



*Primăvara
dermatologică ieșeană*



DERMATOLOGIA
LA INTERFAȚA CU ALTE SPECIALITĂȚI

CURSURI

WORKSHOP-URI

PRELEGERI

AI in Patient Education: Insights from a Multi-Year Vitiligo Use Case

Organizat sub egida:



Spitalul Clinic
C.F. Iași



Yan Valle

Vitiligo Research Foundation

What is AI in Broad Terms



Weak AI mimics human abilities:

- It can listen, see, speak, think, and make decisions like a human
- Learns how to perform tasks faster
- Capable of reasoning in certain situations
- Programmed for a certain purpose
- No self-awareness

Strong AI exceeds human level:

- Possess the full range of human capabilities, like sensing, communicating and emoting
- Capable of reasoning at human level or higher
- aka 'Artificial General Intelligence' (AGI)
- Expected within 10-15 years
- Self-aware, can set it's own goals

AI Journey (1950-2025)



1950



1955



1965



1980



1995

"Turing Test" for
AI-machines

"Official" Birth
of AI

First chat-bot
"Eliza"

The chat-bot
"Jabberwacky"

The chat-bot
"Alice"

2011



2008



2002



1997

"Watson" beats 2
champs in Jeopardy

Big Data & Voice
recognition

"Roomba"
vacuum robot

"Deep Blue" beats
chess champion

2018



2021



2022



2023



2025

First GPT model
trained on Wikipedia

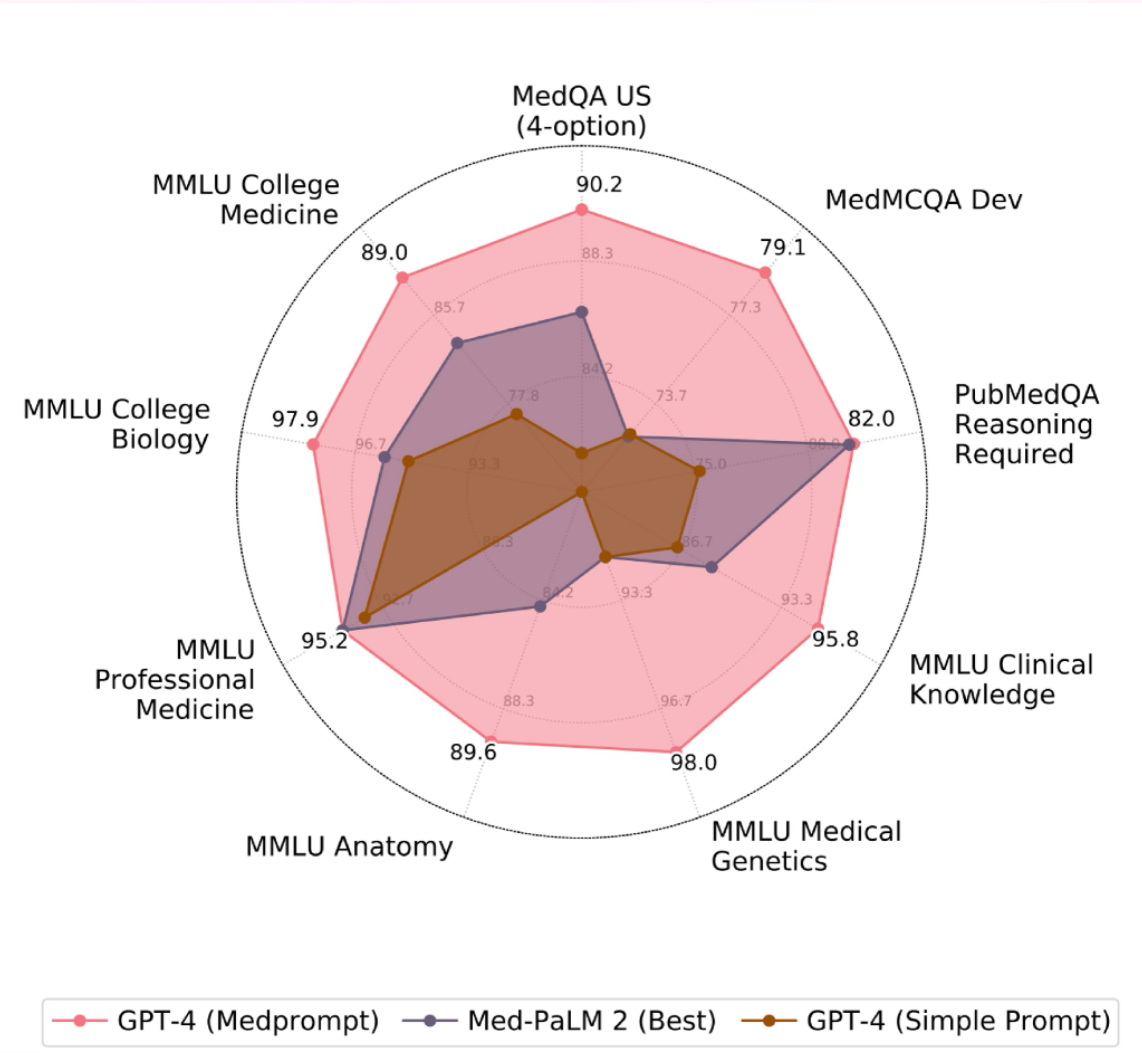
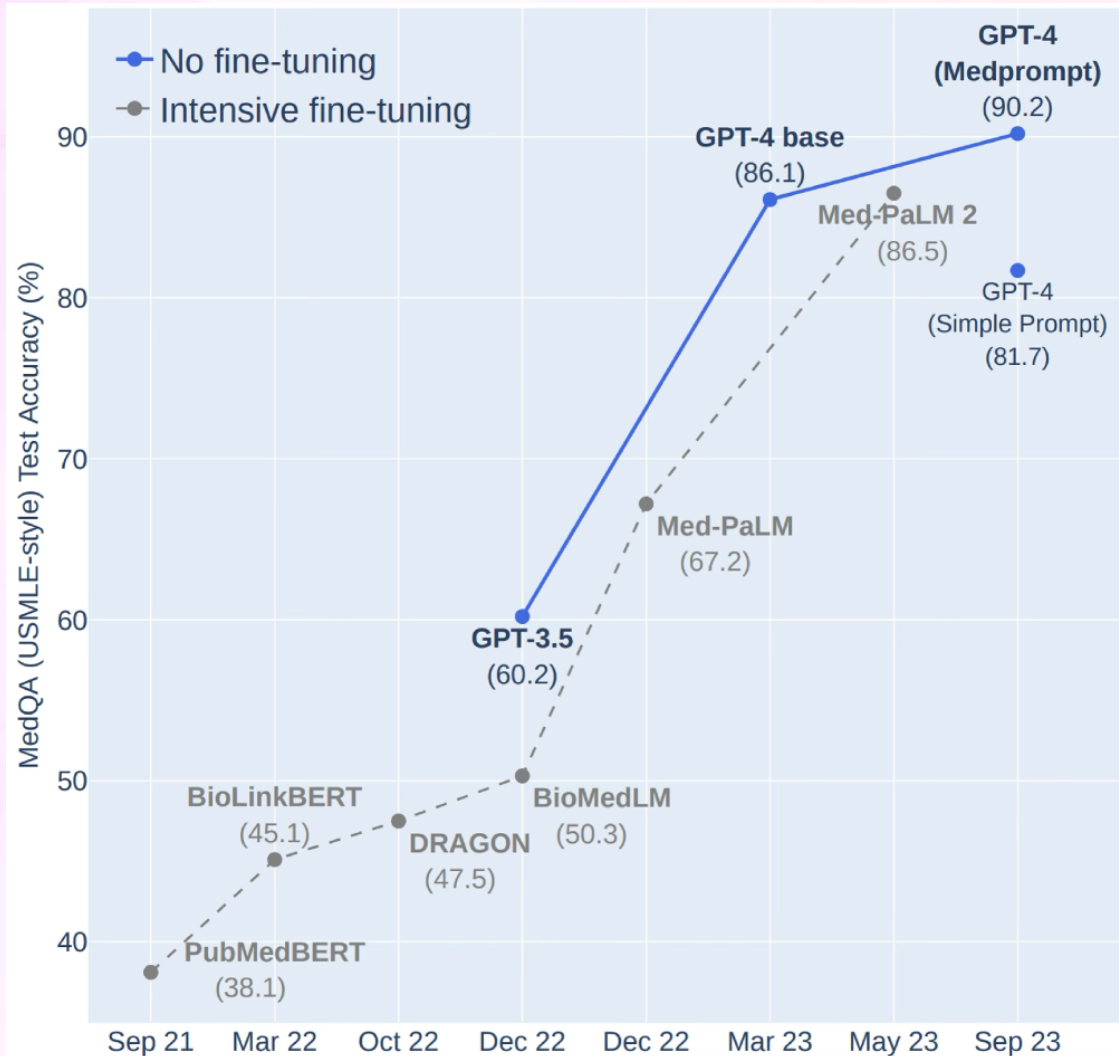
AI-Boom: 24 large
language models

