

La Revolución de la Inteligencia Artificial Generativa

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Laboratorio de Inteligencia Artificial Aplicada



IA: Dos visiones

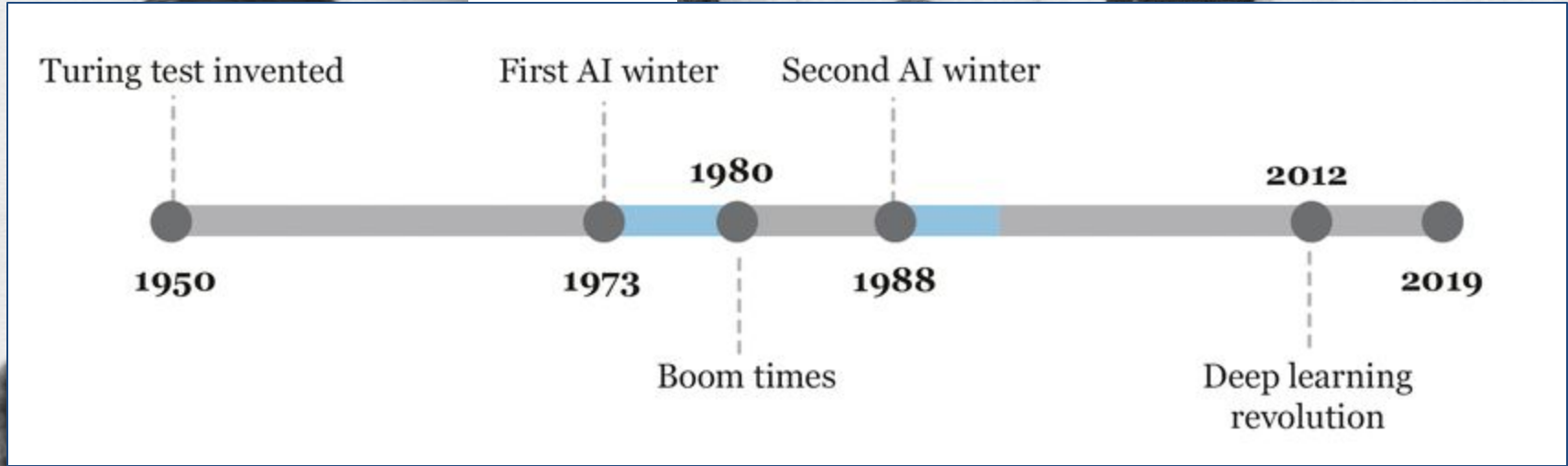


Can machines think?



Simon stated in 1965 that “machines will be capable, within 20 years, of doing any work a man can do”

IA: Dos visiones



Can machines think?

Simon stated in 1965 that “machines will be capable, within 20 years, of doing any work a man can do”

1996

Person of the Year TIME



“Fue una movida maravillosa y extremadamente humana. He jugado con muchas computadoras, pero nunca había experimentado algo como esto. Podía sentir -- podía oler -- que un nuevo tipo de inteligencia estaba sentada al otro lado de la mesa”

Garry Kasparov, 1996



2016



Google DeepMind
Challenge Match
8 - 15 March 2016



Lee Sedol

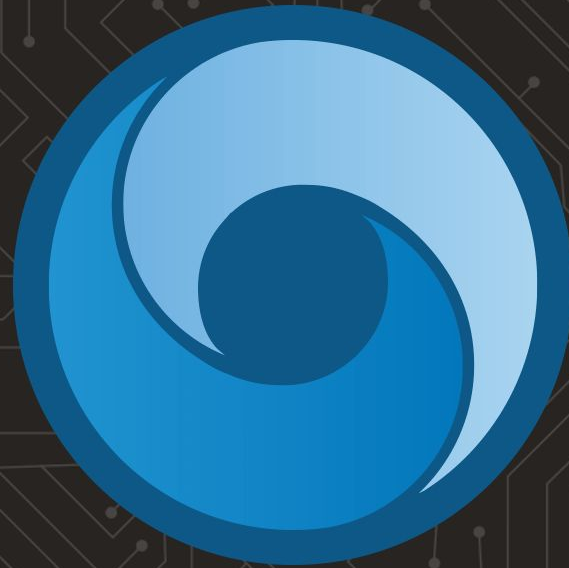


"I thought AlphaGo was based on probability calculation and that it was merely a machine. But when I saw this move, I changed my mind. Surely, AlphaGo is creative."

