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Generative AI: A New Frontier in Innovating Public Services

LA County 20th Annual Leadership Conference
June 14, 2023

Michael Allen

Laserfiche Chief Technology Officer

Agenda

- Generative AI: What is it?

- Large language models: A breakthrough technology

- Digital transformation playbooks: More valuable than ever

- Using AI won't happen automatically

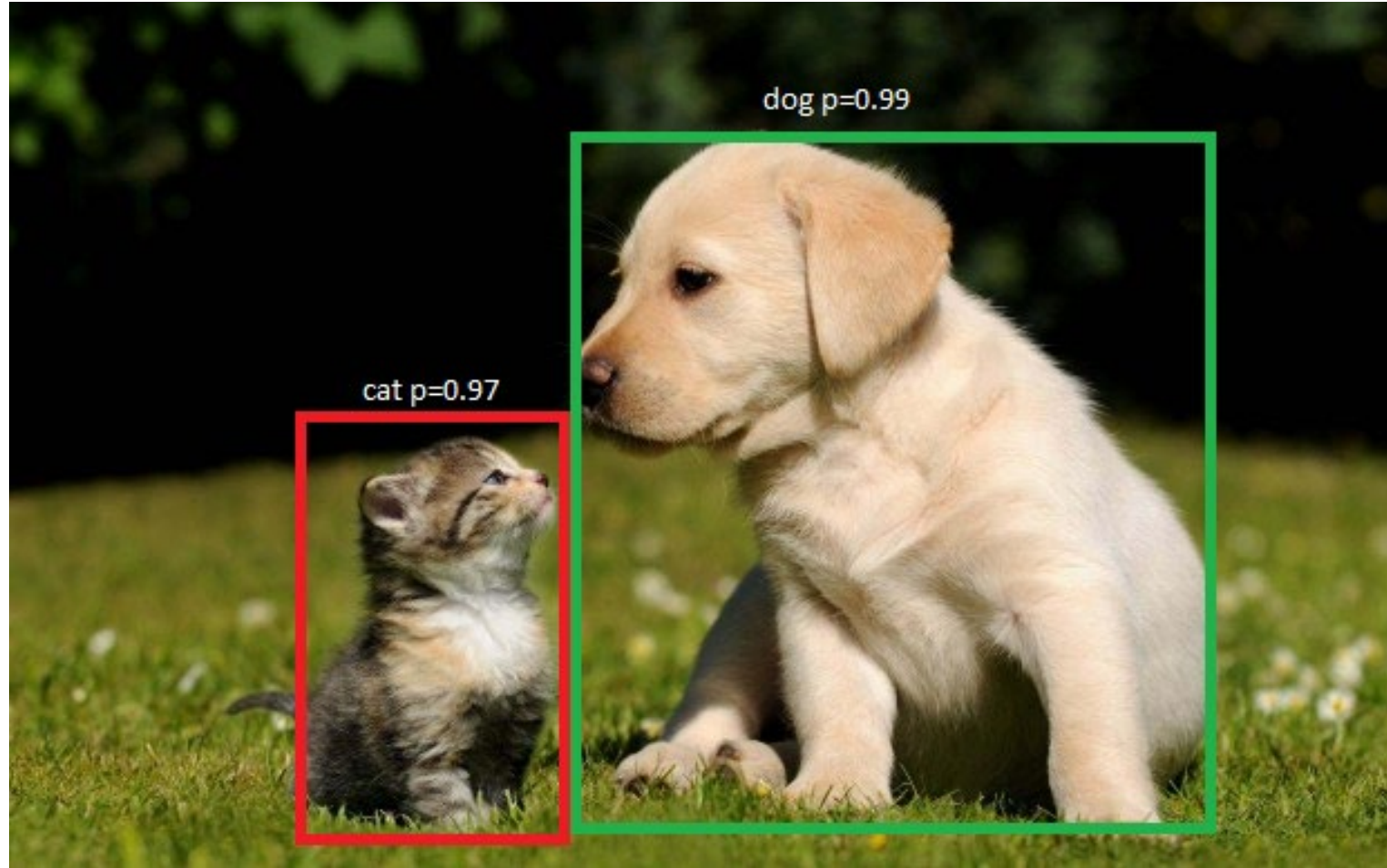- Public trust in AI: An uphill road

- AI risks

Artificial Intelligence: Promise vs. Reality

Source:
Left image: Generated by Bing Image Creator (DALL-E)

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Artificial Intelligence: Promise vs. Reality

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Have You Tried ChatGPT?