Explosion of chat-bots
and generative AI

Emergent cognitive
abilities in AI

Turing Test
passed by LLM

Customized ChatGPT leads across all medical domains and other LLMs



AI Chatbot + Tele Derm = SkinGPT

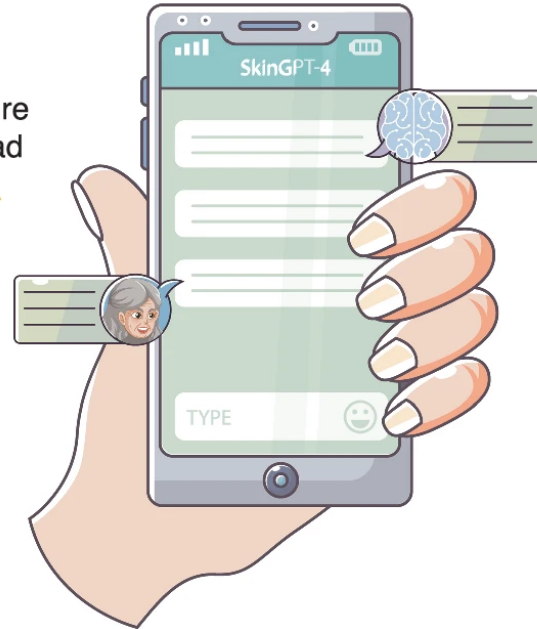


Skin Disease



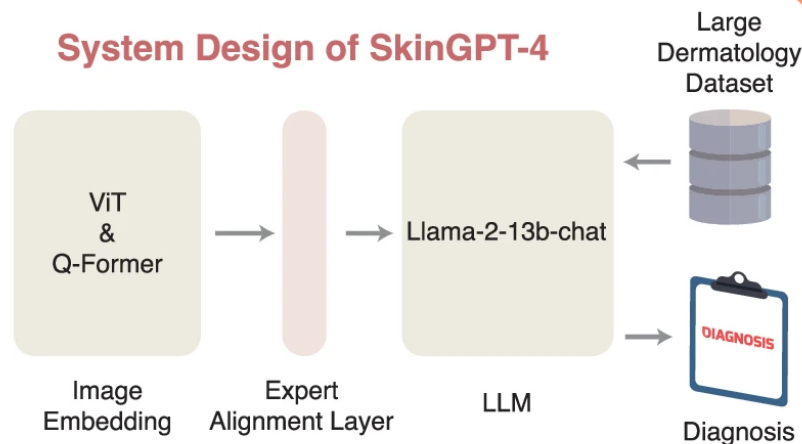
User

Take Picture
and Upload

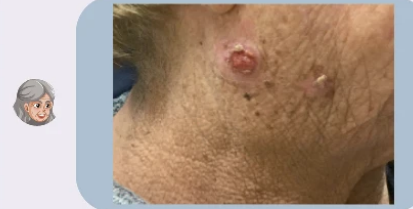


SkinGPT-4

System Design of SkinGPT-4



Interactive Diagnosis



What is wrong with my skin?



