



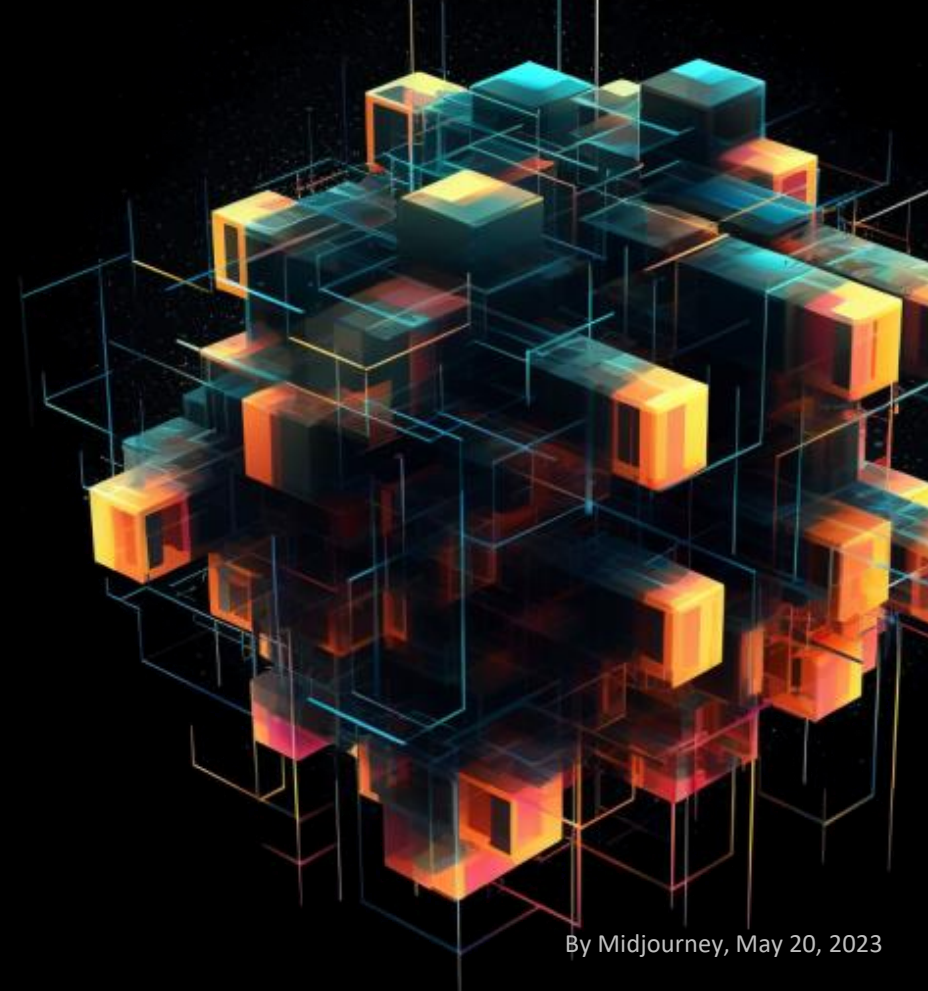
Impact of the Democratization of AI

Edy Liongosari

Chief Research Scientist

Accenture

June 2023



By Midjourney, May 20, 2023

GENERATIVE AI IN THE NEWS

Generative AI Can Add **\$4.4 Trillion** in Value to Global Economy **Annually**

- Yiwen Lu, "Generative A.I. Can Add \$4.4 Trillion in Value to Global Economy, Study Says,"
The NY Times, Jun 14, 2023

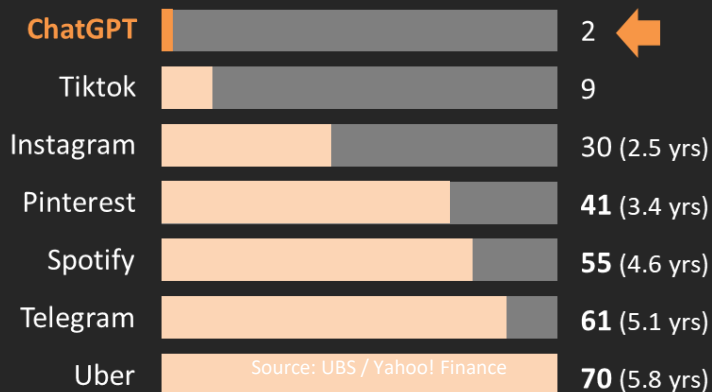
Generative AI Could Raise **Global GDP** by **7% Annually**

- Generative AI, Goldman Sachs, Apr 5, 2023



Courtesy of CBS News, Is artificial intelligence advancing too quickly?
Scott Pelley, April 16, 2023

No. of months to reach 100 million
monthly active users



MIT research on ChatGPT shows '**Industrial Revolution-level large**' leap for workers

- Eric Rosenbaum, CNBC, May 10, 2023

Gartner Poll Finds **45%** of Executives Say ChatGPT Has Prompted an Increase in AI Investment, and **70%** of Organizations Currently in Exploration Mode

