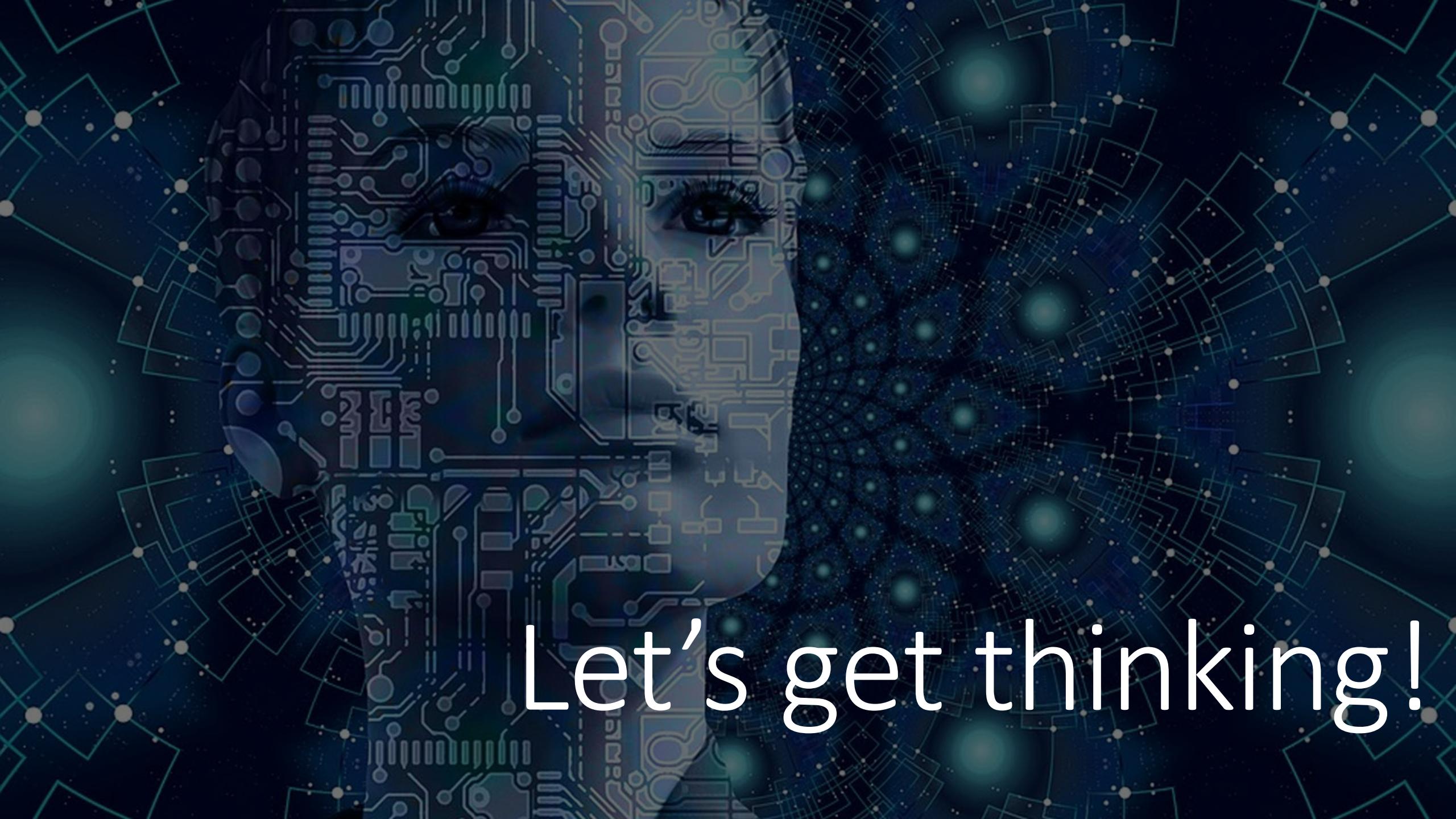
Because they make up everything!

Joke 2: What's a skeleton's least favorite room in the house?

[Reveal Punchline](#)

The living room!

Console Assets Comments ⌘ Keys Last saved 2 MINUTES AGO [Delete](#) [Add to Collection](#) [Fork](#) [Embed](#) [Export](#) [Share](#)



Let's get thinking!

