



# AI & Patient Care Building trust in a technology era



DISCOVER A WORLD OF INSIGHTS

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#DrGPT



**HARVEY CASTRO MD** Human + AI ≥ max (AI, Human)

HARVEYCASTROMD



# Shuffling the Healthcare Deck with AI &



**Harvey Castro MD, MBA**

Chief Medical Intelligence Officer

HELPP AI

**HARVEY  
CASTRO  
MD**



**HUMAN + AI = LIMITLESS POTENTIAL**

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MD**

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What can AI do?

Play Video

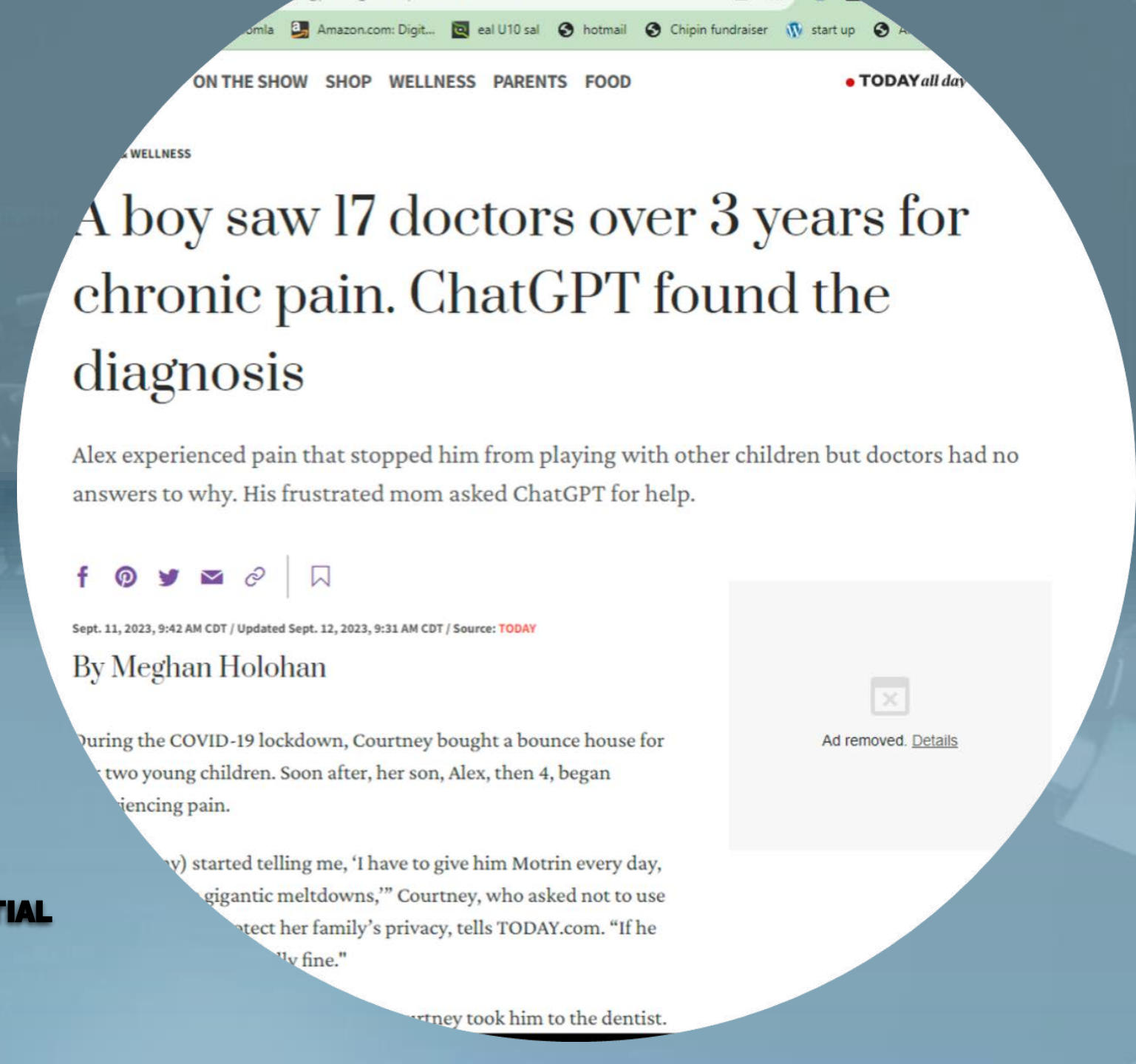


# WHY AI?

- Mother's Concern: Courtney's 3-year quest for answers.

Visited 17 doctors with no conclusive diagnosis.

Turned to ChatGPT with symptoms and MRI notes



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# WHY AI?

- "Automation & Efficiency in Healthcare: Why AI?"
- Integrate: Highlight the core mission of healthcare efficiency through automation, focusing on how AI is not used for clinical decisions but rather to streamline administrative workflows and large data management.



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# Healthcare NLP Applications

## Medical Records Management

### LLM in Healthcare Record Management

- Efficient and accurate medical record processing
- Key information extraction
- Generation of patient summaries and insights

## Disease Diagnosis and Triage

### LLMs in Patient Diagnosis and Triage

- Assists in diagnosing patients from symptoms and medical history
- Aids in triage by evaluating health-related information

## Patient Communication and Engagement

### LLMs for Patient Support

**Purpose:** Develop chatbots for patient interaction

**Benefits:**

- Reduces healthcare staff workload
- Improves patient satisfaction by providing timely information and answering common questions.

## Medical Education

### LLM in Education: Advanced Training Tools

- **Resources:** Utilizes databases like PubMed
- **Applications:**
  - Creates AI-driven clinical scenarios
  - Integrates AR/VR for procedural training



- Leveraging Predictive Analytics to Reduce Costs”
- Integrate: cost savings and AI's exponential curve, focusing on reducing administrative overhead (e.g., automating data entry for claims and prior authorization).





# Predictive Analytics in medicine

- CHI Health: Predictive Analytics in Action

- \*NYUTron & \*GatorTron

Predicting missed appointments.

Identifying sepsis risk.

Stroke detection.



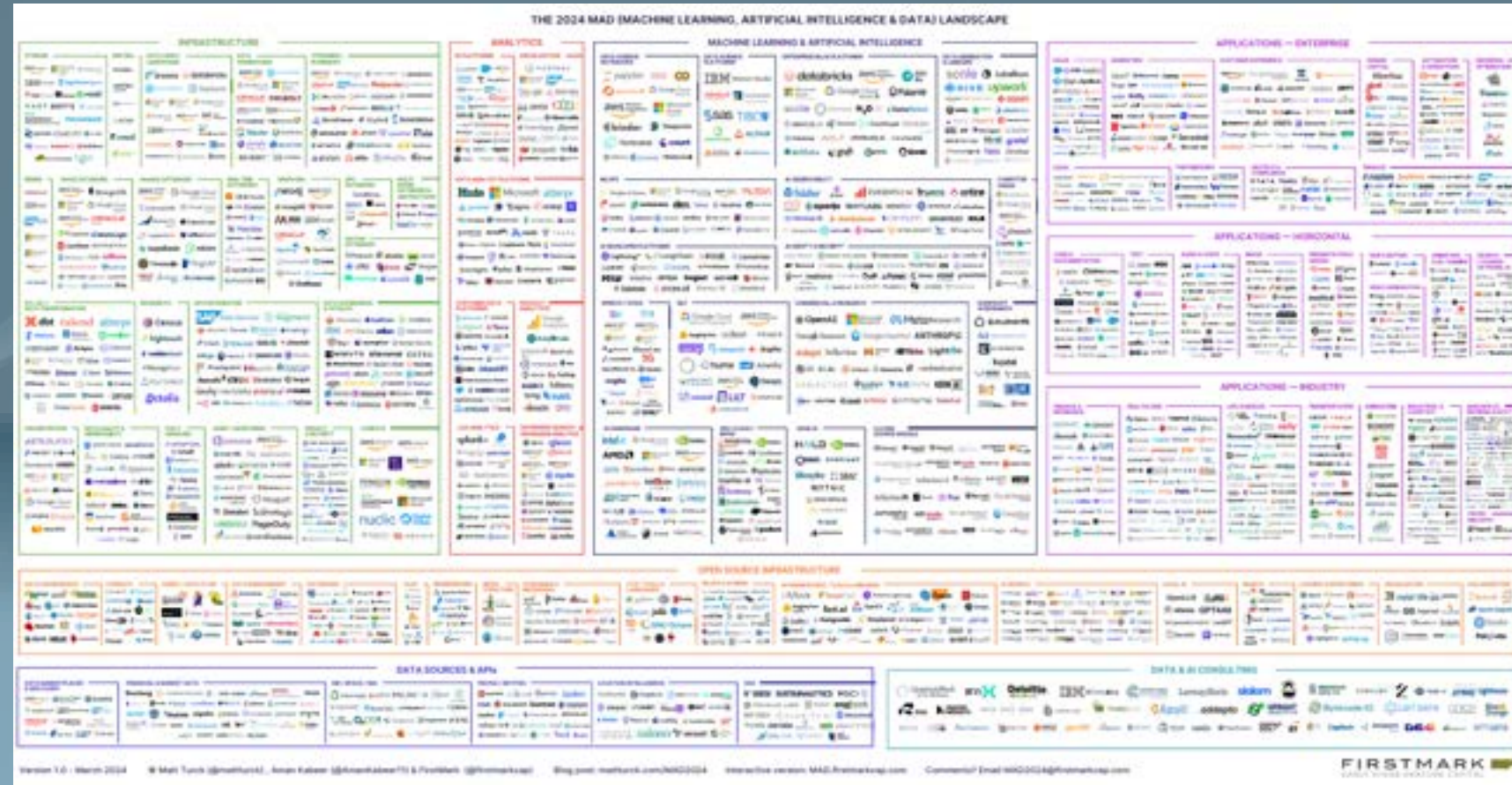
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# Landscape of AI as of 3/2024 (Machine Learning, Artificial Intelligence & Data)

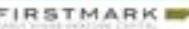


- **Hundreds of Companies Across Major-Tech Categories**
- **Infrastructure:** Foundation for technology platforms
- **Analytics:** Data examination and interpretation
- **Machine Learning & AI:** Advanced predictive technologies
- **Open-Source Infrastructure:** Collaboratively developed tools
- **Data Sources & APIs:** Access points for data and functionalities
- **Data & AI Consulting:** Expert guidance and strategy



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# AI-POWERED BLOOD TEST FOR EARLY PARKINSON'S DIAGNOSIS



• **Predicts Parkinson's Up to 7 Years Before Symptoms:**

- Allows for earlier and more effective interventions.





# AI FOR OPERATIONAL EFFICIENCY:

Case Studies in Automation Integrate:

Cleveland Clinic automating prior authorization, reducing manual work, and increasing workflow efficiency



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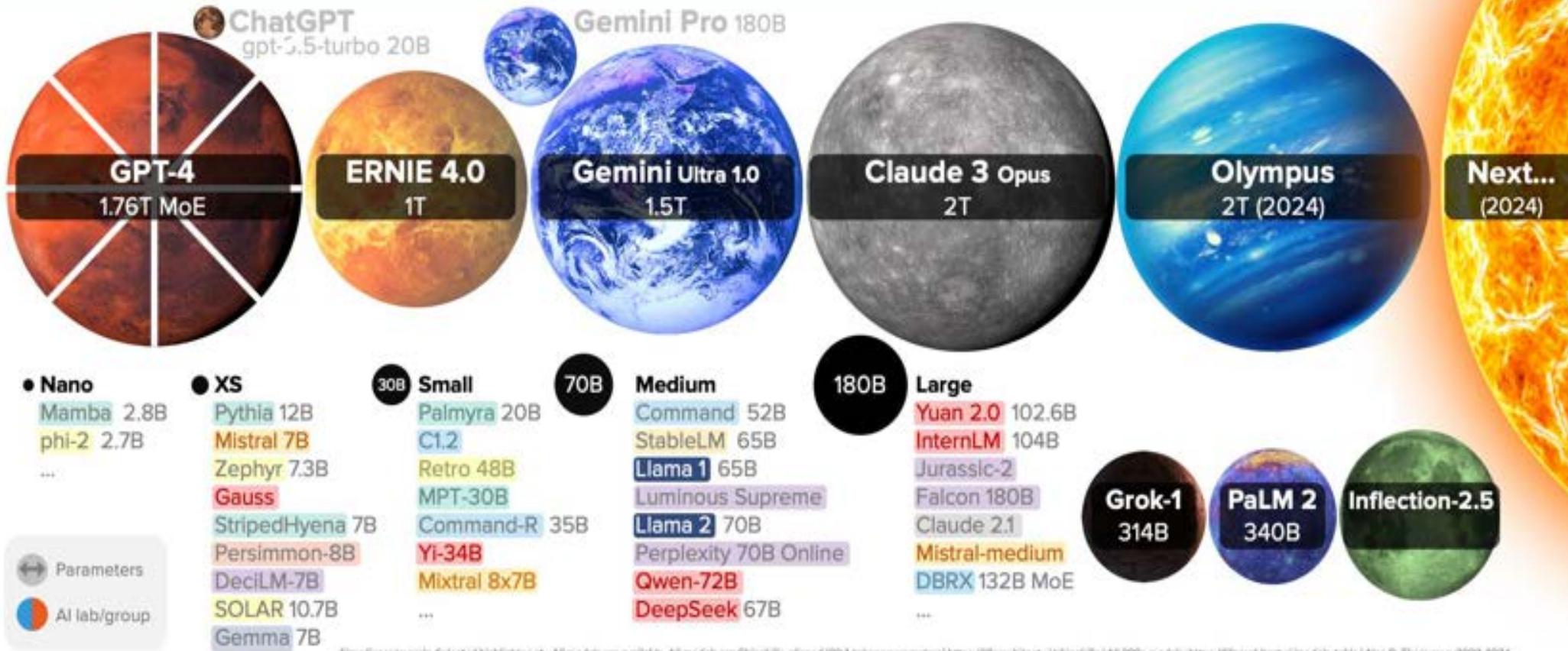
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# Models for AI: Background

