

Professionalism in the Era of AI

Actuarial Research Conference
July 31, 2023

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Society of Actuaries Research Institute



Agenda

- Artificial Intelligence (AI) Overview
- Actuaries and AI
- AI and Actuarial Professionalism

Artificial Intelligence (AI) Overview



Level Set on Terms

- **Artificial Intelligence (AI)** is technology that performs complex tasks and learns from them, commonly through machine learning
- **Machine learning** uses algorithms and statistical models to analyze and learn from training data
- **Large Language Models (LLMs)** are a type of AI model trained on a large amount of text data
- **Artificial General Intelligence (AGI)** applies AI to learn from and perform intricate tasks at a level equal to or beyond human abilities

Chat“GPT”:
Generative
Pre-Trained
Transformer



Bard



AI



AI is Everywhere...

≡ FORTUNE

The 'godfather of A.I.' says his technology is a bigger threat than climate change: 'It's not at all clear what you should do'

BY WILL DANIEL

May 8, 2023 at 1:13 PM CDT



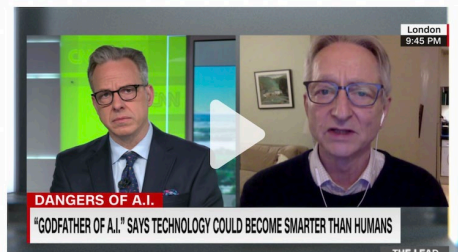
Geoffrey Hinton is known as the godfather of A.I.

≡ CNN BUSINESS Live TV

Exclusive: 42% of CEOs say AI could destroy humanity in five to ten years

By Matt Egan, CNN Business

Published 1:38 PM EDT, Wed June 14, 2023



Computer Science > Artificial Intelligence

arXiv:2306.02519 (cs)

[Submitted on 5 Jun 2023]

Transformative AGI by 2043 is <1% likely

Ari Allyn-Feuer, Ted Sanders

Download PDF

This paper is a submission to the Open Philanthropy AI Worldviews Contest. In it, we estimate the likelihood of transformative artificial general intelligence (AGI) by 2043 and find it to be <1%.

Specifically, we argue:

The bar is high: AGI as defined by the contest - something like AI that can perform nearly all valuable tasks at human cost or less - which we will call transformative AGI is a much higher bar than merely massive progress in AI, or even the unambiguous attainment of expensive superhuman AGI or cheap but uneven AGI.

Many steps are needed: The probability of transformative AGI by 2043 can be decomposed as the joint probability of

Top AI researcher dismisses AI 'extinction' fears, challenges 'hero scientist' narrative

Sharon Goldman
@sharongoldman

June 1, 2023 10:02 AM

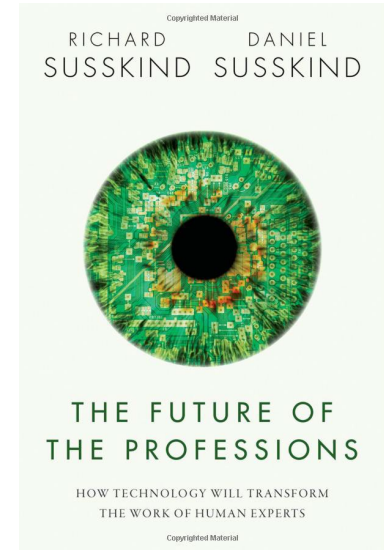


Kyunghyun Cho, a prominent AI researcher and an associate professor at New York University, has expressed frustration with the current discourse around AI risk. While

...but no one agrees whether to be fearful or excited about it.

The Gravity of AI

- Industrial Revolution
 - Many feared it would eliminate jobs, yet it transformed society by creating new industries and professions.
- Internet
 - Similar fears and results, with the creation of a completely new digital economy
- Pace of Change
 - The big difference with AI is the power of exponential growth in technology, a major change in pace from past



What Problems Can AI Solve?



Pattern Recognition

Identifying patterns and trends in large datasets.

Requires: Large, structured datasets.



Automation

Automating repetitive tasks.

Structured, repetitive tasks.



Prediction

Analyzing data to make predictions about future events or behaviors.

Historical Data.

