

# AI-Human Collaboration

## *how advanced technologies are shaping the future of publishing*

Judson Dunham, Sr. Director Product Management, ScienceDirect

Corey Harper, Technology Research Director, Elsevier

Emily McElroy, Associate Dean for Research and Health Sciences, University of Florida

Emily Singley, Vice President North American Library Relations, Elsevier

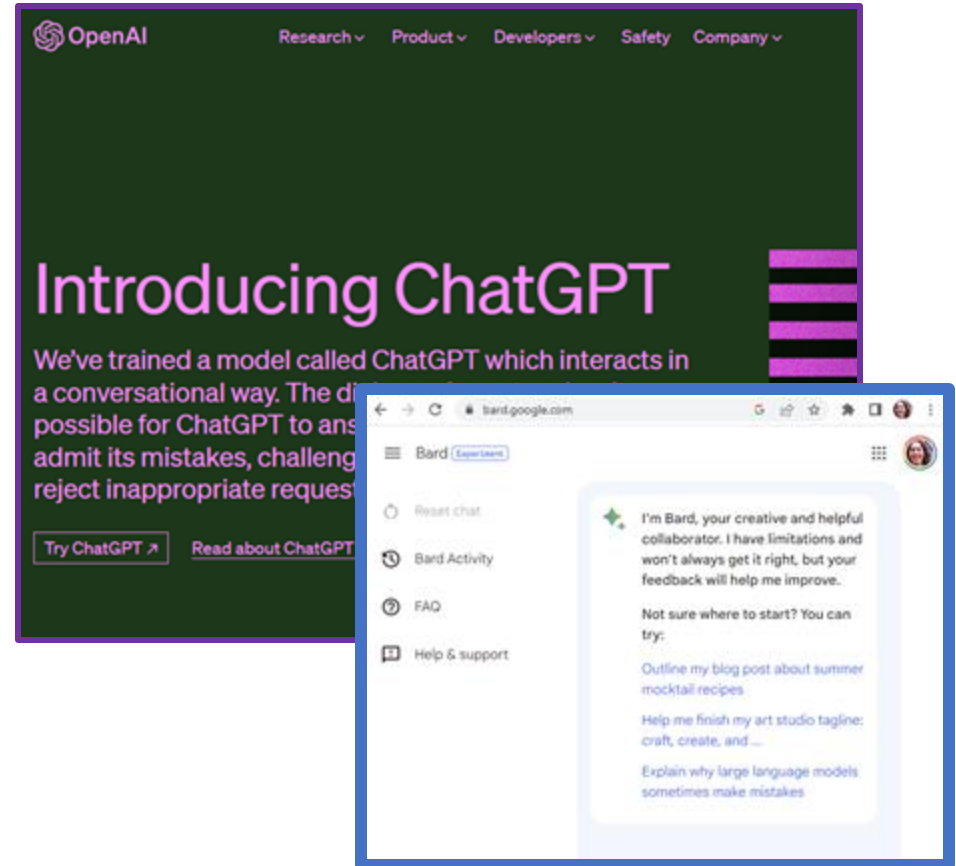
**CNI Spring Meeting**

**April 4, 2023**



# It's a hot topic....

- April 4: Charleston In-Between session "The future of Scholarly Communication in a ChatGPT World" (happening now!)
- March 22: "Digital Futures: Responsible AI or Disinformation at Scale?"
- March 9: "GPT-3 and the Future of Publishing and Academia"
- January 18: "AI and Scholarly Publishing – A View from Three Experts"



# ...that has been around for awhile

## How ScienceDirect Topics works

ScienceDirect Topics creates an interactive, seamless and convenient reading experience by bringing comprehensive, credible and interdisciplinary knowledge when it is most needed in the research process.

Topic pages on ScienceDirect are generated using innovative and automated technology for information extraction.

By applying natural language processing and AI techniques to published content they surface the most relevant snippets of information from Reference Books in succinct, summarized pages. They are discoverable through search engines, hyperlinked from key terms in journals and book chapters, as well as being directly searchable on ScienceDirect.