REUTERS®

World ⌄   Business ⌄   Markets ⌄   Sustainability ⌄   Legal ⌄   Breakingviews   Technology ⌄

Technology

ChatGPT sets record for fastest-growing user base - analyst note

By Krystal Hu ⌄

February 2, 2023 7:33 AM PST · Updated 4 months ago

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Pew Research Center

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MAY 24, 2023

A majority of Americans have heard of ChatGPT, but few have tried it themselves
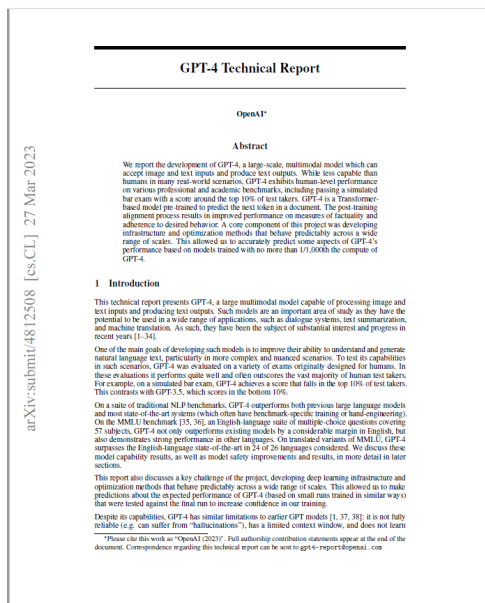
BY EMILY A. VOGELS

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GPT-4
Technical Report

Exam results (ordered by GPT-3.5 performance)

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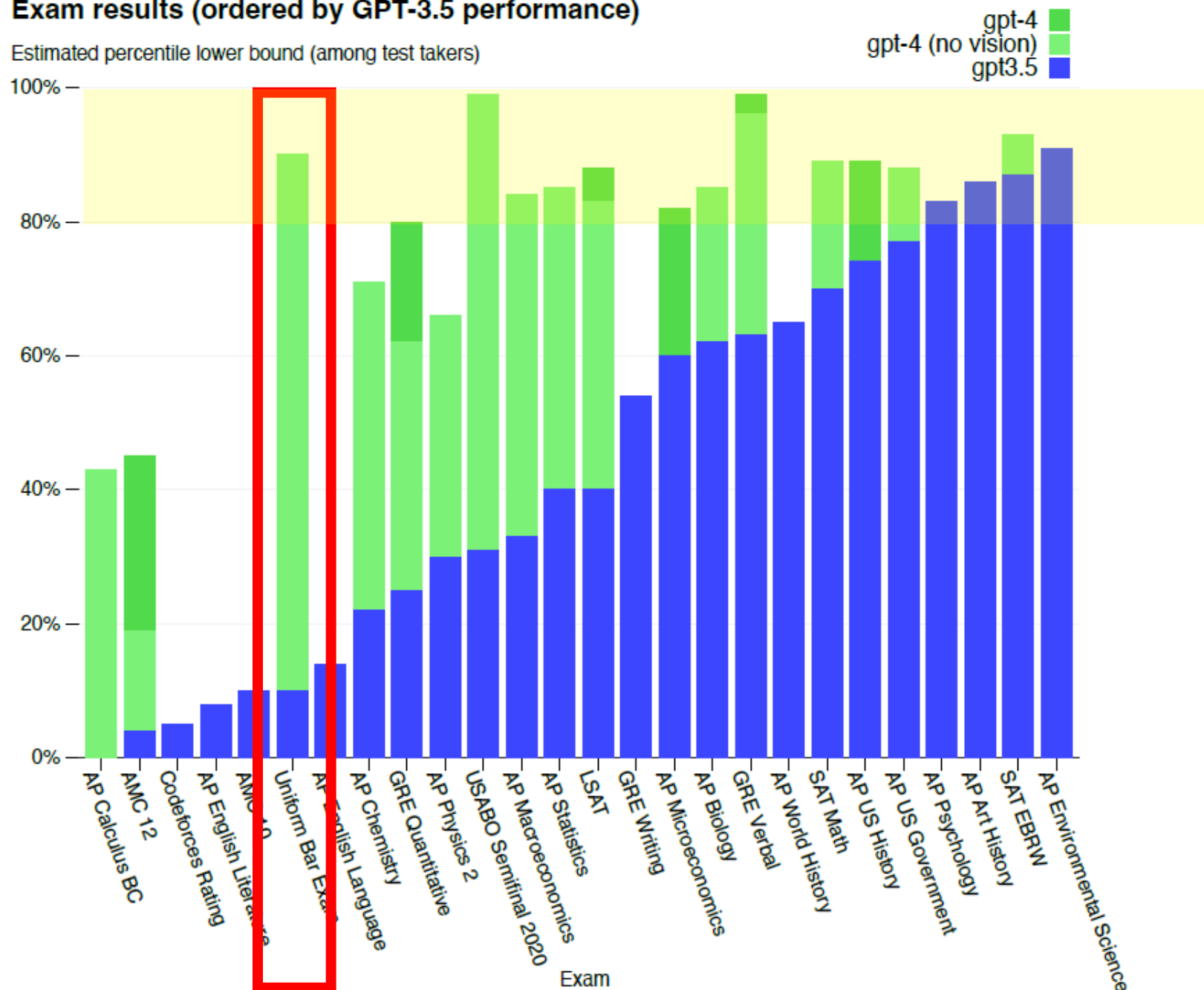
GPT-4: Exam Scores