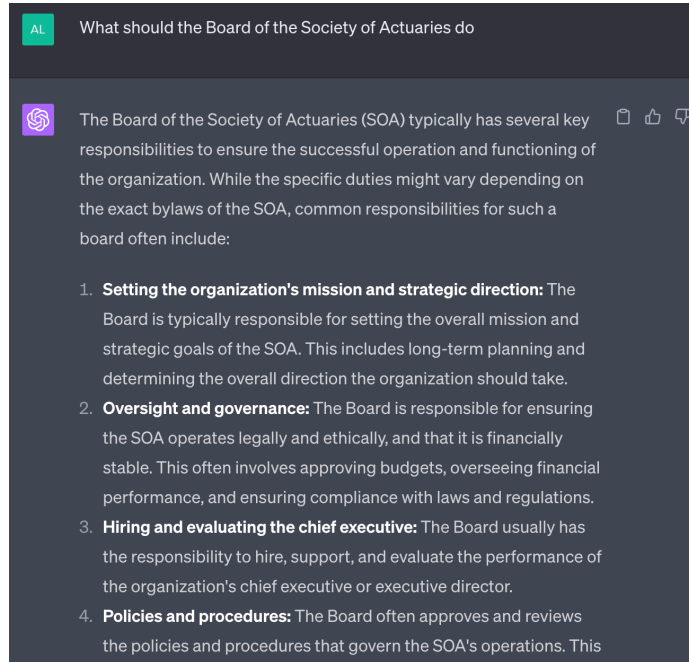


Personalization

Tailoring experiences to users based on behavior and preferences.

User data.

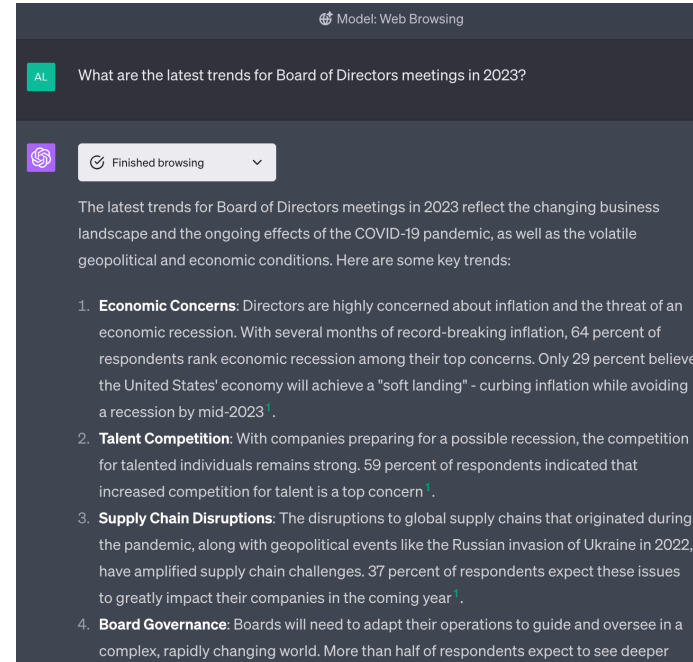
Examples of ChatGPT



AL What should the Board of the Society of Actuaries do

The Board of the Society of Actuaries (SOA) typically has several key responsibilities to ensure the successful operation and functioning of the organization. While the specific duties might vary depending on the exact bylaws of the SOA, common responsibilities for such a board often include:

- Setting the organization's mission and strategic direction:** The Board is typically responsible for setting the overall mission and strategic goals of the SOA. This includes long-term planning and determining the overall direction the organization should take.
- Oversight and governance:** The Board is responsible for ensuring the SOA operates legally and ethically, and that it is financially stable. This often involves approving budgets, overseeing financial performance, and ensuring compliance with laws and regulations.
- Hiring and evaluating the chief executive:** The Board usually has the responsibility to hire, support, and evaluate the performance of the organization's chief executive or executive director.
- Policies and procedures:** The Board often approves and reviews the policies and procedures that govern the SOA's operations. This



Model: Web Browsing

AL What are the latest trends for Board of Directors meetings in 2023?

