XVIII Edició

Actualització en l'Àrea Pediàtrica

Temes d'interès en Pediatria d'Atenció Primària

Dimarts, 24 d'octubre de 2023

Alfredo Vellido

Aplicacions de la Intel·ligència Artificial en Pediatria

IA & clínica

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WHO'S WHO
Published annually since 1848

SOCO

Alfredo Vellido

I am currently a full professor (formerly a *Ramón y Cajal* researcher) at CS / UPC, and part of the SOCO SGR Research Group and the IDI
Member of the CIBER-BBN, IABiomed and the IEEE-CIS Data Mining and Big Data Analytics Technical Committee ,
in which I am **Chair of the** Explainable Machine Learning (EXML) Task Force and a member of the **Task Force on Medical Data Analysis**
Member of the Editorial Boards of PLoS ONE, Neural Processing Letters and Frontiers in Artificial Intelligence, Medicine and Public Health.

CS academic coordinator at **ESEIAAT school in Terrassa**.
Deputy Academic Director of the CS Department at UPC.

Special Sessions Currently Organized:
The Coming of Age of Explainable AI (XAI) and Machine Learning, IJCNN 2023, (Queensland, Australia)
Explainable AI in Healthcare (XAI-Healthcare 2023) Workshop, AIME 2023, (Portoroz, Slovenia)
Analysis of Molecular Dynamics Data in Proteomics, IWBBIO 2023, (Gran Canaria, Spain)
Some invited talks:
Workshop on the Impact of Artificial Intelligence in Healthcare (UPF, Barcelona, Spain), 2019
Science for Dialysis Meeting: Artificial Intelligence at Bellvitge University Hospital (Barcelona, Spain), 2018
"Social beasts: societal challenges of AI and ML in medicine" (youtube video)
Some past conferences/special sessions/workshops over the last five years:
ESANN 2021 (virtual event) "Interpretable Models in Machine Learning and Explainable Artificial Intelligence"
IJCNN 2021 (virtual event) *"Transparent and Explainable Artificial Intelligence (XAI) for Health"*
WCCI/IJCNN 2020 (Glasgow, Scotland, UK) *"Explainable Computational/Artificial Intelligence Methods"*
IJCNN 2019 (Budapest, Hungary) *"Explainable Machine Learning"*
IDEAL 2019 (Manchester, UK) *"Machine Learning in Healthcare"*
ESANN 2019 (Bruges, Belgium) "Societal Issues in Machine Learning: When Learning from Data is Not Enough"
WSOM+2019 Conference in Barcelona, Spain (June 26-28, 2019)

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research   publications   bio   teaching

IDEAI
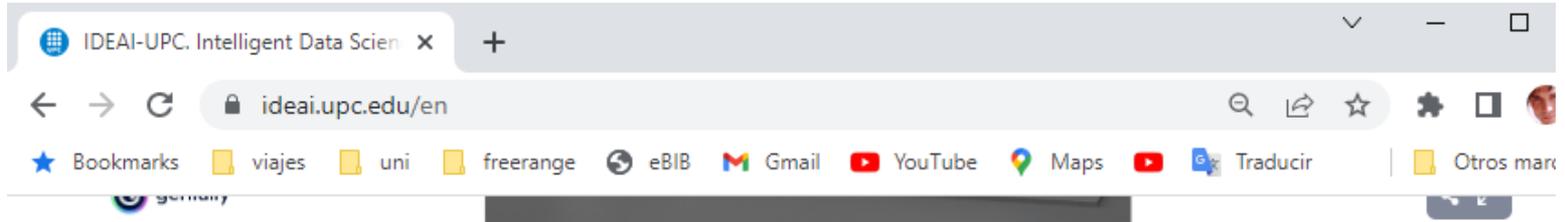
Digital Society

Health, Wellness & Inclusion

Education

Industry 4.0

Economy

Innovation

Efficient Resources

Ethics

Talent

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Our Team

GREC
Knowledge Engineering
Research Group

KEMLG
Knowledge Engineering
and Machine Learning
Group

SOCO
Soft Computing Group

GPI
Image Processing
Group

GPLN
Natural Language
Processing Group at
TALP

VEU
Speech Processing
Group

CBA
Communications
Broadband Group

News ((•))

Polítiques Digitals i la UPC posen a l'abast de tothom el curs divulgatiu en Intel·ligència Artificial 'ciutadanIA'

L'Intelligent Data Science and Artificial Intelligence Research Center (IDEAI) de la Universitat Politècnica de Catalunya · BarcelonaTech (UPC) i el Departament de la Vicepresidència i de...