Exam	GPT-4	GPT-4 (no vision)	GPT-3.5
Uniform Bar Exam (MBE+MEE+MPT)	298 / 400 (~90th)	298 / 400 (~90th)	213 / 400 (~10th)
LSAT	163 (~88th)	161 (~83rd)	149 (~40th)
SAT Evidence-Based Reading & Writing	710 / 800 (~93rd)	710 / 800 (~93rd)	670 / 800 (~87th)
SAT Math	700 / 800 (~89th)	690 / 800 (~89th)	590 / 800 (~70th)
Graduate Record Examination (GRE) Quantitative	163 / 170 (~80th)	157 / 170 (~62nd)	147 / 170 (~25th)
Graduate Record Examination (GRE) Verbal	169 / 170 (~99th)	165 / 170 (~96th)	154 / 170 (~63rd)
Codeforces Rating	392 (below 5th)	392 (below 5th)	260 (below 5th)
AP Art History	5 (86th - 100th)	5 (86th - 100th)	5 (86th - 100th)
AP Biology	5 (85th - 100th)	5 (85th - 100th)	4 (62nd - 85th)
AP Calculus BC	4 (43rd - 59th)	4 (43rd - 59th)	1 (0th - 7th)
AP Chemistry	4 (71st - 88th)	4 (71st - 88th)	2 (22nd - 46th)
AP English Language and Composition	2 (14th - 44th)	2 (14th - 44th)	2 (14th - 44th)
AP English Literature and Composition	2 (8th - 22nd)	2 (8th - 22nd)	2 (8th - 22nd)
AP Environmental Science	5 (91st - 100th)	5 (91st - 100th)	5 (91st - 100th)
AP Macroeconomics	5 (84th - 100th)	5 (84th - 100th)	2 (33rd - 48th)
AP Microeconomics	5 (82nd - 100th)	4 (60th - 82nd)	4 (60th - 82nd)
AP Physics 2	4 (66th - 84th)	4 (66th - 84th)	3 (30th - 66th)
AP Psychology	5 (83rd - 100th)	5 (83rd - 100th)	5 (83rd - 100th)
AP Statistics	5 (85th - 100th)	5 (85th - 100th)	3 (40th - 63rd)
AP US Government	5 (88th - 100th)	5 (88th - 100th)	4 (77th - 88th)
AP US History	5 (89th - 100th)	4 (74th - 89th)	4 (74th - 89th)
AP World History	4 (65th - 87th)	4 (65th - 87th)	4 (65th - 87th)
AMC 10[3]	30 / 150 (6th - 12th)	36 / 150 (10th - 19th)	36 / 150 (10th - 19th)
AMC 12[3]	60 / 150 (45th - 66th)	48 / 150 (19th - 40th)	30 / 150 (4th - 8th)
Introductory Sommelier (theory knowledge)	92 %	92 %	80 %
Certified Sommelier (theory knowledge)	86 %	86 %	58 %
Advanced Sommelier (theory knowledge)	77 %	77 %	46 %