### ScienceDirect Topics:

- Are free to access through ScienceDirect
- Offer hundreds of thousands of comprehensive and topical web pages
- Give definitions and related terms for each concept
- Provide snippets of high-quality, relevant, peer-reviewed content
- Are highly discoverable through search engines
- Include content enriched with hyperlinks to other topics of interest



Click on the image above to see the detail

Home > Elsevier Connect > Editors' Update > How to search for reviewers using the Reviewer Recommender on Editorial Manager

## How to search for reviewers using the Reviewer Recommender on Editorial Manager

Homing in on new referees is made simple in our latest video

By Kimberley Gannon and Christopher Tancock - November 17, 2020

1 mins

- <https://www.elsevier.com/solutions/sciencedirect/topics>
- <https://www.elsevier.com/connect/editors-update/how-to-search-for-reviewers-using-the-reviewer-recommender-on-editorial-manager>

# AI-driven tools exist for almost every stage of the publishing workflow

- Literature reviews, summarizing
- Automatic writing
- Citation management and verification
- Copy editing
- Manuscript preparation
- Research integrity checking
- Fraud detection

See Scholarly Kitchen post for more:

<https://scholarlykitchen.sspnet.org/2023/01/18/guest-post-ai-and-scholarly-publishing-a-view-from-three-experts/>

**Writefull**  
**Scite.ai**  
**Semantic Scholar**  
**Sciscore**  
**Ripeta**  
**Iris.ai**  
**Trinka**  
**Grammarly**  
**Proofig**  
**Etc.**

# Development of best practices and regulation

- Governments have enacted or are in process of developing regulations and policy
- Organizations are building teams and expertise around responsible AI
- Example: Elsevier follows the RELX Responsible AI Principles and have developed RAIDS (Responsible AI and Data Science) best practices

1. We consider the real-world impact of our solutions on people
2. We take action to prevent the creation or reinforcement of unfair bias
3. We can explain how our solutions work
4. We create accountability through human oversight
5. We respect privacy and champion robust data governance

[RELX Responsible AI Principles](#)

# AI policies for authors

- Publishers have policies that outline how authors can responsibly use AI tools
- Recent decision not to allow ChatGPT to be an author



*“Where authors use generative AI and AI-assisted technologies in the writing process, these technologies should only be used to improve readability and language of the work. Applying the technology should be done with human oversight and control and authors should carefully review and edit the result, because AI can generate authoritative-sounding output that can be incorrect, incomplete or biased. The authors are ultimately responsible and accountable for the contents of the work.*”

*Authors should disclose in their manuscript the use of AI and AI-assisted technologies and a statement will appear in the published work. Declaring the use of these technologies supports transparency and trust between authors, readers, reviewers, editors and contributors and facilitates compliance with the terms of use of the relevant tool or technology.”*

From: <https://www.elsevier.com/about/policies/publishing-ethics#Authors>

<https://www.theguardian.com/science/2023/jan/26/science-journals-ban-listing-of-chatgpt-as-co-author-on-papers>