May 19, 2022

XVIII Edició
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Dimarts, 24 d'octubre de 2023

¿Es la IA I?

no

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¿Es la IA I?

I

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¿Es la IA I?

A

¿Es la IA I?

IA

¿Es la IA I?

The Observer
Artificial intelligence (AI)

Fantasy fears about AI are obscuring how we already abuse machine intelligence
Kenan Malik

Sun 11 Jun 2023 06.31 BST

We blame technology for decisions really made by governments and corporations

Facial recognition technology is being tested at Romford in Essex. Photograph: Ian

Nonsense on Stilts - by Gary Mar   ×   +

🔒 garymarcus.substack.com/p/nonsense-on-stilts?s=w

★ Bookmarks   📁 viajes   📁 uni   📁 freerange   🌐 eBIB   M Gmail   ▶ YouTube   📍 Maps   ▶   Traducir

Nonsense on Stilts

No, LaMDA is not sentient. Not even slightly.

Gary Marcus
Jun 12

♡ 47   💬 165

Abeba Birhane
@Abebab

we have arrived at peak AI hype accompanied by minimal critical thinking

June 12th 2022

52 Retweets   **356** Likes

Alberto Delgado
@jadelgador

It is mystical to hope for awareness, understanding, common sense, from symbols and data processing using parametric functions in higher dimensions. @GaryMarcus

IA & clínica

Sucendiendo ahora!!!: un nuevo empuje para la IA en medicina

ML4H: Machine Learning for Health

What Parts of
Disruption by
Now?

NIPS ML4H 2017: a
Friday December 08, 2
Long Beach Conventi

This workshop will bri
clinicians, and healthc
invited talks, contribut

08:20-09:00	Keynote I: Zak Kohane, Harvard DBMI
09:00-09:30	Mustafa Suleyman, Google DeepMind
09:30-10:00	Jennifer Chayes, Microsoft Research New England
10:00-10:30	**Contributed spotlights**
10:30-11:00	**Poster Session I** and *coffee break*
11:00-12:00	Invited clinical panel
	• Susann Beier, U. Auckland
	• James Priest, Stanford
	• Irina Strigo, UCSF
	• Prashanti Vemuri, Mayo Clinic
	• Hollis Potter, Hospital for Special Surgery
	• Enrique Velazquez, Rady Children's Hospital

IA & clínica

Councils use 377,000 people's data in efforts to predict child abuse

Exclusive: Use of algorithms to identify families for attention raises stereotyping and privacy fears

Niamh McIntyre *and* **David Pegg**

Sun 16 Sep 2018 16.00 BST

f ✕ ✉

1,232

▲ At least five councils have developed or implemented a predictive analytics system to safeguard children.
Photograph: Alamy Stock Photo

Vast quantities of data on hundreds of thousands of people is being used to construct computer models in an effort to predict child abuse and intervene before it can happen, the Guardian has learned.

ASUNTOS SOCIALES DE LA IA

- **Legislación**

- **Interpretabilidad & Explicabilidad & Transparencia**

- **Privacidad y Anonimidad**

- **Ética**

- **etc. & todo junto**

Kidney Diseases

Kidney Dis 2019;5:11–17
DOI: 10.1159/000492428

Societal Issues Concerning the Application of Artificial Intelligence in Medicine

Alfredo Vellido

Intelligent Data Science and Artificial Intelligence (IDEAI) Research Center, Universitat Politècnica de Catalunya (UPC BarcelonaTech), Barcelona, Spain

ASUNTOS SOCIALES DE LA IA

Estos asuntos sociales pueden tomar muchas formas, pero todos implican el diseño de modelos desde una **perspectiva centrada en lo humano**, incorporando **requerimientos y limitaciones relevantes para los humanos**.

ASUNTOS SOCIALES DE LA IA

- **Privacidad y anonimidad**

Un ejemplo ilustrativo: *Nature* reporta la declaración de la *U.K. Information Commissioner's Office* indicando que el operador de tres hospitals basados en Londres "**had broken civil law when it gave health data to Google's London-based subsidiary DeepMind**". Tales datos debían ser la base para la creación de modelos para tests de resultados en problemas de detección de signos de *acute kidney injuries*, pero no se cumplieron los protocolos de privacidad e identificabilidad, debido a una transferencia a gran escala de datos de pacientes desde los hospitales a la compañía privada.
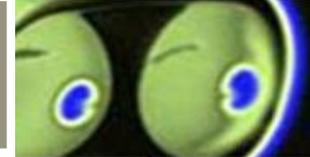
The DeepMind debacle demands dialogue on data

Mishandling of patient information shows how governments and companies must become more worthy of trust, says **Hetan Shah**.