Lee Sedol

Winner of 18 world Go titles

2017



No Castling

No castling allowed leaves kings more vulnerable



0



Torpedo

Pawns can always move forward one or two squares



0



Capture Anything

Capture your own pieces too when you want



0



Sideways Pawns

Pawns can also move sideways one square

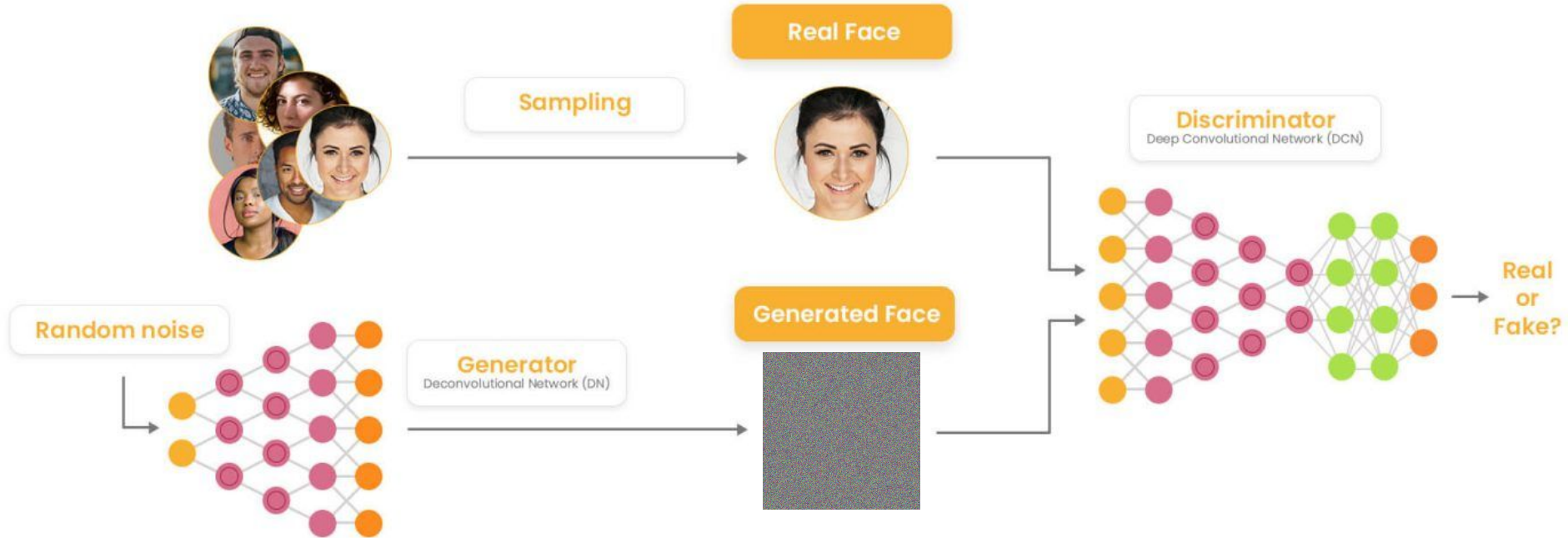


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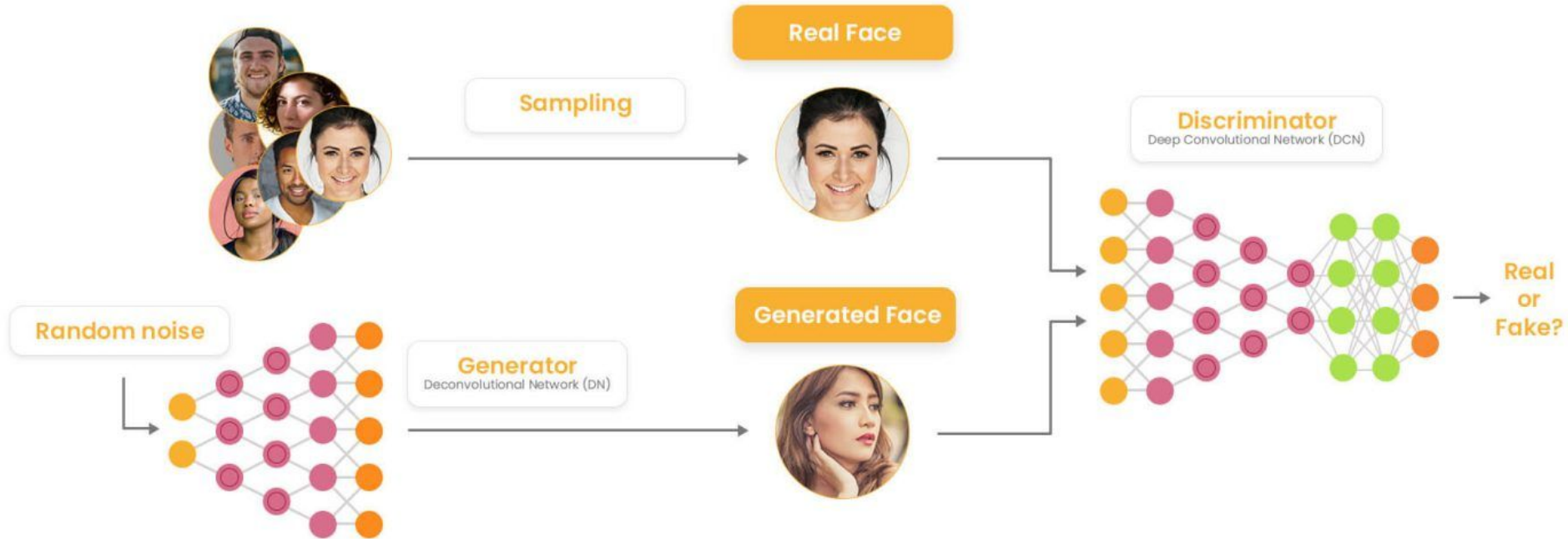
AlphaZero