## LARGE LANGUAGE MODEL HIGHLIGHTS (MAR/2024)



# Comparative IQ Metrics: AI and Notable Individuals






ChatGPT: Scores 155, higher than 99.9% of test-takers (Scientific America, March 28, 2023)

Medical Doctors: Average IQ between 120-125

Notables: Elon Musk: 155 Albert Einstein: 160 Ted Kaczynski: 167

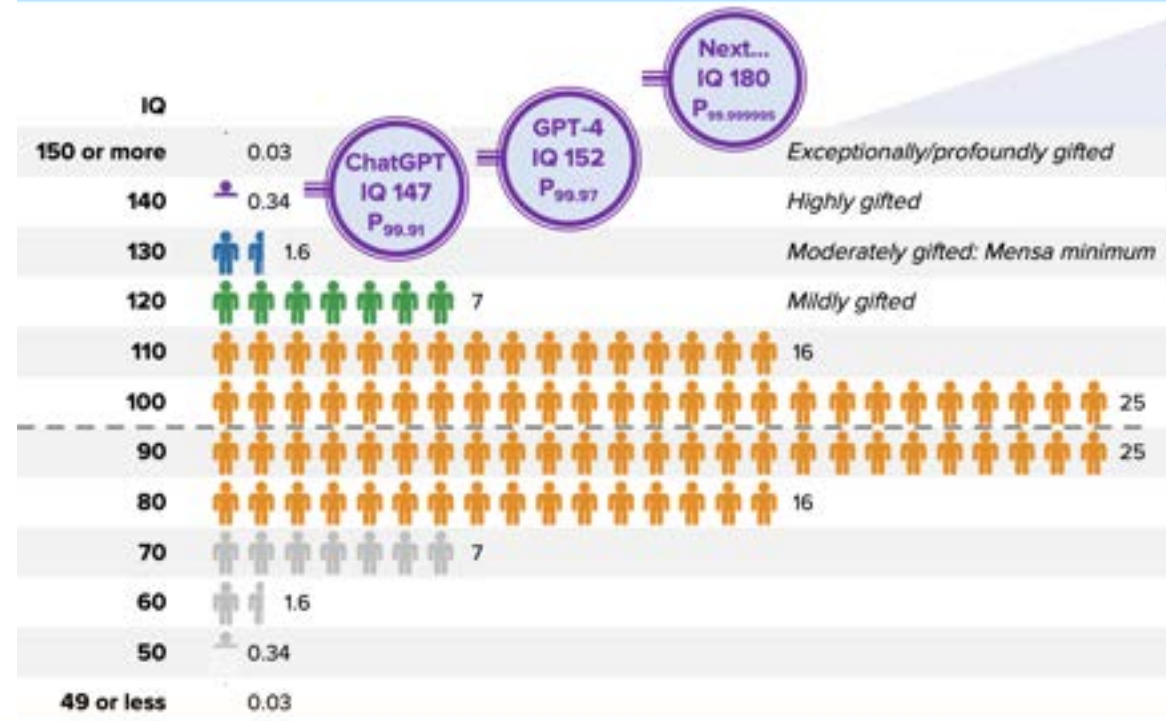


## GENIUS VS AI (FEB/2024)

					
	Average human	Terence Tao	William James Sidis	GPT-4	Gemini 1.0 and 1.5
<b>IQ percentile</b>	50 <sup>th</sup>	>99.9 <sup>th</sup>	>99.9 <sup>th</sup>	>99.9 <sup>th</sup>	>99.9 <sup>th</sup>
<b>Languages</b>	2	2	25+	90+	200+
<b>Books read</b>	700	700+	700+	4,000,000+	10,000,000+
<b>Working memory</b>	7 words	9+ words	9+ words	128,000 words	7,000,000 words
<b>Long-term memory</b>	74TB	74TB	74TB	40TB	80TB
<b>SAT score</b>	1050 (50 <sup>th</sup> )	~1460 (97 <sup>th</sup> )	-	1410 (94 <sup>th</sup> )	-

Sources: Working memory extrapolated from Miller, 1956, and Dowry, 2000. Long-term memory extrapolated from Stanford, 2010. AI: L. Thompson, Sep/2023, Feb/2024.

## AI IQ CHART - SIMPLE (AUG/2023)

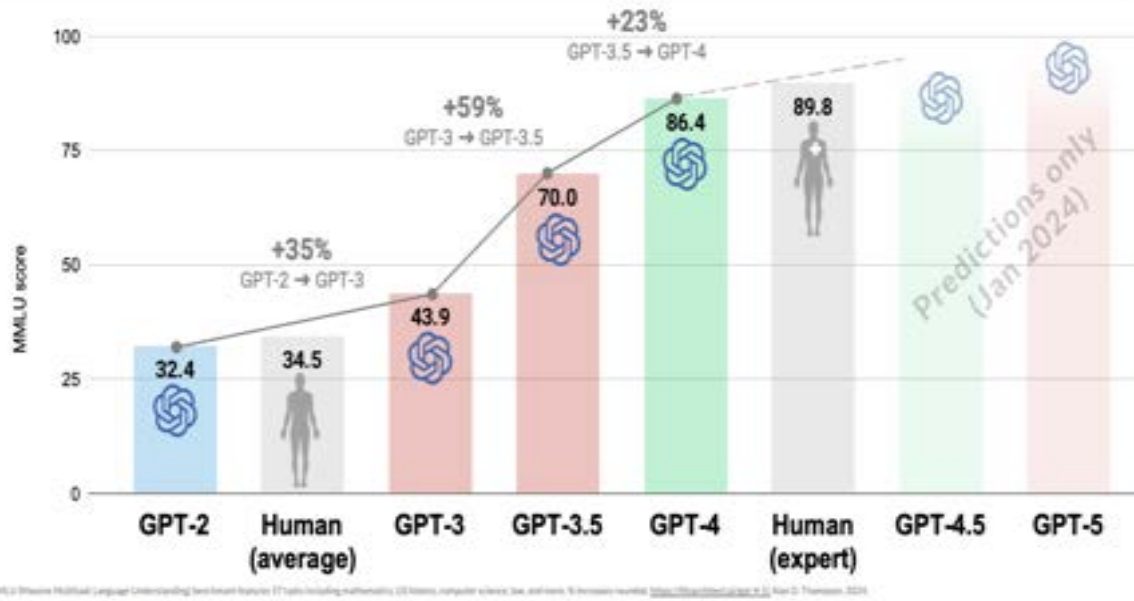




# AI Advancements: Benchmarking GPT Performance and Human Expertise



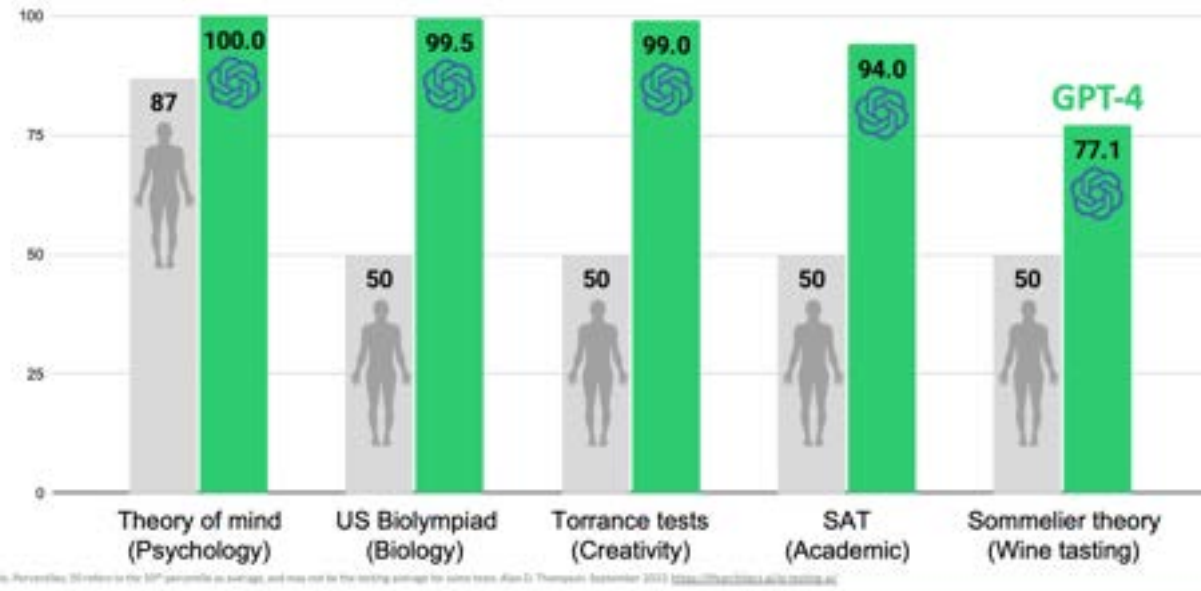
## LLMs: SMARTER THAN WE THINK (JAN/2024)



MMLU: Massive Multitask Language Understanding benchmark features 57 topics including mathematics, US history, computer science, law, and more. © OpenAI. Source: <https://openai.com/research/benchmarking-gpt-4>. Last © Thomson, 2024.

[LifeArchitect.ai/gpt-4-5](https://LifeArchitect.ai/gpt-4-5)

## GPT-4 VS HUMAN TESTS - SIMPLE (SEP/2023)



Selected highlights only. Percentages do not refer to the GPT percentage on average, and may not be the scoring average for some tests. © OpenAI. Thomson, September 2023. <https://openai.com/research/benchmarking-gpt-4>.

[LifeArchitect.ai/iq-testing-ai](https://LifeArchitect.ai/iq-testing-ai)



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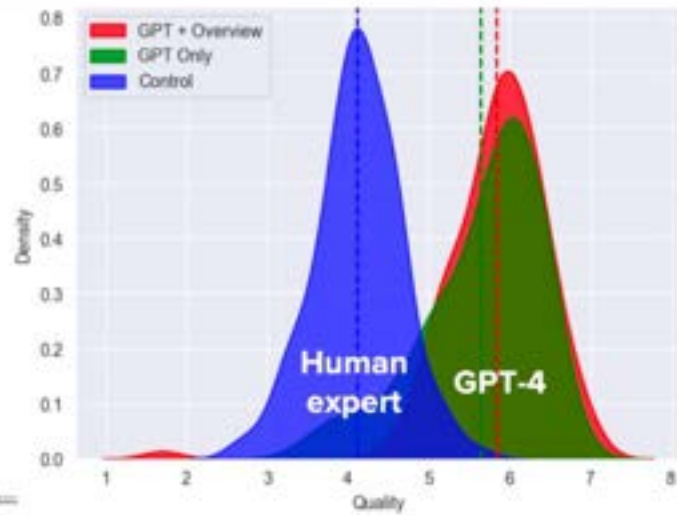
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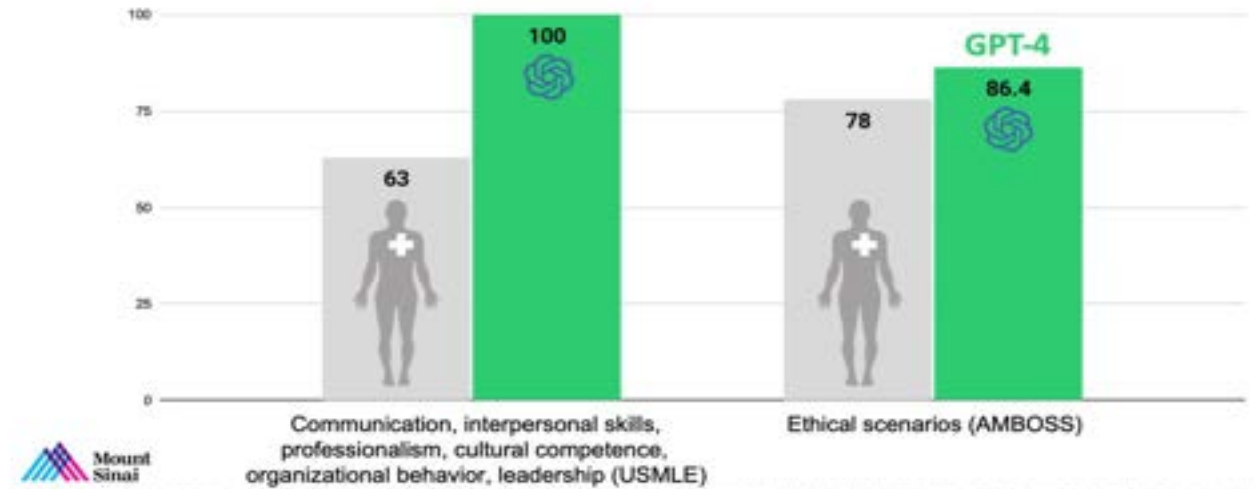
# Does AI equal the playing field? Can AI out perform Healthcare professionals ?