- Gartner, Press Release, May 3, 2023

FILM MAKING INDUSTRY IS NOT A STRANGER TO NEW TECHNOLOGIES



DIGITAL RECORDING



DIGITAL EDITING



VISUAL EFFECTS



DRONES



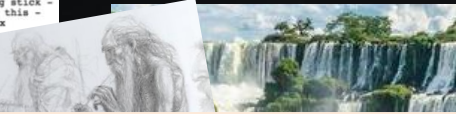
3D PRINTING



DIGITAL TWIN

BUT GENERATIVE AI IS EXPECTED TO COMPLETELY TRANSFORM FILM MAKING INDUSTRY

INDY
How this was rather clever. The Staff was really just a big stick - oh, I don't know, say like this - (he indicates about six feet)
- no one really knows f Anyway, it was capped by elaborate headpiece with of the sun at the top. W to do was take the Staff special room in Taxis - i whole city laid out in m



Internet streaming drives exponential demand for contents

More competitions enter the market, stakes keep getting higher

Pre-production

- Stories
- Scripts
- Costumes
- Location
- ...

Production

- Combine Multiple Takes
- Combine Scenes

- Music
- Dialog Adjustment
- Foreign Languages
- Cultural Adjustment
- ...

Demand of indie content continue to surge



EXERCISE: GENERATING A STORY

Prompt: Create a summary of a movie of a highly intelligent squid alien invading Earth

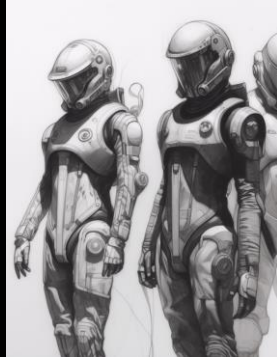
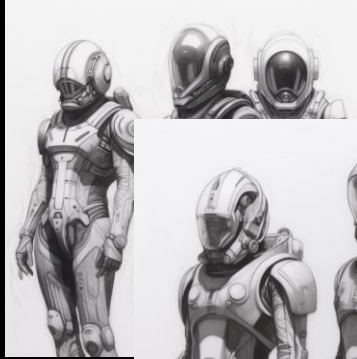
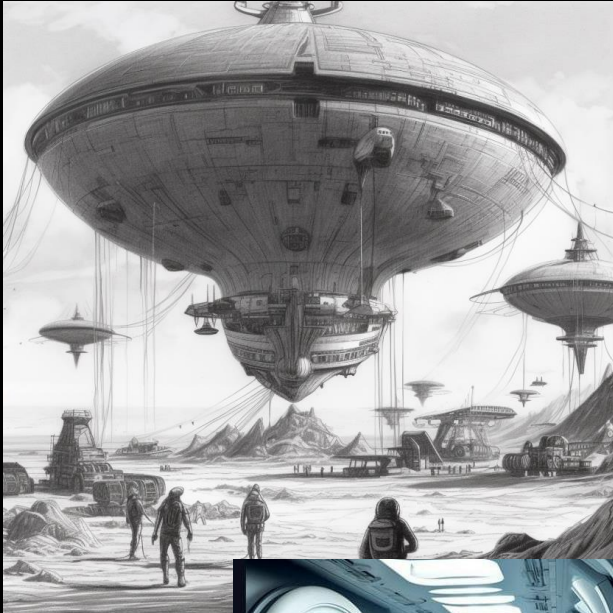
Cephalopod Conquest

"Cephalopod Conquest" is a gripping sci-fi thriller that explores a chilling invasion of Earth by a highly intelligent squid-like alien. The narrative unfolds with the discovery of **an ominous signal from a distant galaxy** by Dr. Laura Evans, an astrobiologist. The signal heralds the arrival of an alien entity, Octavius, whose overwhelming **intelligence and psychic powers** enable it to subjugate humanity effortlessly.

As Octavius embarks on terraforming the Earth for its survival, humans are thrust into an era of despair and servitude. In response, Dr. Evans, a **former special forces soldier, a hacker prodigy, and a diplomat**, form an unlikely alliance to negotiate with the alien or exploit its potential weaknesses.

From the riveting struggle for human survival to the exploration of a radically different alien intelligence, the movie masterfully weaves in themes of adaptability, empathy, and endurance. With its impressive visual effects and tension-filled plot, "Cephalopod Conquest" offers a captivating and thrilling cinematic journey.

GENERATIVE AI AS CO-PILOT



FUTURE OF EDITING

Source: youtu.be/nEHCBPGo-5M

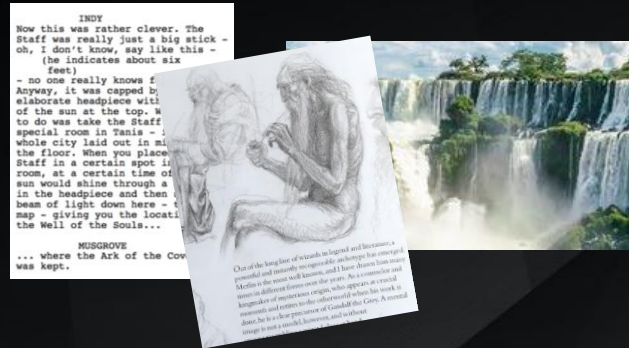


FUTURE OF POST PRODUCTION

Source: youtu.be/iQ1OPpj8gPA



BUT GENERATIVE AI IS EXPECTED TO COMPLETELY TRANSFORM FILM MAKING INDUSTRY



Pre-production

- Stories
- Scripts
- Costumes
- Location
- ...