EXPLORES VARIANTS

Autosupervisión



Autosupervisión



<https://www.thispersondoesnotexist.com/>



2023



ARTIFICIAL
INTELLIGENCE



ChatGPT



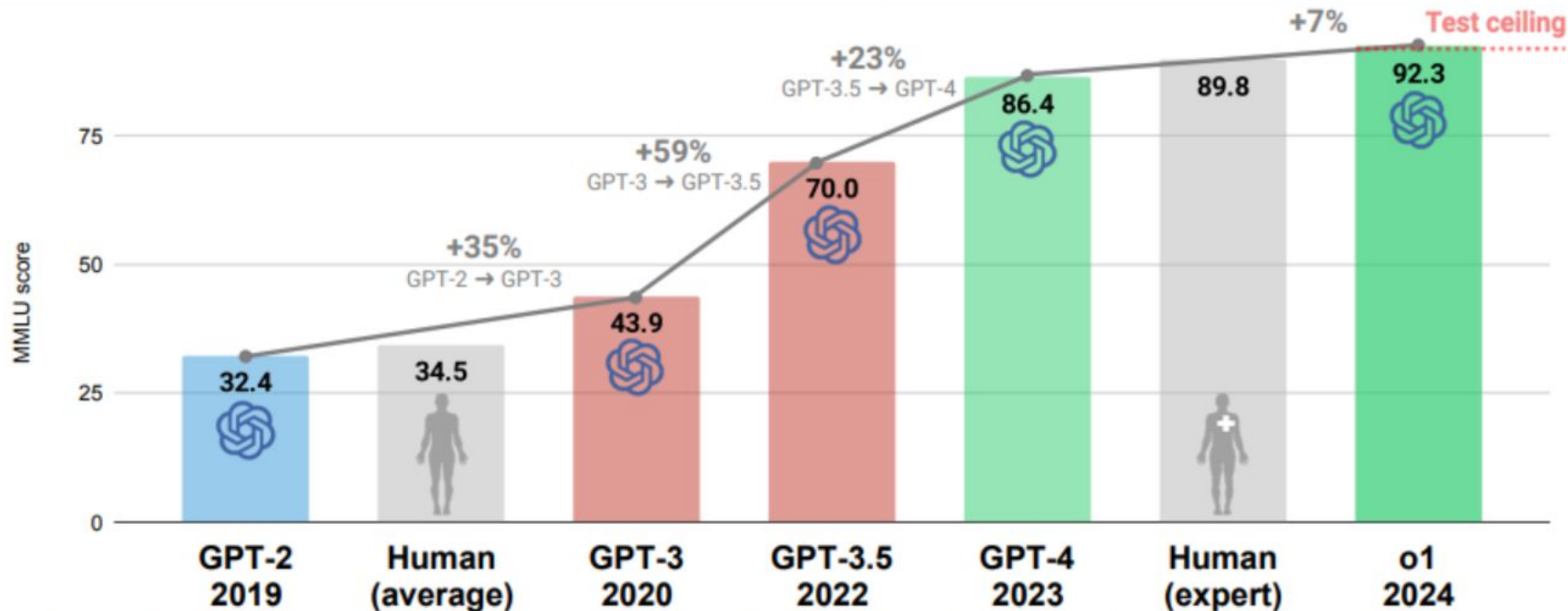
“

"La IA ahora puede piratear y manipular el sistema operativo de la cultura humana. Al adquirir dominio del lenguaje, está apoderándose de la llave maestra de la civilización"

YUVAL HARARI, historiador

”

LLMs: SMARTER THAN WE THINK (SEP/2024)



MMLU (Massive Multitask Language Understanding) benchmark features 57 tasks including mathematics, US history, computer science, law, and more. % increases rounded. <https://life architect.ai/o1/> Alan D. Thompson, 2024.





Y cómo sigue...

AGI: 5-10 years

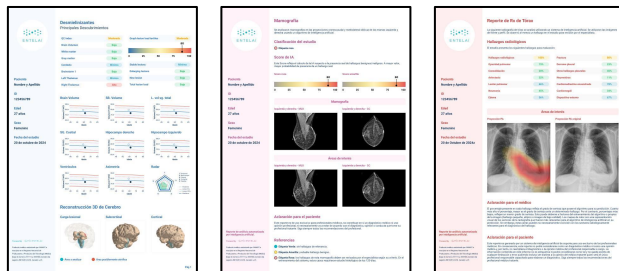
Embrace AI

Two risks: wrong hands and fear to talk

Consciousness: use AI to study the brain



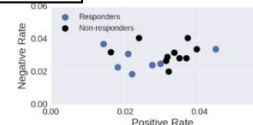
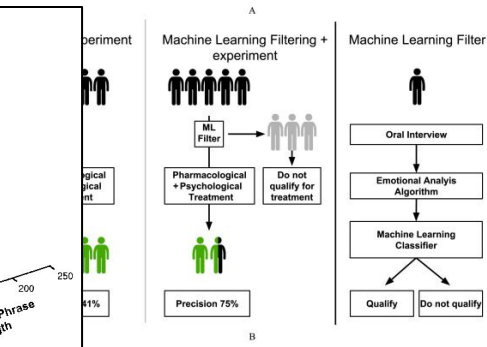
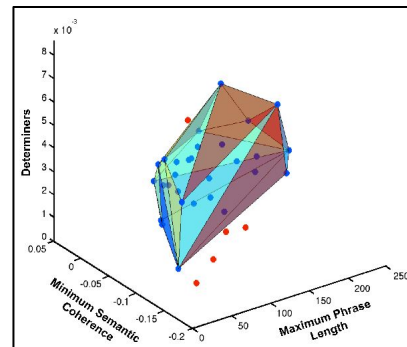
Ejemplos de IA en salud



(a) The Cookie-Theft picture used as stimulus. Participants were asked to describe the scene aloud as part of the assessment task for spontaneous speech and facial behavior analysis.

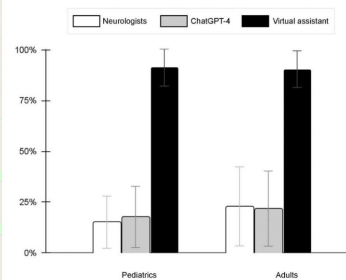
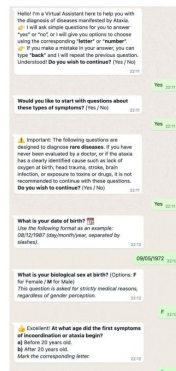


(b) Firefighter-Oasis image used as a narrative prompt. Participants were instructed to create a name for the person depicted and to invent a story based on the image, encouraging spontaneous language and imagination.



Naive Bayes Confusion Matrix Cross-validation 7 folds

NR	R	
8	2	Non-responders (NR)
1	6	Responders (R)



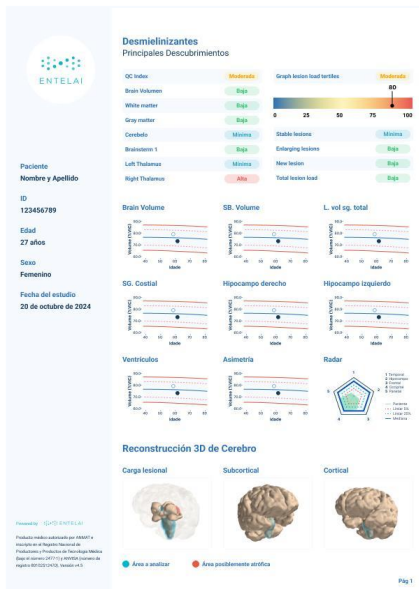
IA en imágenes

(1) Soporte diagnóstico con análisis de imagen con IA

ENTELAI Neuro



+12% increase in AD detection +30% doctors switching treatment upon MS findings

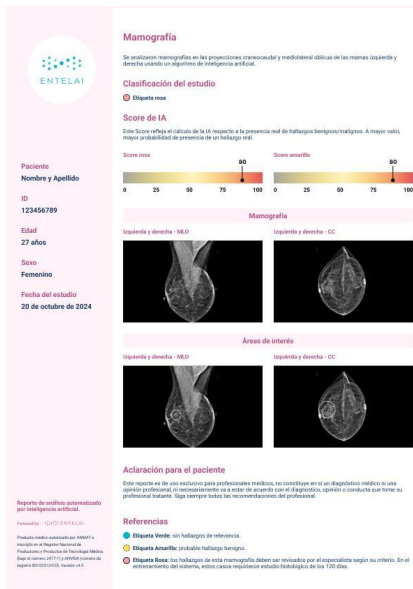


Pág 1

ENTELAI Mammo



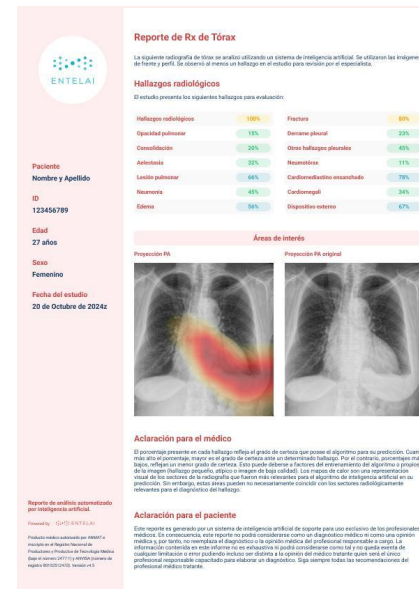
Breast cancer detection up to 2 years earlier



