Inteligencia Artificial & Medicina

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Inteligencia

- Natural:
- Es el balance entre adaptarnos al etorno & adaptar el entorno a nosotros
    - Conversaciones con Jean Piaget, Jean Claude Bringuier, 2004
- Artificial: Simulación de procesos de inteligencia humana por parte de sistemas informáticos.
    - Quizas el ser humano no sea lo suficientemente inteligente para poder definir inteligencia. Gerry Gabulsky, PhD. Director TED en Español, 2023

Tipos de Inteligencias Humanas: 8

Howard Gardner. (Harvard Educational Review, 1983)

Humana & En cuales la IA tiene rol

- Inteligencia matemática y lógica (Medida por el CI)
- IMO: Medalla de Oro (Google y OpenAI) 2025
  - Albert Einstein 160, Elon Musk 155, GPT-5>150
- Inteligencia lingüística
- Inteligencia musical
- Inteligencia visual y espacial: Genie-3
- Inteligencia kinestésica
- Inteligencia interpersonal
- Inteligencia intrapersonal
- Inteligencia naturalista

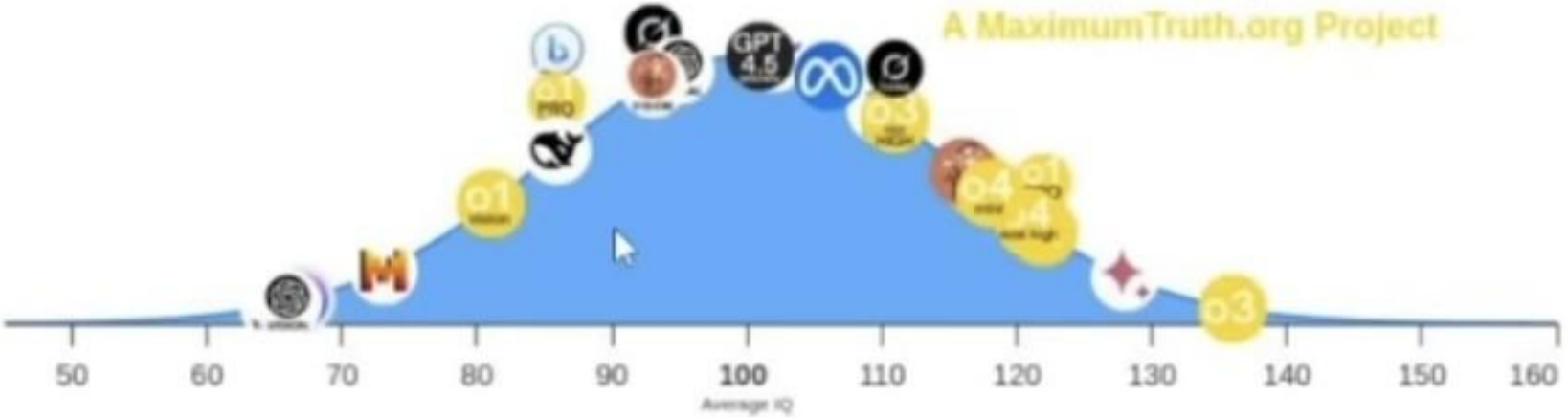
Actualmente, mayor tendencia hacia el concepto de: Destrezas, habilidades

IQ Test Results

Reset | Show Offline Test | Show Mensa Norway

Mensa Norway IQ Scores (Average of last 7 tests)

TrackingAI.org
Mensa Norway quiz
A MaximumTruth.org Project



- Claude-3 Opus
- Grok-3
- Mistral
- Llama-3.2 (Vision)
- Gemini Advanced (Vision)
- Gemini 2.0 Flash Thinking Exp.
- Gemini 2.5 Pro Exp.
- GPT-4o (Vision)
- GPT-4o
- Bing Copilot
- OpenAI o1
- OpenAI o1 Pro

1/3

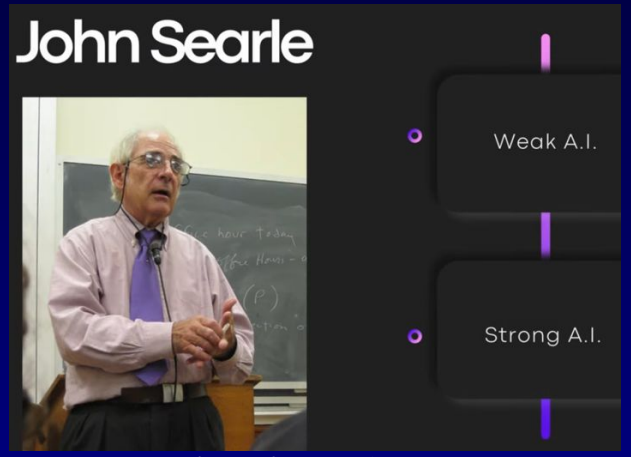
Rank by Test Source

Reset | Show Offline Test | Show Mensa Norway

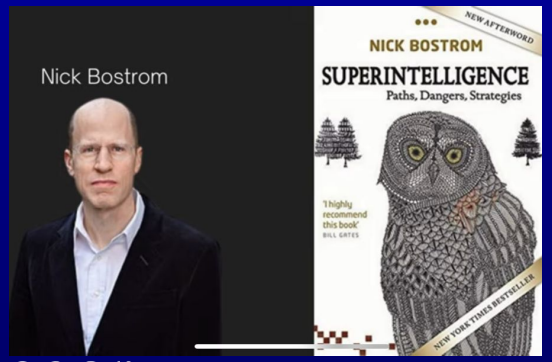
Rank is sorted by Mensa Norway IQ Scores

Mensa Norway

Tipos de IA



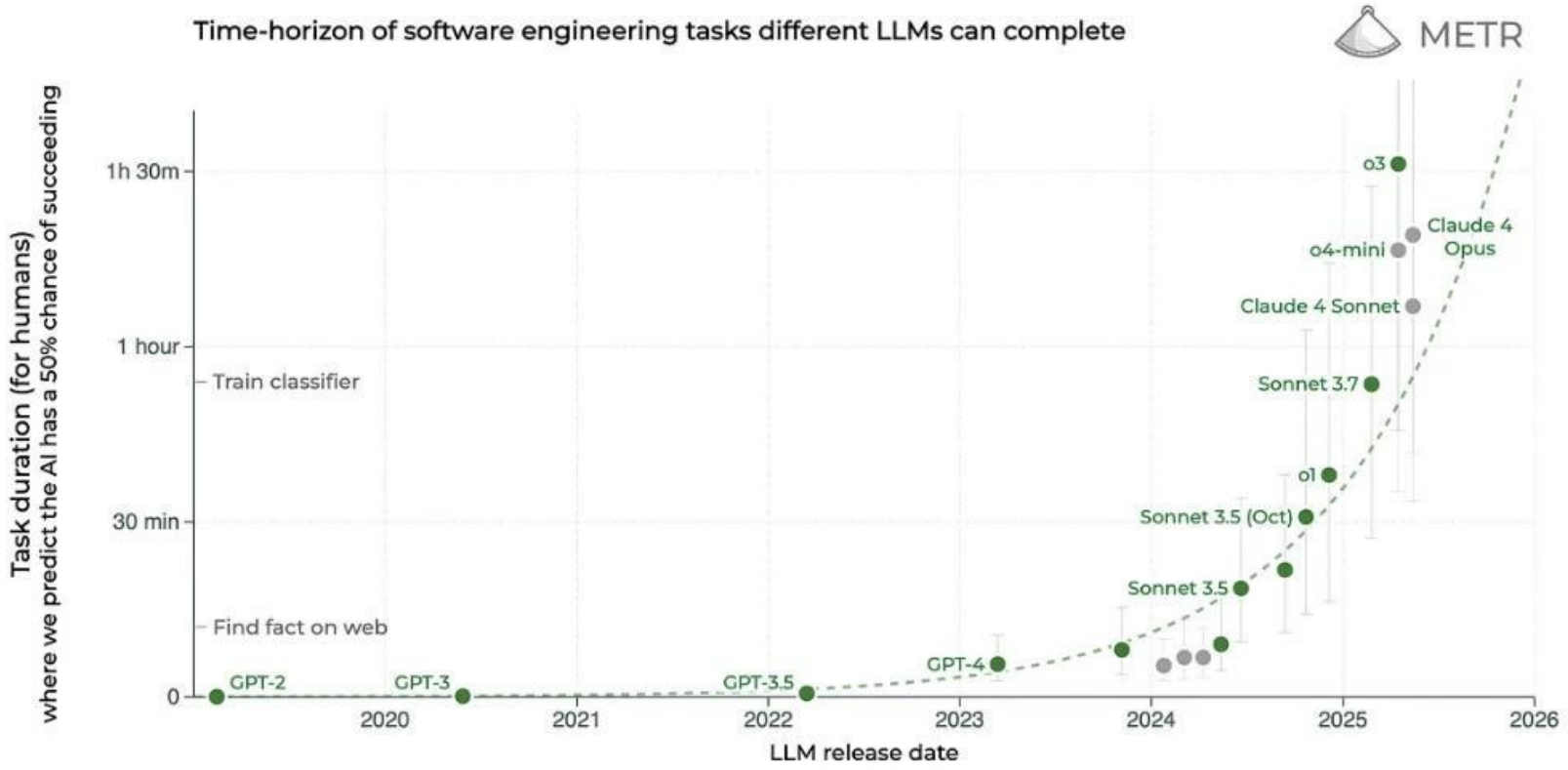
- Simple
  - Sólo puede hacer una cosa (Ej: jugar ajedrez)
- Compleja (AGI) similar
  - Capacidad del cerebro humano
  - 2025-2030?
- Superinteligencia
  - Suprahumana
  - Hasta el 2024 pensé que no iba a llegar…



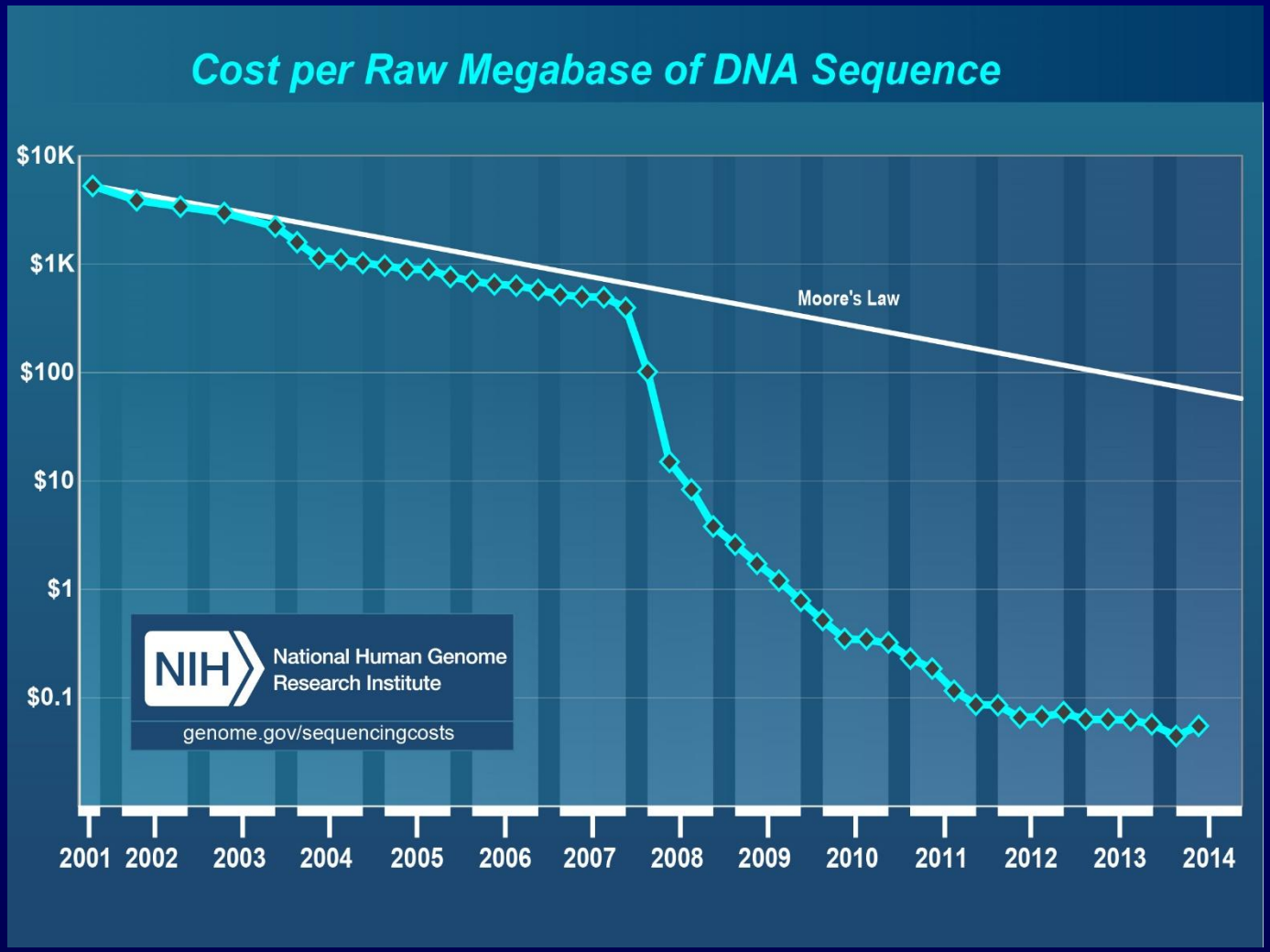
2025: IA Agentica y Robotica

- Le pedi que revise deescalamiento del tratamiento radiante y endocrino en cancer de mama localizado a la fecha (7-5-25)
- Luego de 20 minutos me entrego un folder de 5 hojas
- Redoble la apuesta, tengo que hablar del tema en la Sociedad argentina de Mastologia y le pedi que me haga un PPT de 35 slides
- Lo hizo con una calidad de 8 puntos
- Ahora me queda el trabajo de intentar llevarlo a 10
- Super Grok4 High!!!!!!!!!!!!!!!!!!