This could be a skin disease image of
actinic keratosis.



Please tell us more about this skin
disease, what are the causes?

Actinic keratosis typically appears as a rough, scaly patch on the skin that can be tan, pink, red, or the same color as the surrounding skin. The patches can be flat or raised and may feel itchy or tender to the touch. They can appear anywhere on the body, but are most common on sun-exposed areas such as the face, ears, neck, hands, and arms. Actinic keratosis is caused by prolonged exposure to the sun's UV rays. The sun's rays can damage the skin's DNA, leading to abnormal cell growth and the development of actinic keratosis. There are several treatment options for including topical crea (freezing the lesion w and photodynamic th light-sensitive medica light source to destro



Article | [Open access](#) | Published: 05 July 2024

Pre-trained multimodal large language model enhances dermatological diagnosis using SkinGPT-4

Juexiao Zhou, Xiaonan He , Liyuan Sun, Jiannan Xu, Xiuying Chen, Yuetan Chu, Longxi Zhou, Xingyu Liao, Bin Zhang, Shawn Afvari & Xin Gao

[Nature Communications](#) 15, Article number: 5649 (2024) | [Cite this article](#)

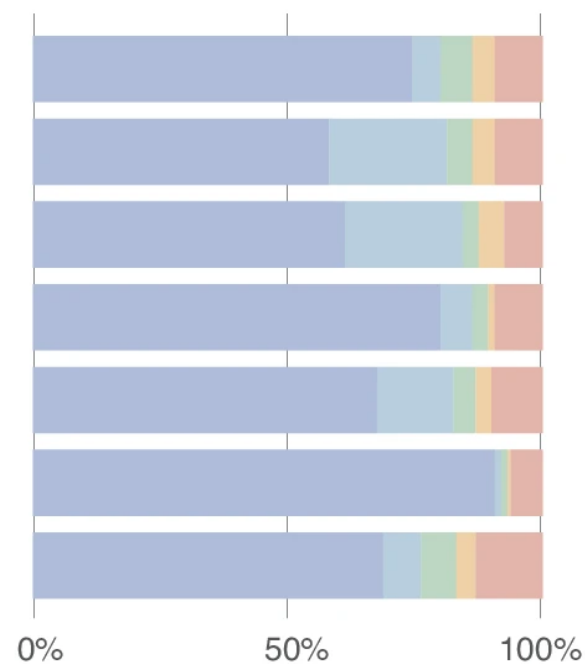
Clinical Evaluation by Dermatologists



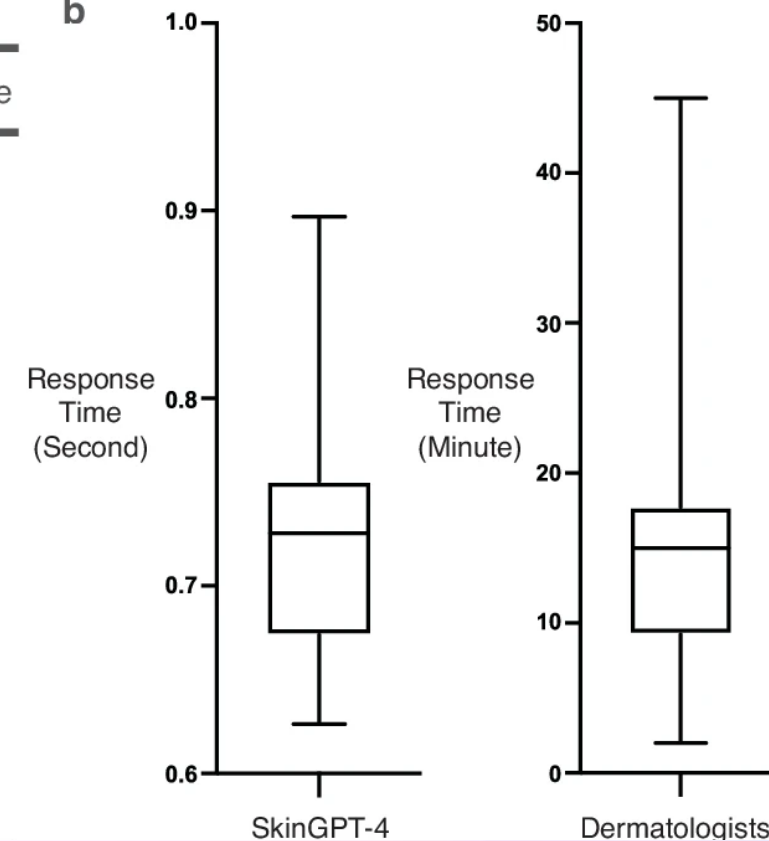
a

Evaluation of SkinGPT-4 (150 cases) Strongly agree Agree Neutral Disagree Strongly disagree

1. SkinGPT-4's diagnosis is correct or relevant.
2. SkinGPT-4's description is informative.
3. SkinGPT-4's suggestions are useful.
4. SkinGPT-4 can help doctors with diagnosis.
5. SkinGPT-4 can help patients to understand their disease better.
6. If SkinGPT-4 can be deployed locally, it protects patients' privacy.
7. Willingness to use SkinGPT-4.