ENTELAI X-ray



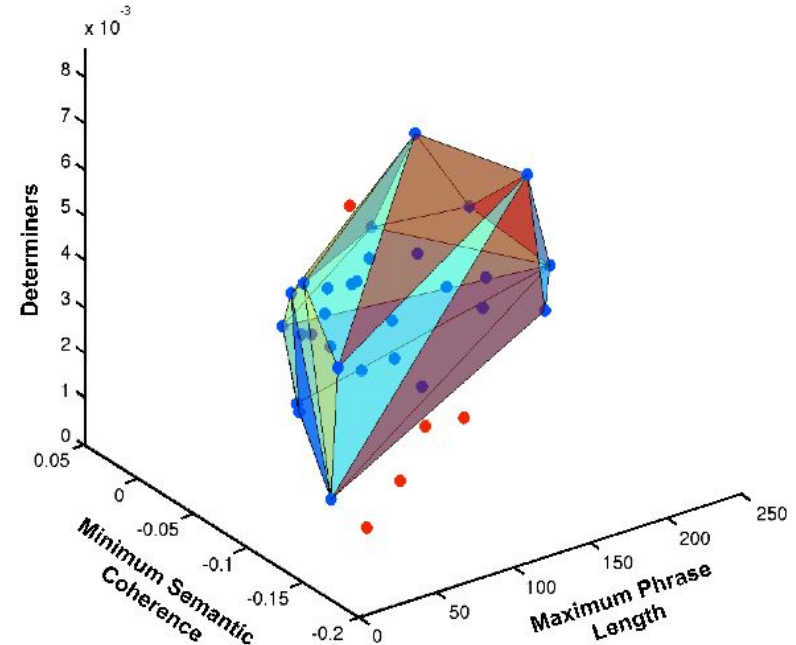
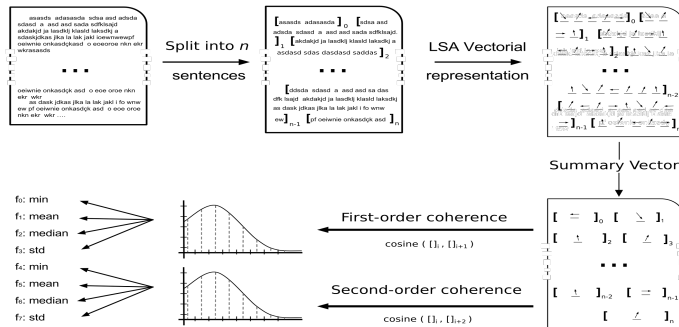
+20% increased sensitivity when compared to radiologist alone



IA en texto

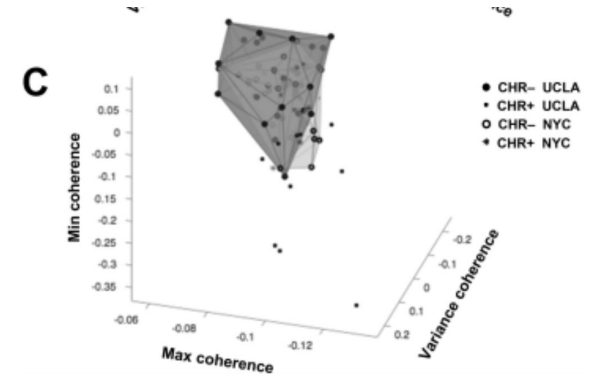
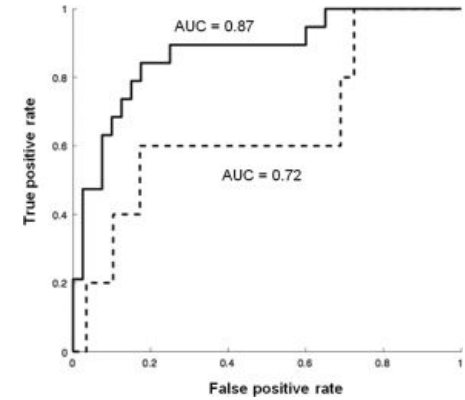
(2) NLP (old-style) para pacientes prodrómicos

- 34 pacientes CHR
- Entrevista abierta
- Seguimiento de 2.5 años
- 5 pacientes desarrollan psicosis