1/ AI capabilities are doubling every 7 months



Evolución del Costo de la Secuenciación del ADN



Aprendizaje Automático

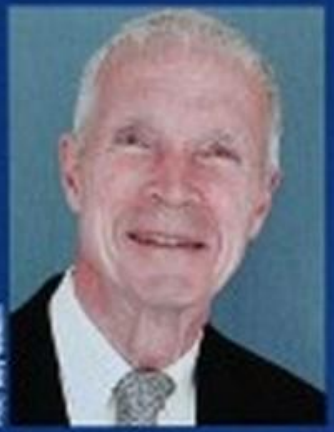
- ¨Machine Learning¨
  - Tecnología que permite a las computadoras aprender y mejorar automáticamente a partir de la experiencia sin ser programadas explícitamente para ello.
- ¨Deep Learning¨
  - Rama que imita al cerebro humano, detecta patrones en enormes cantidades de datos por medio de redes neuronales. Además pueden tomar desisiones propias, sin intervención humana
  - Temor: Por eso la IA tiene que tener un propósito
  - Mayo 2024 Ilya Sustkever: Safe SI (SSI)

Tipos de Aprendizaje Automático

- Aprenden a partir de ejemplos y datos.
  - Supervisado: recibe datos de entrenamiento etiquetados
  - No Supervisado: recibe datos no etiquetados y aprende a detector patrones dentro de los datos
  - **Por Refuerzo: cuando acierta, da una recompensa o castigo**
    - **Reforzando o Debilitando la conexion de la red neuronal**

NOBELPRISET I FYSIK 2024
THE NOBEL PRIZE IN PHYSICS 2024

KUNGL. VETENSKAPS-AKADEMIEN
THE ROYAL SWEDISH ACADEMY OF SCIENCES



John J. Hopfield
Princeton University, NJ, USA

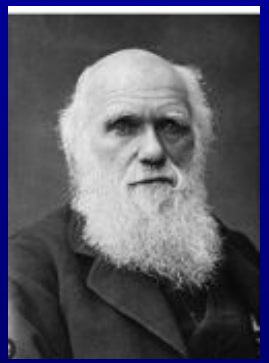
Geoffrey E. Hinton
University of Toronto, Canada

"för grundläggande upptäckter och uppfinningar som möjliggör maskininlärning med artificiella neuronnätverk"

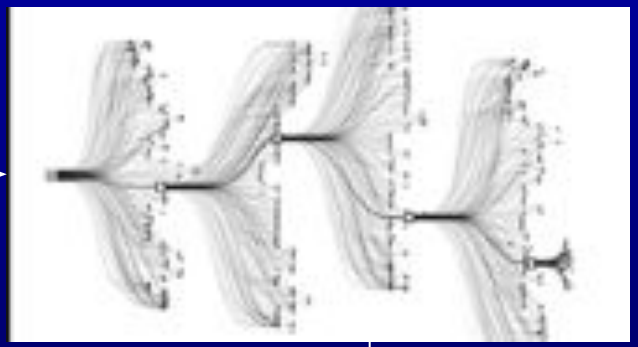
"for foundational discoveries and inventions that enable machine learning with artificial neural networks"

Por Refuerzo: cuando acierta, da una recompensa o castigo

AlphaGo
AlphaGoZero




THE ORIGIN OF SPECIES



Los árboles de Monte Carlo y las Cadenas de Pensamiento son técnicas de búsqueda y toma de decisiones que simulan múltiples posibles futuros para evaluar cuál es la mejor decisión en un escenario complejo, como en juegos de estrategia.

“Post-Neo-Meta Darwinismo” Agosto 2024

Cuando Empezo Todo?

VOL. LIX. No. 236.] [October, 1950

MIND

A QUARTERLY REVIEW

OF

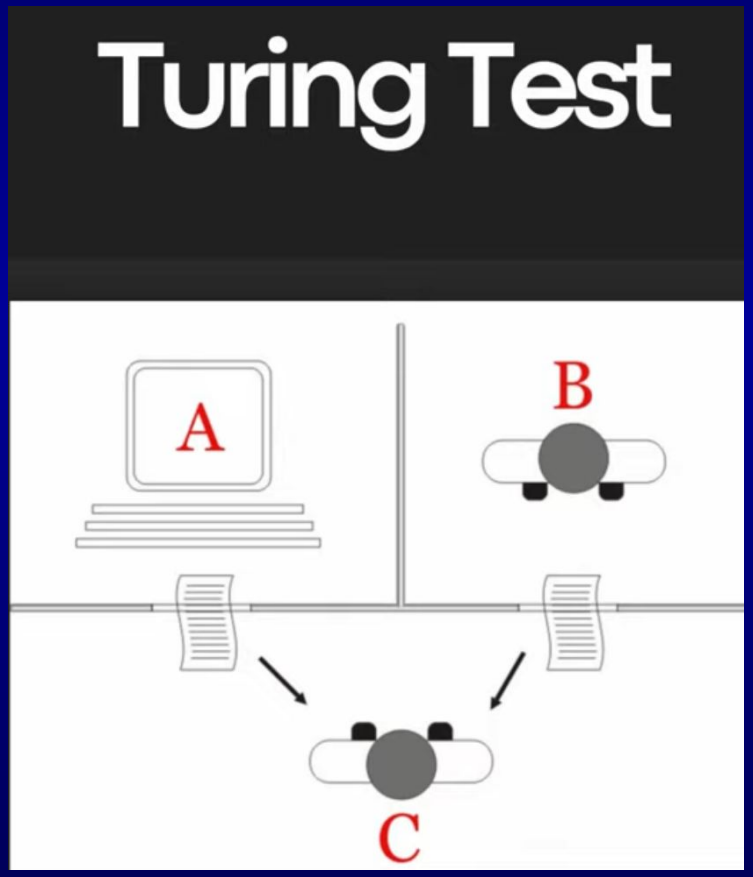
PSYCHOLOGY AND PHILOSOPHY

I.—COMPUTING MACHINERY AND INTELLIGENCE

BY A. M. TURING

1. *The Imitation Game.*

I PROPOSE to consider the question, 'Can machines think?' This should begin with definitions of the meaning of the terms 'machine' and 'think'. The definitions might be framed so as to reflect so far as possible the normal use of the words, but this attitude is dangerous. If the meaning of the words 'machine' and 'think' are to be found by examining how they are commonly used it is difficult to escape the conclusion that the meaning



Historia de la IA

- 1950: Alan Turing (Test de Turing)
- 1956: John Mc Carthy (Darmouth)

- 2000: Potencia de procesamiento y Big Data

- 2017 Transfomers ***(I.A.Generativa)***

Attention Is All You Need

I.A.Discriminativa vs I.A.Generativa

Deep Learning Model Types

Discriminative

- Used to classify or predict
- Typically trained on a dataset of labeled data
- Learns the relationship between the features of the data points and the labels

Generative

- Generates new data that is similar to data it was trained on
- Understands distribution of data and how likely a given example is
- Predict next word in a sequence

Noviembre 2022, Cambia TODO

…Aparece ChatGPT

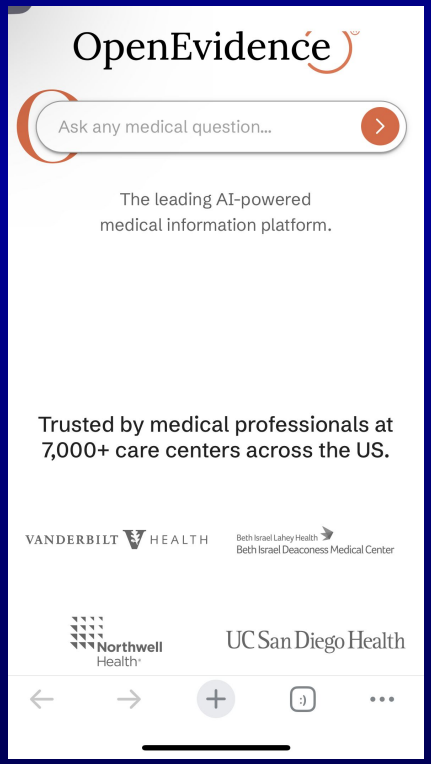
Grandes Modelos de Lenguaje (LLMs)


deepseek
DeepSeek-R1


GPT-5


Gemini 2.5 Pro
DEEP THINK

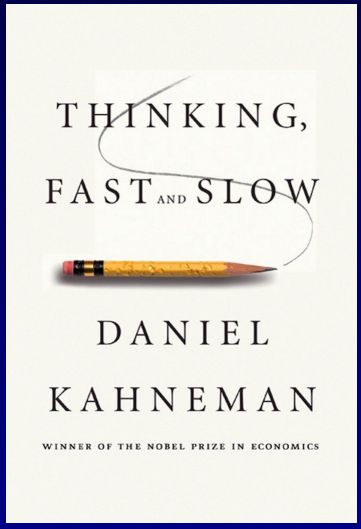

Claude
Opus 4.1


OpenEvidence
Ask any medical question...
The leading AI-powered
medical information platform.
Trusted by medical professionals at
7,000+ care centers across the US.
VANDERBILT HEALTH
Beth Israel Lahey Health
Beth Israel Deaconess Medical Center
Northwell
Health
UC San Diego Health


Perplexity Pro


Grok 4

Quo Vadis Septiembre2024

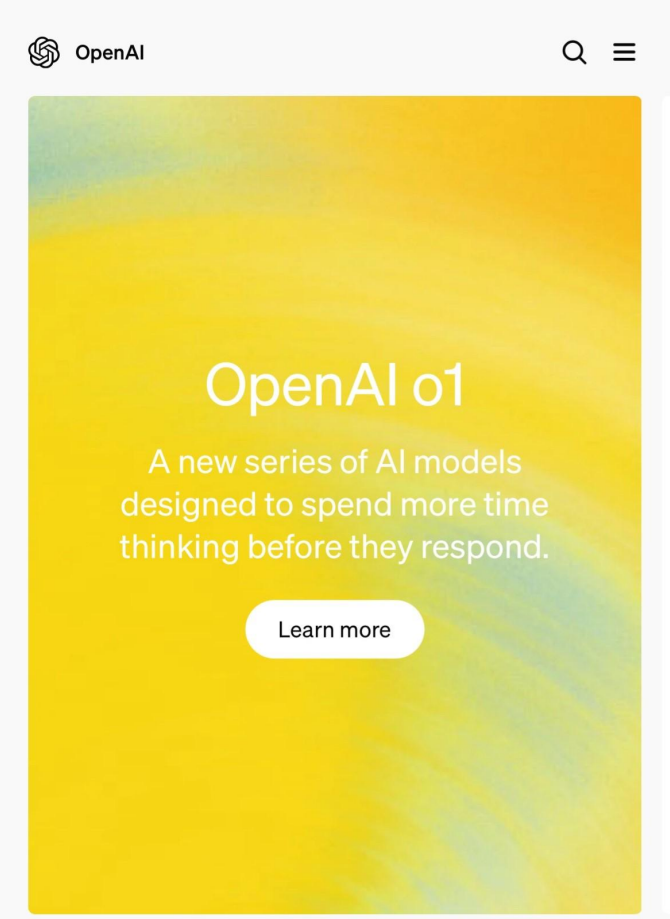


- **<u>IA Neurosimbolica</u>**
- IA que comprenda el CONTEXTO lo que llevara al RAZONAMIENTO
  - 1.Redes Neuronales profundas ej GPT 4o

  <u>MAS</u>
  - 2.Sistemas simbolicos

  Usa reglas y lógica para resolver problemas, es muy buena para razonar y tomar decisiones. Muy útil para pensar de manera estructurada y logica, pero no para aprender de grandes datos

Finalmente…12/9/24…
7 de agosto del 2025



- **GPT-5 (OpenAI) 7/8/2025**
- **Claude 4.1** (Anthropic)
- **Grok4 (Xai)**
- **Gemini 2.5 Pro Deep Think (Google)**
- **Deep Seek R2** (High Flyer)

– STEM

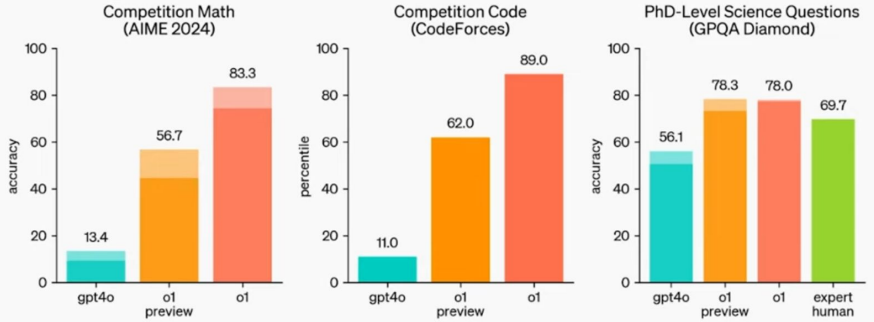
September 12, 2024

Learning to Reason with LLMs

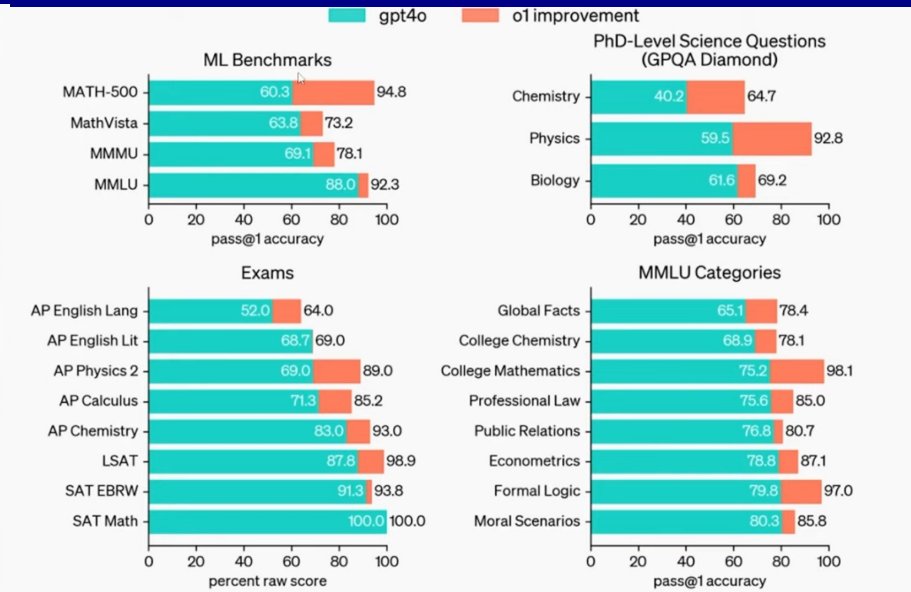
We are introducing OpenAI o1, a new large language model trained with reinforcement learning to perform complex reasoning. o1 thinks before it answers—it can produce a long internal chain of thought before responding to the user.