- **Privacidad y anonimidad**

De acuerdo al **Royal Statistical Society's executive director**, tres lecciones han de ser extraídas:

1) debido al **déficit social de confianza en los datos**, la transferencia de los mismos debería garantizar su transparencia y publicidad;

2) la transferencia de datos debería ser **proporcional a la tarea medica** involucrada (en este caso, el desarrollo de modelos para la detección de signos de *acute kidney injury*);

3) **mecanismos de control de governanza** (y no sólo legislación) para la gestión, uso y manejo de datos deberían ser fortalecidos o creados cuando fuese necesario.

"**innovations such as artificial intelligence, machine learning […] offer great opportunities, but will falter without a public consensus around the role of data**".

HUMANOS, INTERPRETABILIDAD, SALUD

Abismo entre info / patrones / conocimiento / toma de decisiones

Máquinas que aprenden, doctores que deciden

"Machine Learning employed in healthcare will act as a tool to aid and refine specific tasks performed by human professionals"

MJ Reid, **Black-Box Machine Learning: Implications for Healthcare***, Polygeia, April 6, 2017*

IA & clínica
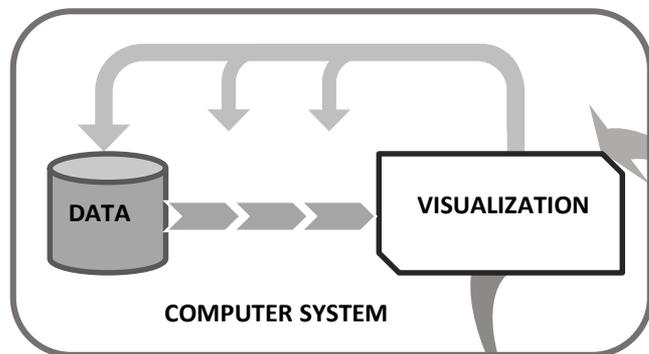
a) Guarantee of medical interpretability
b) Protocols and guidelines compliance
c) Point-of-care workflow compliance