(2) NLP (old-style) para pacientes prodrómicos

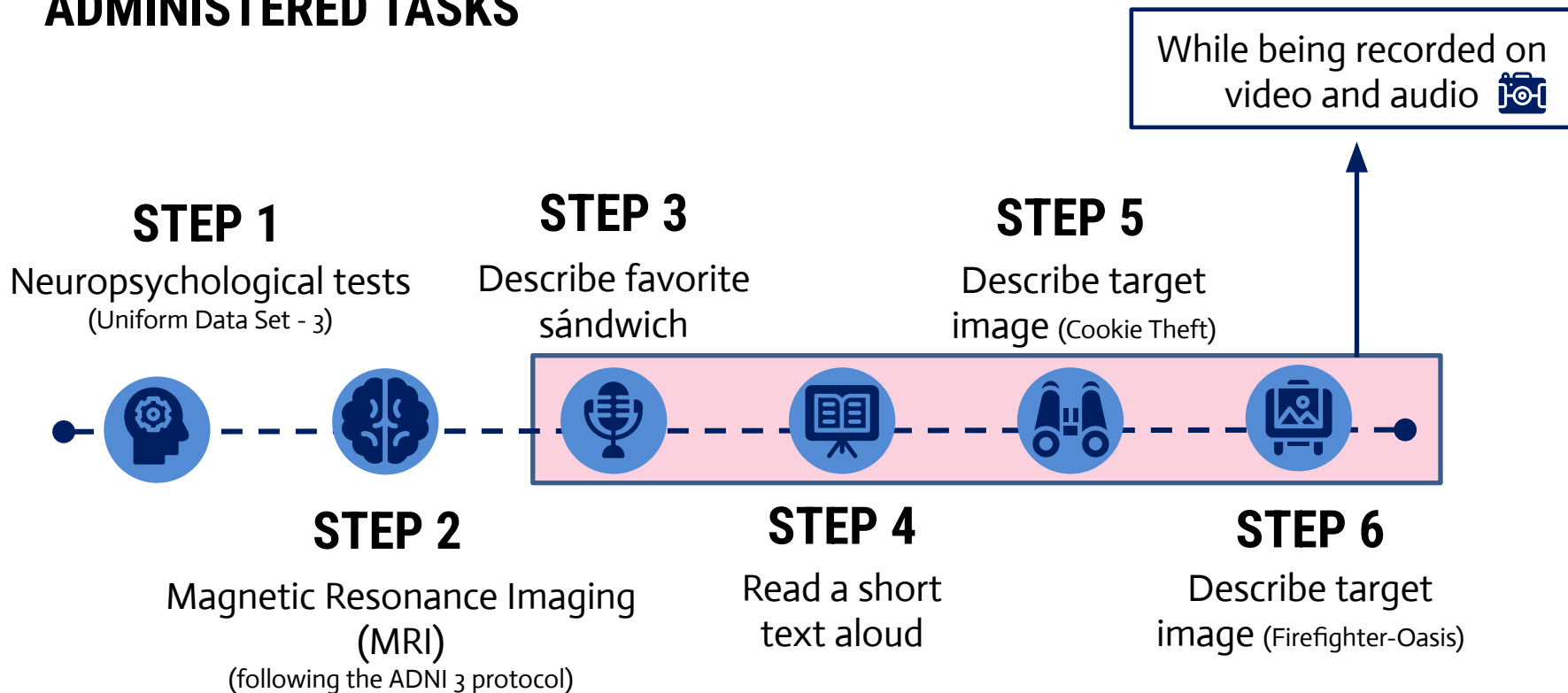
- 34 pacientes CHR + 59 (UCLA)
- Entrevista abierta
- Seguimiento de 2.5 años
- Entrenamos UCLA, validamos NY



IA multimodal

(3) Aplicación de IA para la detección de demencias

ADMINISTERED TASKS



(3) Protocolo

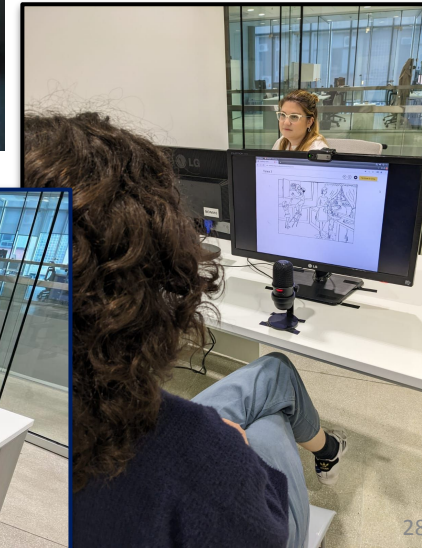
STEP 1 (Neuropsychological tests)

MOCA	/30	MMSE Estimativo: /30
MEMORIA VERBAL		
Craft Story		
Craft Story 21 R.I.	/44	
Craft Story 21 R.I. Parafraseo	/25	
Craft Story 21 R.D.	/44	
Craft Story 21 R.D. Parafraseo	/25	
Reconocimiento	/10	
Aprendizaje Verbal de Rey		
RAVLT Total	/75	
RAVLT Diferido	/15	
RAVLT Reconocimiento	/15	
RAVLT Intrusiones	/15	
RAVLT Falsos Positivos	/15	
MEMORIA VISUAL		
FB Reproducción	/17	Figura de Rey: /36
FB Reconocimiento	C / 1	Figura de Rey rec. C / 1
LENGUAJE		
Test de denominación (Boston 60)	/60	
Test de denominación Mint	/32	
Fluencia semántica animales	/50	
Fluencia semántica verduras	/50	
Fluencia fonológica (Letra P)	/50	
Fluencia fonológica (Letra M)	/50	
ATENCIÓN		
Dígitos Directos	Total: /10 Largo:	
Dígitos Inversos	Total: /10 Largo:	
Trail Making Test "A"	Tiempo: /150 Errores:	
Clave de Números	/133 Punt. Esc:	
FUNCIONES EJECUTIVAS		
Trail Making Test "B"	Tiempo: /300 Errores:	
FAB	/18	
Test de Stroop	PC: /100 Resistencia Inter.: /100	
Wisconsin	Categorías: /6 Perseveraciones:	
HABILIDADES VISUO CONSTRUCTIVAS		
Figura de Benson Copia	/17	Figura de Rey copia: /36
Test del Reloj	/10	
Copia del cubo (MoCa)	C / 1	
ESCALAS NEUROPSIQUIÁTRICAS		ESCALAS DE FUNCIONAMIENTO
GDS /15		FAQ: /30
HADS Ans.: /21 HADS Dep.: /21		EDO-10 FLENI: /10
NPI-Q (Severidad): /36 NPI-Q (Estrés): /60		Lawton and Brody: /8
CFI paciente: /14		CFI informante: /14

STEP 2 (MRI)



STEP 3 (video and audio recording)

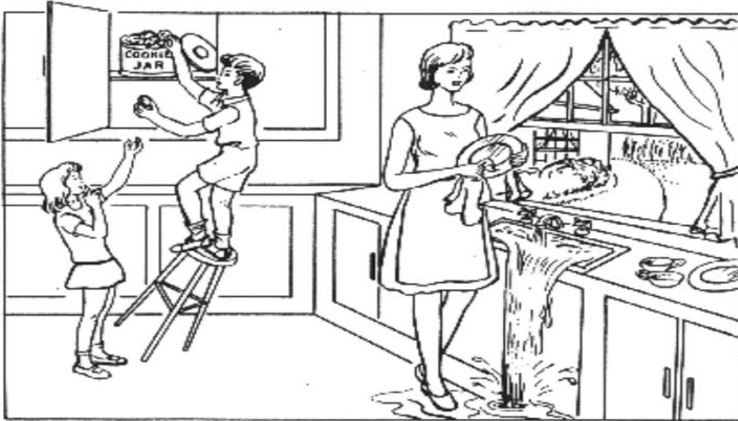


(3) Imágenes a describir

Instruction: "Tell me everything that is happening on the image."