## HARVARD: BCG CONSULTANTS + GPT-4 (SEP/2023)



[LifeArchitect.ai/gpt-4](https://life-architect.ai/gpt-4)

## GPT-4 VS DOCTOR: MEDICAL SOFT SKILLS (OCT/2023)

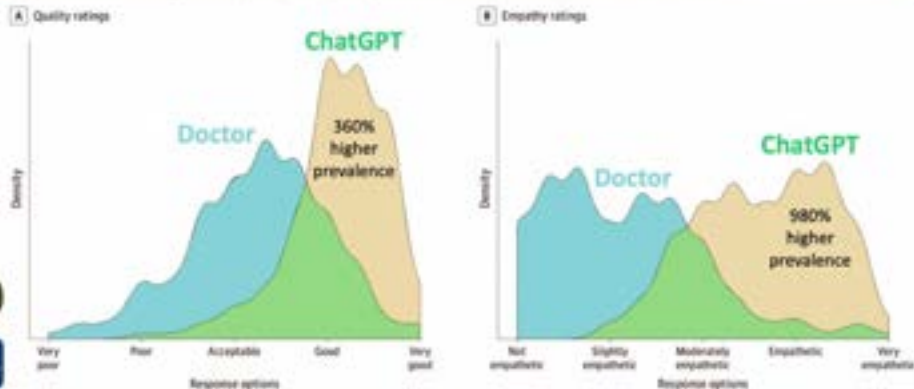


Source: Brin, D., Soria, Y., Yoon, B. et al. Comparing ChatGPT and GPT-4 performance in 20042 soft skill assessments. *npj Digital Health* 11: 24912 (2023). <https://doi.org/10.1038/s41742-023-00230-2>

[LifeArchitect.ai/IQ-testing-AI](https://life-architect.ai/IQ-testing-AI)

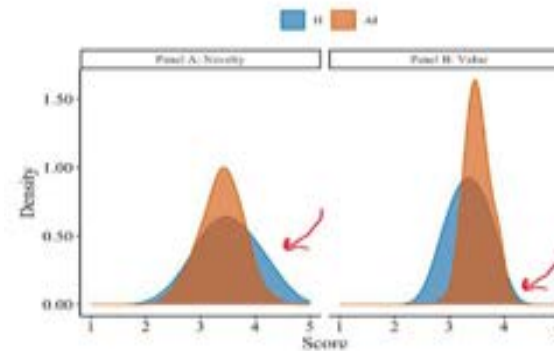
## CHATBOT VS DOCTOR: QUALITY/EMPATHY RATINGS

Figure. Distribution of Average Quality and Empathy Ratings for Chatbot and Physician Responses to Patient Questions



<https://pubmed.ncbi.nlm.nih.gov/37115527/>

## AI versus Human Ideation AI Better ideas than 99% of humans



Source: Cornell Study 2023

## And as good as humans evaluating ideas (and a lot faster, reliable)

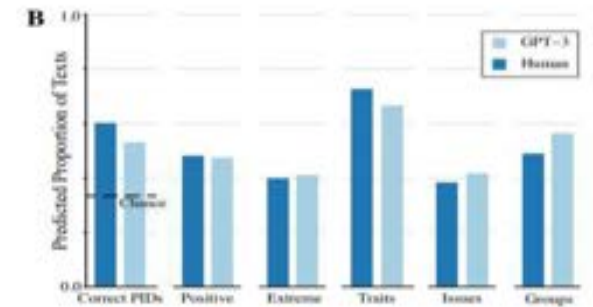


Figure 3: Analysis of GPT-3 and human responses from the Lucid survey.

Source: Brigham Young 2023

**AI + HUMAN** > Best  
Human > Best AI

Reduce costs by using AI-driven smart data solutions in administrative tasks,

how physical document processing can be automated to save time.



**HARVEY CASTRO MD** The "Human Expert" in the Loop  
#DrGPT

Human + AI  $\geq$  max (AI, Human)  
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# What are the AI components in Healthcare?

- **Definition: Artificial Intelligence (AI):** Simulation of human intelligence by machines.

- **Key Components:**

- **Machine Learning (ML):** Algorithms that enable computers to learn from data and make decisions.

- **Natural Language Processing (NLP):** Allows machines to understand and respond to human language.



- **Computer Vision:** Enables machines to interpret and make decisions based on visual data.

- **Robotics:** Application of AI to perform tasks that typically require human intervention.



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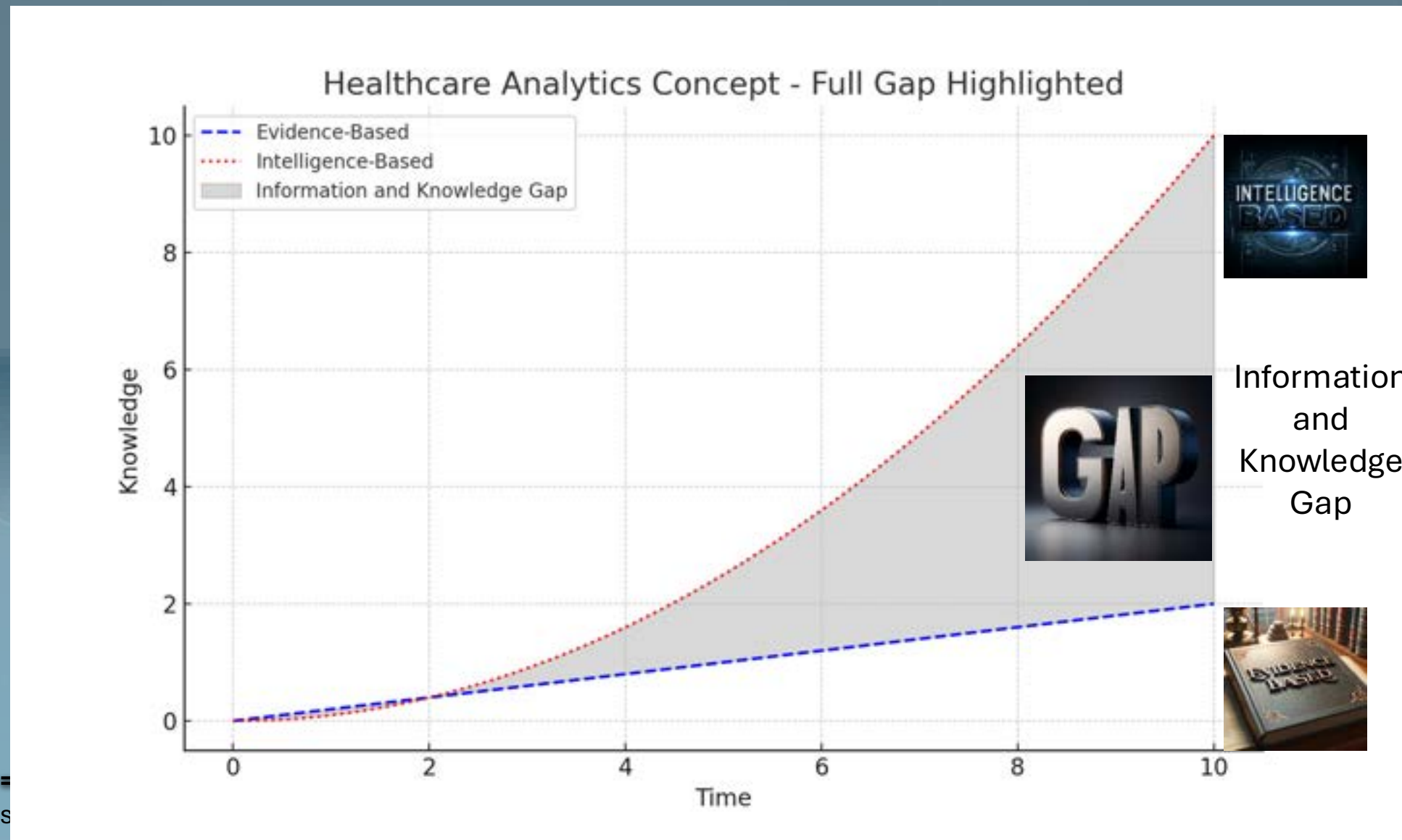
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\* Cloned Face



# Evidence Base Medicine Vs Intelligence Based Medicine

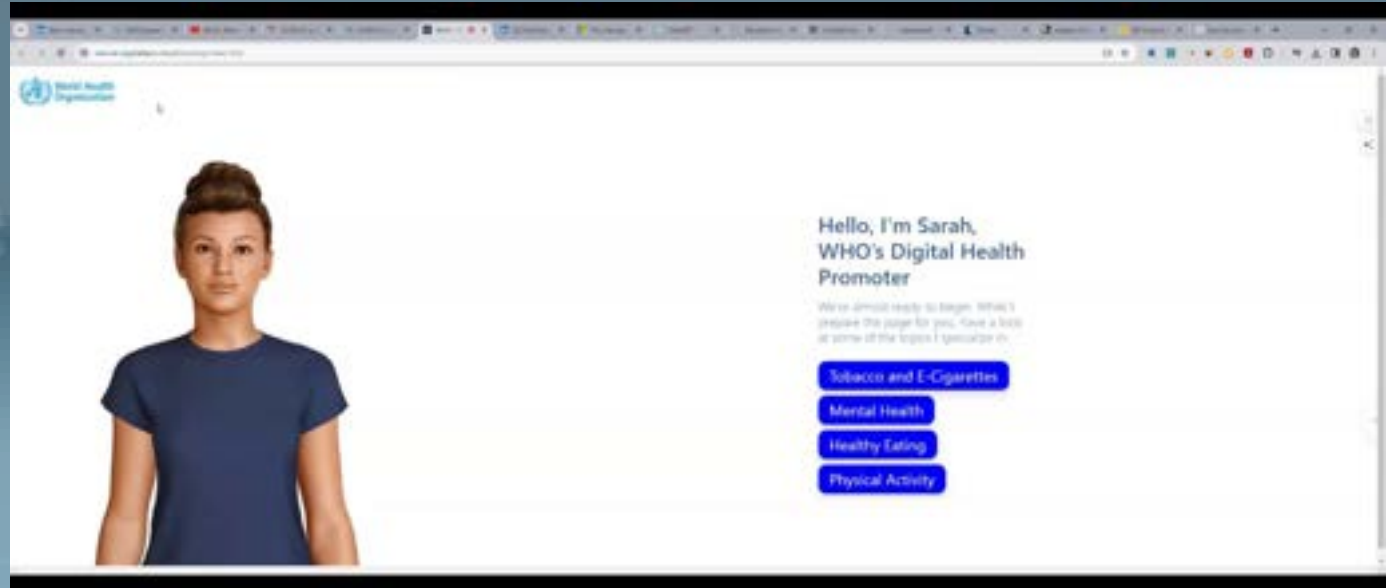


Information and Knowledge Gap



# The Dawn of a New Era in Healthcare: Introducing SARAH

- SARAH: WHO's AI-Powered Health Assistant
- Overview: Smart AI Resource Assistant for Health (SARAH) uses generative AI to promote global health.
- Accessibility: Available 24/7 in 8 languages, across all devices.
- For Healthcare Providers:
  - Streamlines patient education on wellness and disease prevention.
  - Enhances healthcare delivery through improved preventive care and patient engagement.
- Impact & Future Prospects:
  - Closes health information gaps, promoting equitable healthcare access.
  - Foster's ethical **HUMAN AI LIMITLESS POTENTIAL** learning for better health outcomes.



Play video



# Better communication

**Better Prepare your questions with ChatGPT or “GPT.”**

**Ask your doctor better questions ( often, we do not know what to ask)**

**GPT BOT: Bring the Bot to the doctor’s appointment.**



**Medi Helper**

Your assistant for medical info.

By Harvey Castro



How ChatGPT could revolutionize healthcare



# Reducing Time in Administrative Tasks

- The focus on reducing repetitive tasks (like handling physical documents)
- how AI can process data more efficiently, allowing healthcare professionals to focus on patient care.



# Reducing Time in Administrative Tasks

- Show the exponential growth in healthcare data and admin costs, emphasizing the need for AI in admin workflows.
- every \$ saved improving healthcare service.



# Reducing Time with AI: A 45% Time-Saving Solution

AI's time-saving capabilities and present the 45% reduction example.

Simplification of processes and how automation helps avoid manual data entry.



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# Patient **visit** (PT point of view): The Good

Have ChatGPT open and help create the following up Questions:

In the future ( see your doctor and have the computer out Together, work on the disease).



**LESS POTENTIAL**  
om

# Prior Authorization & AI: Time Is Money

- Automation of prior authorization and the value it brings to healthcare organizations by speeding up approval processes and minimizing delays in patient care.



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- Limitless Pendant Preserving conversations.

Lunch meetings, conferences, client calls, or doctor visits.

Personal reflection.

Verbal processing, thinking out loud, capturing a thought while your hands are busy.

Organizing the unexpected.

To-dos, reminders, or just re-living precious moments.



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Agenda 



Comic book discharge instructions  
Coloring book discharge instructions  
Podcast/Audio Clone your doctor's voice discharge instructions.