DATA

VISUALIZATION

COMPUTER SYSTEM

DATA ANALYST

MEDICAL EXPERT

MEDICAL / CLINICAL DOMAINS
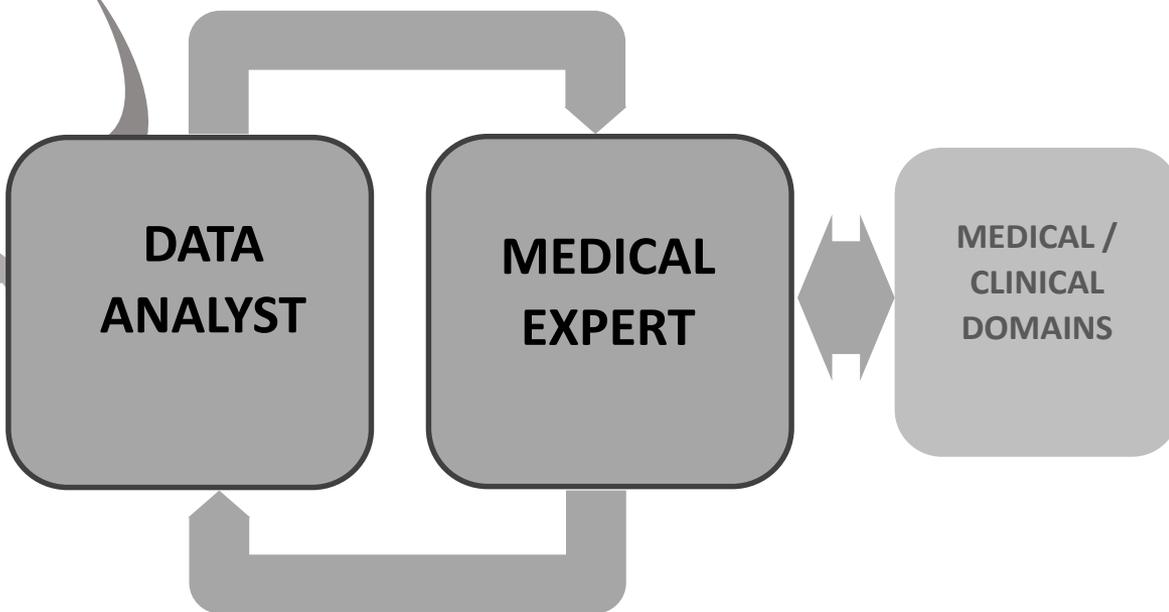
a) Statement of interpretability requirements
b) Understanding model interpretability limitations