<https://www.sciencedirect.com/science/article/pii/S1471595322002517?via%3DiHub>





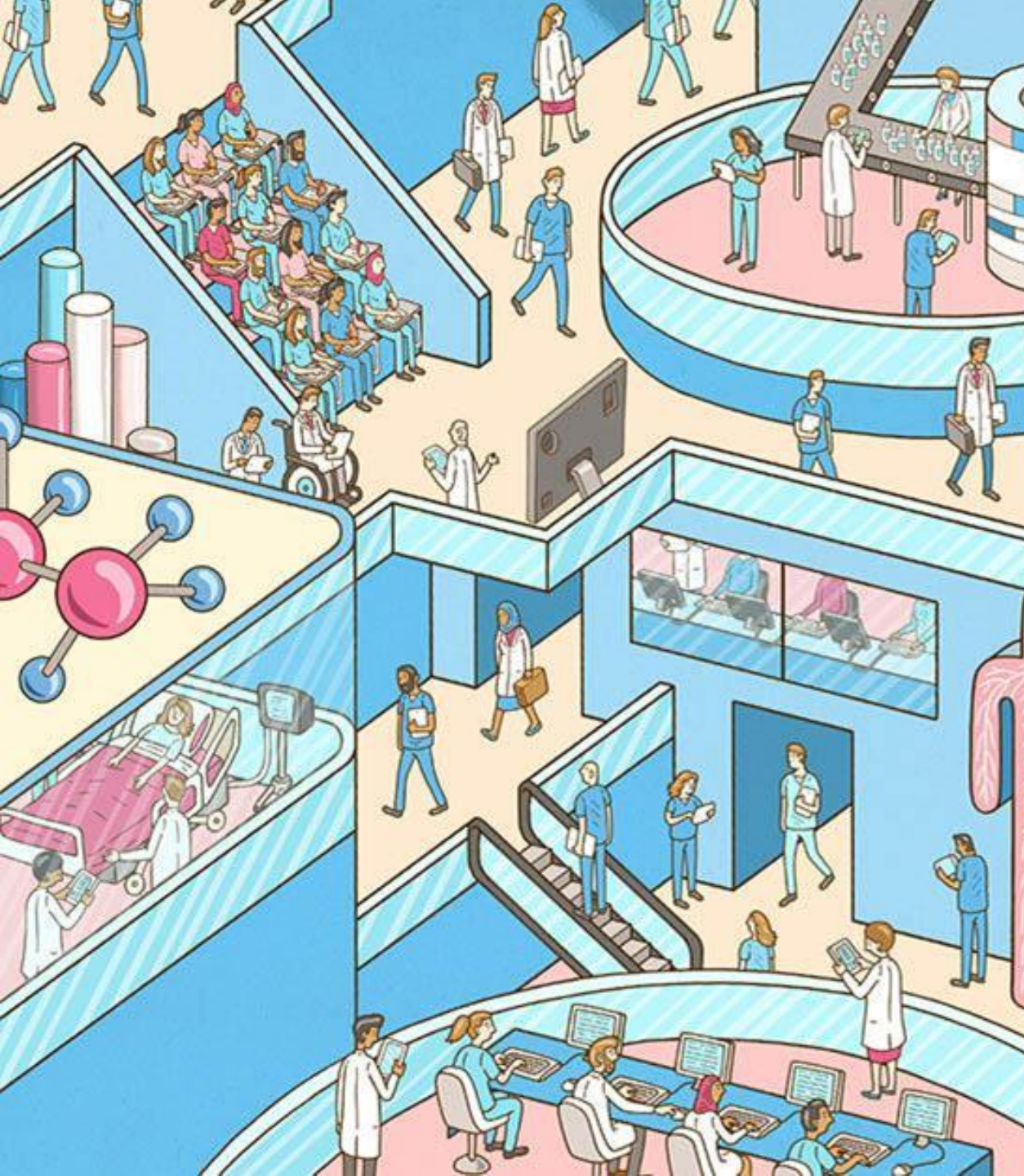
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# Exploring the Utility of AI in Literature Discovery