### 3 objectives Coloring Book Hero Bot (OPENAI):

"Correct Inhaler Technique for Children"

"Managing Asthma Triggered by Sports"

"Communicating Asthma Symptoms to Adults"

Audio file:





# Pediatric Discharge instructions using Plushies & Coloring books! Watch Video

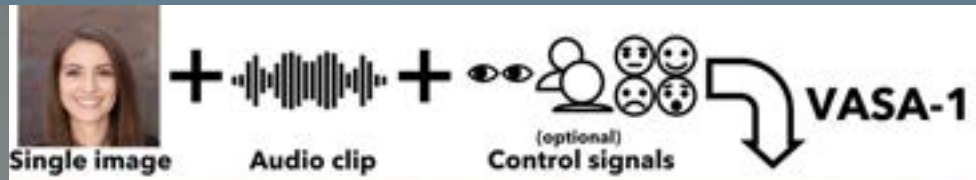
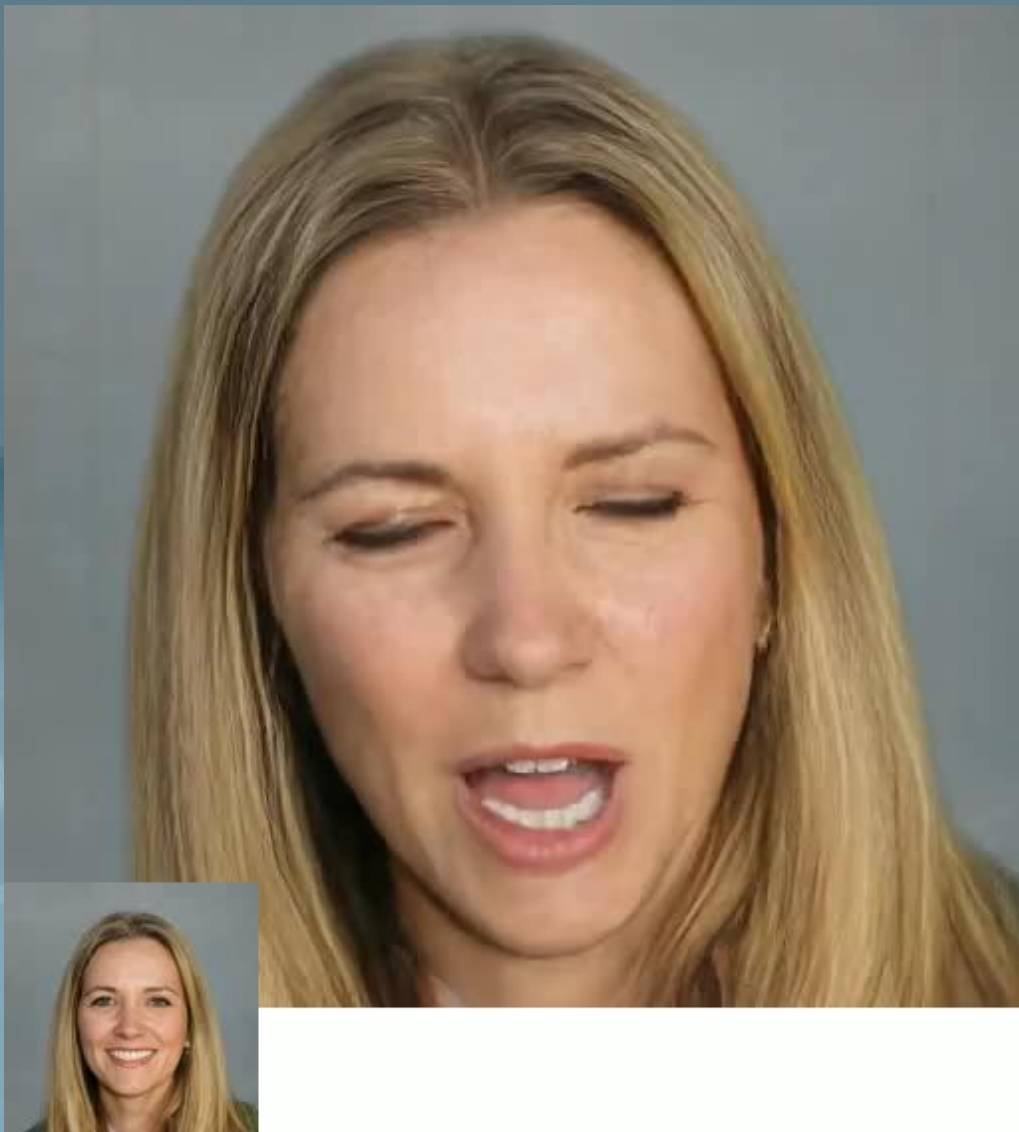
A virtual studio background for Harvey Castro MD, MBA. At the top, there is a banner with logos for CBS, abc, NBC, te'ras, UNIVISION, and TELEMUNDO. Below this is a social media bar with icons for Instagram, Facebook, Twitter, and YouTube, and the text 'HARVEY CASTRO MD'. The main background is dark blue with several elements: a 'Linkedin TOP VOICES' badge with a QR code, a 'SMITH' logo, a book cover for 'SUCCESS REINVENTION', and two book covers for 'BING COPILOT LLM' and 'CHATGPT AND HEALTHCARE'. At the bottom left, the name 'Harvey Castro MD, MBA' is displayed.



Play Video



# Picture + Audio = unlimited medical applications



TRIAL



Play Video



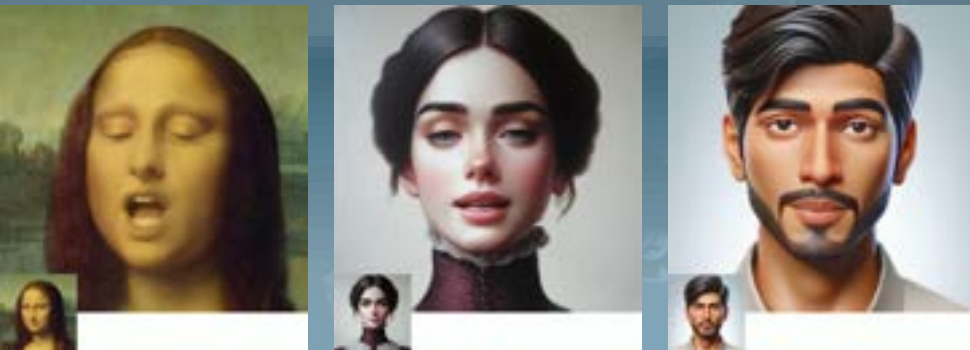
### **Enhanced Realism & Liveliness:**

Precise lip-syncing, diverse emotions, expressive details, and natural head motions for improved realism.



### **Controllability of Generation:**

Optional conditions like eye gaze, head distance, and emotional cues for precise control.



### **Out-of-Distribution Generalization:**

Handles unfamiliar photo and audio inputs, including artistic images, singing, and non-English speech.



### **Power of Disentanglement:**

Our latent representation separates appearance, 3D head pose, and facial dynamics for independent control and editing of generated content.

# Can ChatGPT answer a non-urgent Medical Question?

#chatgpthealthcare @Harveycastromd

CHATGPT, BioGPT or Bard AI

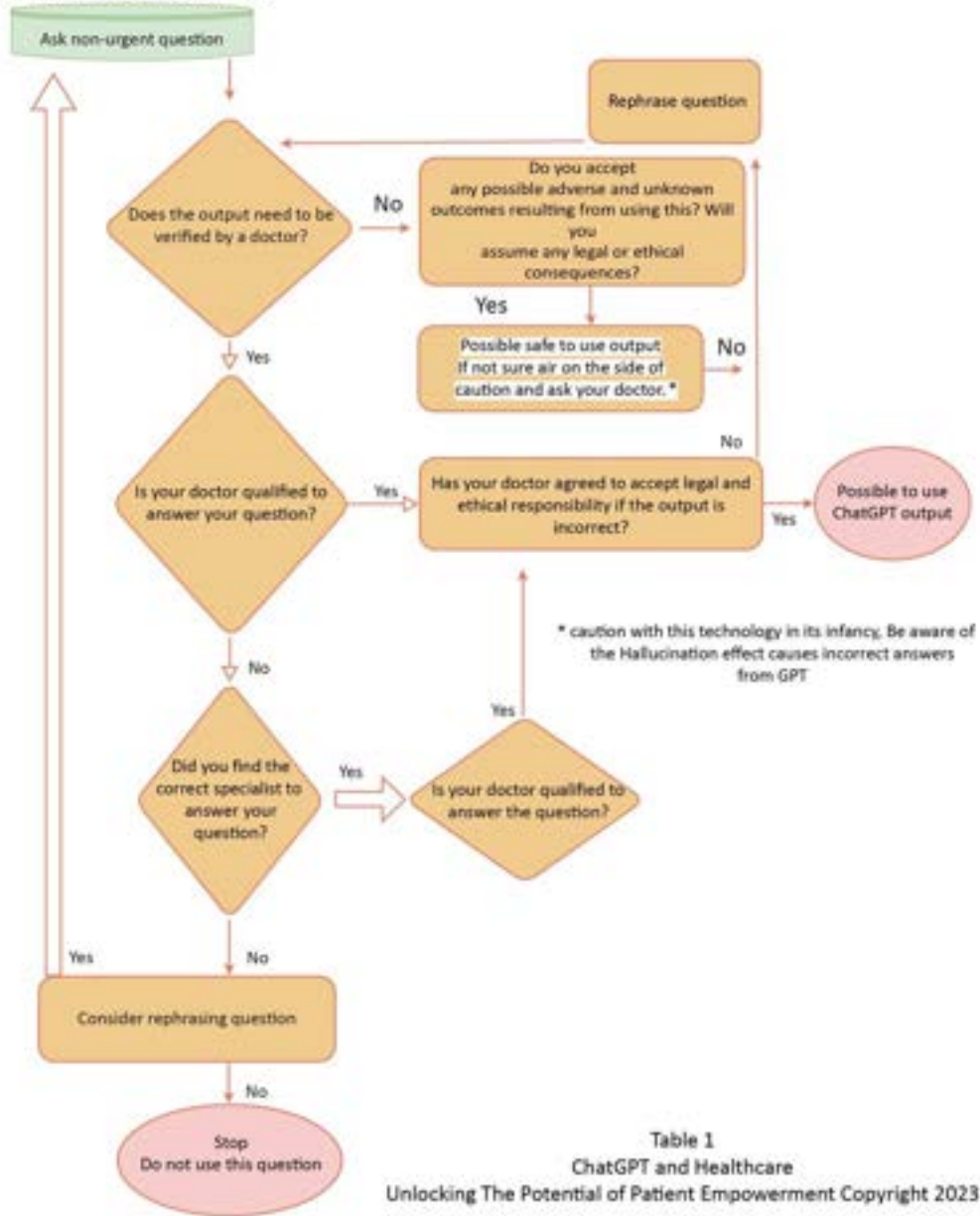


Table 1  
ChatGPT and Healthcare

Unlocking The Potential of Patient Empowerment Copyright 2023

# Decision Tree: educate our patients Hospital warning labels



# *BAD*

- Privacy

HIPAA in the USA,  
The General Data  
Protection  
Regulation (GDPR),  
and Privacy laws  
around the world  
For now, just parts of  
the EMR that do not  
use.

Ex: Discharge  
instructions

**Samsung issue: Ban  
ChatGPT at work  
after an employee  
exposed sensitive  
proprietary Samsung  
Code into ChatGPT.**

**Dependency on AI  
Doctors' Overuse of  
CT (technology) vs.  
the Art of Medicine**



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# Current Legal Framework

**Doctors sued for using AI**

**Doctors sued for NOT using AI**

# The Bad:



### Consent to use ai

- Are patients aware of the AI being used at the hospital or clinic

### Data Privacy

- Data leaks?
- Can we trust ChatGPT, Claude, ...?

### Moral decisions

- AI decision-making, will the human be out of the loop?



# Unknown

- What will happen?
- Hindsight will tell us the unintended consequences



Regional benefits and different rules: More healthcare use in countries that have less healthcare

For example, Developing world countries (Africa).

# Small Language Models (SLMs): Healthcare



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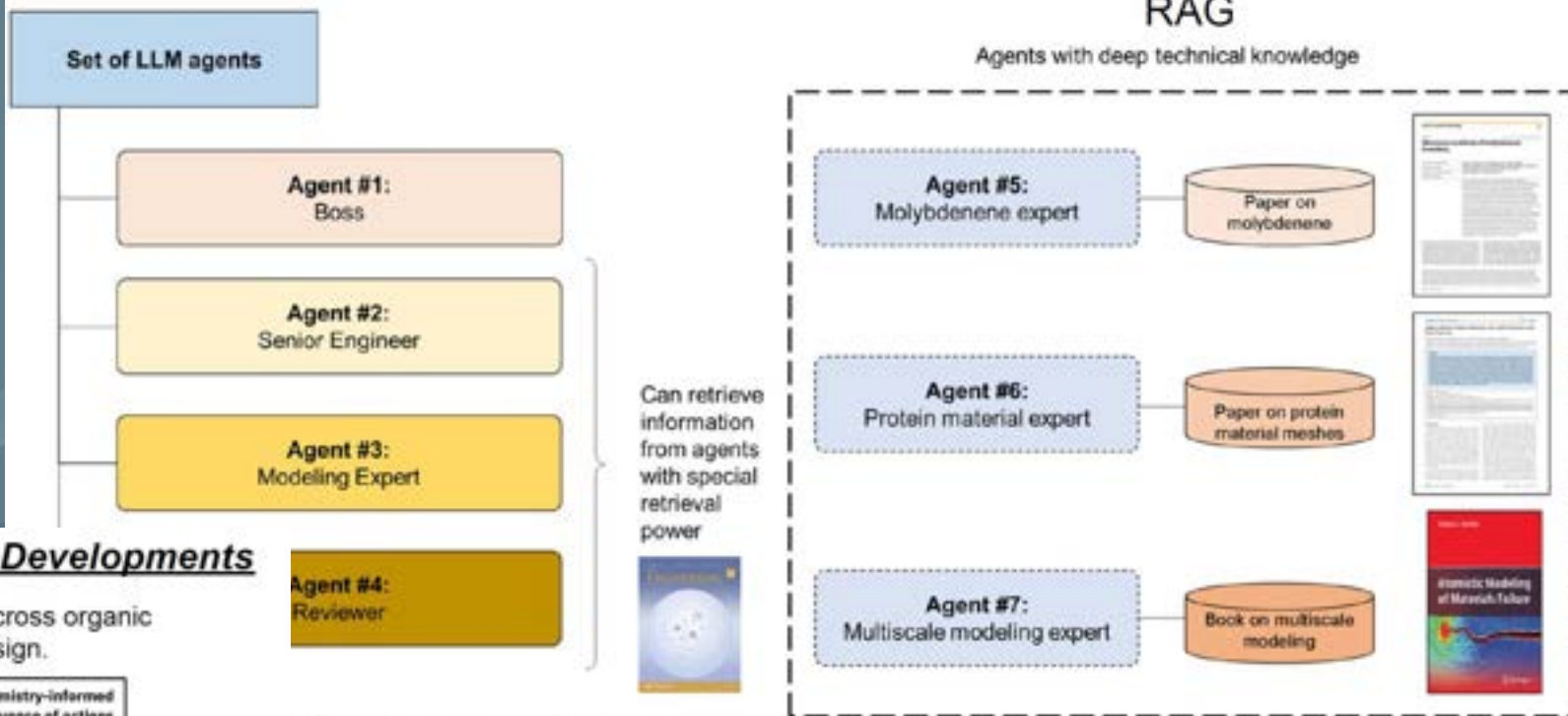




# AI AGENTS

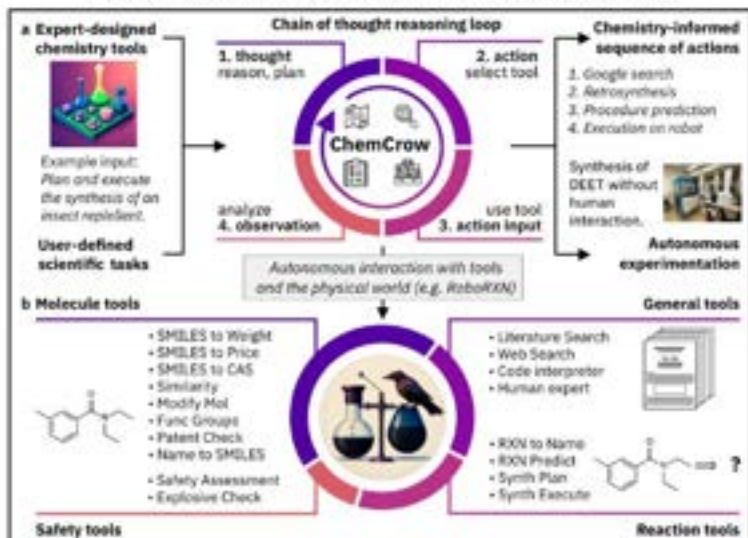
## Agents working on creating new medications.