Evals

To highlight the reasoning improvement over GPT-4o, we tested our models on a diverse set of human exams and ML benchmarks. We show that o1 significantly outperforms GPT-4o on the vast majority of these reasoning-heavy tasks. Unless otherwise specified, we evaluated o1 on the maximal test-time compute setting.



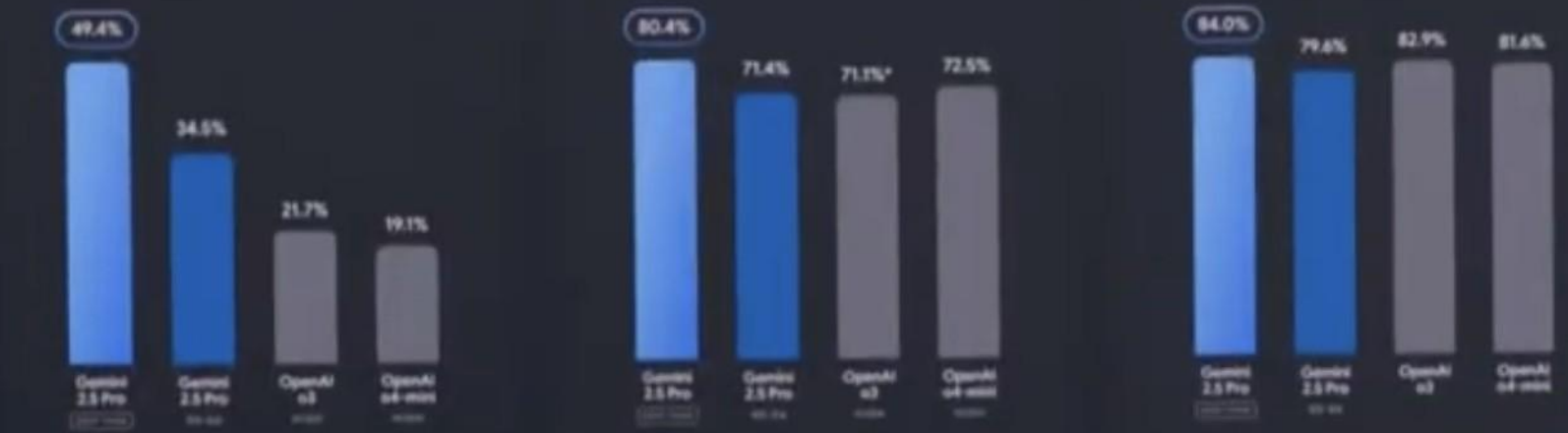
o1 greatly improves over GPT-4o on challenging reasoning benchmarks. Solid bars show pass@1 accuracy



o1 improves over GPT-4o on a wide range of benchmarks, including 54/57 MMLU subcategories. Eight are

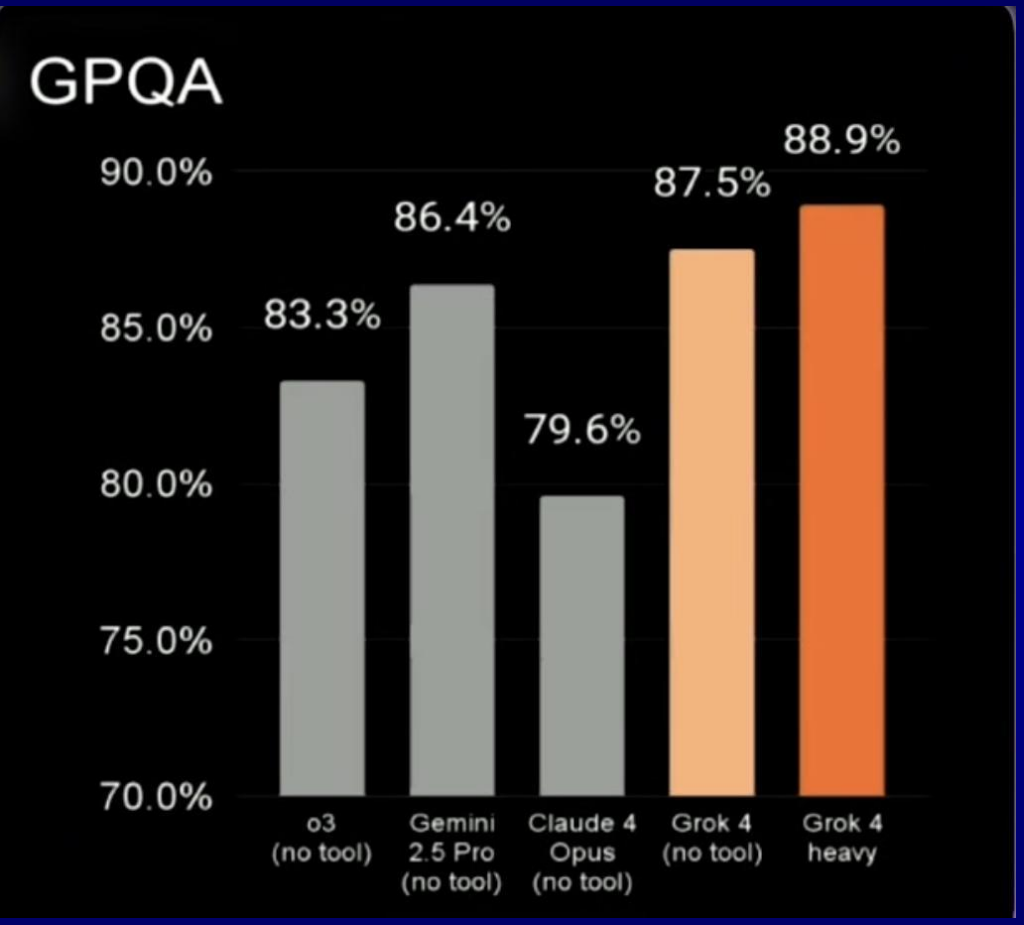
Gemini 2.5 Pro DEEP THINK

Gemini 2.5 Pro Deep Think

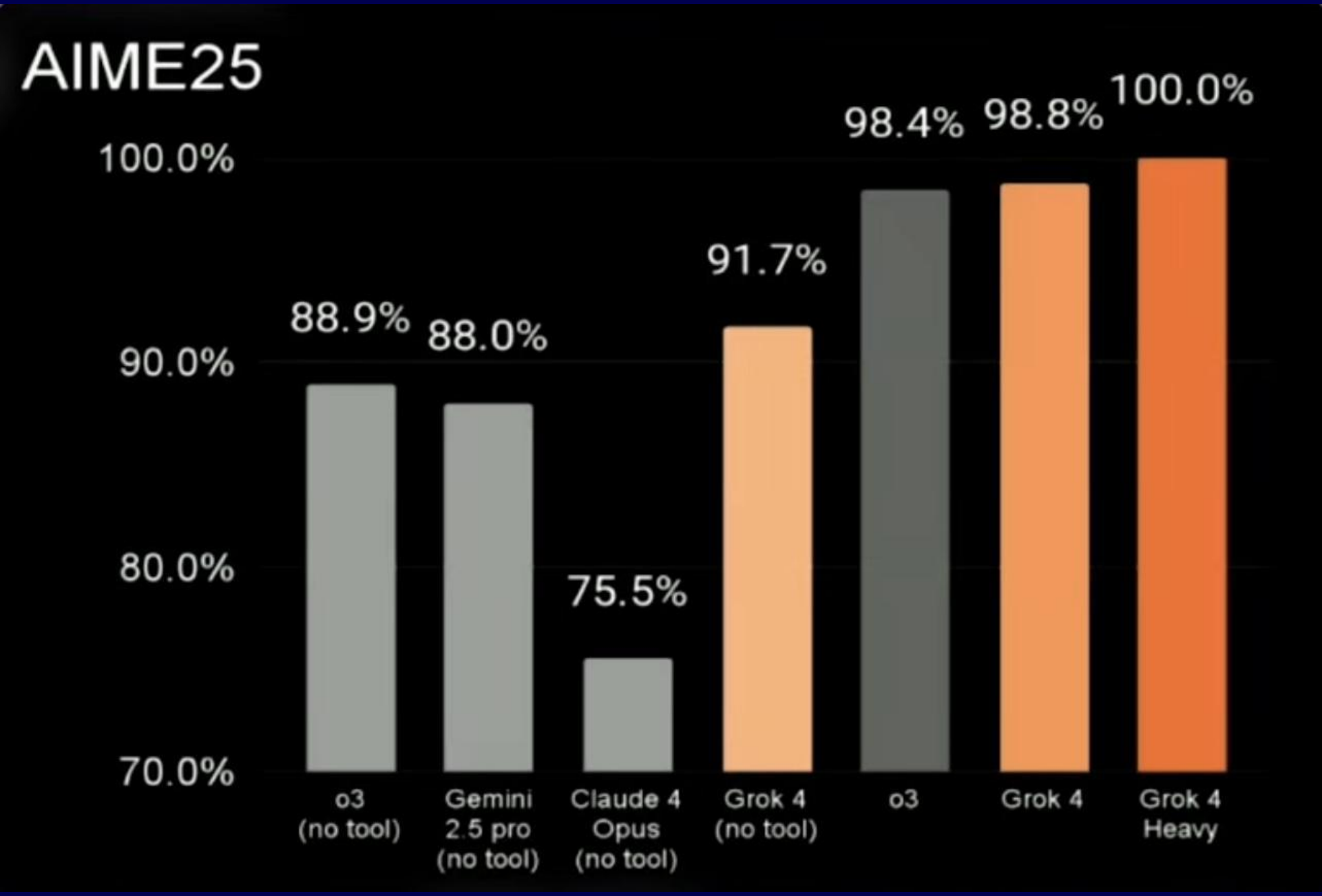


All Gemini results come from our runs
USAMO 2025: https://matharena.ai
LiveCodeBench V6: * o3 High: Internal runs since numbers are not available in official leaderboard, o4-mini High: https://livecodebench.github.io/leaderboard.html (2/1/2025-5/1/2025)
MMMU: Self reported by OpenAI

Grok 4



- 448 preguntas nivel PhD
- Biologia, fisica y quimica
- Expertos en Ciencia: 65-74%


AIME25
100.0%
90.0%
80.0%
70.0%
88.9%
88.0%
75.5%
91.7%
98.4%
98.8%
100.0%
o3 (no tool)
Gemini 2.5 pro (no tool)
Claude 4 Opus (no tool)
Grok 4 (no tool)
o3
Grok 4
Grok 4 Heavy

7 de Agosto 2025

Introducción a GPT-5

GPT-5 representa un avance significativo en inteligencia artificial aplicada al sector sanitario, con mejoras sustanciales en:

- Rendimiento clínico: 67.2% de exactitud en HealthBench vs 59.8% de OpenAI o3
- Seguridad: Reducción de alucinaciones del 12.9% al 1.6% en casos complejos
- Adaptabilidad: Eliminación de fallos en adaptación a contextos sanitarios globales diversos
- Razonamiento: Arquitectura de mezcla de expertos (MoE) para casos complejos

Estas mejoras se traducen en beneficios prácticos para los profesionales de la salud, especialmente en diagnóstico diferencial y situaciones urgentes.

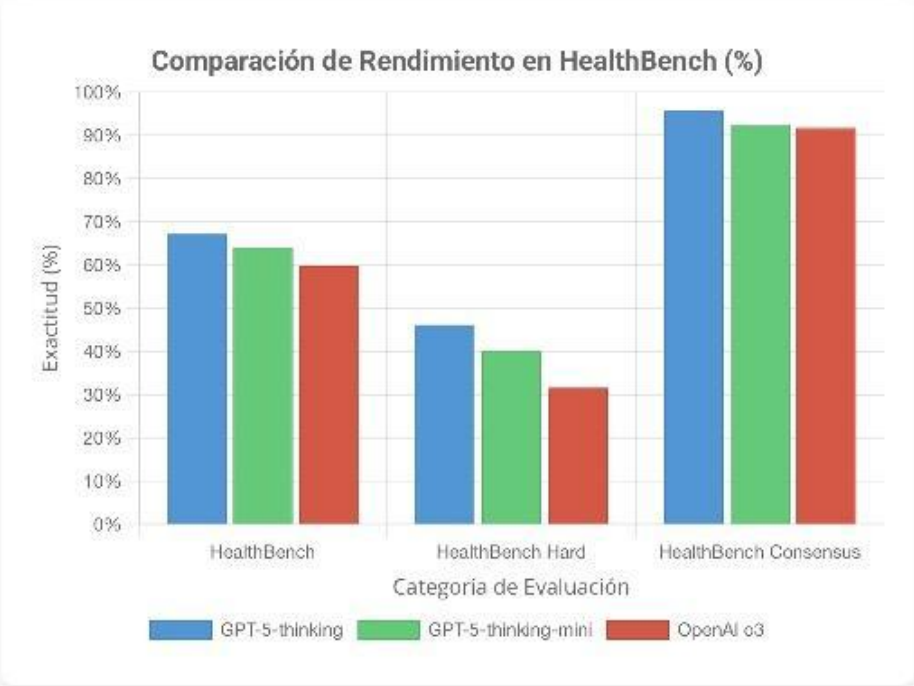
Rendimiento en Casos Clínicos

GPT-5-thinking demuestra un rendimiento superior en los tres escenarios de evaluación de HealthBench:

- **HealthBench estándar:** 67.2% de exactitud (vs 59.8% de OpenAI o3)
- **HealthBench Hard:** 46.2% en casos complejos (vs 31.6% de OpenAI o3)
- **HealthBench Consensus:** 95.7% en casos con consenso médico

Para médicos generalistas, esto significa un apoyo más confiable en el diagnóstico diferencial, especialmente en casos complejos donde la mejora relativa alcanza el 46%.

La proximidad al acuerdo médico humano (95.7%) posiciona a GPT-5 como una herramienta de segunda opinión altamente confiable.