Finished browsing

The latest trends for Board of Directors meetings in 2023 reflect the changing business landscape and the ongoing effects of the COVID-19 pandemic, as well as the volatile geopolitical and economic conditions. Here are some key trends:

- Economic Concerns:** Directors are highly concerned about inflation and the threat of an economic recession. With several months of record-breaking inflation, 64 percent of respondents rank economic recession among their top concerns. Only 29 percent believe the United States' economy will achieve a "soft landing" - curbing inflation while avoiding a recession by mid-2023 .
- Talent Competition:** With companies preparing for a possible recession, the competition for talented individuals remains strong. 59 percent of respondents indicated that increased competition for talent is a top concern .
- Supply Chain Disruptions:** The disruptions to global supply chains that originated during the pandemic, along with geopolitical events like the Russian invasion of Ukraine in 2022, have amplified supply chain challenges. 37 percent of respondents expect these issues to greatly impact their companies in the coming year¹ .
- Board Governance:** Boards will need to adapt their operations to guide and oversee in a complex, rapidly changing world. More than half of respondents expect to see deeper

Example of ChatGPT Limitations

Model: Default (GPT-3.5)

AL: Who is actuary R. Dale Hall?

AI: I'm sorry, but as of my knowledge cutoff in September 2021, I couldn't find any information on an actuary named R. Dale Hall. It's possible that he may be a relatively unknown actuary or a person who is not widely recognized.

AL: Who is actuary Robert Dale Hall?

AI: I apologize for any confusion earlier. As of my knowledge cutoff in September 2021, there is an actuary named Robert Dale Hall who is well-known in the actuarial field. He has served in various leadership positions within actuarial organizations and has made significant contributions to the industry.

Robert Dale Hall, commonly known as Dale Hall, is an actuary who has held prominent roles in the Society of Actuaries (SOA) and the Actuarial Foundation. He served as the Chief Actuary of the SOA from 2008 to 2012, where he was responsible for overseeing the actuarial education system and promoting the actuarial profession. He has also served as the Executive Director of the Society of Actuaries from 2012 to 2020.

actuary R. Dale Hall?

Completed browsing

Hall is the Managing Director of Research for the Society of Actuaries Research Institute (SOA). In his role, he is responsible for managing research projects and experience studies across the SOA's wide variety of actuarial practice areas and markets, as well as coordinating strategic research partnerships¹.

ChatGPT Model 3.5 states that Dale is "relatively unknown"

Then, he's "Executive Director of SOA from 2002-2020"

ChatGPT Model 4 gets it right.

Limitations



- Only as good as what it's trained on
- Understanding context
- Transparency of AI decision-making processes
- "Generative" vs. "Advisory"



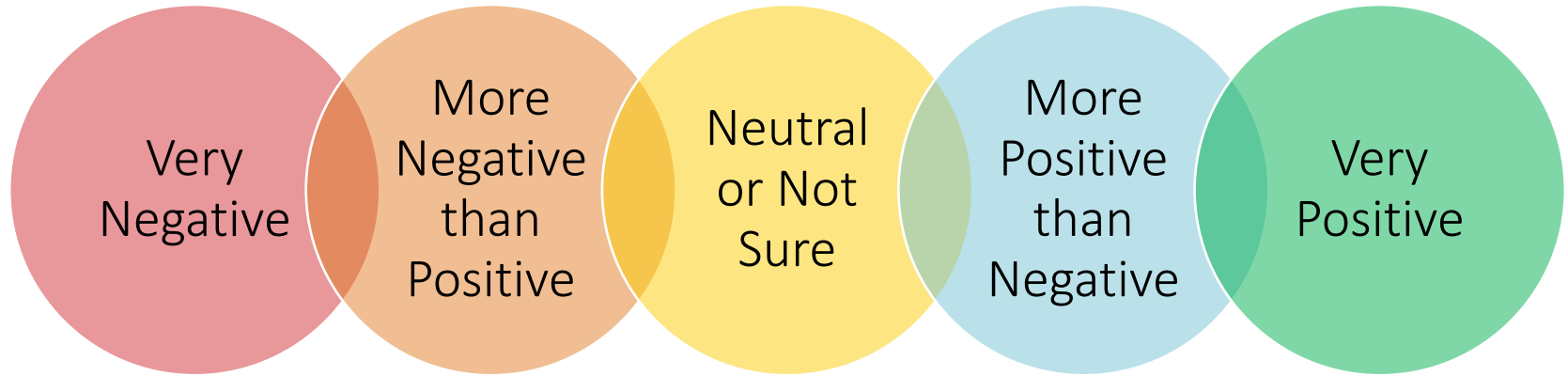
<https://www.soa.org/resources/research-reports/2019/ethical-artificial-intelligence/>