b



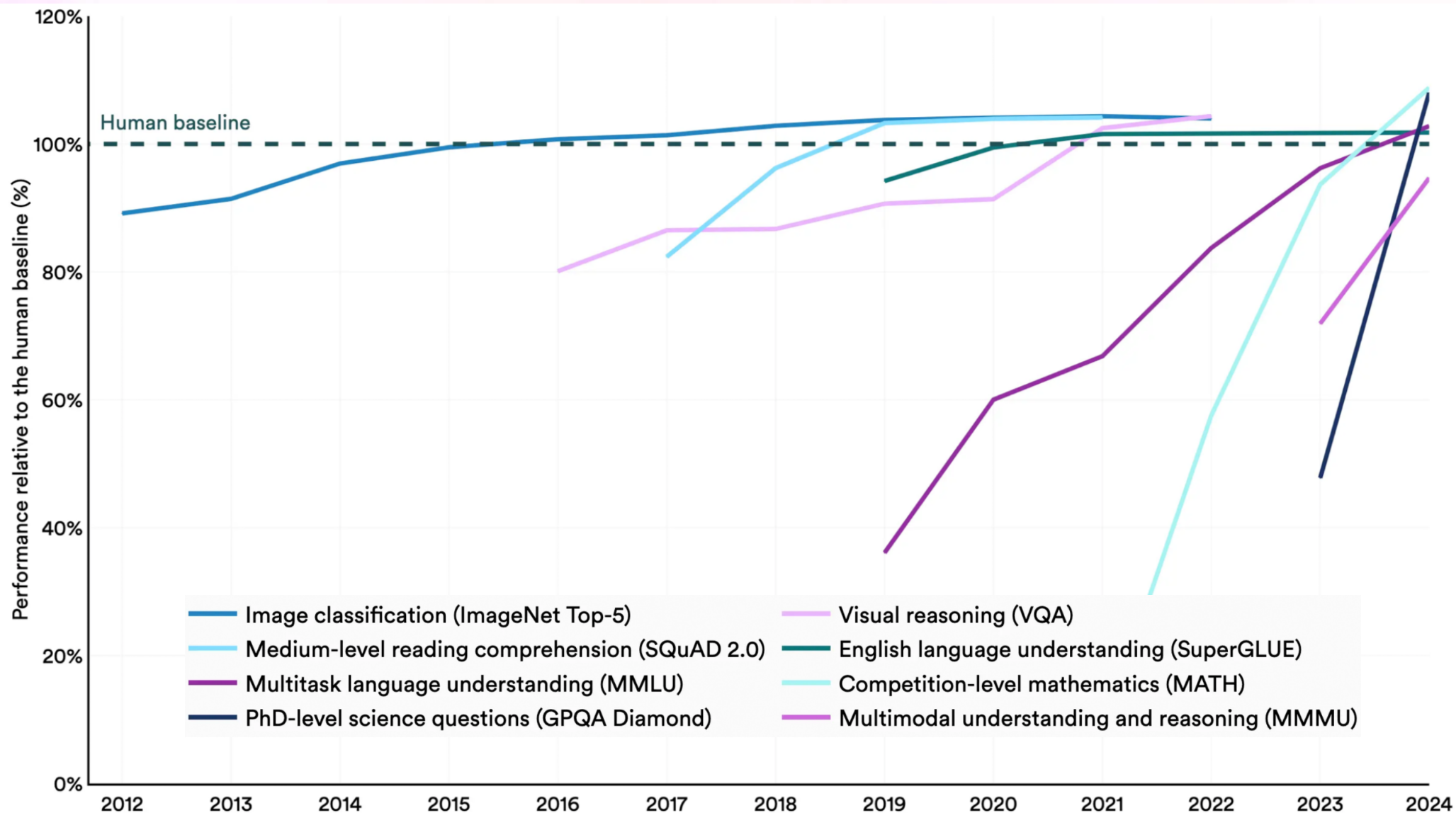
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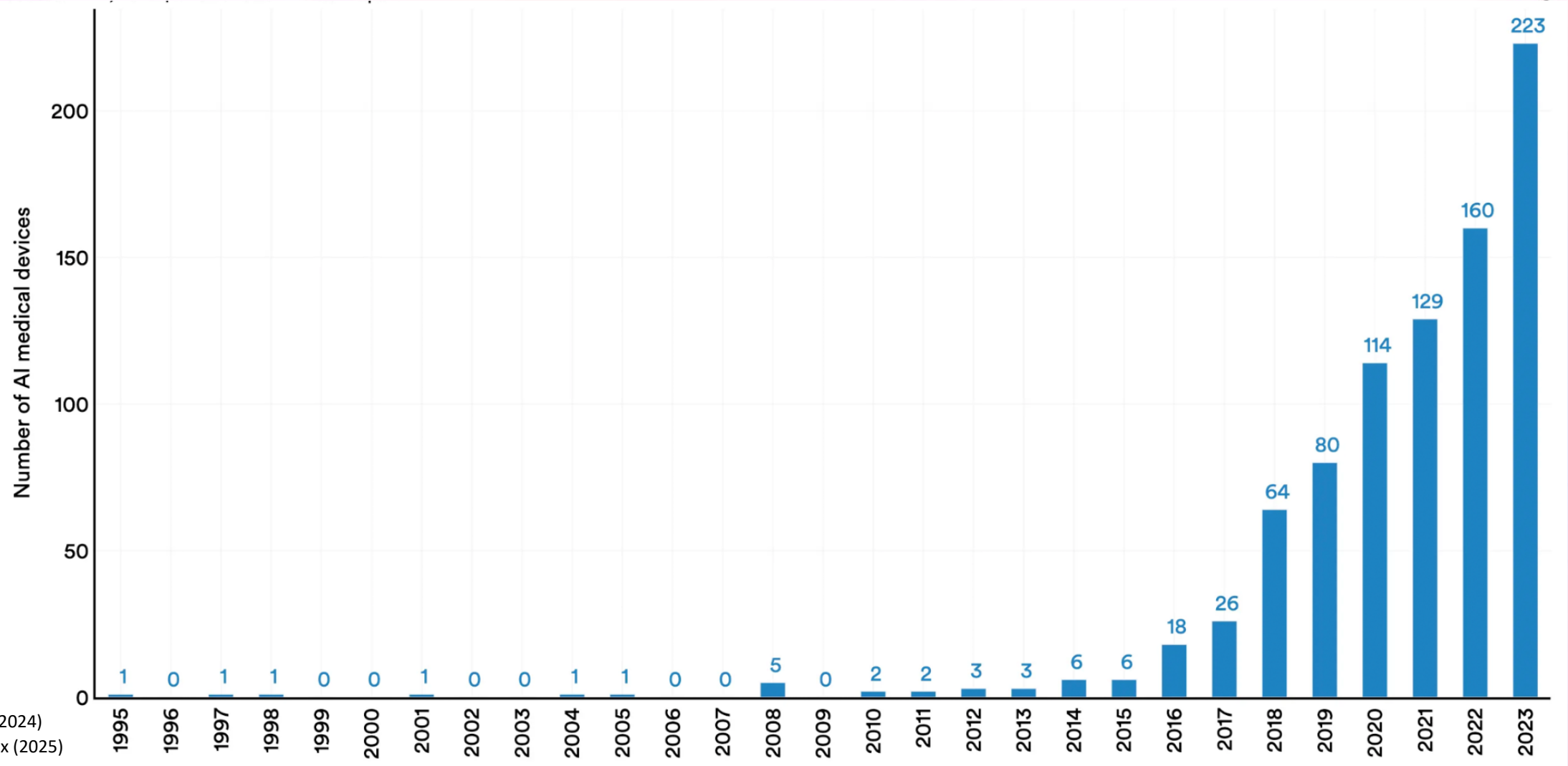
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AI vs Human Performance