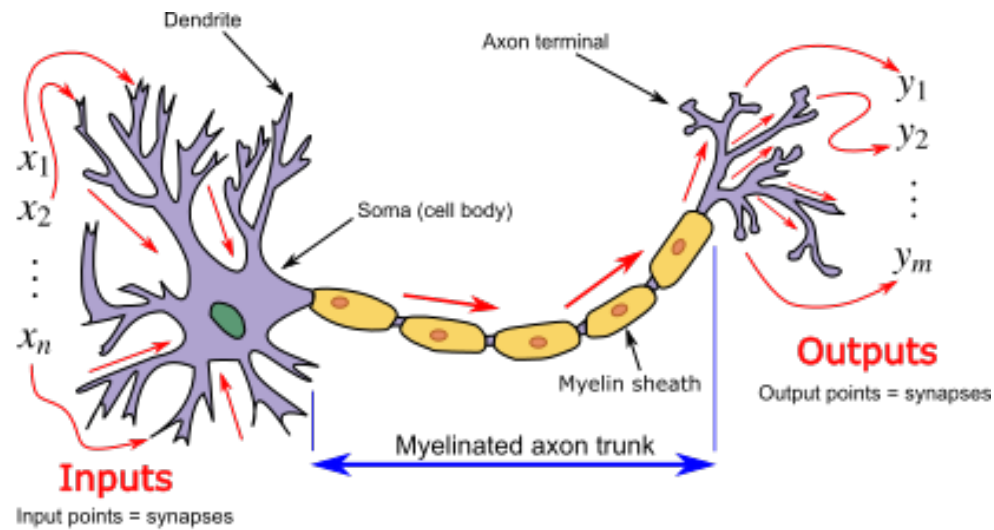|	GPT-4	GPT-4 (no vision)	GPT-3.5
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March SAT scores are now available.
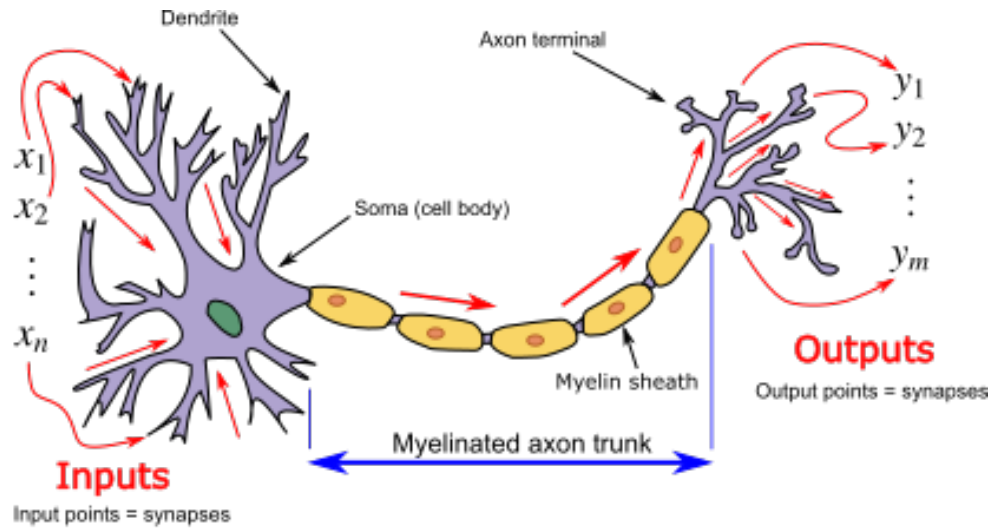
Get Your Scores