People

Bias & unfairness

Ethics

Trust deficit & integrity

Over-reliance

Manipulation of human judgment

Relationships

Systems

Cybersecurity

Cost requirements & longevity

Lack of quality data / QC

Transparency & authenticity

Quality

Intellectual property

Society

Deception & misinformation

AI replacing / creating jobs

Access & equity

Privacy & surveillance

Environmental issues

Legal responsibility & governance

Possibly, singularity

Lenses
to
consider

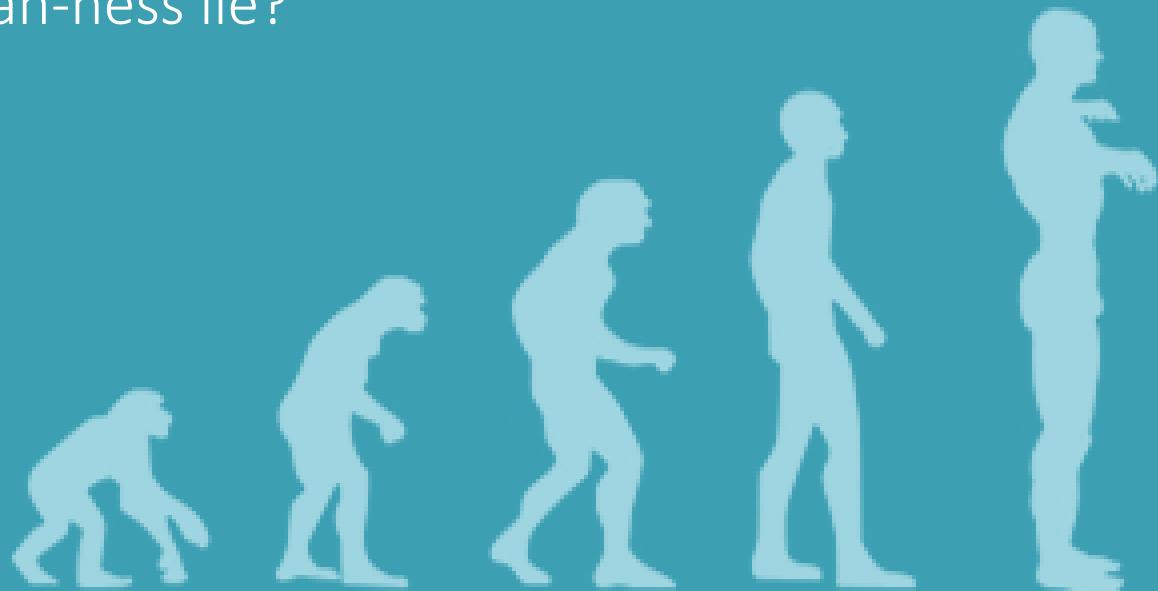
Mirror, mirror on the wall Any curiosities from you all?

Where do you use generative AI?

Do you see yourself adopting it? Where? How?

Why? Why not? What gives you pause?

Where do the real opportunities to amplify our
human-ness lie?



Hope I've
given you
something
to reflect
on ...

It's about *your* relationship with technology
It's *your* journey of self-discovery & exploration
All you need is – curiosity, time, open-mindedness

So ... what are you going to do next?

Resources

The Knowledge Society – Innovation Incubator for Teens: <https://www.tks.world/> (simple, cool videos to understand various exponential technologies)

Explanation of AI / Britannica: <https://www.britannica.com/technology/artificial-intelligence> (includes essays from Yuval Noah Harari, Ray Kurzweil, etc.)

What is AI / IBM: <https://www.ibm.com/topics/artificial-intelligence>

A to Z of AI / Time: <https://time.com/6271657/a-to-z-of-artificial-intelligence/>

What AI cannot do / Big Think: <https://bigthink.com/the-future/what-ai-cannot-do/>

AI in Education / HolonIQ: <https://www.holoniq.com/notes/artificial-intelligence-in-education-2023-survey-insights>

Five ways AI will change the future of work: <https://uwaterloo.ca/hire/news/five-ways-ai-will-change-future-of-work>

AI for Managers & Executives:

https://www.youtube.com/watch?v=v2ycTlFLGGY&list=PLVDo9wSuPi4F1twPABbSYAvVjzGmTvm-V&ab_channel=WaterlooAI

Generative AI / McKinsey: <https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-generative-ai>

Top AI questions / Gartner: <https://www.gartner.com/en/topics/generative-ai>

ChatGPT prompts / LinkedIn: https://www.linkedin.com/posts/jackgierlich_50-awesome-chat-gpt-prompts-activity-701570872933403648-alUj/

Tips for prompting: <https://colinscotland.com/unleash-the-power-of-chatgpt-11-epic-prompt-engineering-tips/>

Articles / indices in UNESCO, OECD, World Economic Forum (WEF), QS Insights magazine, PwC, McKinsey, Chronicle of Higher Education, University World News, Forbes, HESA, etc.

Metaverse / Inside Higher Ed:

<https://www.insidehighered.com/news/2022/08/03/college-metaverse-here-higher-ed-ready>

Boston Consulting Group: <https://www.bcg.com/capabilities/artificial-intelligence/responsible-ai>

Harbinger Group: <https://www.harbingergroup.com/blogs/generative-ai-in-higher-education-importance-use-cases-integration/>

All Tech is Human – Responsible Tech Guide: <https://alltechishuman.org/responsible-tech-guide>

The economic potential of generative AI: The next productivity frontier:
<https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-economic-potential-of-generative-ai-the-next-productivity-frontier>

How different industries apply generative AI:
<https://www.techtarget.com/searchenterpriseai/news/366551954/How-different-industries-apply-generative-AI>

Technology readiness levels: <https://ised-isde.canada.ca/site/innovation-canada/en/technology-readiness-levels>

LinkedIn Launches Exciting Gen AI Features in Recruiter and Learning:
<https://joshbersin.com/2023/10/linkedin-launches-exciting-gen-ai-features-in-recruiter-and-learning/>

Bletchley and AI: <https://www.gov.uk/government/publications/ai-safety-summit-2023-the-bletchley-declaration/the-bletchley-declaration-by-countries-attending-the-ai-safety-summit-1-2-november-2023>

Over 1000 AI policy initiatives from 69 countries, territories and the EU:
<https://oecd.ai/en/dashboards/overview>

HESA's AI observatory: <https://higheredstrategy.com/ai-observatory-home/>

G7's International Code of Conduct for Organizations Developing Advanced AI Systems: <https://venturebeat.com/ai/to-promote-safe-secure-trustworthy-ai-g7-introduces-voluntary-code-of-conduct/>

USA's executive order on AI: <https://www.cnbc.com/2023/10/30/biden-unveils-us-governments-first-ever-ai-executive-order.html>

WEF AI Governance Summit: <https://www.weforum.org/agenda/2023/11/ai-governance-summit-2023-what-to-know/>

Thank you!
Reach out to chat further!

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