Judson Dunham - Sr. Director of Product, ScienceDirect



Focus on **problems** not **solutions**

**Humble** and **realistic**  
about what we can deliver

**Incremental** progress  
that delivers immediate  
**results**





# Break the 3-words -> 10,000 papers paradigm

Questions not queries

Answers not articles

Passages not papers

Scannable, digestible, immediate, exact

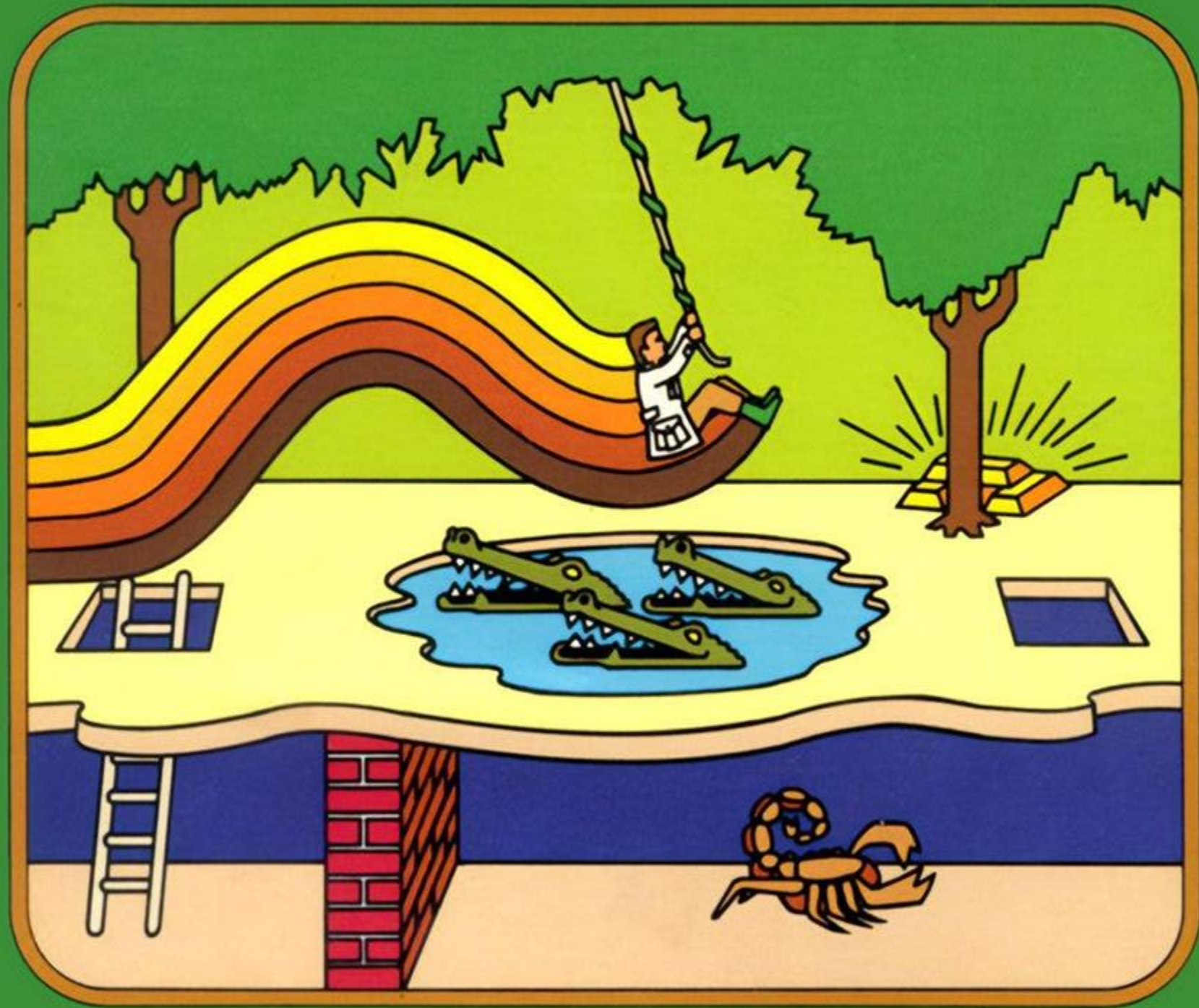
**Authored**, edited, peer reviewed, curated

Verifiable, citable, **linked to source documents**

**Trust**

**Domain  
specificity**

**Focused  
training**







# Librarian Human AI Interaction

## Foundation Models and a Role for Libraries

Many thanks to Marius Doornenbal, Paul Groth, and Tony Scerri for discussions and feedback on this content.