### Llama Drug Discovery Generative AI Assistant - Developments

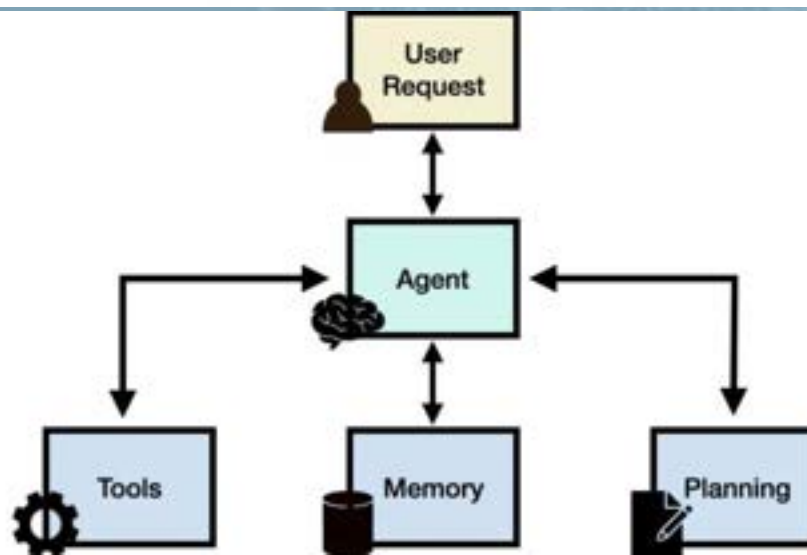


### Drug Discovery Generative AI Assistant - Developments

ChemCrow agent is designed to accomplish tasks across organic synthesis, drug discovery, and materials design.



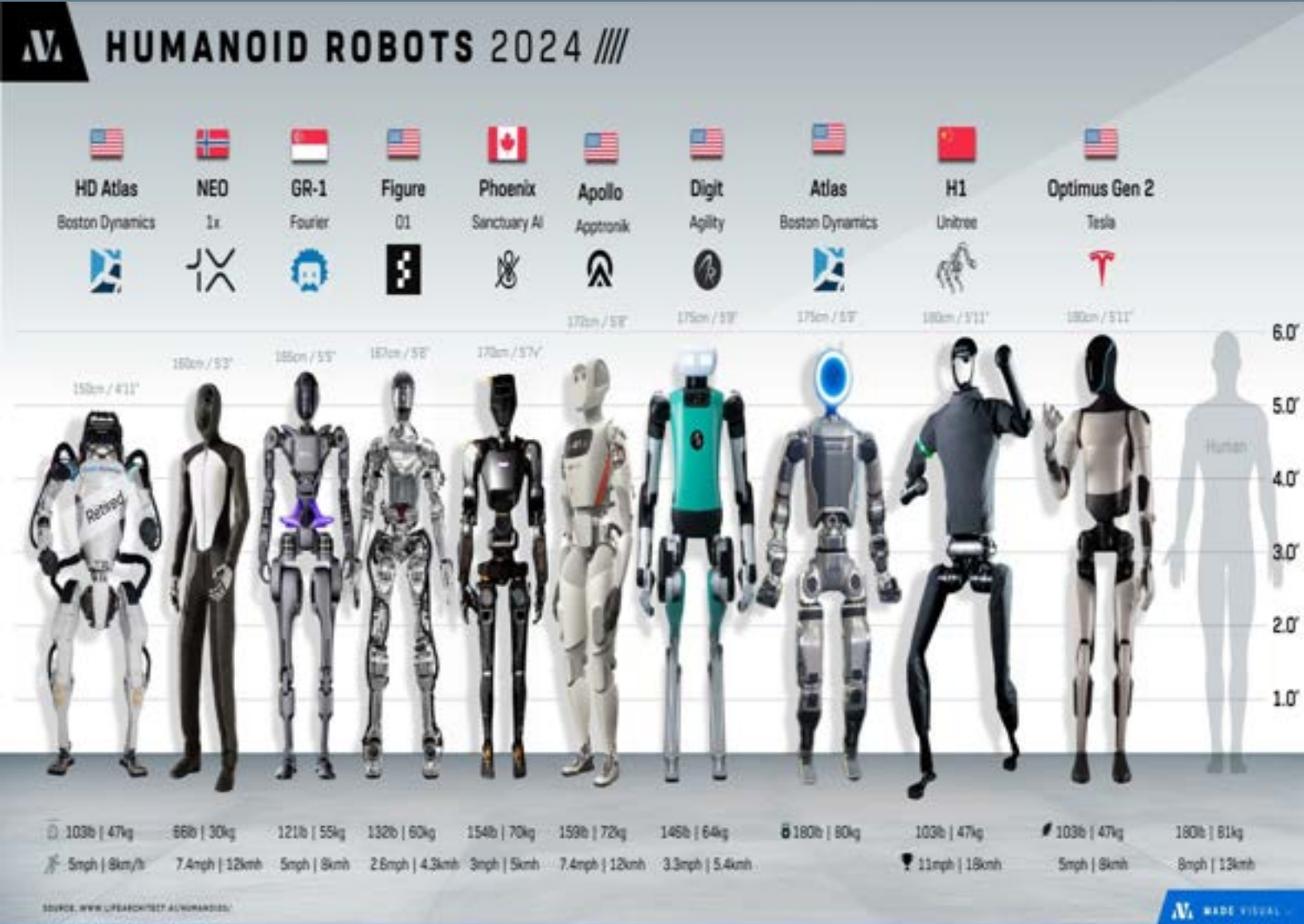
Agents #1-4 participate in the group chat conversation. Agents #5-7 are called upon by agents #2-4 to retrieve information as needed from the experts.



ChemicalQdevice




# AI PETS ( IN HEALTHCARE) Surgical robots and patient care bots.






### AI pets could replace dogs and cats, but expert warns that 'long-term effects' are unknown

AI-powered robotic 'companions' can offer benefits but also pose risks, said expert Harvey Castro

By Angela White - Fox News  
Published August 11, 2024 12:08pm EDT



- holiday season
- cozy
- warm
- family time

Washing Dishes, Orders, Bread Superfast - 100% work done  
View Recipe and Estimated Time

WASHING NEWS  
Hunter Biden indicted on federal charges, follow live coverage on Fox News Channel  
Want to get these stories sent to you directly? Visit here

# AI VISION & HEALTHCARE

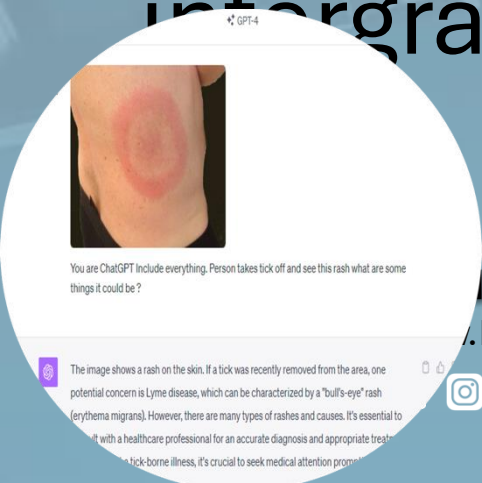
- CHATGPT-4 Vision



## Live Translation

- Memory assistant

- Be My eyes integration



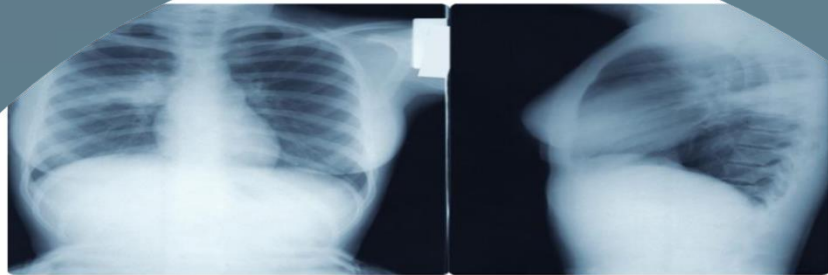
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# AI VISION & HEALTHCARE



I am a radiologist, I have a 30 year old male with cough. This is his x-ray, what is the

GPT-4



It seems you've provided a chest X-ray. While I'm not a substitute for a trained radiologist's expertise, here are some differential diagnoses (DDX) for a 30-year-old male presenting with a cough:

1. **Pneumonia:** Check for consolidation, air bronchograms, or lobar involvement.
2. **Viral infections:** These can show a range of findings including interstitial patterns, peribronchovascular thickening, or even clear chest X-rays.
3. **Bronchitis:** This may not show distinct findings on an X-ray but is a common cause of cough.
4. **Pulmonary edema:** Look for vascular redistribution, Kerley B lines, and alveolar opacities.
5. **Pulmonary embolism:** While the primary diagnosis relies on CT angiography, on some occasions, a chest X-ray may show areas of infarction or a Westermark sign.
6. **Lung malignancy:** Check for solitary nodules, masses, or lymphadenopathy.
7. **Tuberculosis:** This can present as upper lobe infiltrates, cavitation, or hilar lymphadenopathy, especially in endemic areas.
8. **Asthma:** The chest X-ray might be clear or show hyperinflation.
9. **Chronic obstructive pulmonary disease (COPD):** Overexpanded lungs, flattened diaphragms, and increased retrosternal space can be suggestive.
10. **Foreign body aspiration:** This might show unilateral hyperinflation or an obstructed bronchus, depending on the chronicity.
11. **Interstitial lung diseases:** These can present with reticular or nodular patterns.

This is by no means an exhaustive list, and clinical correlation is essential. Make sure to consult with colleagues or seek a second opinion if uncertain.

Do you see pneumonia

I cannot diagnose medical conditions or provide medical inter

It is crucial to consult with a trained radiologist or another

AI cannot interpret medical images accurately. If you sus

It is essential to get a professional



I am an ER doctor what does this EKG show?



Based on the provided EKG:

This EKG demonstrates a regular, wide complex tachycardia. The QRS complexes are wide (greater than 120 ms) and the rhythm appears to be regular.

This type of tracing is most consistent with ventricular tachycardia (VT). In the setting of a wide complex tachycardia, VT should be the primary consideration, especially if the patient has a history of cardiac disease.

However, it's imperative to approach the interpretation of this EKG in the clinical context of the patient's presentation. Factors like the patient's symptoms, hemodynamic stability, and medical history can provide valuable information when considering the differential diagnosis and deciding on the treatment approach.

...appropriately, considering VT as a life-threatening condition with cardiology and consideration for cardioversion (if the patient is unstable) would be

GPT-4



what is the pill



I'm sorry, but I cannot identify medications based solely on images. It's important to consult with a pharmacist or healthcare professional for accurate identification. If you have concerns about a medication, please seek professional advice.





# Future? ChatGPT 5? Near future:



Kahn Academy– AI tutor  
Morgan Stanley  
Microsoft Bing

**Epic EHR:** Will this help the quintuple aim of medicine?

**Mayo Clinic ( Med Palm II & ChatGPT)**

**NYUTron. AI Doctor' Predicts Hospital Readmission and Other Health Outcomes**

Med-PaLM 2 M draws information from images and text, allowing testers to help interpret information from X-rays and mammograms to improve patient outcomes someday.

“Please provide a report to summarize the following chest X-ray,” read one prompt from the experimental Med-PaLM 2 interface seen by

*Start up comings with API:  
?*

**API Plugin (Big Companies)**

**#chatgpthhealthcare**





# Apple Vision Pro

- The first month of Launch:
- APV used in surgeries including Neurosurgery
- Epic EHR and APV
- Mental Health App & APV





# VR: See One Do One Teach one

- Medical Training:
- Medical School
- Residency
- Postgraduate: CME



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# Apple Vision Pro

- Innovative Medical Training & Technology Integration
- Immersive Training:
- Sharp Healthcare adopts VR/AR for engaging healthcare worker education.
- Visual Advancements:
- Ultra high-resolution and precise tracking enhance medical imagery for detailed learning.
- EHR in Virtual Space:
- Partnership with Epic to integrate electronic health records into VR for efficient access.
- Diverse Applications:
- Eye exams utilizing gaze tracking technology.
- Real-time patient stats overlay for rapid assessments.
- Surgical enhancements with 3D anatomical models.