Source: OpenAI, "GPT-4 Technical Report"

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Artificial Neural Networks (ANN)

Animal neuron model

Artificial Neural Networks (ANN)

Animal neuron model

Models of animal neurons (loosely) inspired ANNs
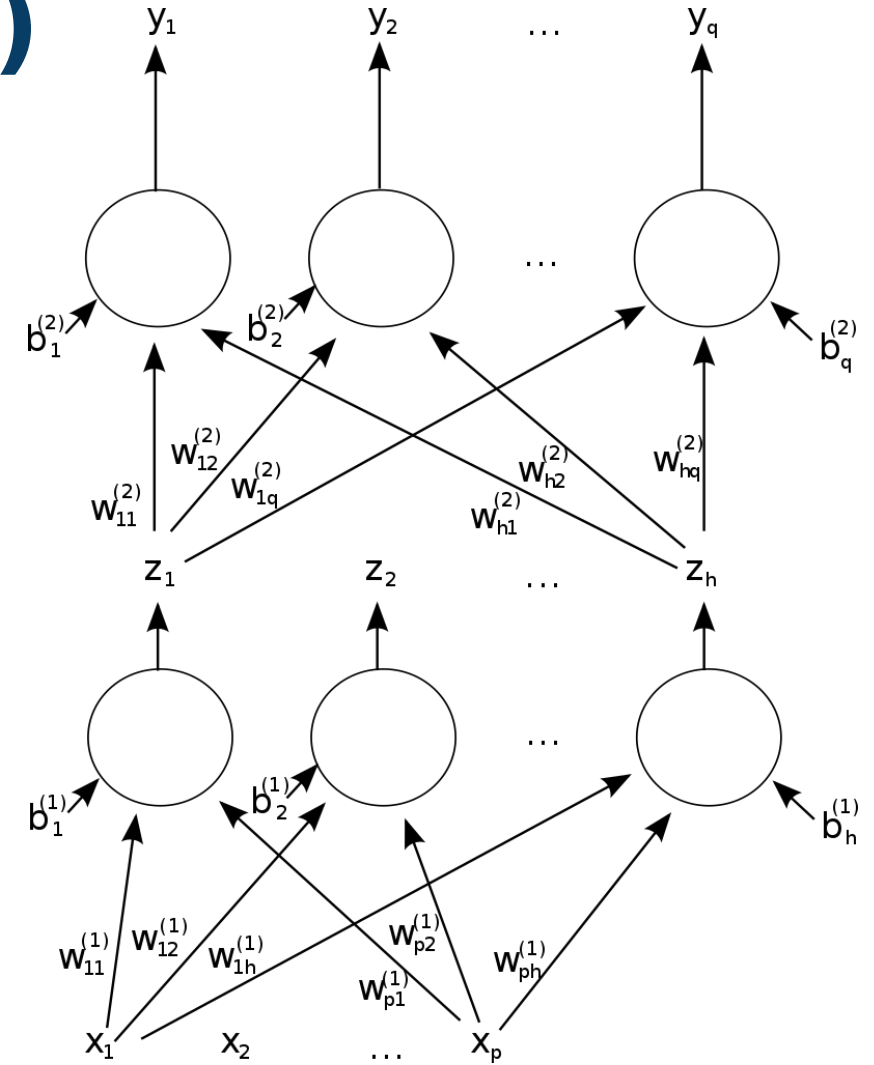
Artificial neural network

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Large Language Models: A Breakthrough in AI

Earlier Model Architectures

- **Flexibility:** Limited; specialized for a type of data and application

- **Uses:** Classification, regression, clustering

- **Results:** Scalars and tensors in a probability space

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Large Language Models: A Breakthrough in AI

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LLM Architectures

- **Flexibility:** General-purpose; able to understand information and apply reasoning to a wide range of tasks