4 April 2023 – CNI  
Corey A Harper



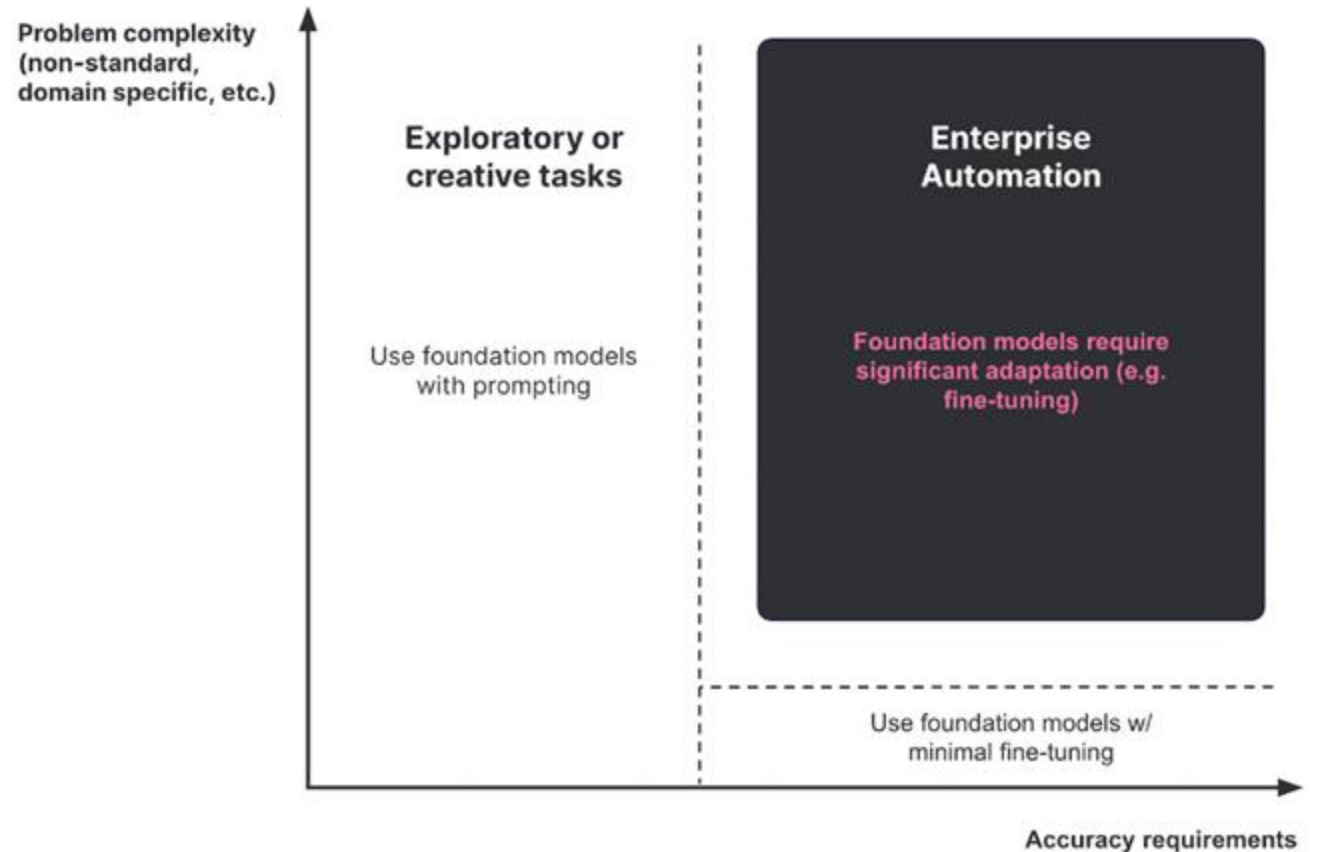


# Foundation Models



Foundation models accelerating the trend of data-centric AI

Snorkel AI 1.02K subscribers **Subscribe** 3 **Share** ...




Alex Ratner (Snorkel) - <https://youtu.be/RFOEhGQhizQ>

<https://snorkel.ai/data-centric-foundation-model-development-bridging-the-gap-between-foundation-models-and-enterprise-ai/>

# Takeaways: Data-centric AI

MLOps' most important task is to make high quality data available through all stages of the ML project lifecycle.



AI system = Code + Data

Model-centric AI	Data-centric AI
How can you change the model (code) to improve performance?	How can you systematically change your data (inputs $x$ or labels $y$ ) to improve performance?

Important frontier: MLOps tools to make data-centric AI an efficient and systematic process.