c) Description of medical decision making process
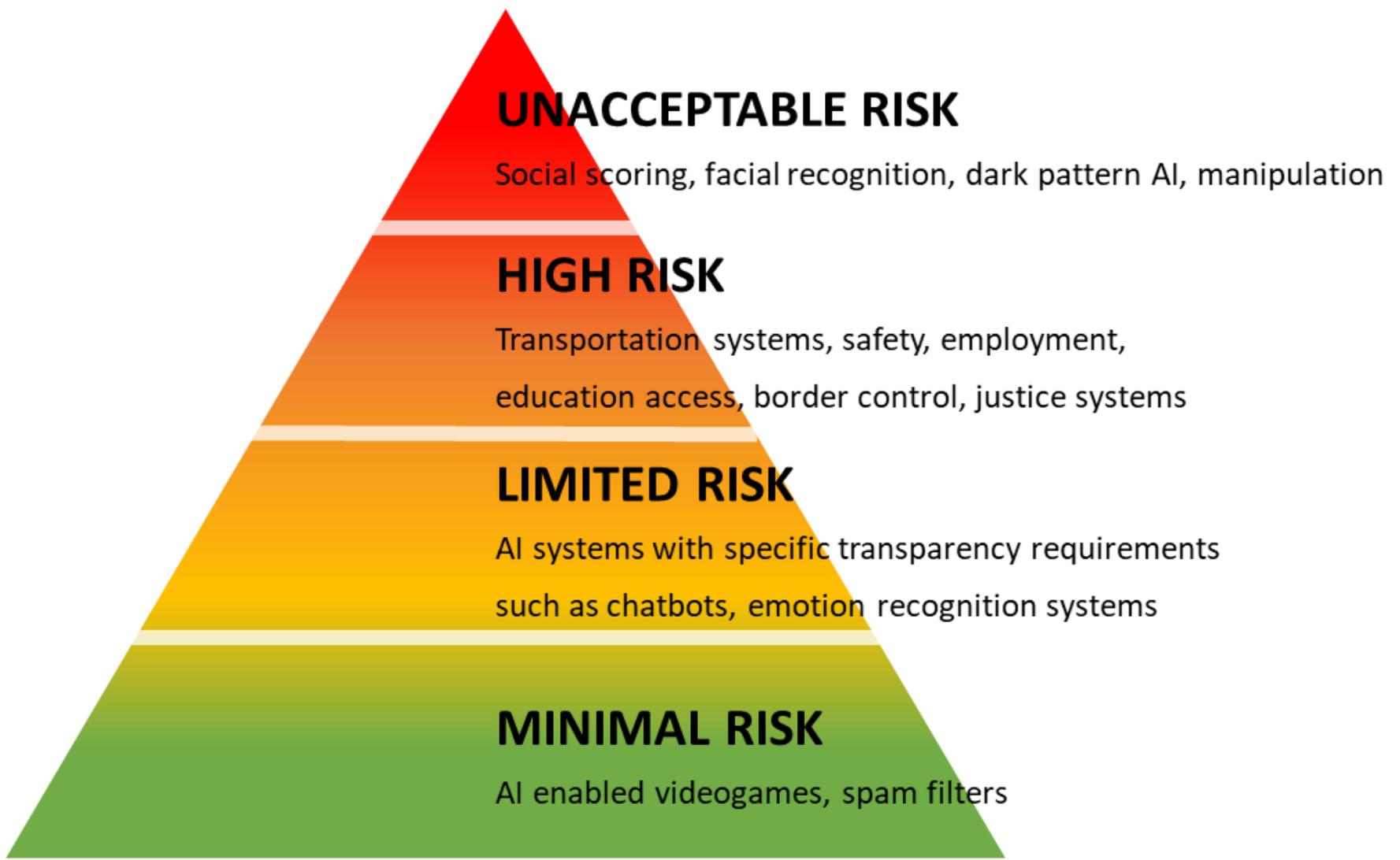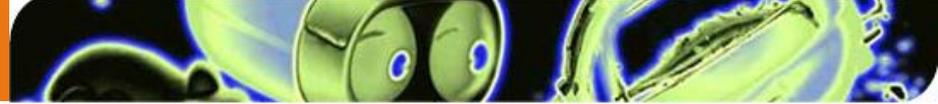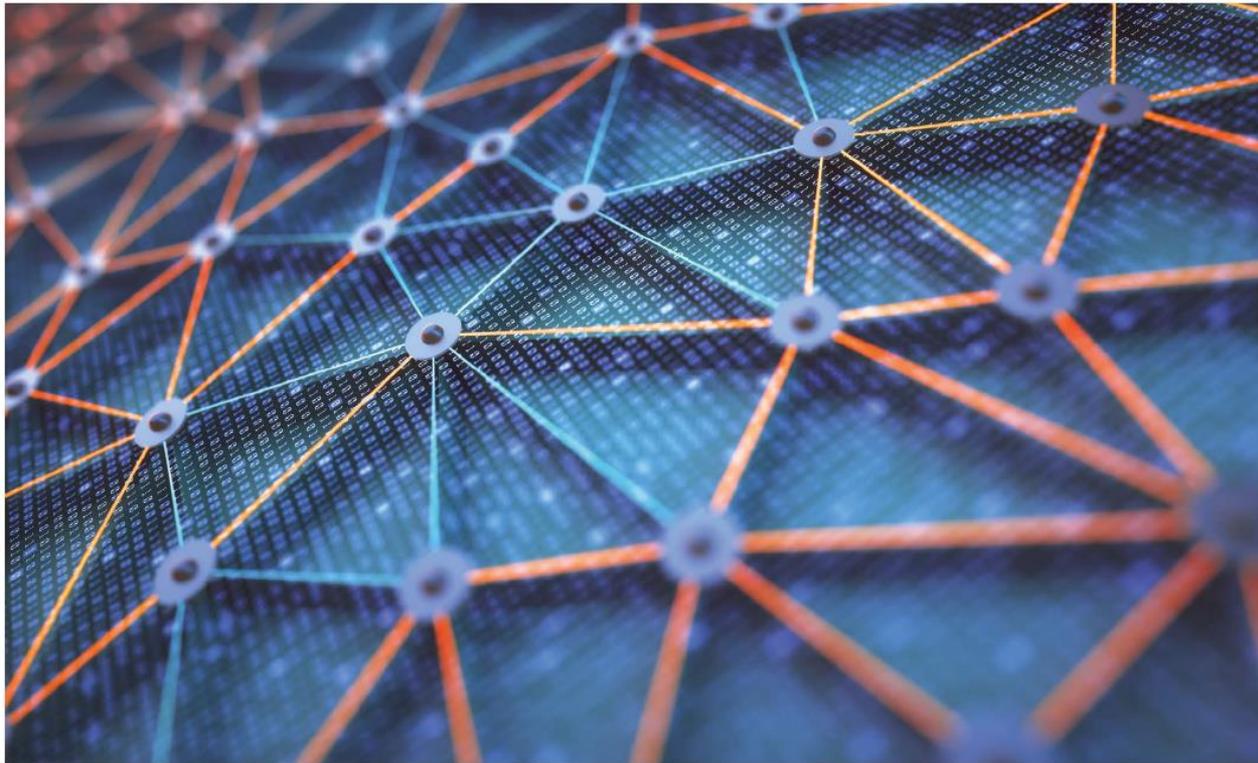d) Verification of data analysis results