Instruction: "Designate a name for the character and include it in a story that has a beginning, development and end"

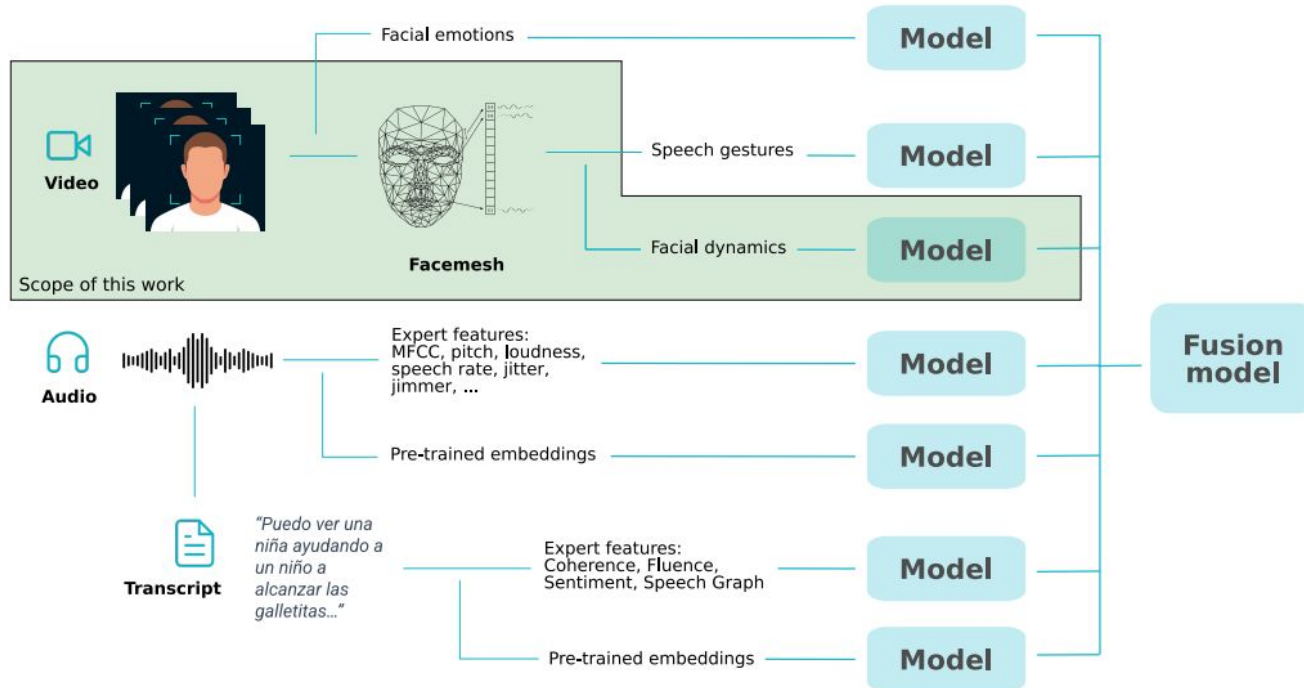
STEP 4 (Describe Cookie Theft Picture)



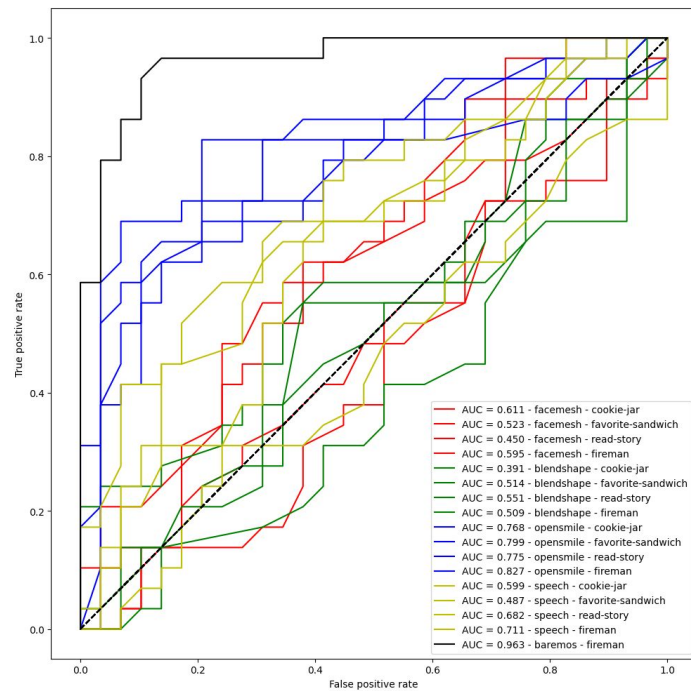
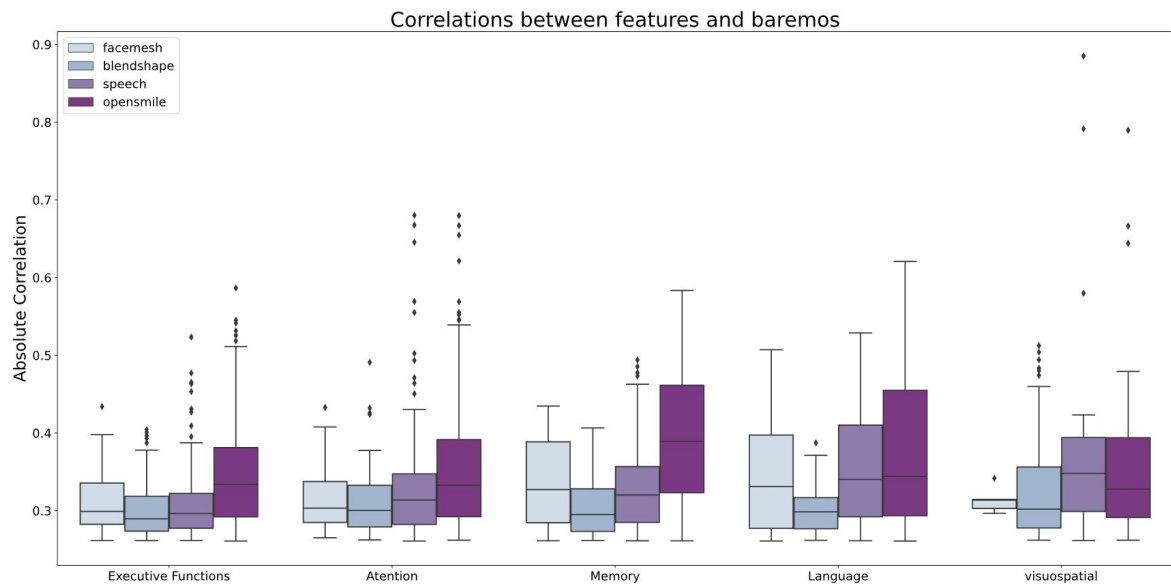
STEP 5 (Describe Firefighter-Oasis picture)



(3) Modelos de IA aplicados



(3) ¿Qué modalidad es la más informativa?