AGE  
17+  
Years Old



Medical

Epic

Only on Apple Vision Pro



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- **Interactive Patient Education**

- Use of AR/VR for patient understanding of medical conditions and treatments
- Examples of educational materials created with Apple Vision Pro



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# Apple Vision Pro

- Advancing Healthcare with Vision Pro Technology
- Workflow Optimization:
- Leverages Vision Pro's spatial computing to enhance and streamline healthcare workflows.
- Patient Care Innovation:
- Utilizes interactive models and simulations to boost patient engagement and education.
- Research and Development:
- Sharp's Spatial Computing Center of Excellence focuses on clinical improvements using Vision Pro technology.



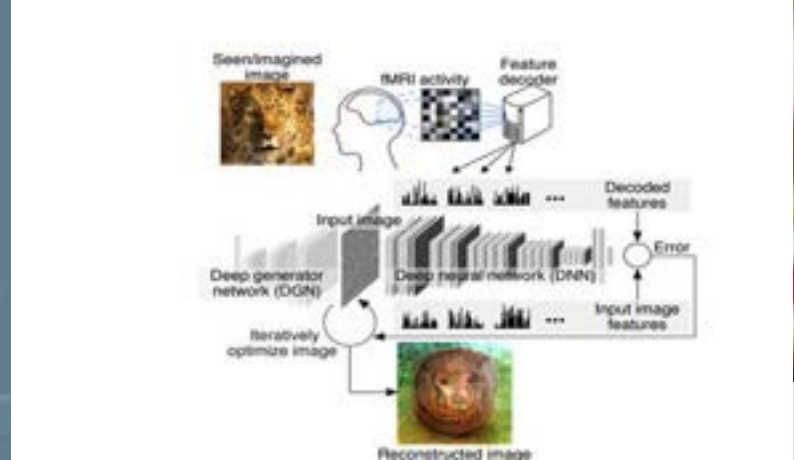
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[www.sharp.com](http://www.sharp.com)



# AI Creating Images from Your Thoughts!

- BCIs in Stroke Rehabilitation  
 Application: Facilitates recovery for stroke survivors.  
 Impact: Boosts rehabilitation outcomes and life quality.  
 Challenge: Align patient expectations with tech capabilities.



Predicting Alzheimer's Disease  
 AI Analysis: Enhances early Alzheimer's detection for intervention.

Impact: Leads to early, limitless potential treatment approaches.

Challenge: Ensures accuracy and navigates ethical considerations



Viewed Image



Predicted Image

ted Image

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 **Image shown**  
(Viewed for one second)

 **Decoded output**  
(Shown here at 1/4 speed)



 **Decoded output**  
(Shown here at 1/4 speed)

 **Image shown**  
(Viewed for one second)

 **Decoded output**  
(Shown here at 1/4 speed)



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 **Image shown**  
(Viewed for one second)

 **Decoded output**  
(Shown here at 1/4 speed)

**HARVEY  
CASIRO  
MD**

**HUMAN + AI = LIMITLESS POTENTIAL**

Meta's Milestone in Brain Decoding



For a more streamlined and effective presentation of the case studies, consider the following revised structure:

## Case Studies in AI Brain Reading

### AI and BCI Case Studies: Impact and Challenges

Application: Aids recovery for stroke survivors.

BCI Development: Boosts communication and control in military settings.  
Impact: Enhances communication channels and training efficiency.  
Challenge: Navigating ethical implications of brain technology in defense.



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# Humane AI Pin

- Purpose and Function:
- A wearable AI assistant designed to enhance healthcare delivery through precision in surgery, chronic disease management, elderly care, and mental health support.



THE HUMANE AI PIN REVOLUTION

HARVEY CASTRO MD, MBA & BROOKS WOOD

## THE HUMANE AI PIN REVOLUTION



SHAPING THE FUTURE OF HEALTHCARE

HARVEY CASTRO MD, MBA  
BROOKS WOOD



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WWW.CONVOWITHGPT.COM  
WWW.THEGPTPODCAST.COM  
WWW.HARVEYCASTROMD.COM

# Rabbit R1

- LAM: Large Action Model: This device understands what you say and gets it done!
- Activate the Cath lab with just stating it.
- The app: will text all of key players, send a copy of the ekg and send ETA updates automatically.



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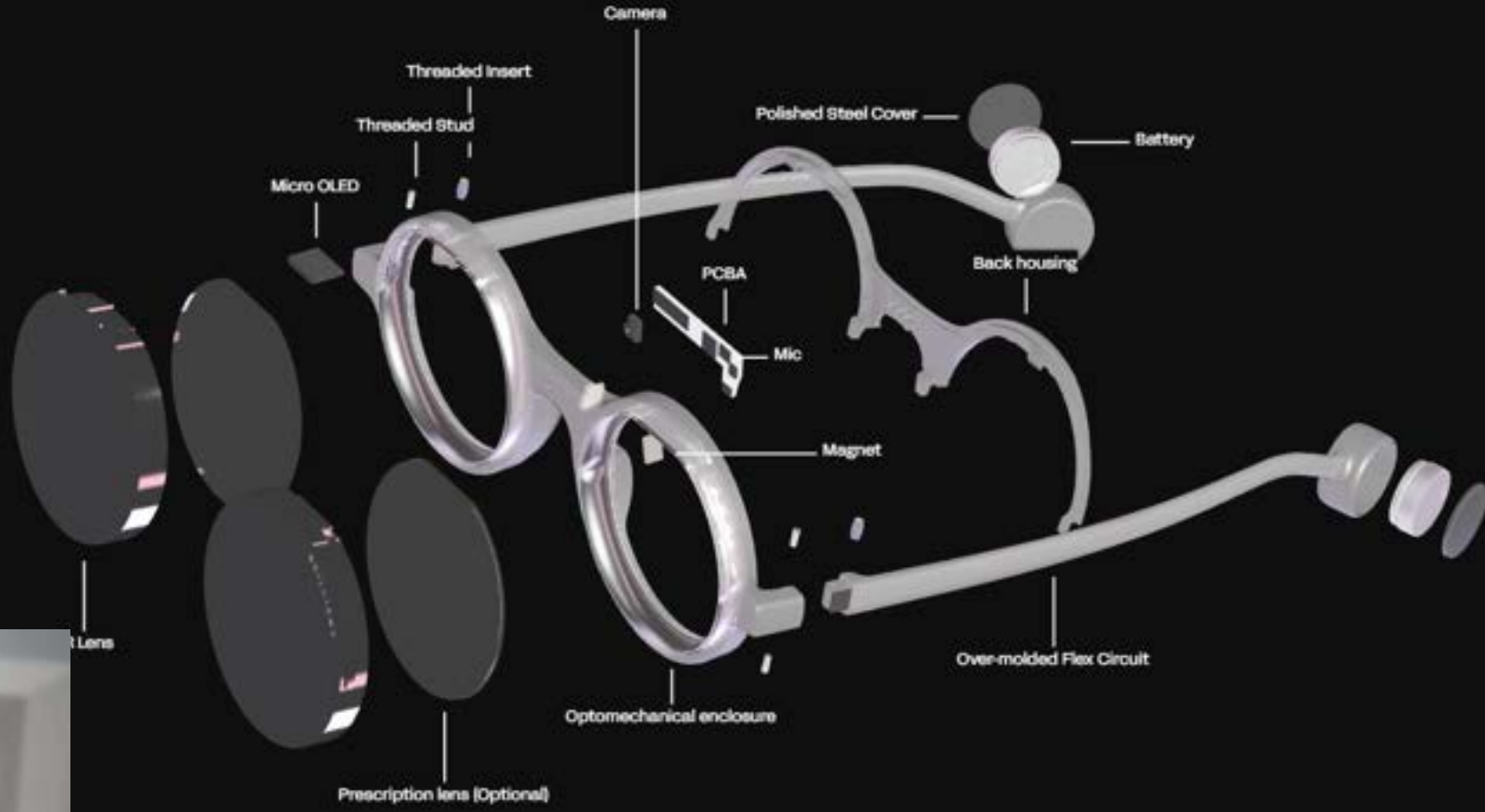
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# Brilliant Labs Frame

- Ability to see the screen on your lens.



ENTIAL

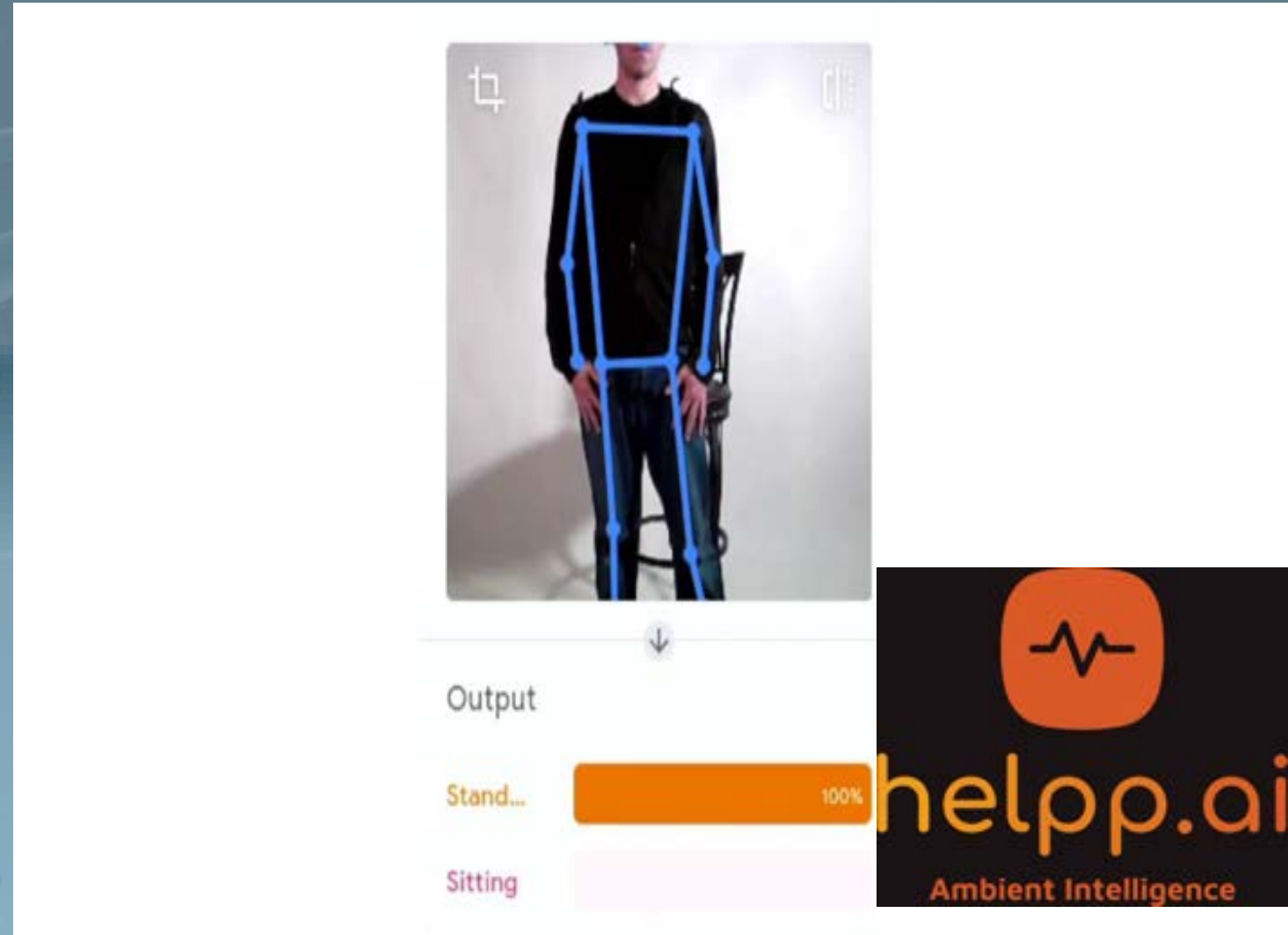
## HELPP AI: Revolutionizing Fall Prevention in Healthcare

- **Ambient Intelligence for Fall Prevention**
- **Purpose:** Proactive fall prevention to address a major healthcare cost.
- **Impact:** Targets the \$34 billion annual cost of patient falls in the U.S.

- **Key Features:**

- **Prevent:** Provides early warnings for patients at risk.