Medicos expertos entre 43.7 y 49.1%, Learn Health Syst. 2024

Error Medico **23%**. 2428 pts UCI, Harvard Gazette, 2024

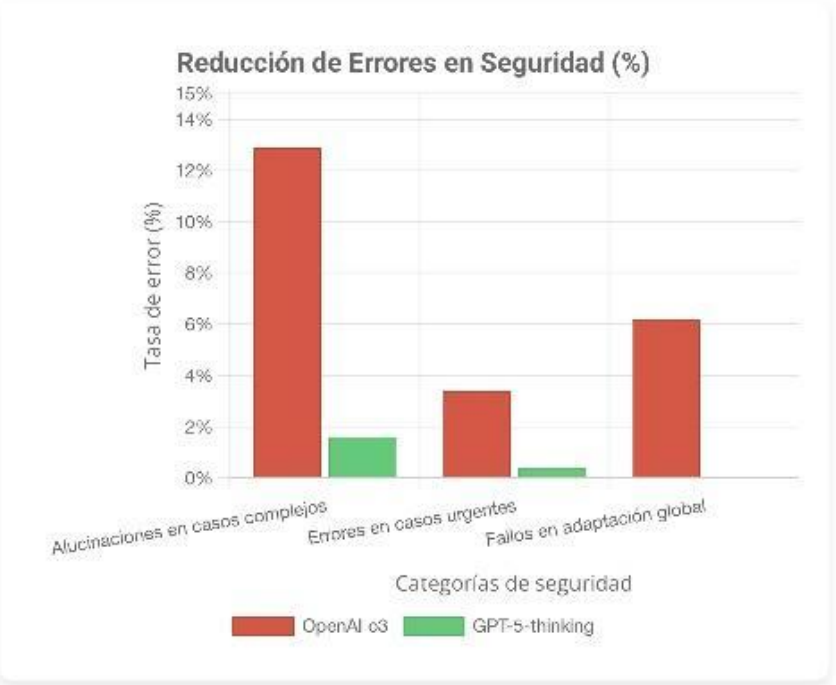
Mejoras en Seguridad

Las mejoras en seguridad de GPT-5 son notables en tres áreas críticas:

Alucinaciones en casos complejos:
Reducción del 12,9% (OpenAI o3) al 1,6% (GPT-5-thinking)
Impacto: Mayor fiabilidad en diagnósticos diferenciales complejos

Errores en casos urgentes:
Disminución del 3,4% al 0,4%
Impacto: Resultados más fiables en medicina de urgencias y triaje

Fallos en adaptación global:
Eliminación total de fallos: del 6,2% al 0,0%
Impacto: Mejor adaptación a contextos sanitarios diversos



Estas mejoras representan un avance significativo para la seguridad del paciente y la confiabilidad clínica.

IA en Salud BMJ Octubre 2024

Es humanamente imposible para mantenerse al día con el conocimiento y los datos (dias de mas de 24 hs)

Tiempo medio de duplicacion del conocimiento medico: 60 dias vs 73 de hace 1 año

Se publican 7000-8000 papers por dia

Check for updates

e this as: *BMJ* 2024;387:q2163
tp://dx.doi.org/10.1136/bmj.q2163
ublished: 03 October 2024

Medicine is difficult—there are no shortcuts

Delivering high quality, patient centred care requires medical training that is long enough, broad enough, and deep enough, writes Andrew Elder

Andrew Elder,

A senior medical leader recently gave me a piece of advice.

"Even when you are bored stiff saying the same thing again and again, say it again. Even when you think everybody will be fed up hearing it, say it again. Because the politicians may not yet have heard you."

So, I will say it again. Medicine is difficult.

Yes, we have fabulous imaging and more laboratory investigations than any of us can name. And yes, we can interrogate our patients' genomes, and the genomes of the organisms and cancers that infect and affect them. But, despite all this wonderful technology, diagnosis remains difficult. Every patient is a unique individual in a unique context, a product of both their biology and their biography. Making accurate and timely diagnoses requires more than just technology—it requires listening, observation, careful thought, judgment, and time. Uncertainty often prevails—and the ability to manage that is not learnt from any textbook.

The treatment, management, and care decisions that follow diagnosis are also difficult. Multiple minds, meeting in multiprofessional teams, seek consensus on the best that can be offered. Complex options lead to complex explanations and discussions with a patient and their family. What could be done may be relatively straightforward, but what should be done requires studied listening, enquiry, exploration, and judgment. Discussing, deciding, and agreeing "to do or not to do" takes time, thought, and commitment. There are no algorithms and no shortcuts for patient centred care.

Medicine is difficult even though we recruit the brightest and best from our schools and colleges. It is difficult even though we teach and train them over intense undergraduate courses of up to six years, sometimes with intercalated higher degrees, using curricula that demand the acquisition of much knowledge, and many skills, behaviours, and attitudes. Medicine remains difficult despite postgraduate training lasting up to 10 further years to consultant level, and five further years to the level of the general practitioner. The learning does not end there—continuing professional development, documented and monitored by appraisal, is a mandatory feature of a doctor's professional commitment to lifelong learning.

And despite all this education and training, doctors can still get things wrong. Errors in diagnosis, treatment, and care can still be made. Medicine is difficult.

Medical knowledge, as measured by published research and guidelines, is now said to double every 60 days. One might think this would provoke calls for longer, even more intense teaching, training, and learning for those who aspire to be doctors. But it is now suggested that we can "make" our doctors in shorter timeframes—for example, in a four year undergraduate degree course. Even shorter training, with entirely different entry criteria, is also promoted. Medical associate professionals, with a pre-degree in a wide range of subjects, are judged ready for clinical practice after only two years of training in "the medical model."

But the "medical model" of education and training is defined by much more than a structured approach to history taking, physical examination, diagnostic reasoning, and care planning. It is defined by the breadth and depth of knowledge and skills that the doctor must acquire. It is defined by the intensity of mandatory assessments of knowledge and skills that the doctor must undergo in the workplace and examination hall. And the "medical model" is also defined by its duration. Clinical experience—by the bedside, in the consulting room, and in the operating theatre—and all that comes with it, is a time-based commodity. Competency based medical education may not see experience, or "time served," as of any relevance—yet few clinicians would deny its central importance in high quality and safe patient care.

The visions of future healthcare that have produced this mission to generate more doctors or more "associate professionals" in shorter and shorter timeframes do not come from the minds of those who see medicine on its front lines. These are remotely conceived, industrial visions of care—and of the workforce that might provide that care—based on a political concept of "productivity" that is alien to those who walk the wards, talk to patients, and see the quality of care, rather than its quantity, as paramount.

Medicine is difficult, has become more difficult over my 40 year career, and will continue to become more difficult. We need to continue to attract the brightest and best to train as doctors. We need to ensure that their training is long enough, broad enough, and deep enough to make them feel *and be* equipped to do the difficult daily work of the doctor, to innovate and to research, and to design and deliver care for people in the way that they—as highly trained professionals—feel their patients need. And not in the way that others speculate may be just about good enough.

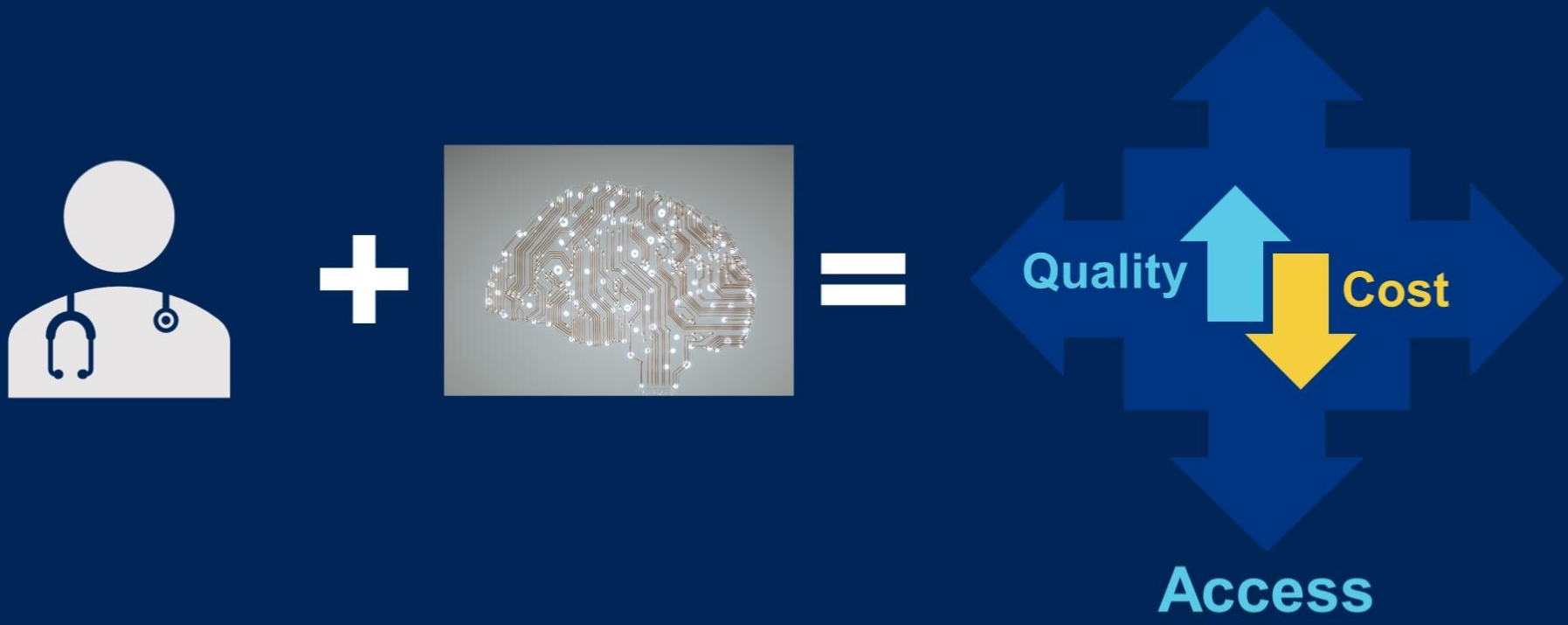
Our patients should demand no less.

¿A Dónde se Dirige la IA?

- **Aumentar el acceso**
- **Disminuir la variabilidad**
- **Promover la calidad**

- 50 % de los médicos hacen residencia
- Los exámenes de re-certificación no son obligatorios en muchas especialidades
- CONSECUENCIA: BAJO NIVEL MEDIO
- IA: permite que obtengamos un piso (nivel medio) y con la inteligencia humana, medico real.....
- AUMENTO DE LA CALIDAD DE ATENCIÓN

AI in Healthcare



Presented By: **Tommaso Mansi, Ph.D.**
Siemens Healthineers

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FDA's Latest Lists for Digital Health Technologies

July 29, 2025

AI-enabled devices

There are 1,247 AI-enabled devices on the list, with the earliest approvals dating back to 1995. As you might imagine, in the early years, there were few AI-enabled devices, with a total of 10 AI-enabled devices authorized in the first ten years. In contrast, 253 AI-enabled devices were authorized in 2024 alone. There have been 1,195 (96%) AI-enabled devices authorized via 510(k) clearance, 36 (3%) AI-enabled devices authorized via De Novos, and 16 (1%) AI-enabled devices authorized via premarket approval (PMA).

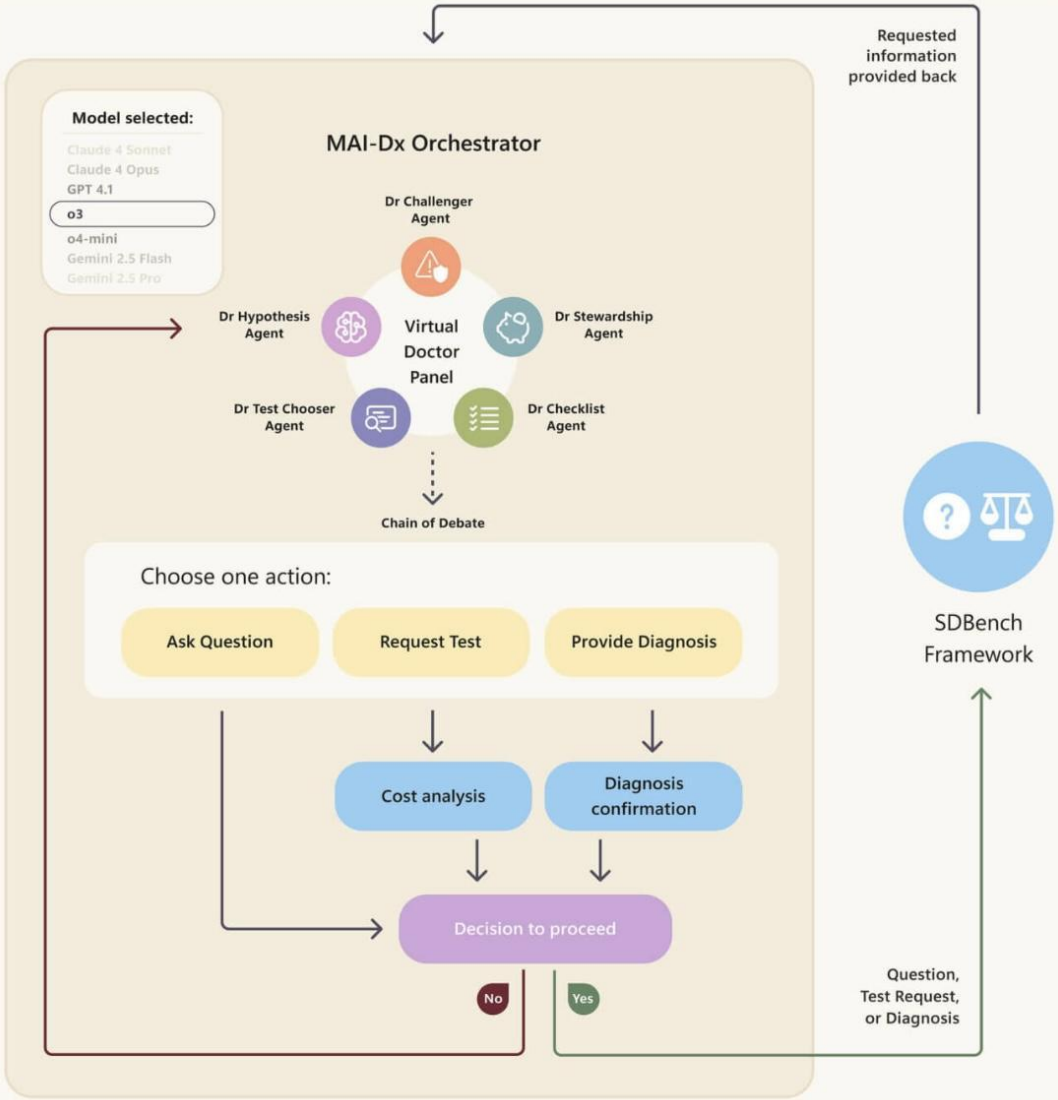
Ingenieria de Prompts (Google, Open AI, Anthropic)

