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# Atención hospitalarIA del futuro

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# Índice

# Introducción

Este documento tiene la intención de recoger y ampliar toda la información de la charla incluidos ejemplos, documentación, noticias y recursos de aprendizaje para aquellas personas que quieran ampliar su conocimiento en este campo.

➔ **Google Health/Deepmind:** Sección específica sobre las innovaciones que aporta Google al desarrollo de IA en salud. Herramientas y artículos.

➔ **No te puedes perder:** Conjunto de artículos en revistas o periódicos técnicos con noticias e innovaciones de IA en salud, así como referencias.

➔ **Lucha contra el cáncer/Alzheimer:** Noticias y avances en estos campos de la mano de la IA

➔ **Dispositivos médicos:** Ejemplos de hardware usados en atención hospitalaria con las certificaciones adecuadas.

➔ **AWS:** Herramientas y servicios de Amazon enfocados en IA en salud

➔ **Regulaciones:** Sección de noticias y artículos referentes a las actuales y futuras regulaciones de sistemas de IA en salud.

➔ **COVID-19:** Herramientas de IA usadas para la predicción de COVID-19.

➔ **Python:** Paquetes de python interesantes para el desarrollo de IA y paquetes concretos aplicables a la salud.

➔ **Empresas:** Ejemplos de compañías actuales especializadas en el sector de IA en salud.

➔ **Libros:** Bibliografía para la realización de la charla y otros.

# Google Health/Deepmind

- Alphafold, el sistema que resolvió el problema de la predicción de la estructrua 3D de las proteínas

- AlphaFold, open source code provides an implementation of the AlphaFold v2.0 system

- How 3 healthcare organizations are using generative AI

- Using AI, Google Research contributed to the Human Pangenome project to improve the quality of data, and draft the first human pangenome.

- DeepConsensus improves the accuracy of sequences with a gap-aware sequence transformer | Nature Biotechnology

- Predicting pathogenic protein variants | Science

- ▶ **How DeepConsensus works**

- ▶ **Google Research Vs. Genomic Bias**

- ▶ **The AlphaFold Revolution**

- What does it take to get AI right for healthcare? | Google Health | Dr. John Halamka and Greg Corrado

- Github releases google/deepconsensus

- AlphaMisense | A catalogue of genetic mutations to help pinpoint the cause of diseases, new AI tool classifies the effects of 71 million 'missense' mutations | DeepMind

- Accurate proteome-wide missense variant effect prediction with AlphaMissense | Science

- Generative-AI: Dreaming up proteins, Alphafold solves protein folding problem

- Building better pangenomes to improve the equity of genomics – Google Research Blog

- A new genome sequencing tool powered with our technology

- How AI can improve health for everyone, everywhere | Google Health blog

- DeepMind - how the AI tool is transforming the world of science

- Developing reliable AI tools for healthcare - DeepMind

- Google DeepMind on LinkedIn: One month until the #AISafetySummit

- Google DeepMind on LinkedIn: How is AlphaFold helping create life-saving treatments?

- Deepmind - Identifying AI-generated images with SynthID

# No te puedes perder

- Medical AIs are advancing - when will they be in a clinic near you? | New Scientist

- Why you may have a thinking digital twin within a decade - BBC News

- Google AI helps doctors decide whether to trust diagnoses made by AI | New Scientist

- Inteligencia artificial al servicio de la salud del futuro | Revista Médica Clínica Las Condes

- La realidad de la Inteligencia Artificial en Salud - IIC

- La IA, un mercado de 13.300 millones para el sector salud – PR Noticias

- Biden-Harris Administration Launches Artificial Intelligence Cyber Challenge to Protect America's Critical Software | The White House + DeepMind

- La OMS publica el primer informe mundial sobre inteligencia artificial (IA) aplicada a la salud y seis principios rectores relativos a su concepción y utilización

- IA en la salud: un caso de éxito para los pacientes con enfermedades cardiovasculares

- The impact of AI at The Royal Bolton NHS Hospital, UK | Qure AI

- Qure AI - AI to enable accessible, affordable & timely care across the globe

- 2023 State of AI in 14 Charts - HAI Standford University

- AI Index Report 2023 – Artificial Intelligence Index

- The AI Index Report 2022 – Artificial Intelligence Index

- The ICPerMed vision for 2030 - Vision Paper 2019

- DICOM Standard Current Edition

- Humanity is on the brink of major scientific breakthroughs, but nobody seems to care

- The biggest scientific challenges that AI is already helping to crack | New Scientist

- Sizing the prize What's the real value of AI for your business and how can you capitalise? | PWC

- Un médico en tu bolsillo | SNGULAR

- Cancer de mama detectado 5 años antes

- La inteligencia artificial al servicio de la salud y el bienestar, a examen

- AI Researchers Tap into Medical Twitter To Create Powerful New Analysis Tool | Standford University

- Visualising AI - Artist-created images and animations about artificial intelligence (AI) made freely available online | DeepMind

- A visual–language foundation model for pathology image analysis using medical Twitter | Nature Medicine

- El Servicio Madrileño de Salud, pionero en la aplicación de Inteligencia Artificial Generativa para la mejora del diagnóstico en pacientes con enfermedades raras – Centro de noticias

- Commercializing AI in Healthcare: The Jobs to be Done | Andreessen Horowitz

- Med-BERT: pretrained contextualized embeddings on large-scale structured electronic health records for disease prediction

- SMART on FHIR - Azure Health Data Services | Microsoft Learn

- Team behind AI program AlphaFold win Lasker science prize | Biology | The Guardian

- Reglamento por el que se establecen normas armonizadas en materia de inteligencia artificial