IA en Agentes

(4) Soporte diagnóstico en ataxias

151 tipos de ataxias, 3 casos clínicos de cada uno

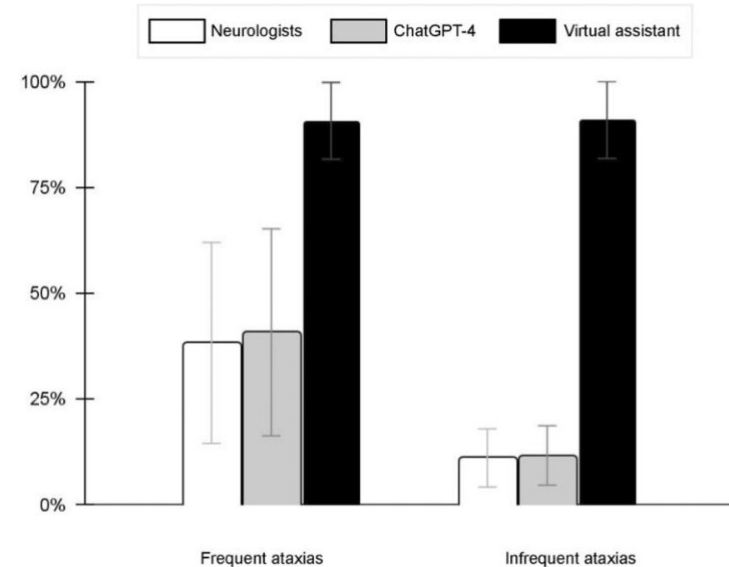
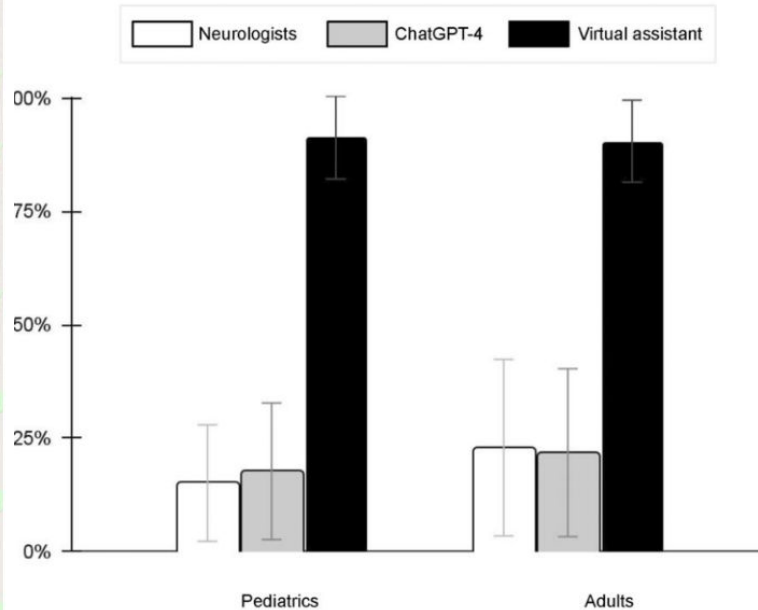
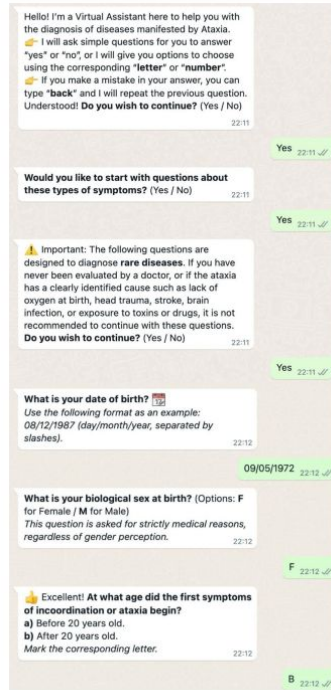
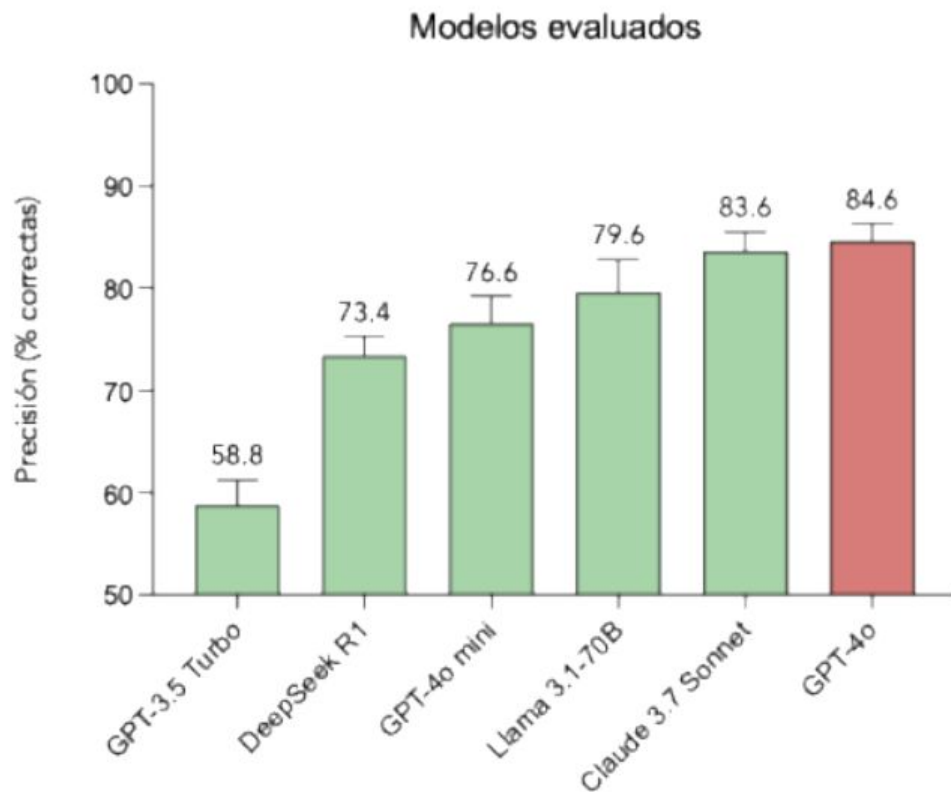
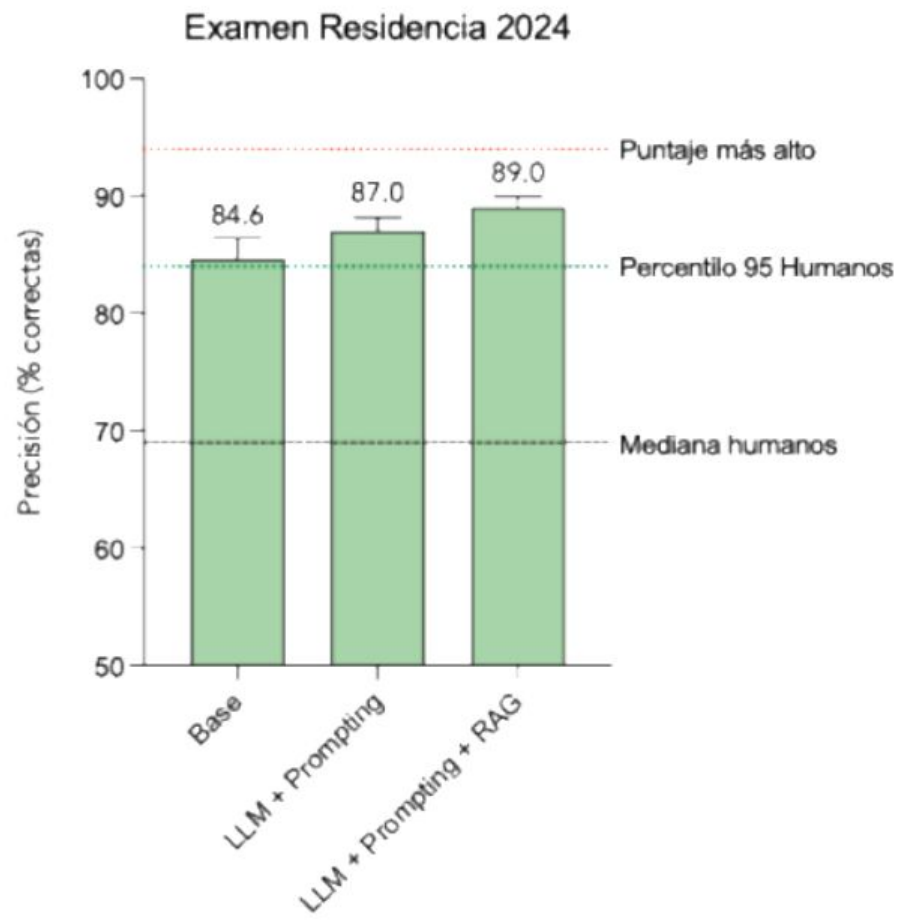