- **TAREA: Resume este caso clinico**
- **CONTEXTO: Mujer de 45 años con cancer de mama E1,Her2**
- **FORMATO: En Bullet Ponits**
- **ROL: Sos Oncologo**

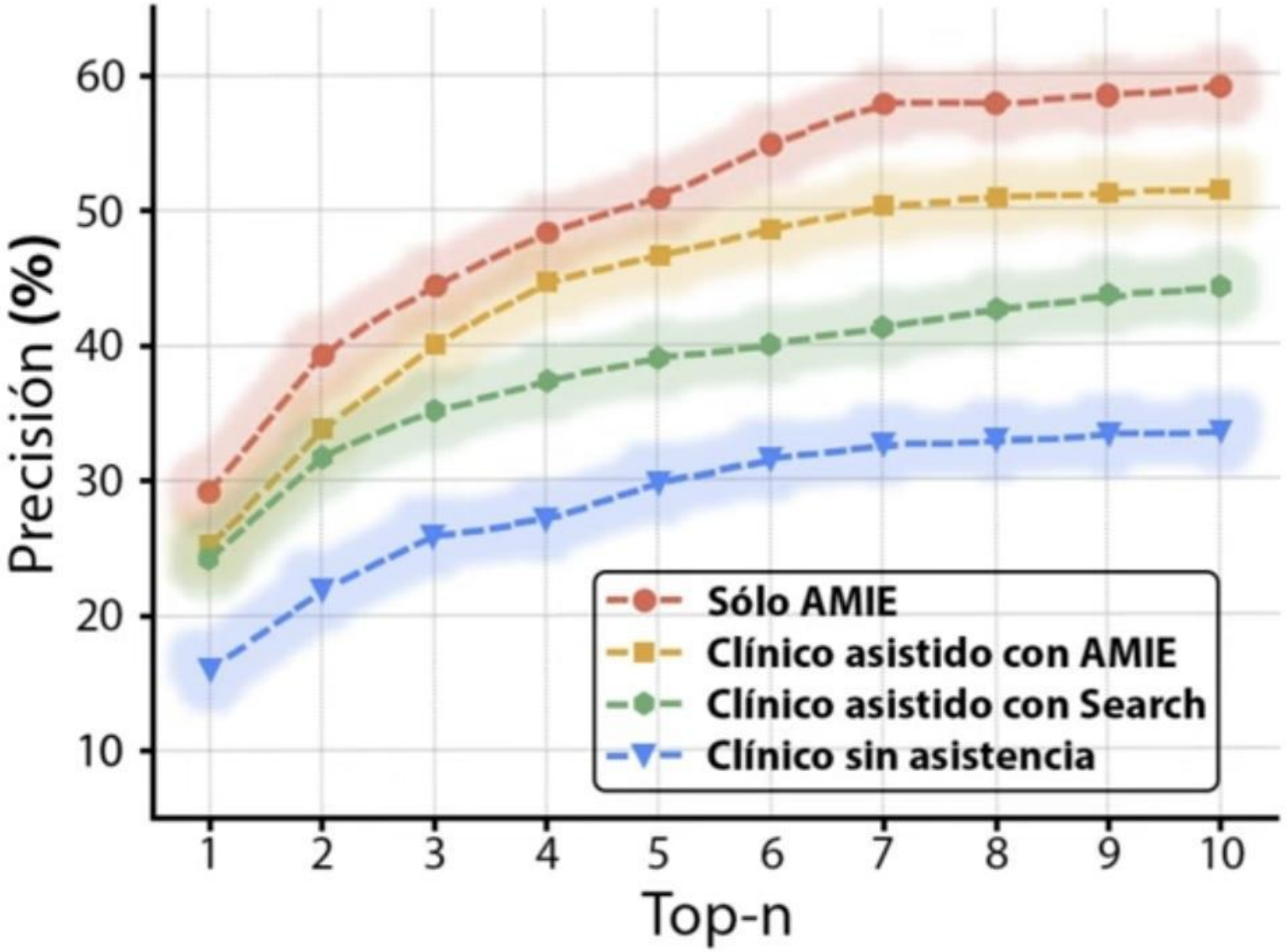
- Adaptacion y Limitaciones: Entender que puede equivocarse
  - Con GPT-5 esto se reduce drásticamente: SOBRE TODO EN MEDICINA
  - Alucinaciones con prompt optimo: 1%

MAI-DxO, Microsoft AI , Junio 2025

- Lee casos complejos del NEJM
- Coordina multiples modelos: GPT, Claude, Gemini, Deep Seek
- Diagnostico con precision 85% vs 20% de 21 medicos de EEUU y UK (5-20 años de experiencia)
- Mayor costo-efectividad



The MAI-Dx Orchestrator turns any language model into a virtual panel of clinicians: it can ask follow-up questions, order tests, or deliver a diagnosis, then run a cost check and verify its own reasoning before deciding whether to proceed.


Precisión (%)
60
50
40
30
20
10
1
2
3
4
5
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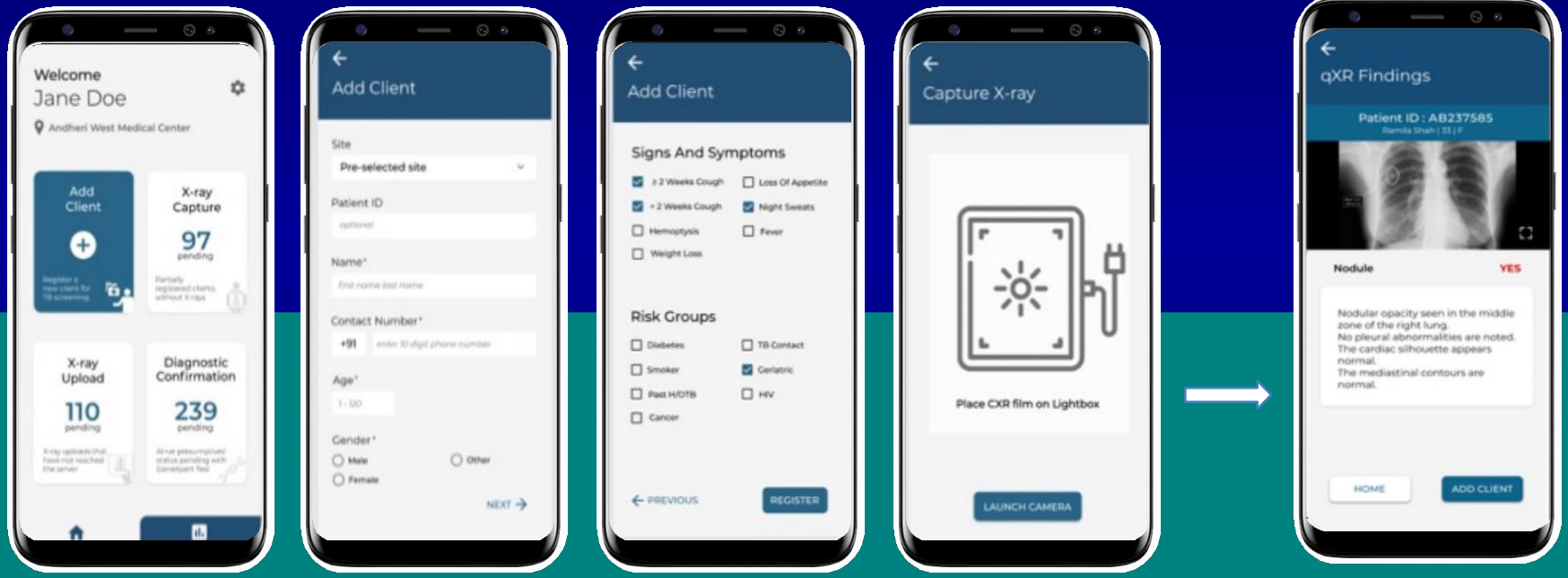
Top-n
Sólo AMIE
Clínico asistido con AMIE
Clínico asistido con Search
Clínico sin asistencia

IA en Salud

- **Diagnóstico por imágenes (y Dermatologia)**
- **Anatomia patologica**
- Medicina de precisión
- Tratamiento
- Búsqueda de estudios clínicos
- Desarrolo de drogas
- Publicaciones
- Asistente de Investigacion
- Co-Piloto mediante LLMs
- Enfermedades Raras

Diagnóstico

qTrack | App para el flujo de trabajo de Médicos, Radiólogos y Personal Médico



Tablero de indicadores del profesional médico

Registro de detallesdel paciente

Capturade rayos X

Análisis de qXR

qTracK

qure.ai

1. **Reducción de la carga de trabajo**:

   El informe automático de radiografías de tórax normales con un VPN alto del 99 %.

2. **Reducción en tiempos de respuesta**:

   qXR ha ayudado a disminuir el TAT medio de informes de grandes cadenas de diagnóstico en más del 40 %.

3. **Incremento en la precisión**:

   qXR es un 17 % más sensible que los radiólogos normales

THE LANCET
Digital Health

Submit
Article

REVIEW | VOLUME 4, ISSUE 6, E466-E476, JUNE 2022

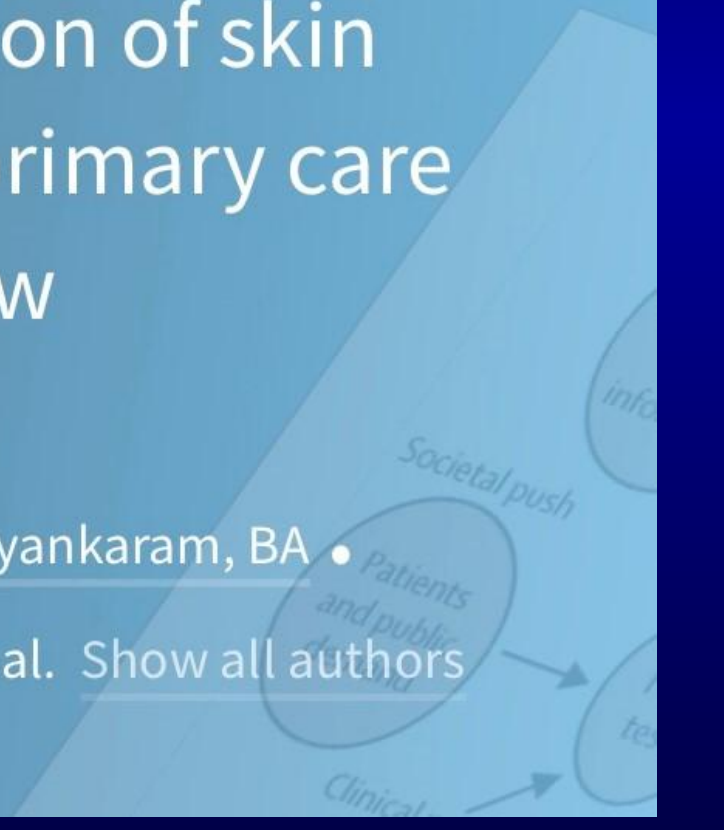
Artificial intelligence and machine learning algorithms for early detection of skin cancer in community and primary care settings: a systematic review

O T Jones, MPhil • R N Matin, PhD •

Prof M van der Schaar, PhD • K Prathivadi Bhayankaram, BA •

C K I Ranmuthu, MBBChir • M S Islam, BA • et al. Show all authors

Open Access • Published: June, 2022 •



IA y Cancer de Piel

Lancet 2022

- Revisión sistemática de mas de 14.000 estudios
- Exactitud diagnóstica en MM casi 90%, algo menos en los no-melanocíticos
- Gran soporte en atención primaria o en medicos con poca experiencia

FDA aprueba el 12 de Abril de 2021 el Primer Sistema de Detección de Pólipos Mediante Colonoscopía por IA de la Empresa Medtronics (GI Genius)

- Algoritmos procesan e identifican anomalías, incluyendo pequeños pólipos planos, que NO son detectable por el ojo humano.
- GI Genius detectó un 14 por ciento mas lesiones precancerosas que el ojo humano.

- **31-7-23** MAGENTIQ-COLO (FDA)
  - Incremento ADR 26% (6-9mm), disminuye 21% CCR

Screening performance and characteristics of breast cancer detected in the Mammography Screening with Artificial Intelligence trial (MASAI): a randomised, controlled, parallel-group, non-inferiority, single-blinded, screening accuracy study

Veronica Hernström, Viktoria Josefsson, Hanna Sartor, David Schmidt, Anna-Maria Larsson, Solveig Hofvind, Ingvar Andersson, Aldana Rosso, Oskar Hagberg, Kristina Lång

Summary

Background Emerging evidence suggests that artificial intelligence (AI) can increase cancer detection in mammography screening while reducing screen-reading workload, but further understanding of the clinical impact is needed.

Methods In this randomised, controlled, parallel-group, non-inferiority, single-blinded, screening-accuracy study, done within the Swedish national screening programme, women recruited at four screening sites in southwest Sweden (Malmö, Lund, Landskrona, and Trelleborg) who were eligible for mammography screening were randomly allocated (1:1) to AI-supported screening or standard double reading. The AI system (Transpara version 1.7.0 ScreenPoint Medical, Nijmegen, Netherlands) was used to triage screening examinations to single or double reading and as detection support highlighting suspicious findings. This is a protocol-defined analysis of the secondary outcome measures of recall, cancer detection, false-positive rates, positive predictive value of recall, type and stage of cancer detected, and screen-reading workload. This trial is registered at ClinicalTrials.gov, NCT04838756 and is closed to accrual.

Findings Between April 12, 2021, and Dec 7, 2022, 105 934 women were randomly assigned to the intervention or control group. 19 women were excluded from the analysis. The median age was 53·7 years (IQR 46·5–63·2). AI-supported screening among 53 043 participants resulted in 338 detected cancers and 1110 recalls. Standard screening among 52 872 participants resulted in 262 detected cancers and 1027 recalls. Cancer-detection rates were 6·4 per 1000 (95% CI 5·7–7·1) screened participants in the intervention group and 5·0 per 1000 (4·4–5·6) in the control group, a ratio of 1·29 (95% CI 1·09–1·51; p=0·0021). AI-supported screening resulted in an increased detection of invasive cancers (270 *vs* 217, a proportion ratio of 1·24 [95% CI 1·04–1·48]), wich were mainly small lymph-node negative cancers (58 more T1, 46 more lymph-node negative, and 21 more non-luminal A). AI-supported screening also resulted in an increased detection of in situ cancers (68 *vs* 45, a proportion ratio of 1·51 [1·03–2·19]), with about half of the increased detection being high-grade in situ cancer (12 more nuclear grade III, and no increase in nuclear grade I). The recall and false-positive rate were not significantly higher in the intervention group (a ratio of 1·08 [95% CI 0·99–1·17; p=0·084] and 1·01 [0·91–1·11; p=0·92], respectively). The positive predictive value of recall was significantly higher in the intervention group compared with the control group, with a ratio of 1·19 (95% CI 1·04–1·37; p=0·012). There were 61 248 screen readings in the intervention group and 109 692 in the control group, resulting in a 44·2% reduction in the screen-reading workload.