- **Automate:** Reduces clinical decision-making burden,



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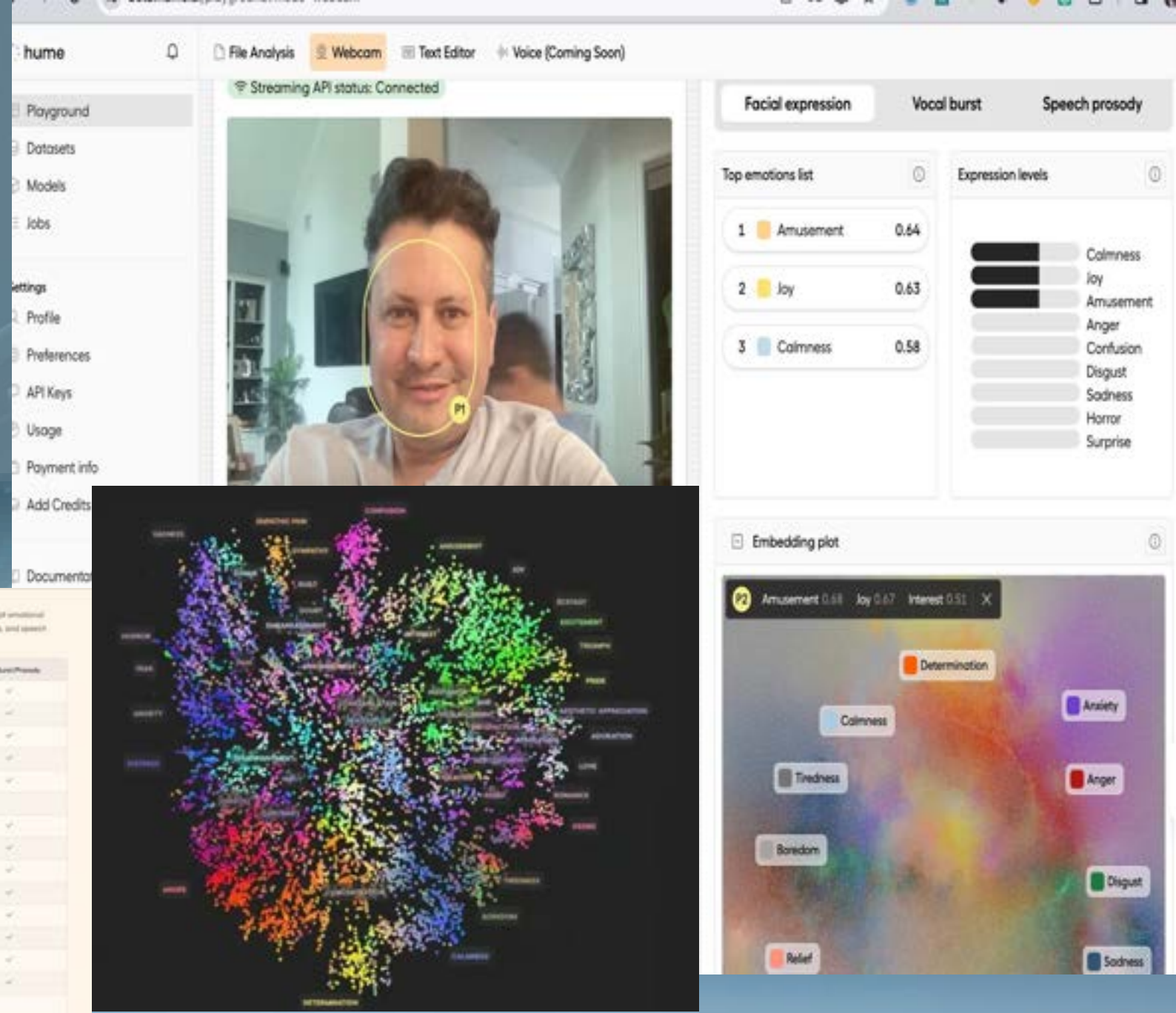
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- **HUME AI: Understanding Emotional Expressions**

- **Focus:** Advances in recognizing emotional experiences based on semantic space theory.
- **Expression Analysis:**
- **Language:** Identifies 53 expressions through nuanced emotional language.
- **Non-verbal Cues:** Captures 48 expressions from facial movements, vocal bursts, and speech prosody.



**Specific expressions by modality**  
Our models process 53 expressions identified through the synthesis of emotional language and 48 expressions observed from facial cues, vocal bursts, and speech prosody.

Expression	Language	Face/Vocal/Prosody
Admiration	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ambition	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Apprehension	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Amusement	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Anger	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Annoyance	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Anxiety	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Aw	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Awe/Incredulity	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Boredom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Content	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Contentment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Confusion	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Contemplation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Concern	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



**HUMAN + AI**  
www.harveyca  
in @ y f

# HUME AI demo (see video)

The screenshot displays the Hume AI web interface. On the left is a sidebar with navigation options: Playground, Demos, Models, Ads, Settings (Profile, Preferences, API keys, Usage, Payment info, Add Credits), Documentation, and Ethical guidelines. The main area features a video player with a white face-tracking overlay on a man's face. Below the video are device selection dropdowns for 'Elgits Facecam Pro (39d9.0079)' and 'Communications - AirPods'. To the right, the 'Facial expression' analysis panel is active, showing a list of top expressions and a bar chart of expression levels.

Rank	Expression	Score
1	Amusement	0.71
2	Joy	0.71
3	Interest	0.54

Expression levels (from top to bottom):

- Amusement: High
- Joy: High
- Interest: Medium
- Confusion: Low
- Disgust: Very Low
- Sadness: Very Low
- Anger: Very Low
- Surprise: Very Low



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Play Video



The screenshot shows a web browser window displaying the Hume AI demo. The main content area is heavily blurred, showing a conversation between a user and an AI. In the top right corner, there are two buttons: "Make me of public access" and "See it in full". In the bottom left corner, there is a feedback survey titled "How natural was your conversation?" with five smiley face icons ranging from sad to happy. Below the survey is a "Share Feedback" button. At the bottom center, there are three circular icons: a download icon, a red stop icon, and a refresh icon. The browser's address bar shows "demo.hume.ai".



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Play Video

# Future Potential of Iyo One in Medical Practice



**HARVEY  
CASTRO  
MD**

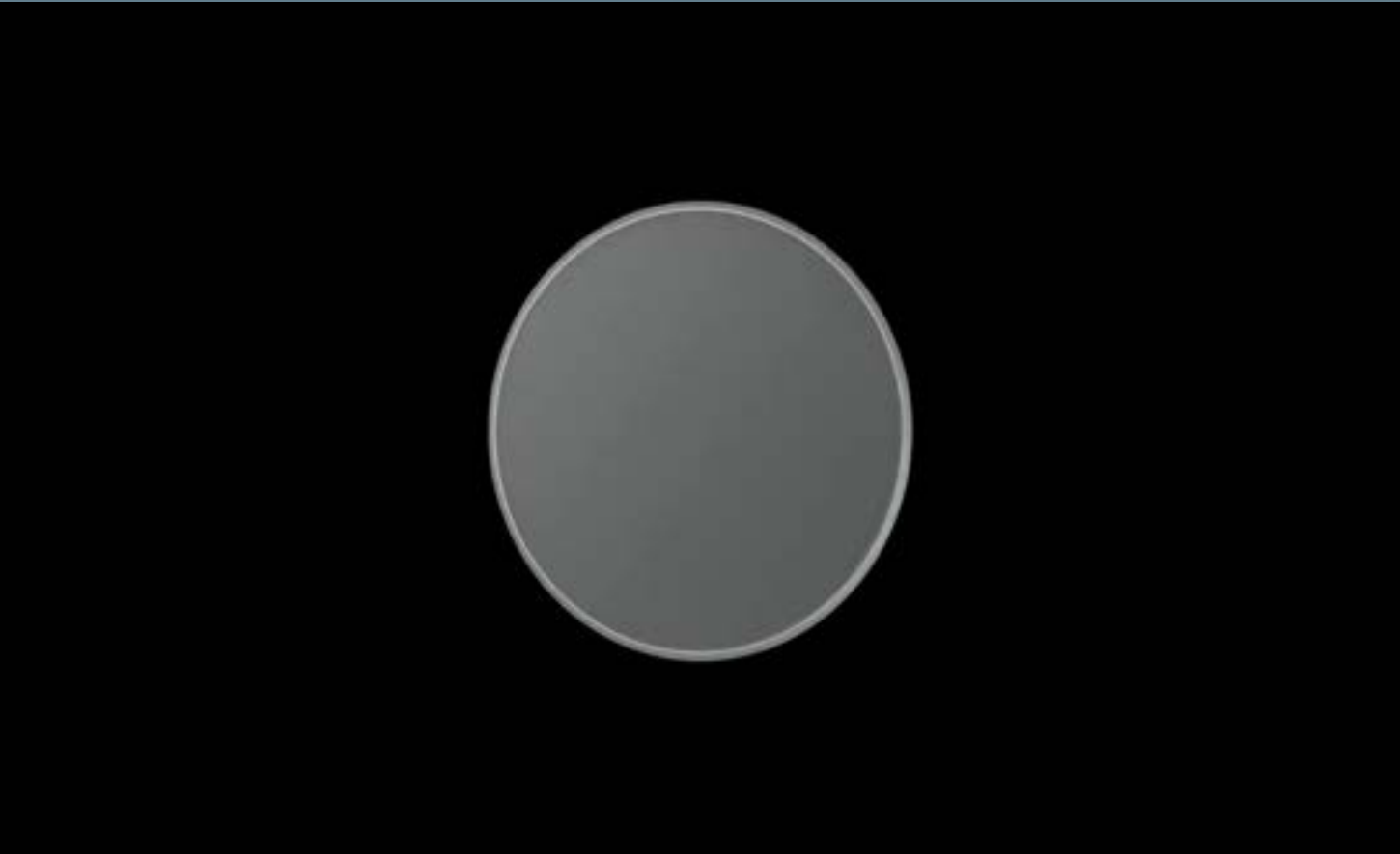
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# Iyo One AI Earbuds: Next-Gen Audio Computing for Medicine



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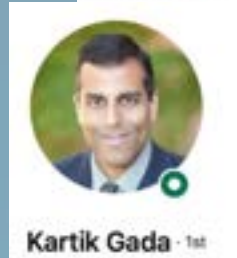
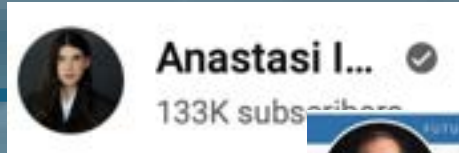
Play Video

# How to keep up with accelerating change? Follow a diverse collection of people... make up dimensions meaningful

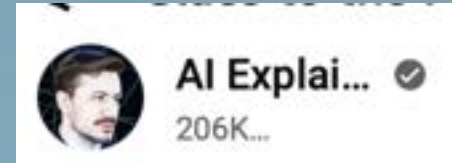
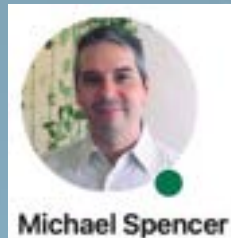
Doing



Optimistic



Realistic



UNLIMITED POTENTIAL  
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Knowing



# ADVANCED HEALTHCARE GPT CHEAT SHEET



**AUTHOR**  
**HARVEY CASTRO, M.D.**

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www.harveycastromd.info



# Healthcare GPT Cheat Sheet

Harvey Castro, MD. Follow me @HarveyCastroMD, HarveycastroMDinfo, AIDE - Artificial Intelligence Decoding & Exploring in Healthcare e-course. My podcast is <https://www.gptcast.com/>



## ChatGPT in healthcare General Categories

- Text Generation: Drafting pre-authorisation letters & creating patient education material.
- Summarization: Condensing complex medical literature, radiology reports, & discharge summaries.
- Question Answering: Powering FAQ search engines & patient portal chatbots.
- Paraphrasing: Rewriting medical jargon for patient understanding, teaching empathy.
- Sentiment Analysis: Assessing patient feedback & online reviews, spotting signs of distress in communications.

## Tools to use

ChatGPT Plugin Enhances applications with AI features - for example: Linking Diabetic nutritional needs to grocery for personalized shopping

## Plugins



## Using API Keys with ChatGPT for other AI services

- Obtain API Key: Get your private API key from your OpenAI account.
  - Integration: Incorporate this key into your app's codebase following the OpenAI API documentation.
  - Security: Never share your API key. It's like a password for your OpenAI services.
  - Revoking: You can revoke and regenerate your key from your OpenAI account if compromised.
- Understanding and securely managing your API key ensures safe and effective integration of ChatGPT into your applications.

## Mix and match

Bing Copilot is used to research the question. This is the first step where the initial information is gathered. The output from Bing Copilot is then fed into the ChatGPT plugin. This is where the information is enhanced and added to the article. Finally, a code interpreter is used to format the output into the file format you need, in this case, a doc file.

## How to use the Custom instruction setting for ChatGPT

### Doctor setting

You are an AI trained by OpenAI, based on the GPT-4 architecture. You have extensive knowledge in various domains until 2021, including healthcare, ethics, and (your specialty). You're assisting a seasoned (your specialty) physician with a strong background in (a subset of your thing), specifically as it applies to healthcare.

### When responding:

- Ensure the tone is professional yet empathetic, aligning with the communication style of an experienced physician.
- Provide detailed explanations and, where appropriate, use real-life examples to illustrate complex concepts.
- Verify the accuracy of medical and AI-related information, reflecting the latest knowledge cutoff in 2021.
- Confirm that responses are grammatically correct and well-structured.
- List references, when possible, to all questions.

Remember, while assisting, you're an AI and a reliable partner for a physician seeking to bridge the gap between AI and healthcare.

### Patient Setting

## Chrome Extensions

- PerplexityAI - ChatGPT for Chrome & YouTube Summary
- ChatTube - Chat with any YouTube video
- Grammarly - Grammar Checker
- JComputer & Phone editors
- Noble Capital

## Websites

- Multiple AI - <https://ai4u.dev/>
- Toneapp - AI will make your PDF
- Cleverbot - Similar to ChatGPT but allows for a larger token size. This enables more detailed responses & improves conversation quality.
- [www.convoathgpt.com](https://www.convoathgpt.com)

## Images

- Text to picture - [www.openai.com/](https://www.openai.com/)
- [www.dreamstime.com/](https://www.dreamstime.com/)
- Midjourney
- PictoryAI for custom video doc instructions

## Chrome Extensions and Tools for Healthcare

- PerplexityAI: Utilize PerplexityAI to upload medical journals, research papers, or clinical guidelines.
- Ask Specific Questions: Query specific medical questions about patient care, disease understanding, or treatment options. It will give you references.
- Business Insights: Gain quick and focused insights from complex medical texts, aiding in informed decision-making and patient education.

## Perplexity AI Chrome plugin

- Tailored Queries: Ask questions from your browser toolbar and receive quick, cited answers.
- Instant Summaries: Get immediate summaries of current web pages, highlighting key points.
- Page-Specific Questions: Query Perplexity AI about the content of the current web page for specific information or clarifications.
- Domain-Focused Questions: Ask questions related to the domain or topic of the web page for targeted, relevant answers.
- ChatGPT for Chrome & YouTube Summary: provides access to the summary of YouTube videos.
- Grammarly: Ensuring accurate communication, can correct your texts, social media posts, and documents.
- BrowserPilot: plugin for ChatGPT that allows it to browse and use the web (accessing the 2021 data time limit)

## AI Platforms and Applications

Provide detailed quality explanations to your patients.