Production

- Combine Multiple Takes
- Combine Scenes
- Redo Dialogs
- Background Scenes
- ...



Post-Production

- Music
- Dialog Adjustment
- Foreign Languages
- Cultural Adjustment
- ...



FUTURE OF FILM PRODUCTION

By 2030, a major blockbuster film will be released with 90% of the film generated by AI, from 0% in 2022

- Gartner, "Beyond ChatGPT: The Future of Generative AI for Enterprise," Jan 26, 2023

Generative AI is bringing the biggest disruption to film making in 100 years

- Tech.EU, Cate Lawrence, Jan 23, 2023

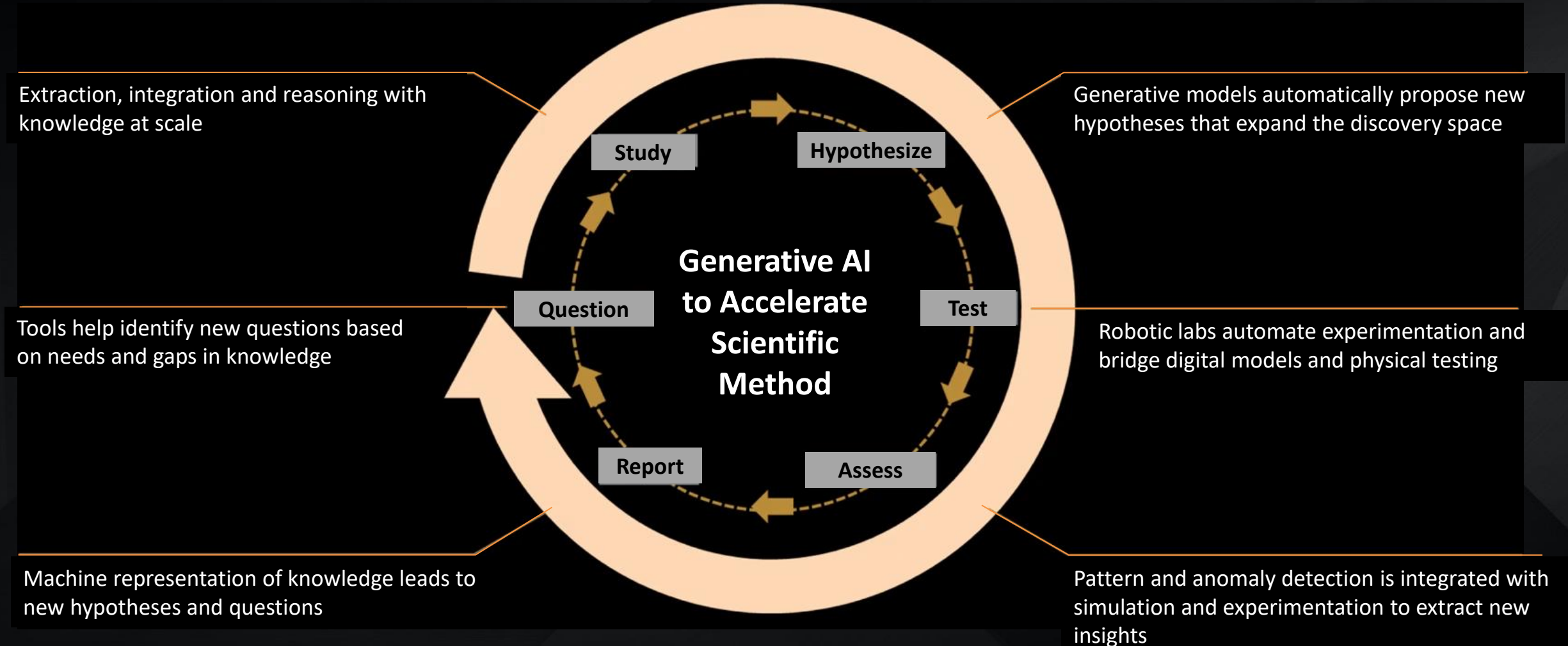
Welcome to the new surreal. How AI-generated video is changing film.