Interpretation The findings suggest that AI contributes to the early detection of clinically relevant breast cancer and reduces screen-reading workload without increasing false positives.

Funding Swedish Cancer Society, Confederation of Regional Cancer Centres, and Swedish governmental funding for clinical research.

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Lancet Digit Health 202

Published Online February 3, 2025 https://doi.org/10.1016/S2589-7500(24)00267

See Online/Comment https://doi.org/10.1016/j.landig.2025.01.004

Diagnostic Radiology, Translational Medicine University, Lund, Swe (V Hernström MD, V Josefsson MD, H Sartor MD PhD, D Sch I Andersson MD PhD, A Rosso MSc PhD, O Hagberg MSc PhD, K Lång MD PhD); **Unila Mammography Unit, University Hospital, M Sweden** (H Sartor, D Sc I Andersson, K Lång); **R Department, Skåne Un Hospital, Malmö, Swe** (V Hernström, V Josefss **Oncology, Clinical Scie Lund, Lund University Sweden** (A-M Larsson **Section for Breast Can Screening, Cancer Reg Norway, Oslo, Norway** (Prof S Hofvind PhD); **H and Care Sciences, Fac Health Sciences, The A University of Norway, Norway** (Prof S Hofvin

Correspondence to: Dr Kristina Lång, Divisio Diagnostic Radiology, Department of Translat Medicine, Lund Univers Malmö 20502, Sweden **kristina.lang@med.lu**

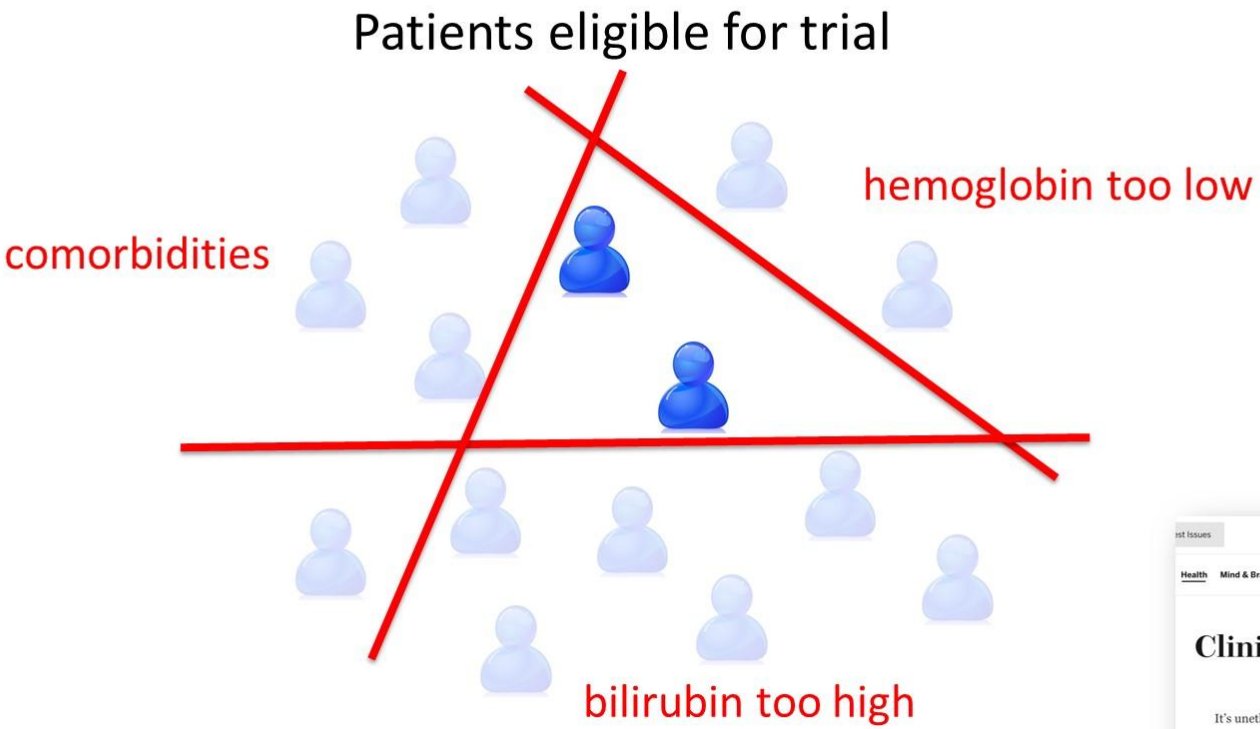
Mamografia e IA

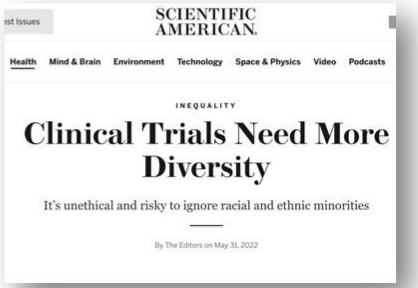
Estudio MASAI, Lancet Digital Health 3-2- 2025

- 106.000 AI (Transpara v1.7.0 Screenpoint Medical) mas IH
- Grupo 1 (IA mas 1 médico) vs Grupo 2 (2 médicos)
- Reduce tiempo de trabajo en 44%, aumenta la detección en 29%, sin aumento de falsos positivos
- PRIMER estudio prospectivo al respecto

Diseño y Busqueda Estudios Clínicos y Nuevas Drogas

Clinical trials are highly selective




SCIENTIFIC AMERICAN.

Health Mind & Brain Environment Technology Space & Physics Video Podcasts

INEQUALITY

Clinical Trials Need More Diversity

It's unethical and risky to ignore racial and ethnic minorities

By The Editors on May 31, 2022

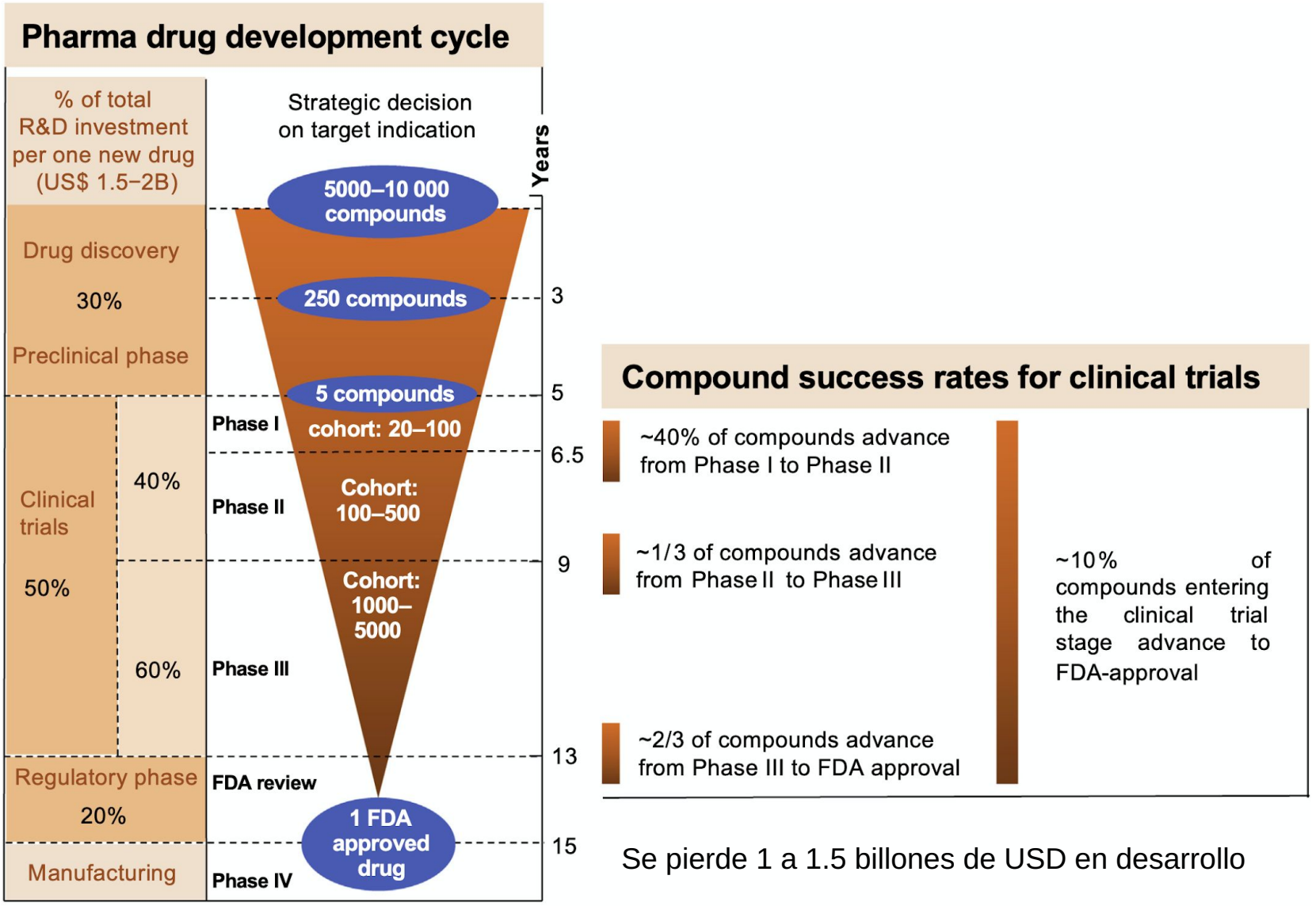
Data-driven criteria doubles # eligible patients and reduces hazard

aNSLC trials	Original Trial Criteria		Data-driven Criteria	
	Number of Patients	Hazard Ratio	Number of Patients	Hazard Ratio
FLAURA	2277	0.81	2546	0.75
LUX8	129	0.65	141	0.58
Checkmate017	523	0.67	4085	0.71
Checkmate057	792	0.75	2594	0.66
Checkmate078	1509	0.74	3348	0.68
Keynote010	806	0.56	1948	0.51
Keynote189	4066	0.88	4595	0.85
Keynote407	2031	1.13	9173	1.04
BEYOND	2902	1.09	3043	1.08
OAK	493	0.88	620	0.80
Average	**1553**	**0.82**	**3209**	**0.77**

Enables more women, minorities and older patients to access trials.

Liu et al. *Nature* 2021

Aca se evidencia como el uso de IA puede duplicar la cantidad de pts eligibles para EC
Comparado con los criterios clasicos, se observa un aumento significativo en el numero de pts
Aplicando esto, se incluyen mas mujeres, minorias, pacientes añosos mejorando la DIVERSIDAD y REPRESENTATIVIDAD