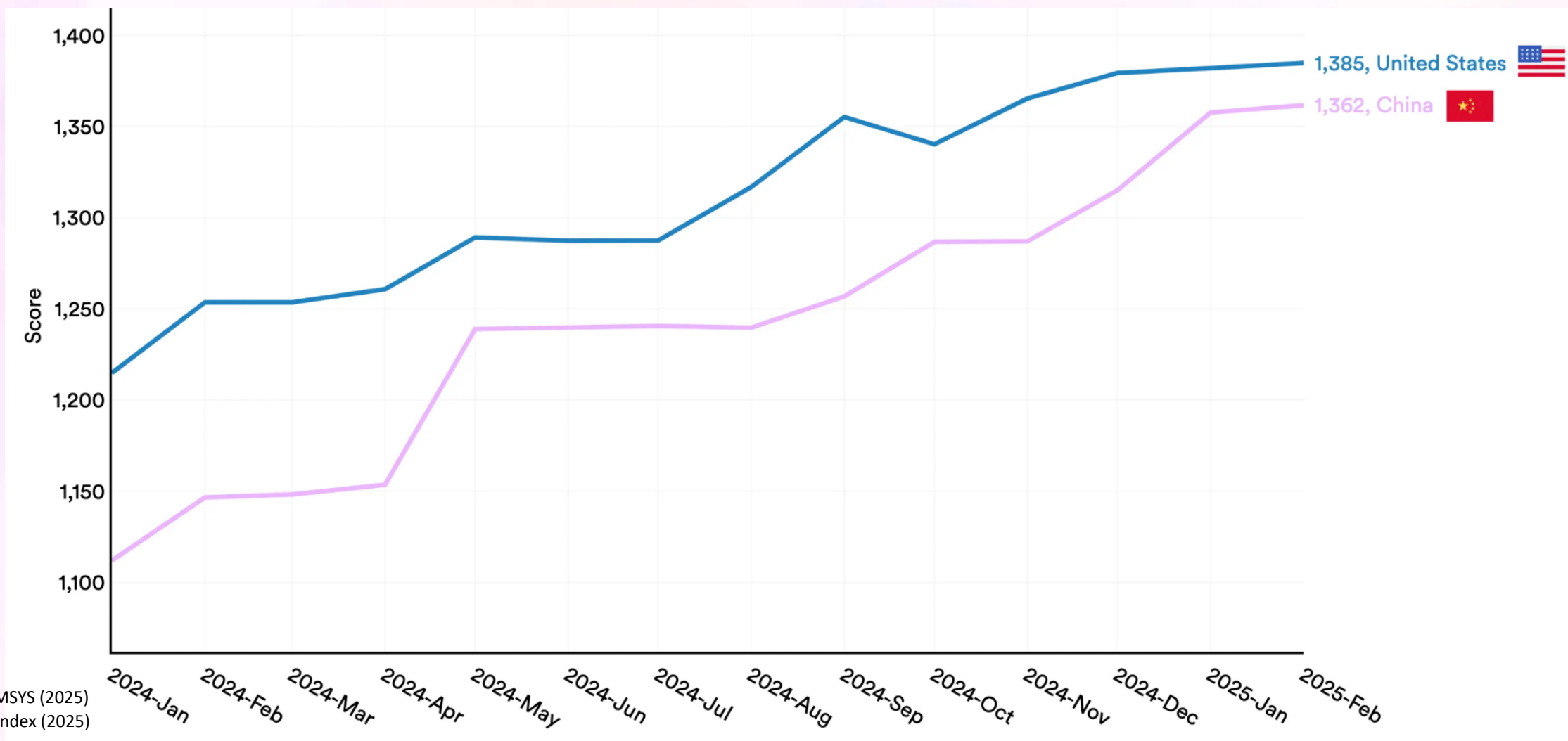
Source & Chart:
AI Index (2025)

Medical Devices Approved by FDA



Source: FDA (2024)
Chart: AI Index (2025)