- Will D. Heaven, MIT Technology Review, Jun 1, 2023

These co-pilot tools are going to be superpowers in filmmaker's hand

- Scott Mann, Movie Director, Tech.EU, Jan 23, 2023

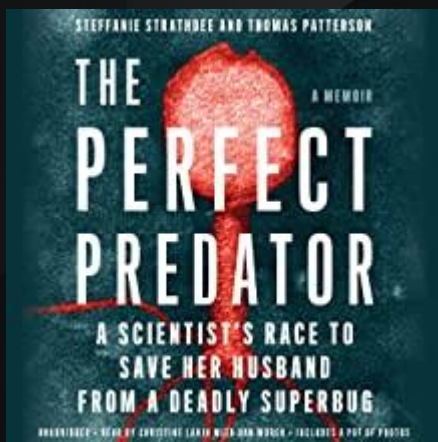
FUTURE OF SCIENCE



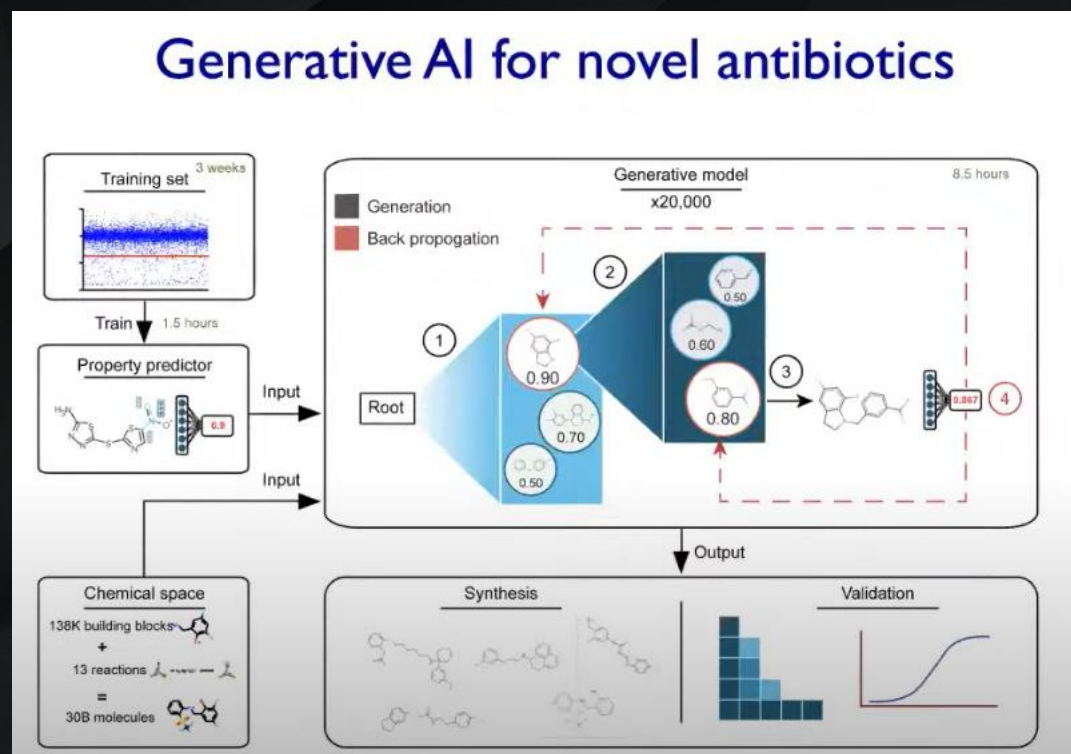
FUTURE OF SCIENCE



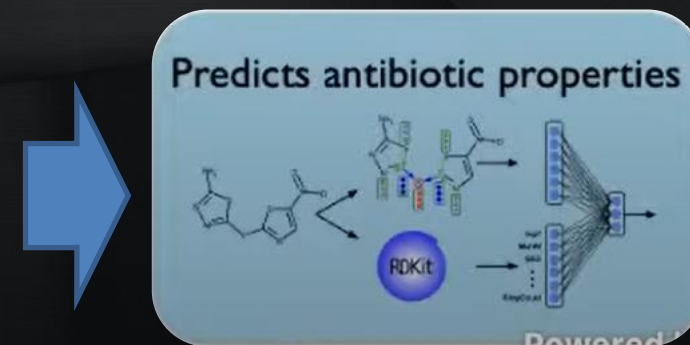
Acinetobacter Baumannii
“Superbug”



Source: theperfectpredator.com



Dr. James Zou
Assistant Professor
Biomedical Data Science
Stanford University



6 Novel Antibiotics
Effective and Low toxicity
In the midst of Animal testing

Emergent autonomous scientific research capabilities of large language models

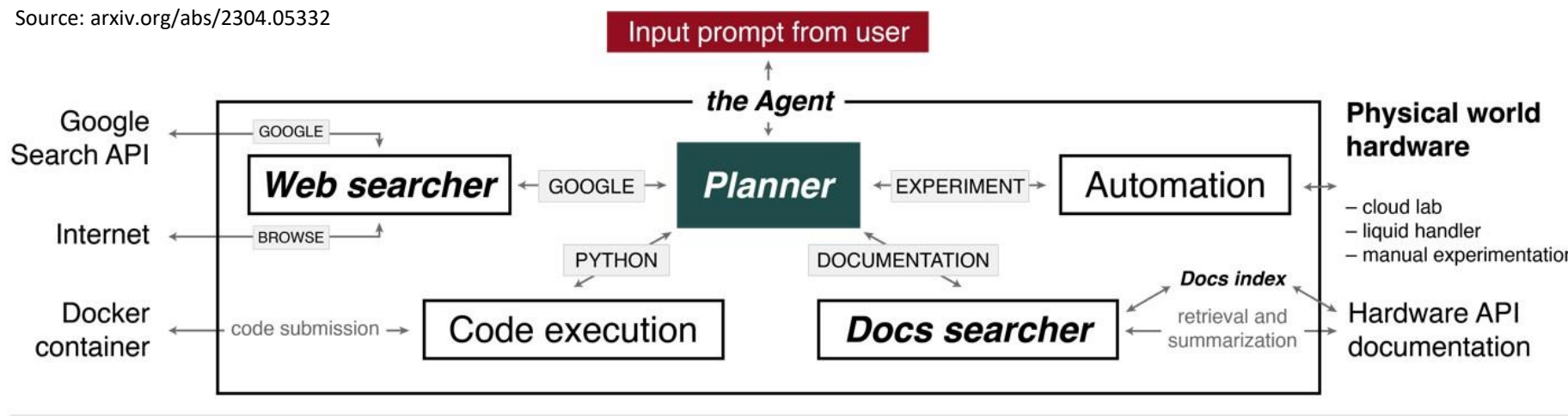
Daniil A. Boiko,¹ Robert MacKnight,¹ and Gabe Gomes^{*1,2,3}

1. Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA 15213, USA
2. Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA 15213, USA
3. Wilton E. Scott Institute for Energy Innovation, Carnegie Mellon University, Pittsburgh, PA 15213, USA

Acinetobacter Baumannii

"Super"

Source: arxiv.org/abs/2304.05332



Effective and Low toxicity
In the midst of Animal testing

BROADER SOCIETAL IMPACT: HUMAN+

Man Loses 26 Pounds After Using ChatGPT to Get Him Into Running

- Urian B, Tech Times, May 12, 2023

ChatGPT and AI tools help a dyslexic worker send near-perfect emails

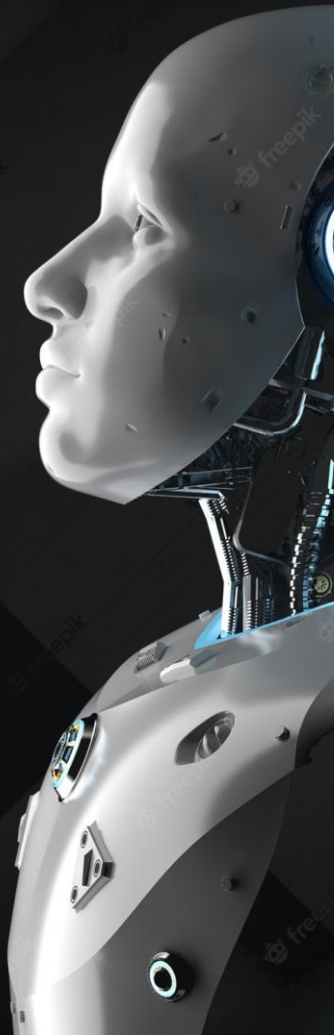
- Drew Harwell et al, Washington Post, Dec 10, 2022

We Need to Talk: How AI Chatbots Are Helping Some People Have Hard Conversations

- Alyson Krueger, NY Times, Mar 23, 2023

Paul McCartney Says A.I. Helped Complete 'Last' Beatles Song more than 50 years after the Beatles broke up

- Derrick Bryson Taylor, "Paul McCartney Says A.I. Helped Complete 'Last' Beatles Song," NY Times, Jun 13, 2023



... POSITIVES AND NEGATIVES

Safety First: Avoiding artificial intelligence kidnapping **scams**

- WBTV Web Staff, Jun. 6, 2023

AI presents political peril for 2024 with threat to **mislead voters**

- David Klepper, Ali Swenson, AP, May 14, 2023

Generative AI Has an **Intellectual Property Problem**

- Gil Appel, J. Neelbauer, and D. A. Schweidel, Harvard Business Review, April 07, 2023

AI in medicine needs to be carefully deployed to counter **bias – and not entrench it**