Andrew Ng

Andrew Ng

48:15 / 1:00:10 • Takeaways: Data-centric AI >

A Chat with Andrew on MLOps: From Model-centric to Data-centric AI

<https://www.youtube.com/watch?v=06-AZXmwHjo>

January / February AI Hype

**The  
Guardian**

**Explainer**

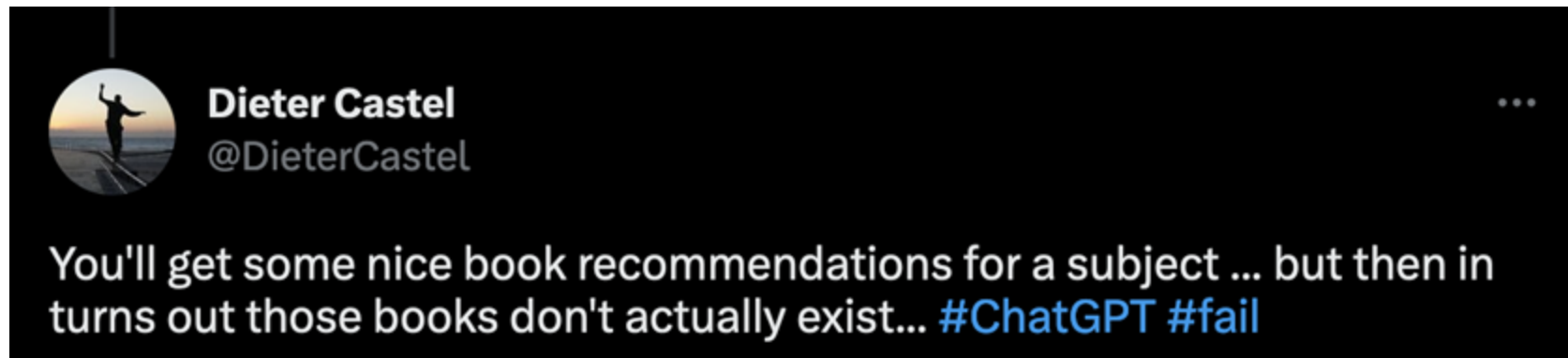
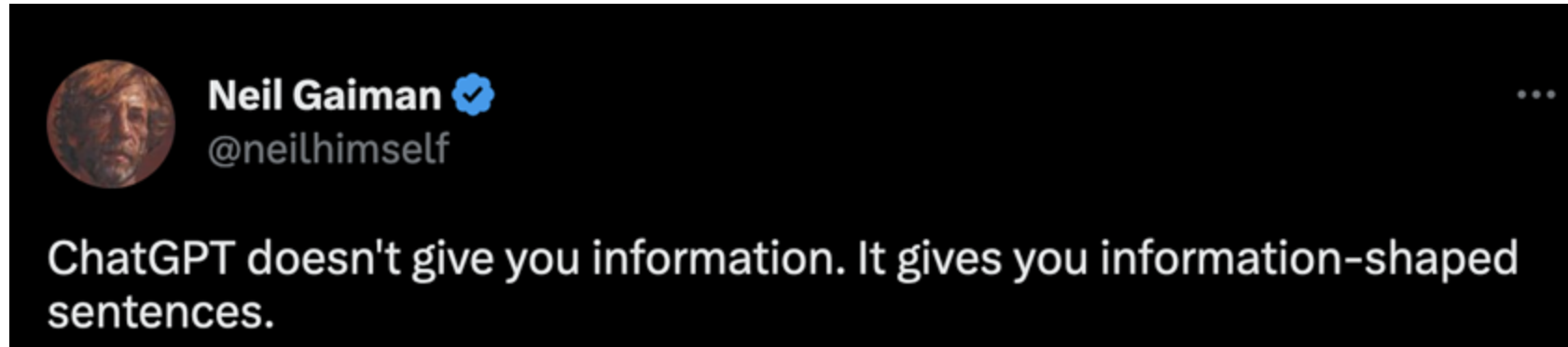
**What is AI chatbot phenomenon  
ChatGPT and could it replace  
humans?**

Home > News > Artificial Intelligence

**ChatGPT Passes Google Coding Interview  
for Level 3 Engineer With \$183K Salary**

**ChatGPT passes MBA exam given by a  
Wharton professor**

# The Threat of Misinformation



# Stochastic Parrots



“Contrary to how it may seem when we observe its output, an LM is a system for **haphazardly** stitching together **sequences of linguistic forms** it has observed in its vast training data, according to probabilistic information about how they combine, but **without any reference to meaning**: a stochastic parrot.”

- Bender, Gebru, et al. 2021

“Each day is bringing us a little bit closer to a kind of **information-sphere disaster**, in which bad actors **weaponize large language models**, distributing their ill-gotten gains through armies of **ever more sophisticated bots**. GPT-3 produces more plausible outputs than GPT-2, and GPT-4 will be more powerful than GPT-3.”

- Gary Marcus

Source: Why Are We Letting the AI Crisis Just Happen? Atlantic Monthly

<https://www.theatlantic.com/technology/archive/2023/03/ai-chatbots-large-language-model-misinformation/673376/>



“All models are wrong,  
but some are useful.”  
- George Box



# Grounding LLMs

The New England Journal of Medicine is a registered trademark of **[QA("Who is the publisher of The New England Journal of Medicine?") → Massachusetts Medical Society]** the MMS.

Out of 1400 participants, 400 (or **[Calculator(400 / 1400) → 0.29]** 29%) passed the test.

The name derives from "la tortuga", the Spanish word for **[MT("tortuga") → turtle]** turtle.