- **Uses:** Generation of text, images, music, videos, and other media

- **Results:** Media directly consumable by humans, e.g., plain-language text

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Exponential Growth In ANN Model Sizes
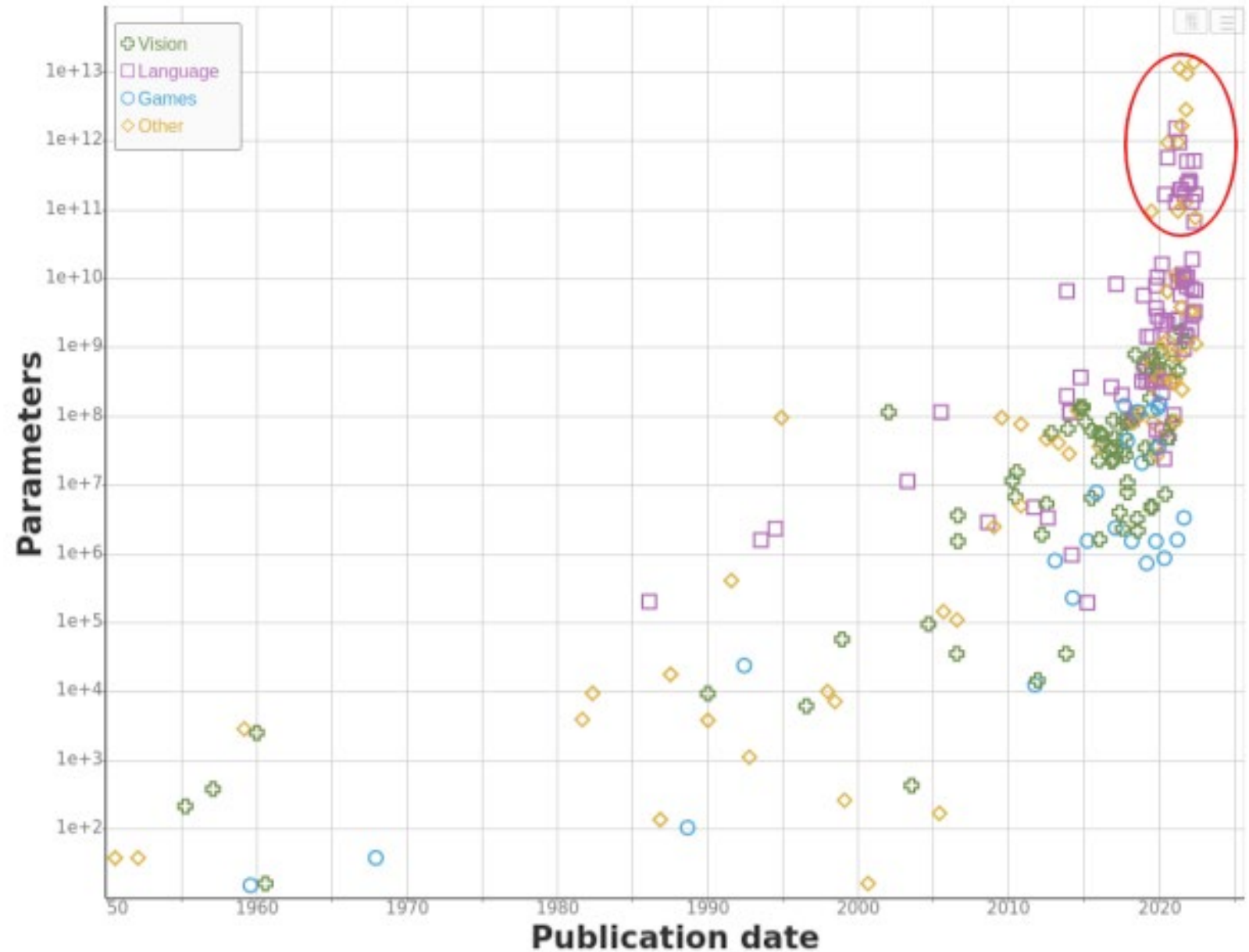
Source: P. Villalobos *et al.,* *"Machine Learning Model Sizes and the Parameter Gap,"* arXiv: 2207.02852

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Digital Transformation Playbook

Vision
- Clear picture of success
- Aligned with the mission
- Ends, not means – not overly technology centric

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Change Management
- Proven strategy for change management
- Don't reinvent the wheel
- Risk-based approach

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Infrastructure
- Appropriate IT investments to support AI
- Data lakes to centralize enterprise data storage
- Investing in "human capital" – human knowledge is the hidden infrastructure

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AI at Scale

- AI is used to transform operations and decision-making across the org.