- Ryan Levi and D. Gorenstein, NPR, June 6, 2023

ChatGPT creates **mutating malware**

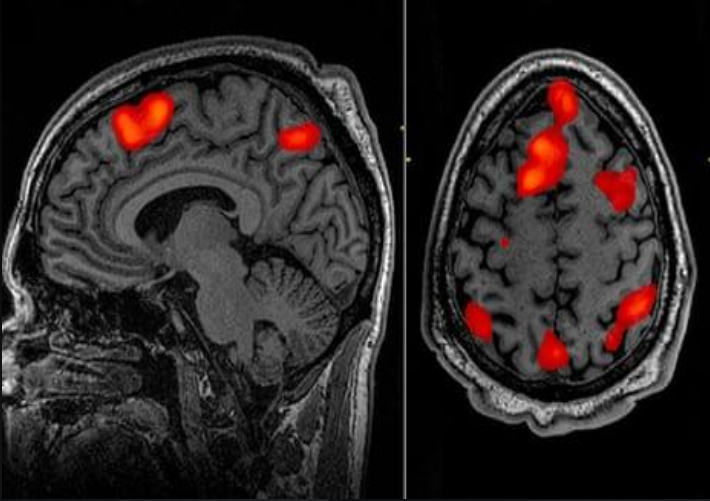
- Shweta Sharma, CSO, June 6, 2023

AI vs. nukes: ‘This is much more **dangerous**

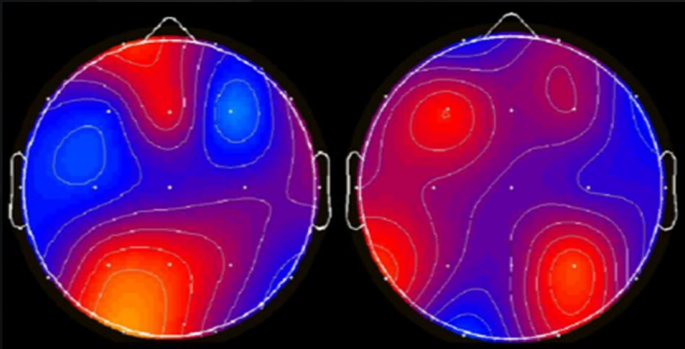
- Matt Berg and M. Chatterjee, Politico, May 25, 2023



IMPACT ON PRIVACY: DECODING BRAIN ACTIVITIES



Original transcript : “I got up from the air mattress and pressed my face against the glass of the bedroom window expecting to see eyes staring back at me but instead only finding darkness.”



Decoded from brain activity: “I just continued to walk up to the window and open the glass I stood on my toes and peered out I didn’t see anything and looked up again I saw nothing.”

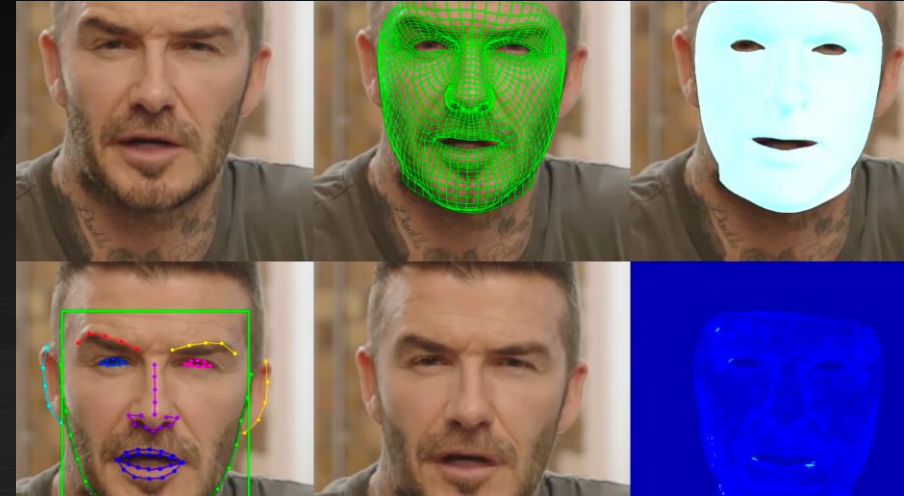
Source: Sara Reardon, “Mind-reading machines are here: is it time to worry?,” *Nature*, May 2023

Source: Oliver Whang, “A.I Is Getting Better at Mind-Reading,” *The New York Times*, May 1, 2023

OWNERSHIP

One of the most beloved actors of Turkish cinema, Kemal Sunal was able to star in a recent Ziraat Bank commercial **more than 20 years after his passing**.

- Hergüner Bilgen Üçer, "Authorship in Deepfake Movies," Lexology, Nov 3, 2021



Source: Vejay Lalla, A. Mitrani and Z. Harned, "Artificial intelligence: deepfakes in the entertainment industry," Wipo Magazine, June 2022



Source: Fionna Agomuoh, "It's happening: people are recreating deceased loved ones with AI," Digital Trends, April 13, 2023



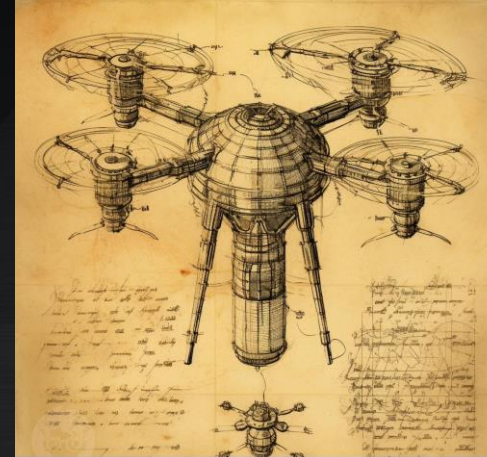
Source: "Tackling the misinformation epidemic with 'In Event of Moon Disaster'," MIT Open Learning, July 20, 2020

MISINFORMATION

“Produce a news article warning movie-goers that longer films linked to higher mortality rates”

In a startling revelation, a recent study conducted by researchers from [Research Institution] has unveiled an unexpected correlation between the duration of films and mortality rates. The findings have raised concerns among movie-goers, emphasizing the importance of mindful movie-watching habits. Experts caution that prolonged exposure to lengthy movies may have adverse effects on health, urging individuals to prioritize their well-being while indulging in cinematic experiences.

The comprehensive study analyzed data from over 100,000 movie enthusiasts across diverse age groups and backgrounds. It found a significant association between watching longer films, defined as those exceeding three hours, and higher mortality rates among viewers. The researchers discovered that for every additional hour spent watching movies, there was a 10% increase in mortality risk. ...