SOCIETAL ISSUES of AI

- ## Legislación

The 2018 **European Union directive for General Data Protection Regulation (GDPR)** mandates a ***right to explanation*** of all decisions made by **"automated or artificially intelligent algorithmic systems"**. According to its Article 13, the right to explanation implies that the **"data controller"** is legally bound to provide requesting citizens with **"meaningful information about the logic involved, as well as the significance and the envisaged consequences of such processing** [automated decision making, as described in its Article 22] **for the data subject**".

eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0206

UNACCEPTABLE RISK

Social scoring, facial recognition, dark pattern AI, manipulation

HIGH RISK

Transportation systems, safety, employment,

education access, border control, justice systems

LIMITED RISK

AI systems with specific transparency requirements

such as chatbots, emotion recognition systems

MINIMAL RISK

AI enabled videogames, spam filters

Work / Technology & tools

The use of artificial intelligence in medicine is growing rapidly.

THE REPRODUCIBILITY ISSUES THAT HAUNT HEALTH-CARE AI

Health-care systems are rolling out artificial-intelligence tools for diagnosis and monitoring. But how reliable are the models? **By Emily Sohn**
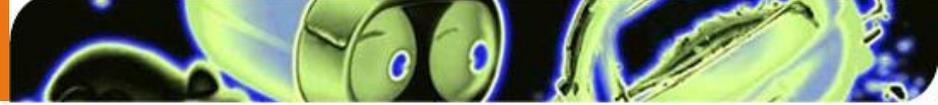
Reproducibilidad

- **Representatividad de los datos.**
- **Barreras estructurales: legislación y normativas, privacidad, recursos ...**
- **Sesgo**
- **Data leakage**
- **Falta de estándares. *ML as medical device*.**
- **Falta de política de datos (★)**
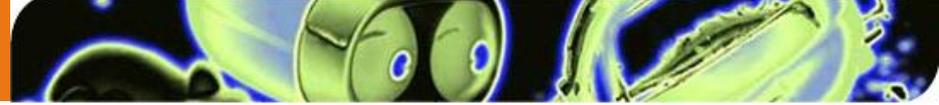
¿Qué hay de lo mío? IA y pediatría

Machine Learning for Child and Adolescent Health: A Systematic Review

Zahra Hoodbhoy, MBBS, MEd,[a,*] Sarah Masroor Jeelani, MBBS,[a,*] Abeer Aziz, MBBS,[a] Muhammad Ibrahim Habib,[b] Bilal Iqbal,[b] Waqaas Akmal, MBBS,[b] Khan Siddiqui, MD,[c] Babar Hasan, MBBS,[a] Mariska Leeflang, PhD,[d] Jai K. Das, MBBS, MBA[a]
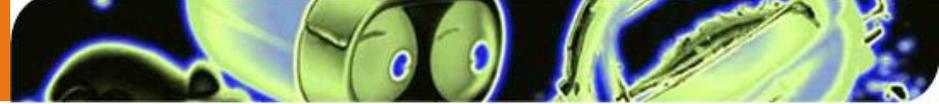
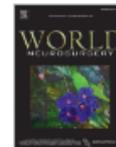# ¿Qué hay de lo mío? IA y pediatría

Machine learning concepts, concerns and opportunities for a pediatric radiologist

Michael M. Moore ✉, Einat Slonimsky, Aaron D. Long, Raymond W. Sze & Ramesh S. Iyer

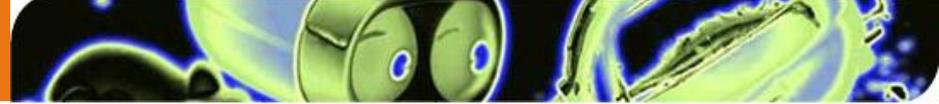*Pediatric Radiology* **49**, 509–516 (2019) | Cite this article

ELSEVIER

World Neurosurgery
Volume 157, January 2022, Pages 99-105

Literature Review

Artificial Intelligence Applications in Pediatric Brain Tumor Imaging: A Systematic Review

Jonathan Huang, Nathan A. Shlobin, Sandi K. Lam, Michael DeCuypere ⚲ ✉

¿Qué hay de lo mío? IA y pediatría

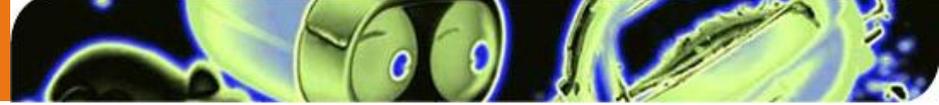## Computerized decision support and machine learning applications for the prevention and treatment of childhood obesity: A systematic review of the literature

Andreas Triantafyllidis [a], Eleftheria Polychronidou [a], Anastasios Alexiadis [a], Cleilton Lima Rocha [b], Douglas Nogueira Oliveira [b], Amanda S. da Silva [b], Ananda Lima Freire [b], Crislanio Macedo [b], Igor Farias Sousa [b], Eriko Werbet [b], Elena Arredondo Lillo [c], Henar González Luengo [c], Macarena Torrego Ellacuría [c], Konstantinos Votis [a], Dimitrios Tzovaras [a]

¿Qué hay de lo mío? IA y pediatría