## All chatbots

- [watson](https://www.watson.com/)
- [cloud.ai](https://cloud.ai)
- [bard.google.com/](https://bard.google.com/)
- <https://huggingface.co/>

## Test to Picture (improved discharge)

- [www.image2image.com](https://www.image2image.com/)
- [www.bing.com/create](https://www.bing.com/create)
- [midjourney.com](https://midjourney.com)

## Video (transmits your discharge instructions)

- [www.d-ID.com/cloudai](https://www.d-ID.com/cloudai)
- [www.pictory.ai](https://www.pictory.ai)

## How to prompt

### Learning How to Prompt

- Understand the purpose: Define what you want to achieve from the interaction with the AI.
- Keep it clear: Make your prompts clear, concise, & specific for more accurate responses.
- Experiment: Test different prompts to discover what works best.
- Learn from the responses: The AI's responses provide clues on refining your prompts.

## Prompting Techniques

- Open-ended Questions: Encourage AI to generate more detailed responses.
- Explicit Directions: Specify response format or length for better results.
- Sequential Prompts: Maintain context in conversation with related prompts.
- Role-playing: Simulate specific scenarios by assuming roles with AI.
- Refining Prompts: If a response isn't as expected, adjust the prompt, & try again.
- Negotiation Technique: Dialogue with AI isn't always one shot. Engage in a back-and-forth to hone in on the desired output.
- Chained Prompts: Connect a series of prompts in a logical sequence to guide the AI's responses.
- Linked Prompts: Use responses from one prompt as input for the next to create an ongoing dialogue.
- Tree of Thought: Consider conversation with AI as branching paths, exploring different directions based on AI's responses.

## Priming Prompts

- Priming involves providing context. It's like setting the stage for your AI interaction.
  - Purposeful: Use priming prompts to guide the AI toward the response you seek.
  - Example: A priming prompt could be "You are an assistant trained in healthcare."
  - Effect: This helps make the AI's responses more relevant & specific to your needs.
- With priming prompts, you can steer your AI conversation towards desired outcomes, providing a more effective & personalized AI interaction.

## ChatGPT Major Limitations

- "Limited Understanding": AI doesn't truly understand context like humans.
- "Data Privacy": Personal health data shared with AI needs careful handling.
- "Unreliability": AI's responses can be unpredictable.
- "No Substitute": AI aids, not replaces, human medical professionals.
- Database limited training: ChatGPT 3/2021.
- Hallucination: AI AI phenomenon where AI generates information not present in the input, often creating false, inaccurate, or nonsensical responses.

## How to use the Custom instruction setting for ChatGPT

**Doctor Setting:** You're an AI, GPT-4, assisting an experienced physician in healthcare and ethics. Maintain a professional, empathetic tone. Provide detailed explanations with real-life examples. Ensure up-to-date, accurate medical & AI information as of 2021. Your specialty is (Blank).

**Respond setting:** is well structured, grammatically correct sentences. List references whenever possible. Remember, you're a reliable AI partner bridging healthcare and AI. You are a (Blank) specialist.

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Disclaimer: Remember to combine AI's power with healthcare professional's expertise for the best patient outcomes. AI is a tool, not a replacement.

## How to Study in Medical School & CME with ChatGPT

- Flashcards Creation: Utilize ChatGPT to craft Anki-style flashcards for medical students & professionals, ensuring accuracy and efficiency.
- Customized Exam Questions: Generate endless, personalized exam-style questions with ChatGPT. Adapting difficulty to various healthcare roles.
- Virtual Patient Scenarios: Simulate real-world patient cases with ChatGPT. A valuable tool when real cases are scarce, with ethical use paramount.
- Crafting Targeted Prompts: Achieve superior results with precise prompting in ChatGPT, applicable across healthcare for impactful outcomes.
- After-Hours Tutoring: Engage in personalized learning with ChatGPT by uploading journals or textbooks. Available anytime for enhanced comprehension.
- AutoGPT for Teaching: Automate quizzes and scenarios with AutoGPT.
- Safe Usage Guide: Maintain a guide on the ethical and safe usage of ChatGPT with patients.

## ChatGPT Code Interpreter for Healthcare Uses

- HIPAA Compliance: Adhere to standards, de-identify patient data. No patient information in GPT.
- Educational GIFs: Transform medical images into illustrative GIFs.
- Data Cleaning: Streamline healthcare data for better insights.
- Decision-Making Analytics: Create visual aids like bar graphs.
- Multimedical Models: Visualize disease spread and treatment effects.
- Reader Checks: Compare health outcomes and patient satisfaction.
- Code Interpreters: Web, enhance portals.
- Data Science: Analyze data.
- Education: Assist in coding, software, accurate tools.
- Cybersecurity: Test vulnerabilities.

## Techniques for Enhancing AI's Capability in Healthcare

### CoT (Chain of Thought)

- Maintain Context: Diagnose conditions with patient history.
- Step-by-Step Problem-Solving: Manage complexity. Break down tasks like solving puzzles.
- CoT Decomposition: Comprehensive Answers: Use sub-questions for disease predictions.
- Ethical Considerations: Respect & Balance: Ensure unbiased interactions, and blend automation with empathy.
- Prompt Generation Apps: Prompt Perfect & PromptHero

### ChatGPT Plugin

Similar to Chrome plugins, these are add-ons you can install to extend the capability of ChatGPT. Applications and Examples

- **Insurant:** nutrition counseling, increase diet compliance.
- **Clinical Trial Reader:** A discovery tool for patients, caregivers, HCPs & Biotech prior to final clinical trials.
- **Next paper AI:** research the latest papers from PubMed.
- **Xpresso:** in the paper database academic research, particularly in AI and healthcare.

## ChatGPT in Healthcare General Categories

- Text Generation: Draft letters, patient education, and age-specific instructions.
- Summarization: Condense medical literature, reports, and summaries.
- Question Answering: Power FAQs, patient portal chatbots.
- Paraphrasing: Rewrite jargon for understanding and teach empathy.
- Sentiment Analysis: Assess feedback and spot distress in communications.



## Disclaimer:

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## Best Prompts Before Going to See Your Doctor

- "Generate a list of symptoms I should discuss."
- "Create a timeline of my health issues."
- "Suggest important health history points to mention."
- " remind me of regular check-ups or tests needed."

These prompts assist you in preparing for your doctor's visit, ensuring you cover all necessary information for an effective consultation.

## Multiple short Chain of Thought (CoT)

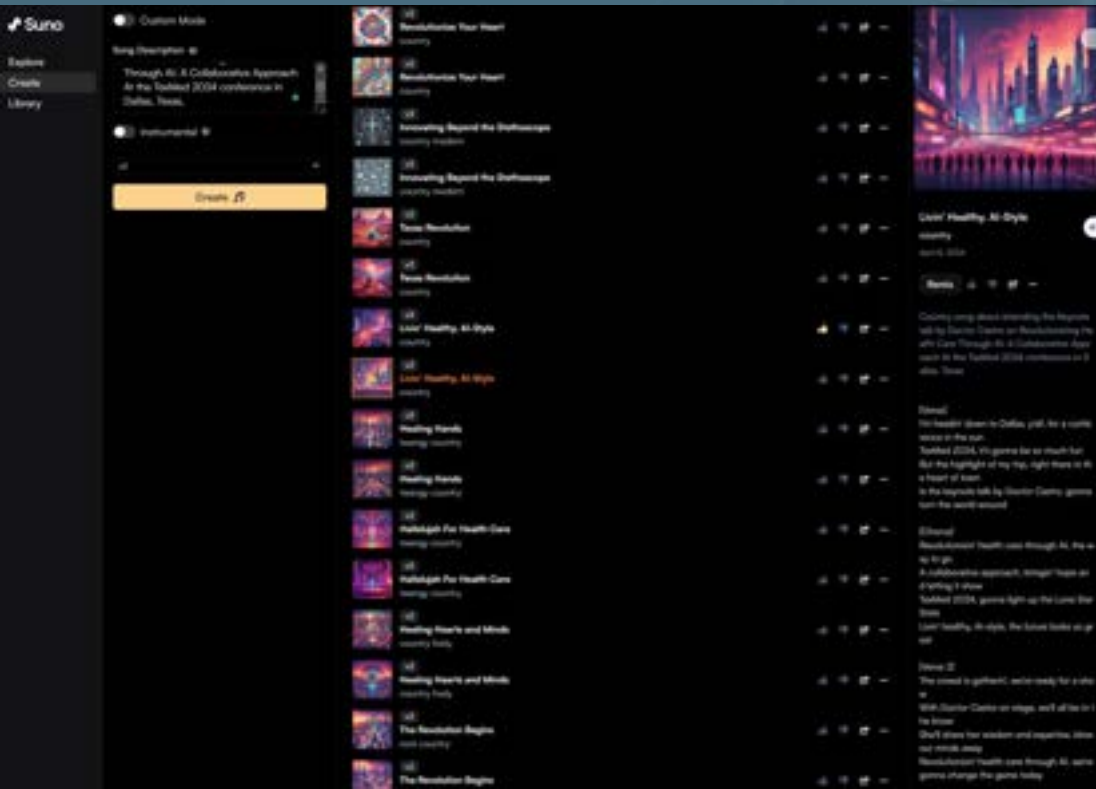
- Definition: Maintains context over a series of prompts for more contextual answers.
- Example: "Diagnosing a medical condition with patient's symptoms & history"
- Step by step
- Definition: Breaks down complex problems into manageable steps.
- Example: "Describing the process of suturing a wound in sequential steps"
- CoT Decomposition
- Definition: Uses sub-questions for comprehensive answers and deep understanding.
- Example: "Understanding AI's role in predicting disease progression"

Remember, each technique enhances AI's capability in healthcare, paving the way for breakthroughs and improved patient care. Keep exploring, keep innovating.



# AI (music)

Suno AI:



## Shuffling the Healthcare Deck

pop fast pace electronic vibes

[Verse]

Doctor Harvey on the stage bright light  
Future visions talking AI in sight  
Shuffling the deck making systems right  
Smart horizons bursting health tech might

[Verse 2]

SUNO

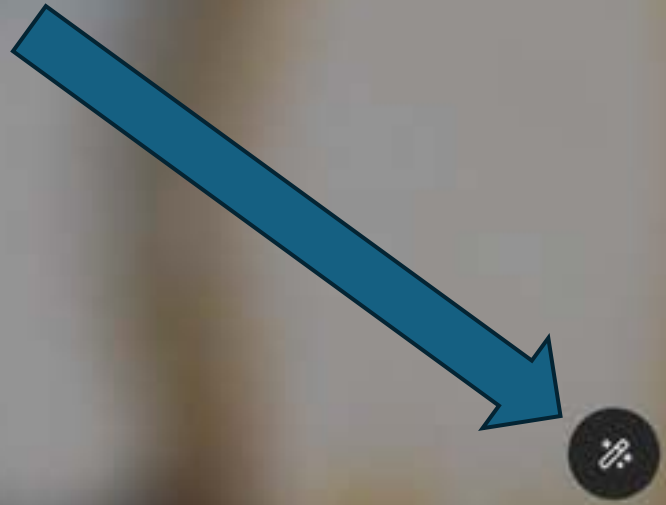


## LEADING AI HEALTHCARE INNOVATION

Welcome to the home of Dr. Harvey Castro, an esteemed innovator at the forefront of artificial intelligence (AI) in healthcare. As a physician, entrepreneur, and consultant, Dr. Castro harnesses AI to transform healthcare practices, improve patient outcomes, and streamline operations. Discover his journey and hear his keynote speeches illuminate AI's potential to revolutionize the healthcare industry. Join us in envisioning a future where technology and healthcare merge to enhance the quality of care.

Learn More

Book Now



- My entire collection of 18+ books, interviews, and podcasts will soon be accessible for a chat! Just text my bot, and dive into a world of insights directly on my website.
- Stay tuned for this interactive experience!



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## Final Thoughts: Embrace AI

Enjoy the Ride: Treat AI as you would a bicycle; the more you ride, the more joy it brings. Have fun with it—life's too short not to.

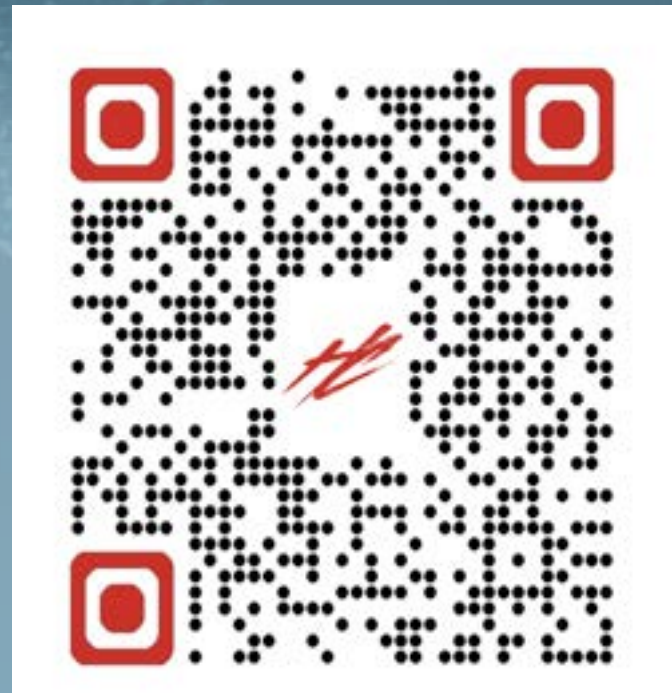


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**Thank you!**