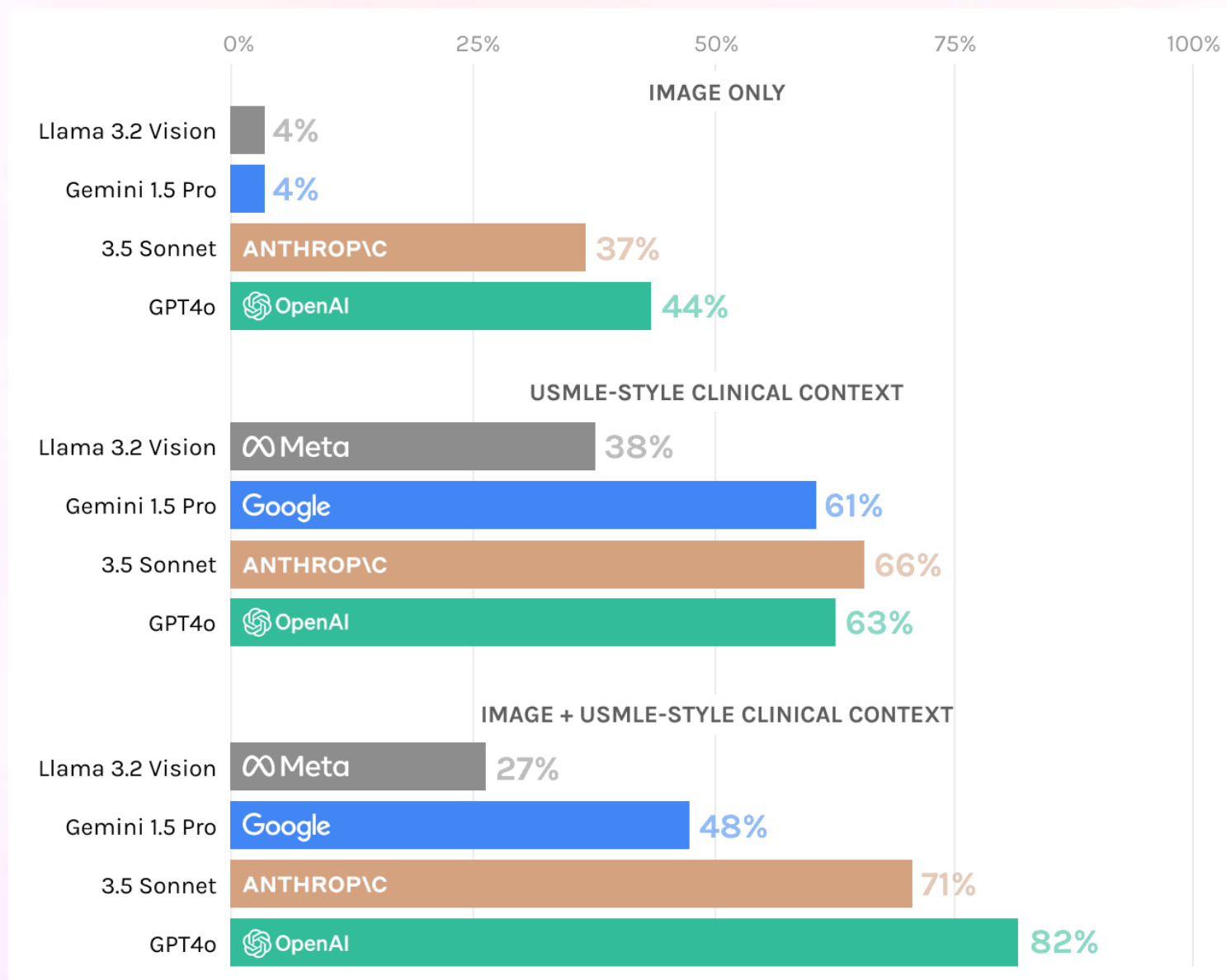
USA vs China on AI Chatbot Arena



Multi-modal AI Ability for Diagnosis



“Out of the box”, that is without special prompting techniques of the past



Responses to diagnosis-verified dataset of 113 images featuring 88 conditions

Real-life Dermatological Capabilities



- AI diagnostic systems have reached human-level performance in some fields, achieving an accuracy of 99.86% in diagnosing skin cancers, with 0.2% malignant lesion miss rate in real-world settings

Research | [Open access](#) | Published: 31 January 2025

Towards unbiased skin cancer classification using deep feature fusion

[Ali Atshan Abdulredah](#), [Mohammed A. Fadhel](#), [Laith Alzubaidi](#) , [Ye Duan](#), [Monji Kherallah](#) & [Faiza Charfi](#)

[BMC Medical Informatics and Decision Making](#) **25**, Article number: 48 (2025) | [Cite this article](#)

AI also outperforms physicians in communication, yet lags in drug matters



The proportion of **high-quality responses** from ChatGPT is **3.6 times greater** than those from physicians (78.5% for ChatGPT compared to 22.1% for physicians).

Furthermore, ChatGPT's responses are rated as **empathetic 9.8 times more frequently** than those of physicians (45.1% for ChatGPT versus 4.6% for physicians).

Keep in mind that AI's answers to specific **drug-related** questions are **mostly incomplete** or wrong. This might be due to ethical considerations or IP restrictions set during the model training.



Bold Predictions



Microsoft's co-founder Bill Gates believes only **coders**, **energy specialists**, and **biologists** will survive AI's hostile takeover. "*AI will replace humans for most things*" — making many medical specialists and tutors obsolete within a decade...