- Driven by organizational leadership

- Supports the mission, crosses functional units

- People + Process + Technology = Transformation Enablers

AI Will Mostly Complement, Not Replace

Global Economics Analyst
The Potentially Large Effects of Artificial Intelligence on Economic Growth
(Briggs/Kodnani)

But there are likely exceptions in:
- Legal-related occupations
- Administrative work
- Software development and testing

Building Public Trust in AI: An Uphill Road

Americans lean toward concern over excitement when it comes to the increased use of AI in daily life ...

% of U.S. adults who say that overall, the increased use of artificial intelligence computer programs in daily life makes them feel ...

- **More excited** than concerned — 18
- **Equally** concerned and excited — 45
- **More concerned** than excited — 37
- No answer <1

And public views are varied when it comes to three specific AI applications

% of U.S. adults who think widespread use of each of the following has been/would be a ...

	Bad idea for society	Good idea for society	Not sure
Facial recognition technology by police	27	46	27
Computer programs by social media companies to find false information on their sites	31	38	30
Driverless passenger vehicles	44	26	29

Note: Respondents who did not give an answer are not shown. Figures may not add up to 100% due to rounding.
Source: Survey conducted Nov. 1-7, 2021.
"AI and Human Enhancement: Americans' Openness Is Tempered by a Range of Concerns"

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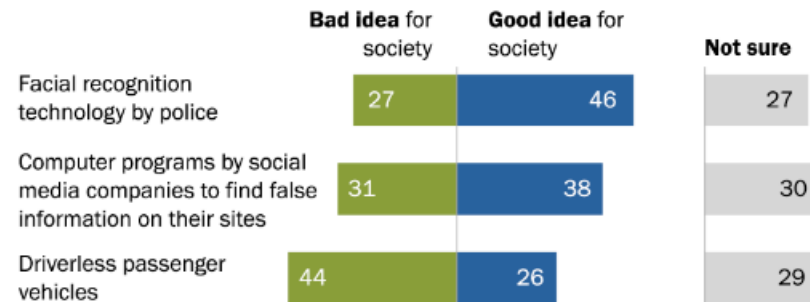# Building Public Trust in AI: An Uphill Road

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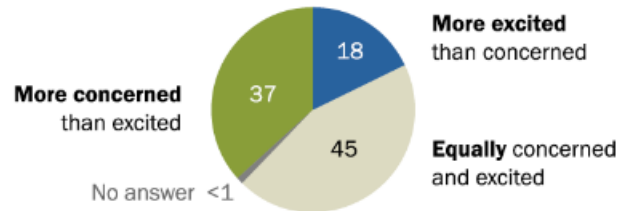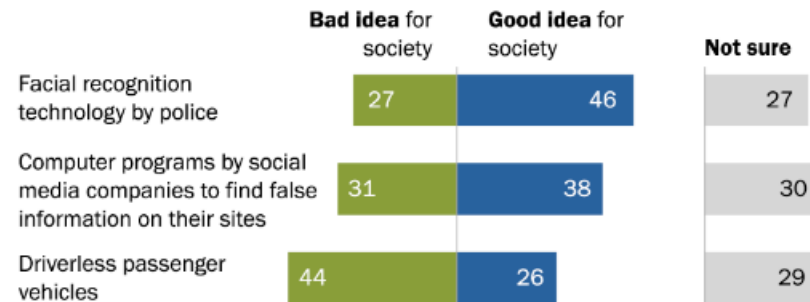"AI and Human Enhancement: Americans' Openness Is Tempered by a Range of Concerns"

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Americans explain in their own words what makes them either more concerned or more excited about the increased presence of AI in daily life

% of U.S. adults who say that overall, the increased use of artificial intelligence computer programs in daily life makes them feel ...