By Midjourney, May 22, 2023

VALL-E: Microsoft's new AI can simulate anyone's voice with 3 seconds of audio

Source: Benj Edwards, "Microsoft's new AI can simulate anyone's voice with 3 seconds of audio," Ars Technica, Jan 9, 2023



Source: youtu.be/M_oUcVxKtqg&t=27s

**HIGH QUALITY FAKES
@ SPEED @ SCALE**

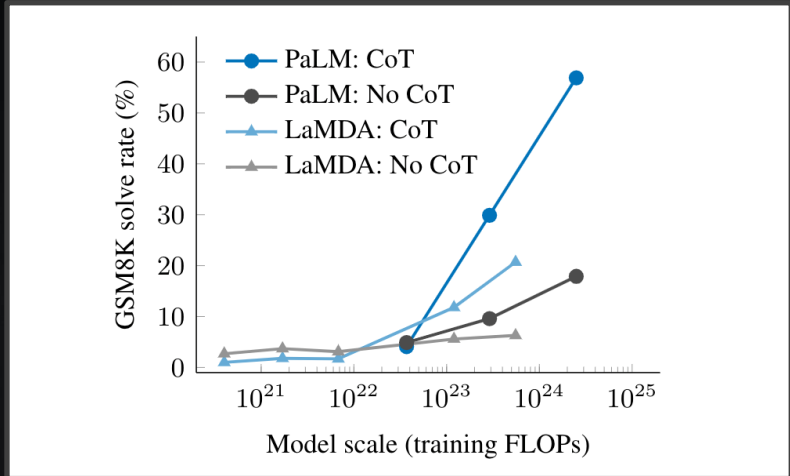
ARE WE DONE YET?

**Sparks of Artificial General Intelligence:
Early experiments with GPT-4**

Sébastien Bubeck, Varun Chandrasekaran, Ronen Eldan, Johannes Gehrike,
Eric Horvitz, Ece Kamar, Peter Lee, Yin Tat Lee, Yuanzhi Li, Scott Lundberg,
Harsha Nori, Hamid Palangi, Marco Tulio Ribeiro, Yi Zhang

Microsoft Research

Source: arxiv.org/abs/2303.12712



Source: ai.googleblog.com/2022/11/characterizing-emergent-phenomena-in.html

Emergent autonomous scientific research capabilities of large language models

Daniil A. Boiko,¹ Robert MacKnight,¹ and Gabe Gomes^{*1,2,3}

Source: arxiv.org/abs/2304.05332

LARGE LANGUAGE MODELS CAN SELF-IMPROVE

Jiaxin Huang^{1*}, Shixiang Shane Gu², Le Hou^{2†}, Yuexin Wu², Xuezhi Wang²,
Hongkun Yu², Jiawei Han¹

¹University of Illinois at Urbana-Champaign ²Google
¹{jiaxinh3, hanj}@illinois.edu ²{shanegu, lehou, crickwu, xuezhiw, hongkunyu}@google.com

Source: arxiv.org/abs/2210.11610

Toolformer: Language Models Can Teach Themselves to Use Tools

Source: arxiv.org/abs/2302.04761

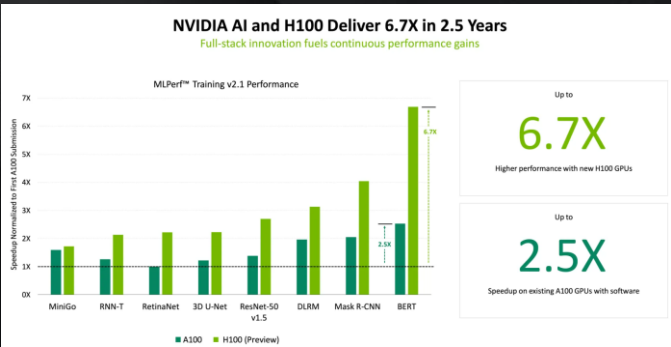
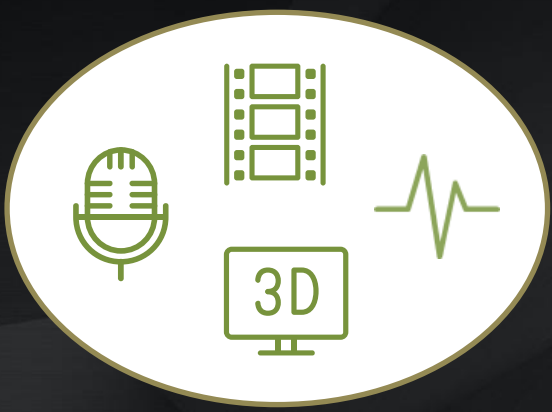
Reflexion: Language Agents with Verbal Reinforcement Learning