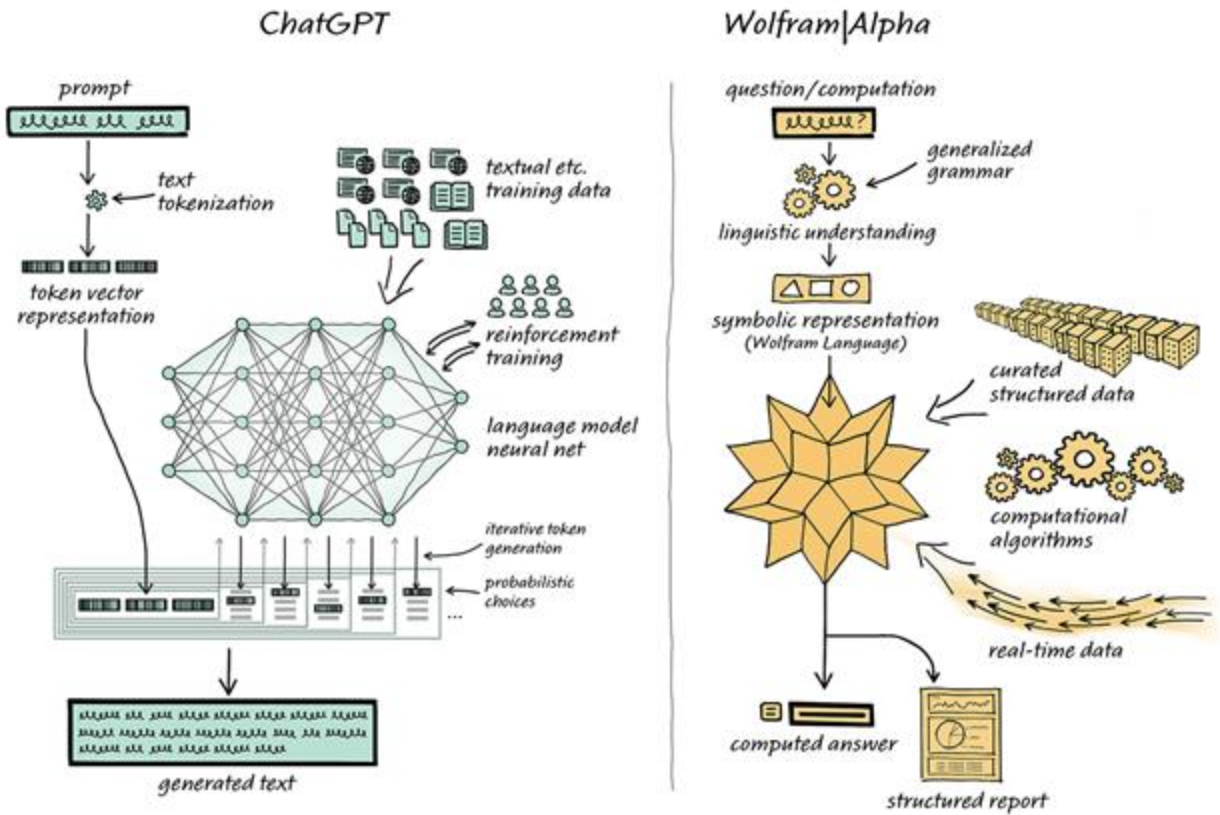
The Brown Act is California's law **[WikiSearch("Brown Act") → The Ralph M. Brown Act is an act of the California State Legislature that guarantees the public's right to attend and participate in meetings of local legislative bodies.]** that requires legislative bodies, like city councils, to hold their meetings open to the public.

- Toolformer: Ability to call out to alternate systems, including information retrieval or other machine learning models.
- Augmented Language Models (ALMs) more generally
- <https://arxiv.org/pdf/2302.04761.pdf>
- <https://arxiv.org/pdf/2302.07842.pdf>