Journal and Research Agreements Evolving

Any generative Artificial Intelligence (AI) tools used in performing this research project shall be acknowledged, and documented responsibly and appropriately. You are accountable for the originality and integrity of the content of your research work and for ensuring any AI-generated output, citations, or references have been validated. AI tools shall not be listed as an author, and you agree to acknowledge all sources and contributors included in your work.



How do you feel about AI right now?



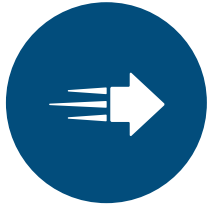
Neighborly Discussion

- Pick one of the following to discuss with 2 or more neighbors around you...
- RISKS of AI you may be worried about
- OPPORTUNITIES of AI you may be excited about
- THREATS to the research work of the actuarial profession

Actuaries and AI

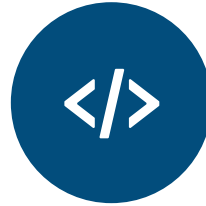


Uses of AI: Go Faster



Efficiency and Scale

Reduce time required to perform calculations, perform routine standard operations, and handle larger tasks more quickly



Programming code construction

Utilize AI to create and optimize programming code



Scenario construction

Use AI to create and analyze scenarios for decision making

Uses of AI: Predictive Modeling

AI can help actuaries identify trends and make predictions more accurately and efficiently.



Pattern Recognition

AI can recognize trends in large datasets, allowing for more accurate predictions.



Forecasting

AI can predict future patterns with more detail and speed.



Risk Assessment

AI can provide nuanced risk assessments based on patterns.

Potential Profession Impact

- Entry level actuarial tasks may be absorbed by AI
- Opportunities for new roles to focus on interpreting and applying AI outputs
- Opportunities to focus on strategic decision-making on use of AI and oversight of AI systems
- Development of new skills
- Lead Workforce Transition

"...increasingly capable technologies such as artificial intelligence will place the practical expertise of the finest specialists at the fingertips of everyone, often at no or low cost and without face-to-face interaction..."

The Future of the Professions: How Technology Will Transform the Work of Human Experts

AI and Professionalism



Overarching Concepts

- Responsibility... there could be consequences
- Transparency... can conclusions be explained
- Predictability... be useful rather than frustrating
- Auditability... be able to track actions
- Incorruptibility... be robust against manipulation



**Ethical & Responsible
Use of Data &
Predictive Models
Certificate Program**

**Managing Risk in
Predictive Modeling**

<https://www.soa.org/resources/research-reports/2019/ethical-artificial-intelligence/>

What do the governing standards say? 😊

- Code of Conduct
- Profession Integrity
- *ANNOTATION 1–4. An Actuary shall not engage in any professional conduct involving dishonesty, fraud, deceit, or misrepresentation or commit any act that reflects adversely on the actuarial profession*
- U.S. Standards of Practice
- ASOP 23: Data Quality
- *Appropriate data that are accurate and complete may not be available. The actuary should use available data that, in the actuary’s professional judgment, allow the actuary to perform the desired analysis. However, if significant data limitations are known to the actuary, the actuary should disclose those limitations and their implications.*

<https://www.soa.org/about/governance/about-code-of-professional-conduct/>

<http://www.actuarialstandardsboard.org/asops/data-quality/>

Discussion

- What reactions do you have to share?
- If AI ramps up quickly, what will you wish the profession had done sooner?
- What questions do you envision the profession or academic communities getting regarding AI?
- What actions should the SOA take?

Questions and Feedback

@soactuaries

<https://www.soa.org/research/research-institute/>

<https://www.soa.org/newresearch>

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