- AI Risk Management Framework | NIST

- Towards a Standard for Identifying and Managing Bias in Artificial Intelligence

- Health Insurance Portability and Accountability Act of 1996 (HIPAA) | CDC

- Enforcement | Federal Trade Commission

- AI Incident Database

- Team behind AI program AlphaFold win Lasker science prize | Biology | The Guardian

- AI in precision medicine | Healthcare Transformers

# Lucha contra el cáncer

- Luchar contra el cáncer con Inteligencia Artificial y Big Data | OpenMind (bbvaopenmind.com)

- Cronología: la lucha contra el cáncer | Interactivos OpenMind

- What Is Cancer? - NCI

- The Cancer Genome Atlas Program (TCGA) - NCI

- Big data in basic and translational cancer research | Nature Reviews Cancer

- Cancer Genome Project

- Project Baseline

- Mayo researchers use AI to detect weak heart pump via patients' Apple Watch ECGs

- The role of big data in medicine | McKinsey

- What can we do | CNAG, Centro Nacional de Análisis Genómico

- BPGbio | AI-Powered Biology-Focused Biopharma - BPGbio

# Alzheimer

- Un increíble algoritmo de aprendizaje profundo detecta el alzhéimer con un 90% de precisión

- TARTAGLIA - Red Federada de Inteligencia Artificial | Ace Alzheimer Center Barcelona (fundacioace.com)

- Inicio - Tartaglia

- TARTAGLIA, la red de IA que acelerará la investigación clínica y sanitaria en España | Sanidad | CIO

- IA y el Alzheimer: Una Revolución en la Detección Temprana (msn.com)

- 'Would You Send Your Grandma Here?' How Data Scientists Are Making Healthcare More Humane | Built In NYC

- Chiesi joins Barcelona Health Hub in its commitment to innovation and research to improve the lives of patients | Barcelona Health Hub

## Dispositivos médicos

- IDx-DR - Healthvisors
- AI Software - Imagen
- Ada - Chatbot médico con marcado CE
- Diagnose HFpEF with confidence

## AWS

- Amazon Mechanical Turk
- AWS HealthOmics - Genomic Data Analysis
- Generate clinical notes with AI – AWS HealthScribe
- Medical Imaging in the Cloud – AWS HealthImaging
- Healthcare NLP - Extract Health Data - Amazon Comprehend Medical
- Annotate data for less with Amazon SageMaker Ground Truth and automated data labeling | AWS Machine Learning Blog

## Regulaciones

- Standford -Analyzing the European Union AI Act: What Works, What Needs Improvement
- Conozca a su gemelo digital, una versión virtual de sí mismo - EU Commission
- USA-China-EU plans for AI: where do we stand?
- The European AI Alliance | Shaping Europe's digital future
- David Talby - Forbes Technology Council
    - The Accuracy Limits Of Data-Driven Healthcare
    - Large Language Models, No-Code, and Responsible AI - Trends in Applied NLP in Healthcare - AMIA April 2023
    - State-Of-The-Art Applied Artificial Intelligence Defined
    - The Current State Of The Healthcare AI Revolution
    - Why Machine Learning Models Crash And Burn In Production

- Spain launches AI regulation agency in bid to become industry leader
- Referencia de Consejo de Ministros Aprobado el estatuto de la Agencia Española de Supervisión de la Inteligencia Artificial - Gobierno España
- ¿Qué aporta la Inteligencia Artificial y en qué consiste la Agencia Española encargada de su supervisión?
- Regulating AI in the UK | Ada Lovelace Institute
- Urgent Call for AI to "Do No Harm" in Biomedicine | Standford University

## COVID-19

- Inteligencia artificial, la nueva aliada contra el COVID-19
- AI-Driven Tools for Coronavirus Outbreak: Need of Active Learning and Cross-Population Train/Test Models on Multitudinal/Multimodal Data | SpringerLink
- The role of artificial intelligence in tackling COVID-19 - PMC
- Bi-Level Prediction Model for Screening COVID-19 Patients Using Chest X-Ray Images
- Using AI to risk stratify COVID19 patients from chest X-ray | qure.ai

## Python

- MedPy · PyPI
- OpenCV
- MNE-Python Official Site
- MNE · PyPI
- NLTK
- spaCy
- MONAI
- MedNet: Pre-trained Convolutional Neural Network Model for the Medical Imaging Tasks | arxiv

## Empresas

- 2bPrecise | 2bPrecise is a precision medicine data delivery platform, bringing genomic data to doctors acros...

- DNAnexus | The world's most secure & trusted biomedical cloud platform that accelerates clinical and scie...

- Molecular You | Get a clearer picture of your health

- Adhera Health | Empowering people with chronic conditions and their family caregivers with adaptive self-management for better health

- Canary Speech | Improving our health, one voice at a time.

- Philips Healthcare | About

- Mediktor | Dirigimos a los pacientes a su servicio de atención sanitaria más adecuado

- AgileMD | Stop working for your EHR. Make it work for you.

- Healthcare Technology Solutions to Streamline Care Delivery with Enhanced Workflows and Reduced Workarounds

- Arterys | The Arterys platform extracts actionable insights from medical images to add clinical value, improve diagnostic decision making, efficiency and productivity.

- Tempus | We built the platform for oncology and have expanded it to neuropsychiatry, cardiology, infectious disease (through COVID), and radiology.

- Interpretation + AI - Imagen

## Libros

- Inteligencia artificial en el ámbito de la salud | ELSEVIER

- Deep Medicine | Eric Topol

- Machine Learning for High-Risk Applications | O´Reilly