AI chatbot confused for human in 73%



Computer Science > Computation and Language

[Submitted on 31 Mar 2025]

Large Language Models Pass the Turing Test

Cameron R. Jones, Benjamin K. Bergen

We evaluated 4 systems (ELIZA, GPT-4o, LLaMa-3.1-405B, and GPT-4.5) in two randomised, controlled, and pre-registered Turing tests on independent populations. Participants had 5 minute conversations simultaneously with another human participant and one of these systems before judging which conversational partner they thought was human. When prompted to adopt a humanlike persona, GPT-4.5 was judged to be the human 73% of the time: significantly more often than interrogators selected the real human participant. LLaMa-3.1, with the same prompt, was judged to be the human 56% of the time -- not significantly more or less often than the humans they were being compared to -- while baseline models (ELIZA and GPT-4o) achieved win rates significantly below chance (23% and 21% respectively). The results constitute the first empirical evidence that any artificial system passes a standard three-party Turing test. The results have implications for debates about what kind of intelligence is exhibited by Large Language Models (LLMs), and the social and economic impacts these systems are likely to have.

Subjects: **Computation and Language (cs.CL)**; Human-Computer Interaction (cs.HC)

Cite as: [arXiv:2503.23674](https://arxiv.org/abs/2503.23674) [cs.CL]

Medical chatbots more “human”, eh...?



They appear **empathic**, charismatic, **confident**, and often compelling...

... but they **don't know when they're wrong**.
Worse, they don't care.

Turing's Test isn't enough for **medical AI**, we need something closer to a **Hippocratic Test**.

Now What?



- As technologies evolve, mass clinical applications of AI are **inescapable in the next 2-3 years**
- **Inevitable AI-arms race** between Big Pharma, hospitals, medical chains, and AI applications from insurance companies, - as well as AI-powered startups and other innovators
- AI-Assistance for industry-sponsored Phase III **clinical trials recruitment**
 - Even if medical **chatbots are not ready** for direct patient interaction **today**, AI has tremendous opportunities to optimize routine burden and to refocus on patients
 - We shall avoid interfering with the patient-physician interaction and instead facilitate **education, communication and administrative support**

Why Patient Education?



ADULT LITERACY IN THE UNITED STATES



How Many U.S. Adults Have Low English Literacy Skills?

43 million U.S. adults are unlikely to have the reading skills necessary to compare and contrast information, paraphrase, or make low-level inferences.

79%
Mid or
High
English
literacy



21%
Low
English
literacy

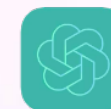


1 in 5 adults
have low English literacy skills



NOTES: The percentages above show the proficiency of U.S. adults ages 16 to 65 on the PIAAC literacy scale in 2012/2014. **Low English literacy** refers to adults who perform at PIAAC literacy proficiency level 1 or below or adults who could not participate in the study because of language barrier or a cognitive or physical inability to be interviewed. **Mid or High English literacy** refers to adults who perform at PIAAC literacy proficiency level 2 or above.

AI Chatbots Excel in “Patient Speak”



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New Frontiers in Health Literacy: Using ChatGPT to Simplify Health Information for People in the Community

Original Research | Open access | Published: 08 November 2023 | (2023)

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Julie Ayre PhD, Olivia Mac MPH, Kirsten McCaffery PhD, Brad R. McKay FRACGP, MPH, Mingyi Liu MPH, Yi Shi MPH, Atria Rezwan BPsychSc(Hons) & Adam G. Dunn PhD

The **original texts** inputted into ChatGPT and Google Bard ranged from 10th to **17th-grade** reading levels.

ChatGPT effectively **reduced** the reading level from 11th to 9th grade, and in another instance, **to 6th grade**.

Bard excelled in simplifying the language to a 6th-grade level but exhibited a significant omission of text and its meaning.

Welcome to “AI Guide To Vitiligo”



- Offers deep insights into vitiligo research, treatments, nutrition, and mental health
- Can adapt to educational level, from kindergarten to doctorate
- Communicates in 50+ languages
- Offers interactive features like contact details, visuals, etc.
- Works 24/7, free of charge
- **Still imperfect, work in progress**



vitiligo.ai

Mid-2023: Basic text mode



What is vitiligo? Explain to a 9-year old.

Here is how I would explain vitiligo to a 9-year-old:

Vitiligo is a skin condition where some areas of the skin lose their color. It happens because the cells that give color to the skin stop working right. So white patches show up on the skin in different places. The patches can get bigger over time or stay the same size.

It's not contagious - you can't catch it from someone else. And it doesn't hurt or itch. Some people with vitiligo also get white hair in spots.

Doctors don't know exactly what causes it, but it seems to run in families sometimes. There's no cure yet, but there are treatments that can help even out skin color. And there's nothing wrong with having vitiligo - it just makes someone look a little unique! Let me know if you have any questions!

ig...



How would you explain vitiligo to a researcher?

"Vitiligo is an acquired chronic skin condition characterized by progressive, patchy loss of pigmentation caused by the destruction of melanocytes. It affects 0.5-2% of the population. The precise pathogenesis is not fully understood, but multiple hypotheses exist:

- Autoimmune hypothesis - One widely accepted theory is that vitiligo is an autoimmune condition. Autoantibodies and T cells targeting melanocytes have been found in lesions and blood of vitiligo patients. There also seems to be a genetic predisposition involving genes related to the immune system.
- Oxidative stress hypothesis - Increased reactive oxygen species (ROS) and decreased antioxidant levels are observed in active vitiligo lesions. ROS can damage melanocytes and alter immune responses.
- Neurogenic hypothesis - Nerves and neuropeptides may contribute to melanocyte destruction and depigmentation. This is supported by a segmental pattern following dermatomes in

Write something...



July 2024: Redesign + Voice



Just a moment...

Hello and welcome! I'm your friendly AI guide for all things vitiligo.

We can chat via text, audio, and even video!

Need help? Click the '?' button above.