# Wolfram|Alpha as the Way to Bring Computational Knowledge Superpowers to ChatGPT



January 9, 2023



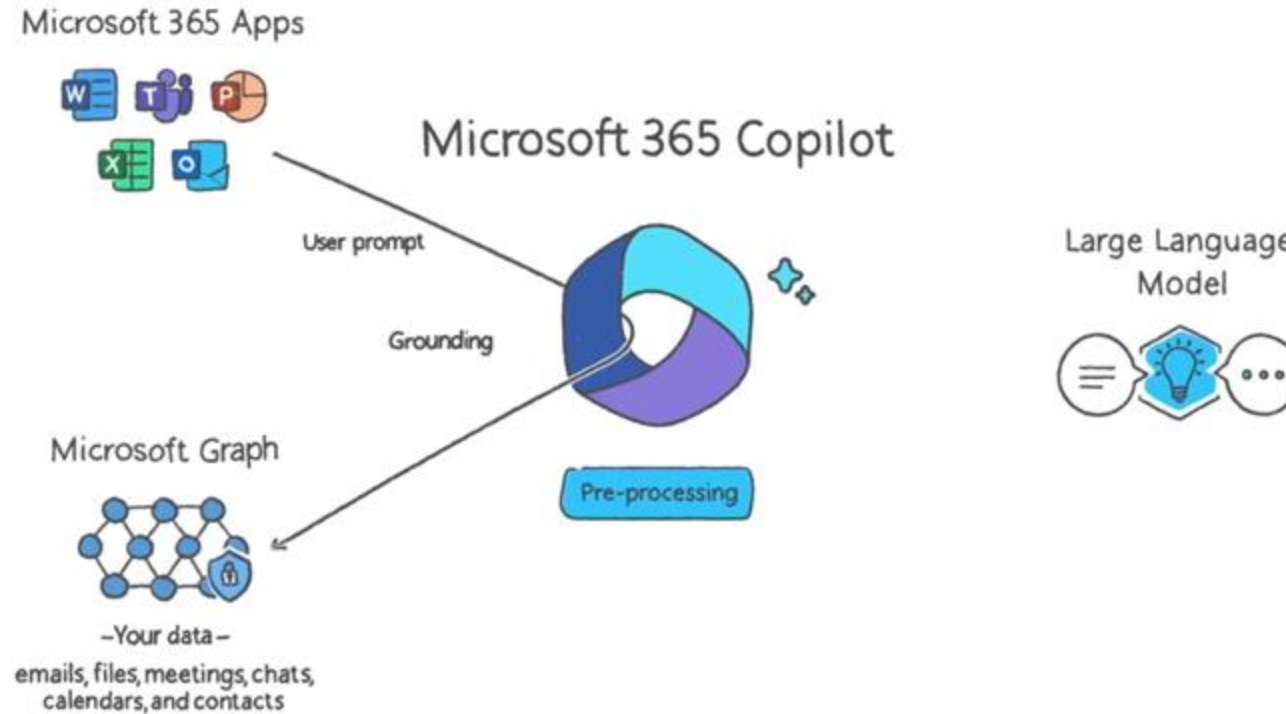
Source: <https://writings.stephenwolfram.com/2023/01/wolframalpha-as-the-way-to-bring-computational-knowledge-superpowers-to-chatgpt/>



# Overview / *Semantic Web*

- To date, the World Wide Web has developed most rapidly as a medium of documents for people rather than of information that can be manipulated automatically. By augmenting Web pages with data targeted at computers and by adding documents solely for computers, we will transform the Web into the Semantic Web.
- Computers will find the meaning of semantic data by following hyperlinks to definitions of key terms and rules for reasoning about them logically. The resulting infrastructure will spur the development of automated Web services such as highly functional agents.
- Ordinary users will compose Semantic Web pages and add new definitions and rules using off-the-shelf software that will assist with semantic markup.

# Grounding to user context



Source: The Future of Work With AI - Microsoft March 2023 Event  
[https://www.youtube.com/watch?v=Bf-dbS9CcRU&ab\\_channel=Microsoft](https://www.youtube.com/watch?v=Bf-dbS9CcRU&ab_channel=Microsoft)

# Library Curation

- Vetted information is becoming ever more important
- LLMs and other Foundation Models need *grounding*
- Grounding and vetting contribute to AI Safety
  
- Building Knowledge Graphs:
  - Of domains
  - Of organizational structures & the research landscape
  
- Curating the *output* of language models
- Providing API endpoints to library tools for Augmented Language Models
- Exploring ways to track provenance and enhance reproducibility with AI



# Thank you!

## Questions?

Judson Dunham, [j.dunham@elsevier.com](mailto:j.dunham@elsevier.com)

Corey Harper, [c.harper@elsevier.com](mailto:c.harper@elsevier.com)

Emily McElroy, [emilymcelroy@ufl.edu](mailto:emilymcelroy@ufl.edu)

Emily Singley, [e.singley@elsevier.com](mailto:e.singley@elsevier.com)