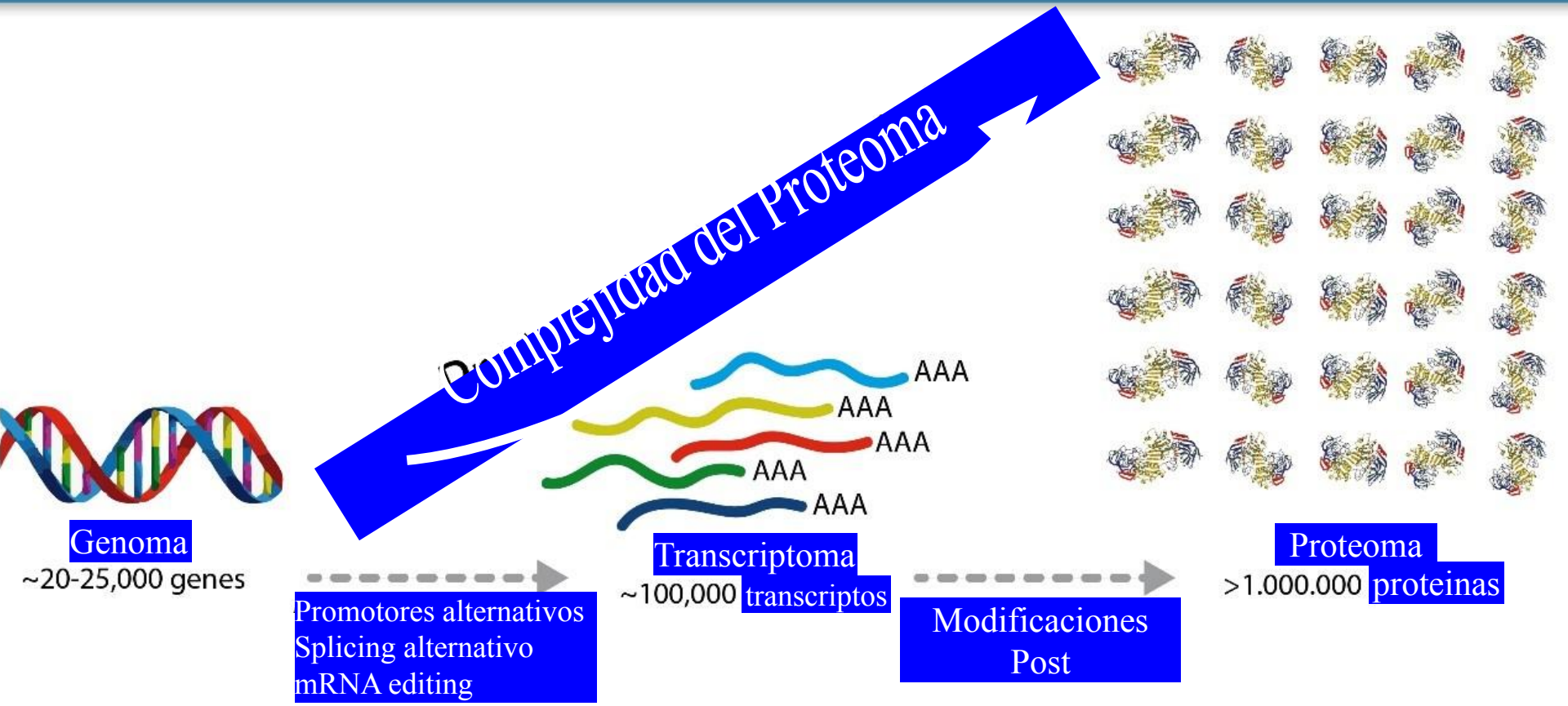


Se pierde 1 a 1.5 billones de USD en desarrollo

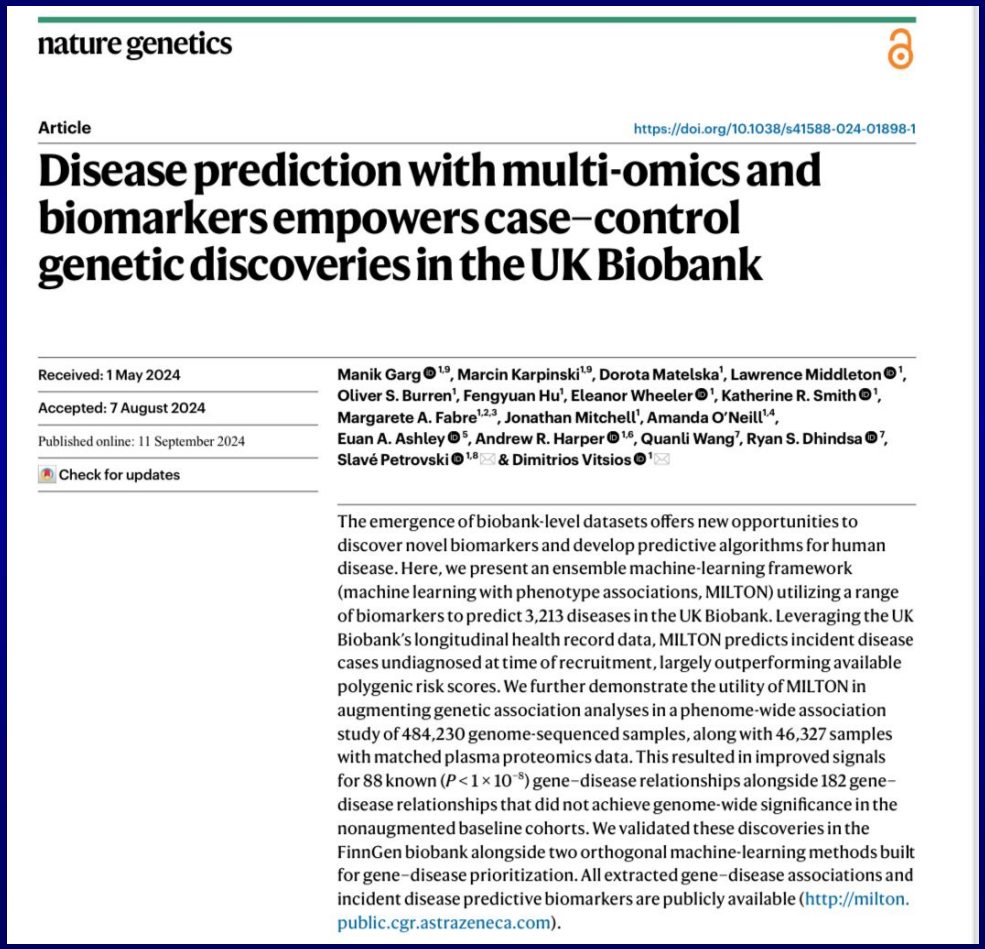
Stefan Harrer et al, Trends in Pharmacological Sciences, August 2019, Vol. 40, No. 8

¨OMICS¨

Genoma-Transcriptoma-Proteoma



IA en detección ultraprecoz de mas de 3200 enfermedades



nature genetics

Article

https://doi.org/10.1038/s41588-024-01898-1

Disease prediction with multi-omics and biomarkers empowers case–control genetic discoveries in the UK Biobank

Received: 1 May 2024

Accepted: 7 August 2024

Published online: 11 September 2024

Check for updates

Manik Garg[1,9], Marcin Karpinski[1,9], Dorota Matelska[1], Lawrence Middleton[1], Oliver S. Burren[1], Fengyuan Hu[1], Eleanor Wheeler[1], Katherine R. Smith[1], Margarete A. Fabre[1,2,3], Jonathan Mitchell[1], Amanda O'Neill[1,4], Euan A. Ashley[5], Andrew R. Harper[1,6], Quanli Wang[7], Ryan S. Dhindsa[7], Slavé Petrovski[1,8] & Dimitrios Vitsios[1]

The emergence of biobank-level datasets offers new opportunities to discover novel biomarkers and develop predictive algorithms for human disease. Here, we present an ensemble machine-learning framework (machine learning with phenotype associations, MILTON) utilizing a range of biomarkers to predict 3,213 diseases in the UK Biobank. Leveraging the UK Biobank's longitudinal health record data, MILTON predicts incident disease cases undiagnosed at time of recruitment, largely outperforming available polygenic risk scores. We further demonstrate the utility of MILTON in augmenting genetic association analyses in a phenome-wide association study of 484,230 genome-sequenced samples, along with 46,327 samples with matched plasma proteomics data. This resulted in improved signals for 88 known ($P < 1 \times 10^{-8}$) gene–disease relationships alongside 182 gene–disease relationships that did not achieve genome-wide significance in the nonaugmented baseline cohorts. We validated these discoveries in the FinnGen biobank alongside two orthogonal machine-learning methods built for gene–disease prioritization. All extracted gene–disease associations and incident disease predictive biomarkers are publicly available (http://milton.public.cgr.astrazeneca.com).

- 500.000 personas del Biobanco de UK
- MILTON (Astra Zeneca) analizo 67 biomarcadores clínicos y 3000 proteínas
- AI con DL detecto sutiles desvíos en los patrones normales invisibles para el humano
- Capacidad predictiva "Excepcional" AUC >0.9 en 121 enfermedades (Ca mama, Ca Pulmon, DBT 2, Enf. Coronaria, etc)
- Diagnostico 1 década previa

Mapa de Proteinas (Proteoma)

Nature 8/5/2024

- Alpha Fold 1,2, y 3 (ML), transformer que predice que AA viene luego del otro: similar mecanismo que ChatGPT
- Base de datos mas completa en la predicción de la estructura de las proteinas humanas
- Predijo el 100% **(4 veces lo conocido)** de acuerdo a la secuencia de sus ladrillos: los aminoácidos (TRANSFORMERS)
- Ademas LIGANDOS y como se unen a las porciones vulnerables de las estricturas 3D de las proteinas

Nobel prizes

Google DeepMind scientists win Nobel chemistry prize

British founder of DeepMind Demis Hassabis,

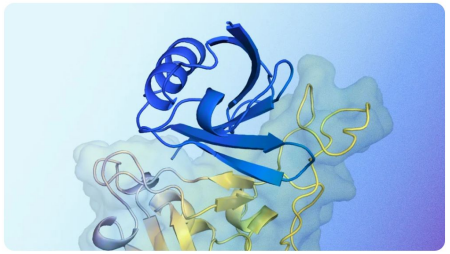
Google DeepMind

AlphaProteo generates novel proteins for biology and health research

5 SEPTEMBER 2024

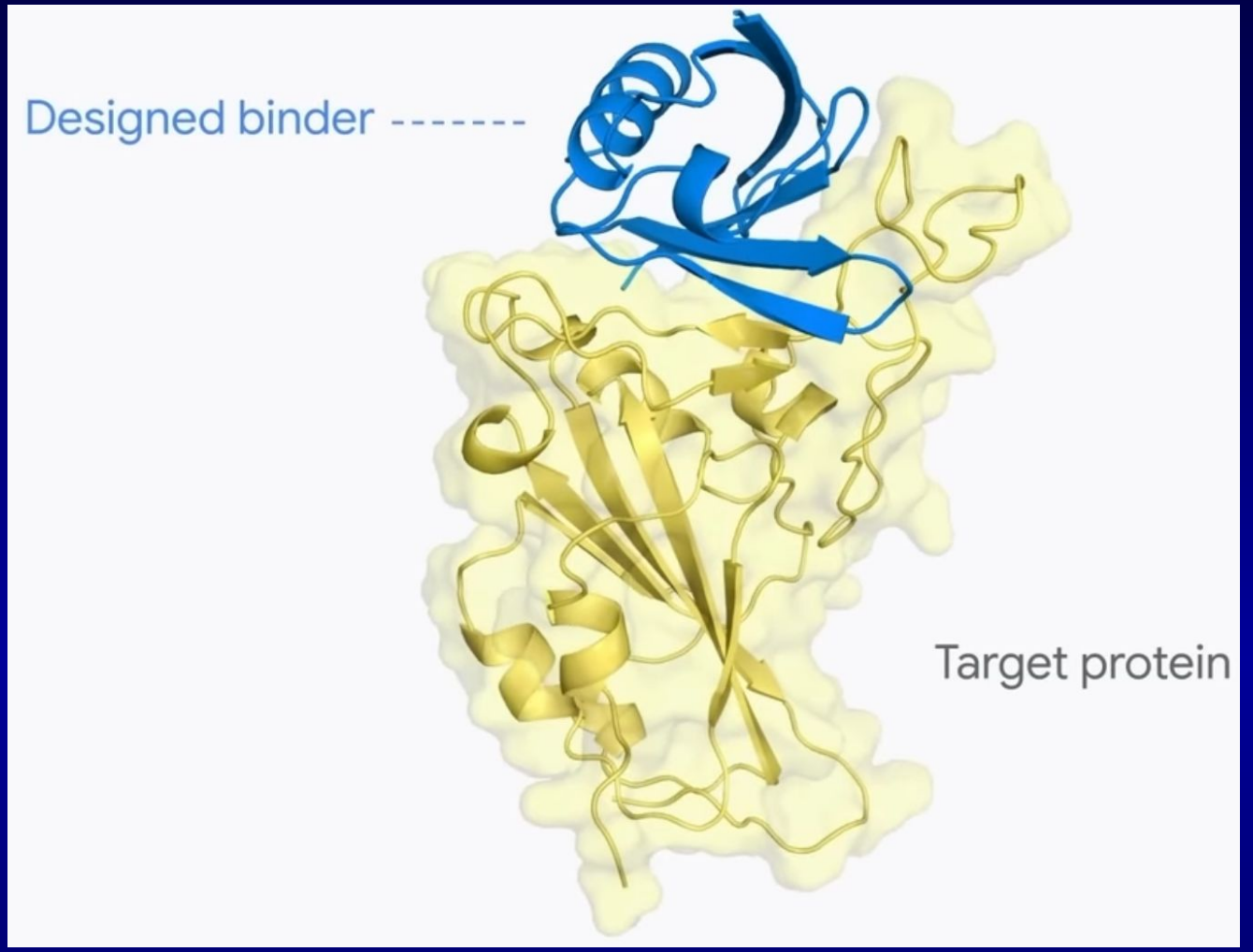
Protein Design and Wet Lab teams

Share



New AI system designs proteins that successfully bind to target molecules, with potential for advancing drug design, disease understanding and more.

Every biological process in the body, from cell growth to immune responses, depends

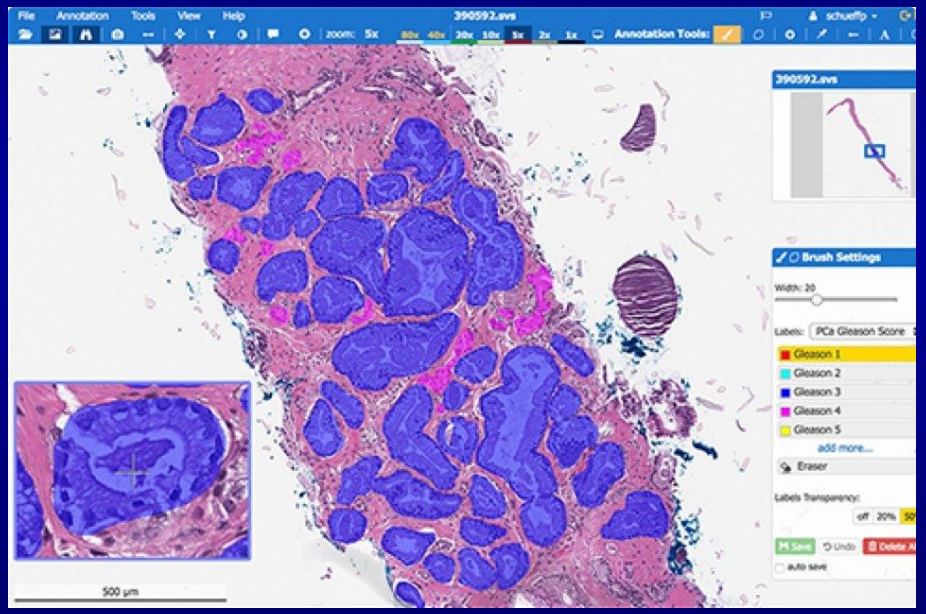


AlphaProteo also achieves higher experimental success rates and 3 to 300 times better binding affinities than the best existing methods on seven target proteins we tested.

Anatomía Patológica

FDA 2021

Paige®



Paige Prostate (PP)

Modern Pathology 2021

- 16 patólogos examinaron 527 biopsias.
- PP incrementó la capacidad de los patólogos en 7.3%
- Los patólogos que usaron PP obtuvieron un 70% de reducción en falsos negativos y 24% de disminución de los falsos positivos
- LLEVO A LOS NO ESPECIALISTAS AL MISMO NIVEL QUE LOS ESPECIALISTAS EN PROSTATA

Ahora entramos
NOSOTROS!!!!!
Contención

Epidemia de Burnout en Medicos

- 40%-60% en EE UU
- Elsevier Health: 2025 un 75% del personal de salud dejara su profesión.
- 2020 AAMC, proyecto un déficit de 139.000 médicos para el 2033
- Causas:
  - **HCE y carga burocratica: 6,25 hs extra-Semana**
  - Covid
  - Mayor relación entre retirados y graduados

Microsoft + NUANCE

DAX Copilot

AI-automated clinical notes—available in seconds

DAX Copilot, an AI-powered voice-enabled solution that automatically documents care, combines proven conversational and ambient AI with the most advanced generative AI. View the on-demand demo to see how DAX Copilot creates clinical notes from patient conversations and delivers them immediately after conducting a patient visit.

The positive impact on care delivery

7 min

saved per encounter, reducing documentation time by 50%.

70%

reduction in feelings of burnout and fatigue.

3 of 4

physicians state DAX improves documentation quality.