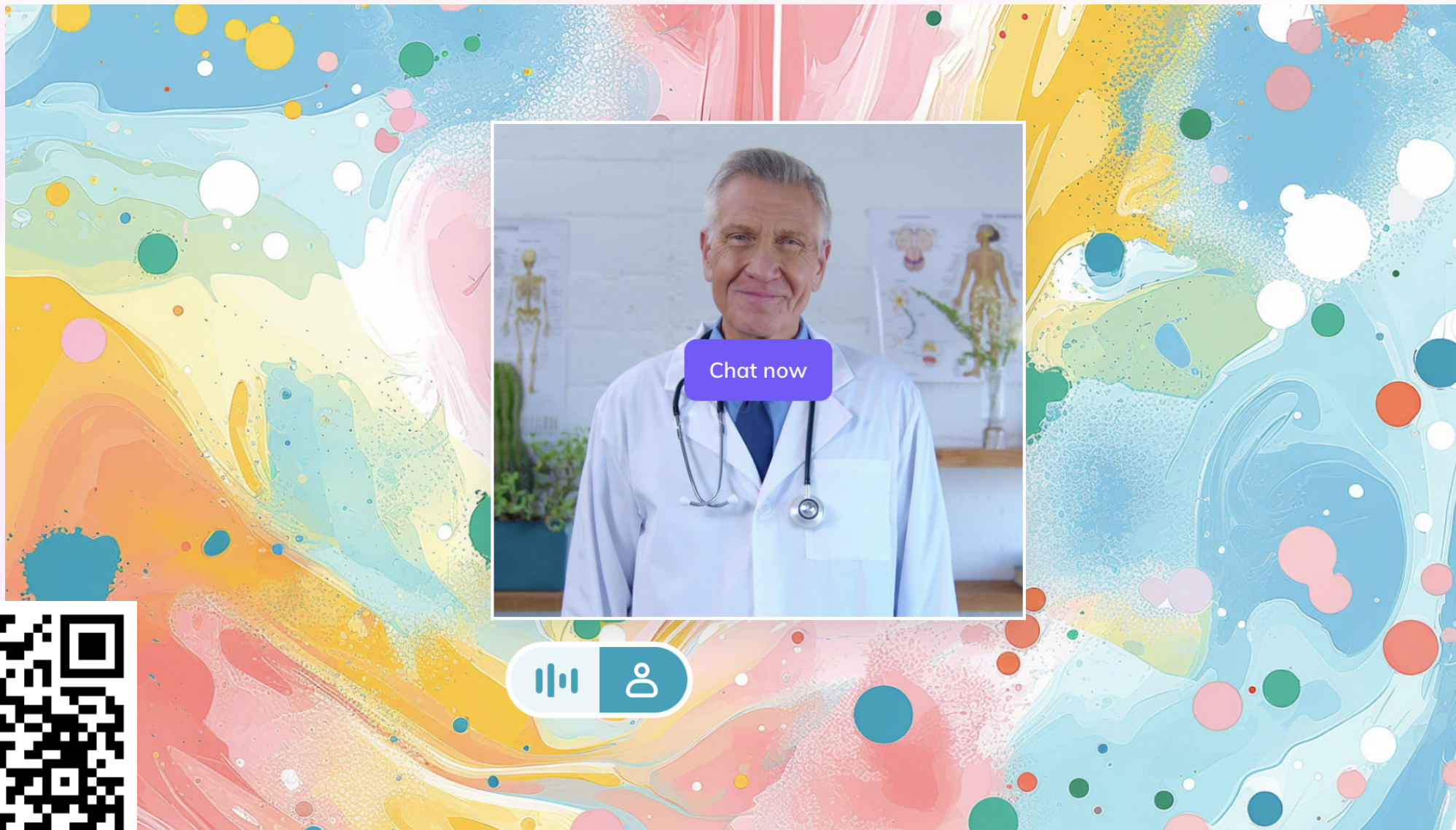
How can I assist you today?



00:00



December 2024: + Video Avatar



January 2025: + Widgets



Dr. Nanette B. Silverberg

A top specialist in pediatric dermatology and vitiligo, Dr. Silverberg is Chief of Pediatric Dermatology for the Mount Sinai Health System in New York City. She specializes in the care of skin diseases, including vitiligo, in children and adolescents.

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Email: nsilverb@chpnet.org



Behind the Scenes: AI Technology



- Advanced Large Language Models (ChatGPT 4, Gemini)
- Custom-trained on:
 - Comprehensive vitiligo knowledge base from VRF and “A No-Nonsense Guide To Vitiligo”
 - Ethical & mental health guidelines
- Results in reliable, accurate, culturally sensitive patient communication

Unique Features and Capabilities



- Personalized communication levels (from child to medical professional)
- Restricted to the training dataset, doesn't search the internet
 - thus requires regular re-training
- Specialist locator (geographically tailored) from World Vitiligo Map by VRF
- *In progress: Interactive widgets (e.g. equipment instructions)*
- *Soon: Clinical trial navigator (real-time eligibility checks)*

Impact & User Feedback



- Over **1,200 users** since launch in mid-2023
 - Most users from USA (31%), Japan (18%) and Russia (12%), also: China, Canada, India, Brazil, Germany, France, UK, Australia
- Engagement rate: 67%
- **Return rate: 97%**
- Engagement time from top 20: **6 min 52 sec** (5 sec - 16 min)
 - above average: Iraq, Chile, Senegal, Nepal, Algeria, Kuwait, Russia, Japan, Indonesia
- Tech: Desktop 58%, Mobile 42%

Key Insights



- What worked best:
 - Personalized, multimodal communication
 - Integration of specialist navigation features
- Key challenges:
 - Building initial user trust
 - Overcoming digital literacy barriers
 - Ensuring clinical alignment and accuracy

Future Directions



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Innovation for Every Skin

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Conclusion

- AI tools will redefine healthcare continuum in the next 3-5 years
- Explore AI teledermatology platforms (e.g. Skinopathy) to get ready
- Earn trust in your patient community