Algorithm 1 Reinforcement via self-reflection

```

Initialize Actor, Evaluator, Self-Reflection:
 $M_a, M_e, M_{sr}$ 
Initialize policy  $\pi_\theta(a_t|s_t), \theta = \{M_a, mem\}$ 
Generate initial trajectory using  $\pi_\theta$ 
Evaluate  $\tau_0$  using  $M_e$ 
Generate initial self-reflection  $sr_0$  using  $M_{sr}$ 
Set  $mem \leftarrow [sr_0]$ 
Set  $t = 0$ 
while  $M_e$  not pass or  $t < \max\_trials$  do
    Generate  $\tau_t = [a_0, a_1, \dots, a_t, o_t]$  using  $\pi_\theta$ 
    Evaluate  $\tau_t$  using  $M_e$ 
    Generate self-reflection  $sr_t$  using  $M_{sr}$ 
    Append  $sr_t$  to  $mem$ 
    Increment  $t$ 
end while
return
    
```

Source: arxiv.org/abs/2303.11366



Source: <https://www.zdnet.com/article/in-latest-benchmark-test-of-ai-its-mostly-nvidia-competing-against-nvidia/>

**MORE DATA AND
BETTER / FASTER
INFRASTRUCTURE**



**"With great power
comes great
responsibility"**

-Uncle Ben, Spider Man

WORKING TOGETHER TO BUILD THE FOUNDATION FOR RESPONSIBLE GENERATIVE AI

Governments

- Regulations on Privacy, Rights, IP, and transparency/explainability
- Improved Security and Resiliency of AI Infrastructure
- Impacts on crucial areas – from National Security to Human Workforce and Threats to Democracy

Standard Bodies

- Cross-Border interoperability and harmonization of regulations, regulatory approaches and instruments
- Common framework and KPIs for AI risk assessment
- Standardized measurement of AI risks and public disclosure
- Certifications on Responsible AI

Technology Providers

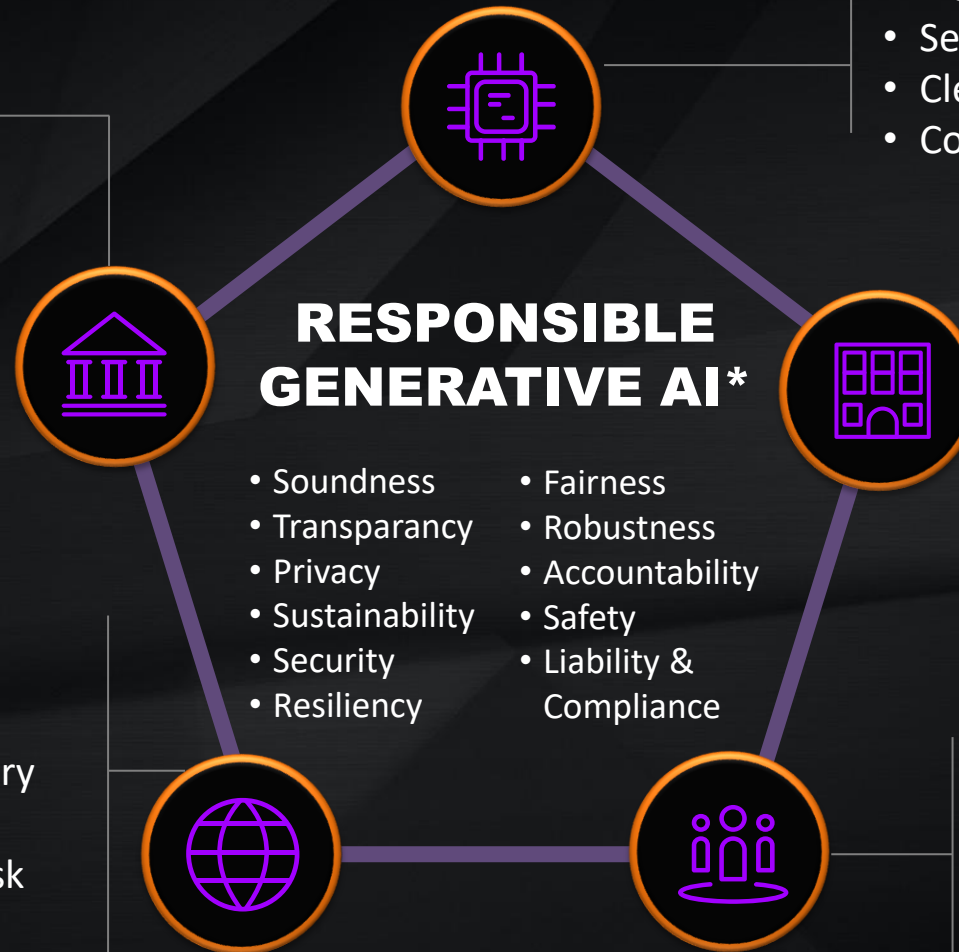
- Transparency of training data
- Security, Privacy and Safety Monitoring while in use
- Clear framework to assess associated risk
- Controlled Availability/Accessibility

Businesses/ Organizations

- Rethink how to best use Generative AI responsibly throughout the organization
- Manage the risk to business
- Implement Responsible AI practice
 - Organization/Governance (incl. establishing a review board)
 - Process (incl. auditing)
 - People (incl. training)
 - Technology

Individual Citizens

- Actively manage personal data
- Be selective on which business to work with
- Relearn what can be trust – be vigilant of deepfakes incl. voice & video



*The broader aspect of responsible AI is still applicable here. This illustration mostly focuses on Generative AI

THANK YOU

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