85%

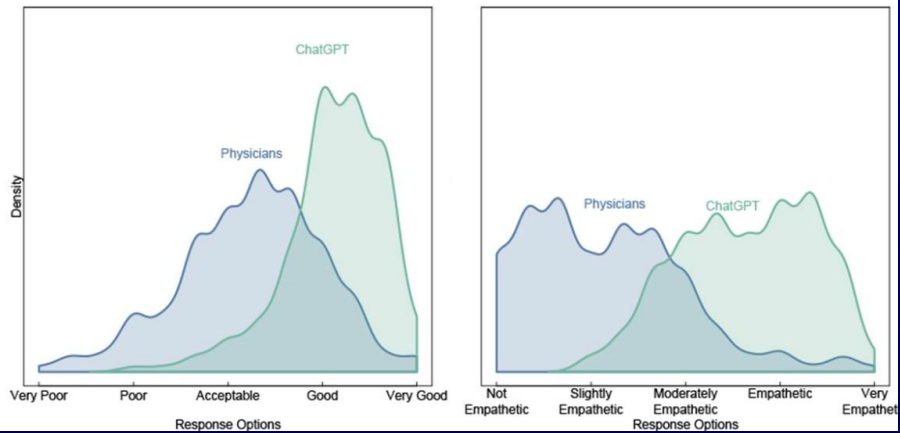
of patients say their physician is more personable and conversational.

nuance.com

- JAMA abril 2023
- 195 intercambios con AskDocs
- 3 médicos vs ChatGPT (ciego)
- Respuestas mas empáticas que los médicos
- **45.1% vs 4.6%**

Study Finds ChatGPT Outperforms Physicians in High-Quality, Empathetic Answers to Patient Questions

While AI won't replace your doctor, the JAMA Internal Medicine paper suggests physicians working together with technologies like ChatGPT may revolutionize medicine



Educación General y Educacion Medica e Inteligencia Artificial

Aprobación de IA en Medicina

2020 y en 2023 junto con la Universdad Austral

IUC INSTITUTO UNIVERSITARIO CEMIC

Buenos Aires, 12 de junio de 2020

VISTO la propuesta de una nueva asignatura electiva para el Ciclo Clínico Quirúrgico de la Carrera de Medicina sobre Inteligencia Artificial y,

CONSIDERANDO que el tema resulta importante e interesante para los alumnos,

EL DECANO DE LA UNIDAD ACADÉMICA

ESCUELA DE CIENCIAS DE LA SALUD

DISPONE

1) Aprobar el Programa de la Asignatura Electiva "Inteligencia Artificial y Medicina"

2) Incorporar esta asignatura a la oferta de asignaturas electivas de 4° y 5° año de la Carrera de Medicina.

3) Regístrese. Comuníquese al docente organizador de la asignatura, a la Secretaria de la Unidad Académica Escuela de Ciencias de la Salud Dra. Teresita Manzur, a la Directora de la Carrera de Medicina Dra. Marcela Villarruel, a la Coordinadora del Ciclo Clínico Quirúrgico Dra. Silvina Barbieri, a la Directora del Depto. de Pedagogía Esp. Romina Modlin, a la Secretaria de Gestión Institucional del Rectorado Sra. Gloria Ferreyra, a la Jefa del Depto. de Profesores y Alumnos Lic. María Victoria Beherengaray, a la Coordinadora de Aseguramiento de la Calidad Mg. Julieta Gómez y a la Secretaria de Gestión Administrativa del Decanato Lic. Silvana Brozzi. Cumplido, archívese

DISPOSICIÓN N° 32/20

Dr. Jorge Nazar
Decano
Unidad Académica Escuela de Ciencias de la Salud

IA EN MEDICINA Y SALUD DIGITAL

PRIMEROS PASOS PARA PROFESIONALES DE LA SALUD

ACTUALIZACIÓN 2025

100% ONLINE

- **Curso de matrícula abierta**
  Inicia en el que momento en que se inscriba y cuenta con 4 meses para finalizarlo, a su ritmo
- **Material disponible las 24 horas los 7 días de la semana**
  Durante los 4 meses de duración de la matrícula
- **Dirigido a todo el equipo de salud**
- **Certificado de aprobación otorgado por la Academia Nacional de Medicina de Buenos Aires**
  Carga total: 66 créditos / 22 horas. CON EVALUACIÓN

CCPM Créditos® Categoría 1

Apertura del curso: 8 de julio de 2025

PROGRAMA

NO REQUIERE CONOCIMIENTOS PREVIOS SOBRE PROGRAMACIÓN NI INTELIGENCIA ARTIFICIAL

Inteligencia Artificial en Medicina. Aspectos introductorios.
Dr. Enrique Díaz Cantón

Principios de ciencias de datos. Parte 1.
Dr. Mario Rossi

Principios de ciencias de datos. Parte 2.
Dr. Pablo Mandó

Aprendizaje automático.
Dra. Débora Chan

Métricas.
Dra. Fabiana Rossi

Redes neuronales.
Dr. Jerónimo Pissinis

Procesamiento del lenguaje natural y Chat Bots.
Dr. Juan Corvalán

Inteligencia Artificial generativa y grandes modelos de lenguaje.
Dr. Joaquín Fernández Sande

Historia clínica electrónica y telemedicina.
Dr. Oscar Mandó

Inteligencia Artificial en diagnóstico por imágenes.
Dr. Juan Miquelini

Inteligencia Artificial y anatomía patológica.
Dr. Carlos Galmarini

Inteligencia Artificial y estadística.
Dr. Mario Rossi

Inteligencia Artificial y Oncología.
Dr. Enrique Díaz Cantón

Blockchain en Medicina.
Dr. Joaquín Fernández Sande

Inteligencia Artificial y Medicina Crítica.
Dr. Eduardo San Román

Inteligencia Artificial y ética.
Dra. Soledad Paladino

Inteligencia Artificial en investigación.
Dr. Mario Rossi

Inteligencia Artificial y Medicina de Precisión.
Dr. Marcelo Risk

Robótica e impresión tridimensional.
Dr. Eduardo Cremaschi

Inteligencia Artificial agente.
Dr. Joaquín Fernández Sande

Bioinformática.
Dr. Ignacio Cassol

Inteligencia Artificial y gestión hospitalaria.
Ing. Luciano Tourn

Directores:

Dr. Enrique Díaz Cantón
Dr. Mario Rossi
Dr. Joaquín Fernández Sande

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Valor total del curso desde el exterior: USD 150

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INTELIGENCIA ARTIFICIAL Y MEDICINA
Transformando el cuidado de la salud con innovación
Enrique Díaz Cantón
Mario Rossi
Joaquín Fernández Sande

FPN: 2307

ESMO 2025

Oncology 2025: A Clinical Decision Support GPT for Integrating Evidence-Based Oncology Practice with AI Assistance

Enrique Díaz Cantón MD MSc MSc
Professor of Oncology, Professor of Artificial Intelligence in Medicine
Instituto Universitario CFMIC, Buenos Aires, Argentina

BACKGROUND & METHODOLOGY

CLINICAL NEED

- AI applications in oncology address current challenges in staying current with evidence-based decisions
- Limited integration of AI support tools into routine oncology practice
- Need for real-time clinical decision support systems

DEVELOPMENT APPROACH

Custom GPT Platform

- Chain of Thought (CoT) O-3 implementation
- Temperature setting: 0.5 for balanced responses

Virtual Tumor Board

- Simulates multidisciplinary team meetings
- Integrates multiple specialist perspectives

Real-time Updates

- Continuous alignment with latest research
- Dynamic guideline integration

CONCLUSIONS

- **Demonstrated Efficacy:** Oncology 2025 successfully showcased the potential of custom GPT for evidence-based clinical assistance
- **Widespread Adoption:** Platform achieved significant user engagement with consistently positive feedback
- **Clinical Integration:** Successful integration into routine oncology practice workflows

MEDICAL ONCOLOGY ASSISTANT

RESEARCH DATABASES

- PubMed comprehensive search
- Web of Science integration
- Scopus database access

CLINICAL RESOURCES

- UpToDate evidence synthesis
- DynaMed clinical summaries
- Cochrane systematic reviews

CLINICAL TRIALS

- ClinicalTrials.gov database
- WHO ICTRP registry
- Real-time trial matching

GUIDELINES INTEGRATION

- NCCN & ESMO guidelines
- ASCO & ASTRO protocols
- ESTRO recommendations

Key Innovation: Integration of multiple evidence sources through advanced AI processing to provide comprehensive, evidence-based clinical decision support in real-time.

RESULTS & IMPACT

3M+	4.8/5	Top 5%	2nd
USER INTERACTIONS	USER RATING	GPT RANKING	GLOBAL POSITION

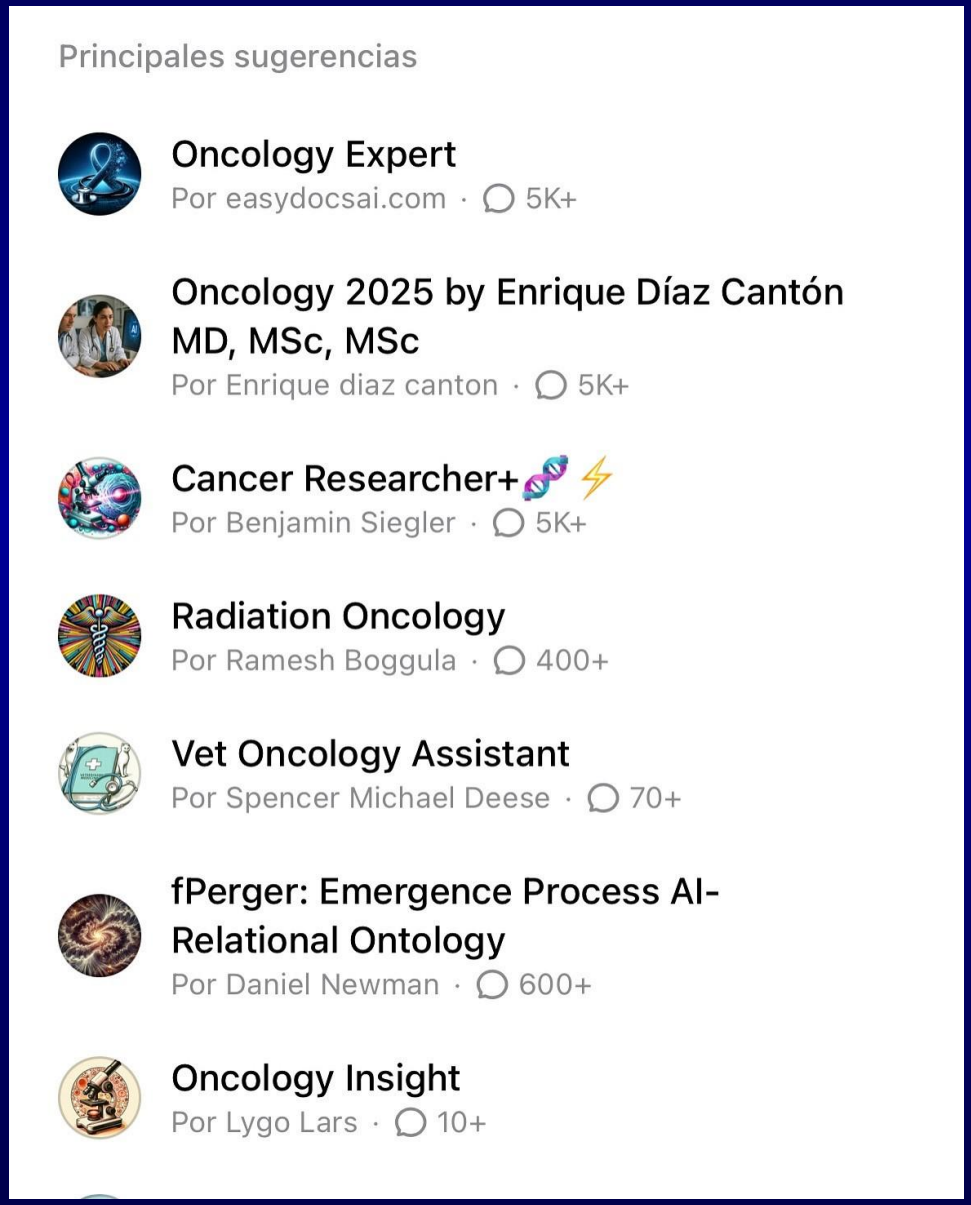
FUTURE DEVELOPMENTS

- Enhanced multimodal capabilities for imaging integration
- Expanded specialty-specific modules
- Advanced predictive analytics implementation
- Integration with electronic health records

Conflict of Interest Declaration: None declared

Contact: ediazcanton@ucedu.ar

Ranking entre los GPTs Especializados…pero



Como la IA Cambio mi Practica

- Todas las noches presento mis casos problema a:
  - GPT-5, Perplexity Pro, Claude 4.1 Opus, Open Evidence, Gemini 2.5 Pro (a tres)
- Si tengo que escribir un articulo, preparar una clase…
- Si tengo que mandar un mail por un pedido de medicación a una obra social
- Si le tengo que explicar algo difícil a un paciente
- Si estoy ANGUSTIADO por un paciente
- Tengo MIS ateneos multidisciplinarios 7/24 horas toda vez que lo necesito (MDO)

Multidisciplinary Oncology 2025

Analiza casos de oncologia desde una perspectiva multidisciplinaria

Por Enrique diaz canton

Dame tu opinion sobre este paciente, haz de oncologo experto en (Ejemplo cancer de pulm...

Envía un mensaje a Multi...

- AMD en Oncologia mejora SG en un 10%
- Se presenta el caso clinico
- Lo analiza desde la perspectiva de:
  - ONCOLOGO CLINICO
  - RADIOONCOLOGO
  - CIRUJANO ONCOLOGICO
  - ONCOLOGO MOLECULAR
  - GENETISTA
  - PATOLOGO
  - PALIATIVISTA

¨En poco tiempo será sub-estandard un medico que no atienda asistido por IA¨

Isaac Kohane
Editor de NEJM AI

“El medico que perdera su trabajo por la IA es el que NO aprenda a trabajar con lA”. JAMA 25/10/23

Bernard Chang
Decano de la Facultad de Medicina
Harvard

“En poco tiempo sera mala praxis no ejercer la medicina sin ser asistido por la IA” (Agosto 2024)

Peter Diamandis
Co-Fundador, Singularity University

JANUS: Mitología Romana

Dios de la Dualidad

Muchas Gracias

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