FIG. 1. Representative screenshot of the virtual assistant's workflow.
[Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1111/ene.15111)]

LLMs rindiendo exámenes de residencia



LLMs + Prompting + RAG vs humanos



Resumen

Imágenes

- Anania, Pilar, et al. "Enhancing Multiple Sclerosis Differential Diagnosis with AI-Powered Brain Volumetry." *MULTIPLE SCLEROSIS JOURNAL*. Vol. 30. No. 3., 2024.
- Hernández, Micaela A., et al. "Cognitive impairment, brain connectivity, and long-Covid: understanding the complex interplay." *Alzheimer's & Dementia* 20 (2024): e091565.
- Chaves, Hernán, et al. "Assessing robustness and generalization of a deep neural network for brain MS lesion segmentation on real-world data." *European Radiology* 34.3 (2024): 2024-2035.
- Travi, Fermín, et al. "Impact of long-COVID on the local and global efficiency of brain networks." *Clinical Neuroimaging* 1.1-2 (2024): e70001.

Texto

- Bedi, Gillinder, et al. "Automated analysis of free speech predicts psychosis onset in high-risk youths." *npj Schizophrenia* 1.1 (2015): 1-7.
- Corcoran, Cheryl M., et al. "Prediction of psychosis across protocols and risk cohorts using automated language analysis." *World Psychiatry* 17.1 (2018): 67-75.
- García, Adolfo M., et al. "How language flows when movements don't: An automated analysis of spontaneous discourse in Parkinson's disease." *Brain and language* 162 (2016): 19-28.
- Bedi, Gillinder, et al. "A window into the intoxicated mind? Speech as an index of psychoactive drug effects." *Neuropsychopharmacology* 39.10 (2014): 2340-2348.
- Carrillo, Facundo, et al. "Natural speech algorithm applied to baseline interview data can predict which patients will respond to psilocybin for treatment-resistant depression." *Journal of affective disorders* 230 (2018): 84-86.

Multimodalidad en demencia

- Belloli, Laouen, et al. "Multi-modal AI screening for MCI and Alzheimer's Disease: results from an Argentine Cohort." *Alzheimer's & Dementia* 20 (2024): e087333.

Agentes

- Alessandro, Lucas, et al. "Artificial Intelligence-Based Virtual Assistant for the Diagnostic Approach of Chronic Ataxias." *Movement Disorders* (2025).

Conclusiones

IA Ubicua: imágenes, textos, audio, videos, agentes... demuestran consistentemente rendimientos comparables o superiores a tareas que realizan los médicos

IA reemplaza tareas, no humanos. ¡Ojo con el sedentarismo cognitivo!

Soberanía y regulación: Cada país o región tiene que desarrollar los métodos e infraestructura para evaluar y acomodar estas nuevas tecnologías.

Deshumanización vs Rehumanización

¡Muchas gracias!

¿Preguntas?

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