More excited than concerned	Equally concerned and excited	More concerned than excited
18	45	37

Among those who say they are more excited than concerned, % who mention each of the following when asked what the main reason is for their view

- 31 Makes life, society better
- 13 Saves time, more efficient
- 10 Inevitable progress, is the future
- 7 Handles mundane, tedious tasks
- 6 Helps with work/labor
- 6 AI is interesting, exciting
- 6 Helps humans with difficult/dangerous tasks
- 4 More accurate than humans
- 4 Helps those who are elderly/have a disability
- 2 Personal anecdotes
- 2 Other people's fears based on sci-fi, not reality
- 7 Other

Among those who say they are more concerned than excited, % who mention each of the following when asked what the main reason is for their view

- 19 Loss of human jobs
- 16 Surveillance, hacking, digital privacy
- 12 Lack of human connection, qualities
- 8 AI will get too powerful, outsmarting people
- 8 People misusing AI
- 7 People becoming too reliant on AI/tech
- 6 AI fails, makes mistakes
- 3 Concerns about govt./tech companies using AI
- 3 Don't trust AI or people wielding it
- 2 Unforeseen consequences/effects
- 2 Loss of freedom
- 2 Human bias coded into AI
- 2 Lack of oversight and regulation
- 7 Other

Note: Open-ended responses have been coded into categories. The 22% who received but did not give an answer for the more excited than concerned question and the 20% who received but did not give an answer for the more concerned than excited question are not shown. Including these groups, figures for each question may add up to more than 100% because multiple responses were allowed.
Source: Survey conducted Nov. 1-7, 2021.
"AI and Human Enhancement: Americans' Openness Is Tempered by a Range of Concerns"

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AI Risk: Lack of Transparency

Would you want to apply for a job that uses AI to help make hiring decisions?

% of U.S. adults who say they would or would not want to apply for a job with an employer that uses artificial intelligence to help in hiring decisions

66% say **No**   **32%** say **Yes**

IN OPEN-ENDED RESPONSES TO THIS QUESTION,
PEOPLE SHARED WHY THEY SAID "YES" OR "NO"

WHY NO?

AI lacks the human touch

"It would lack/overlook the human factor. What if I don't have the 'right' keywords on my application? Would I be dismissed outright? I would need to learn more about AI to feel comfortable with it."
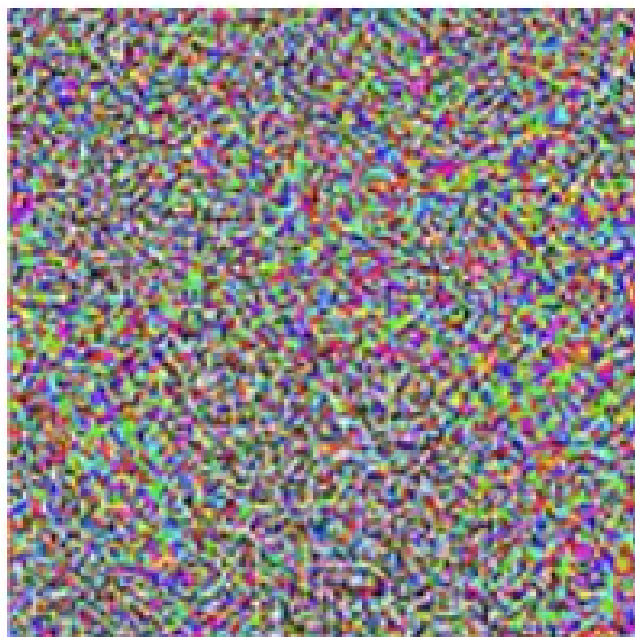
— WOMAN, 40s

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AI Vulnerability: Adversarial Example

"panda"

57.7% confidence

+ ε

= "gibbon"

99.3% confidence

Source: I. Goodfellow *et al.*, "Explaining and Harnessing Adversarial Examples," arXiv:1412.6572

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Questions & Answers

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