

ARTIFICIAL INTELLIGENCE IN HEALTH

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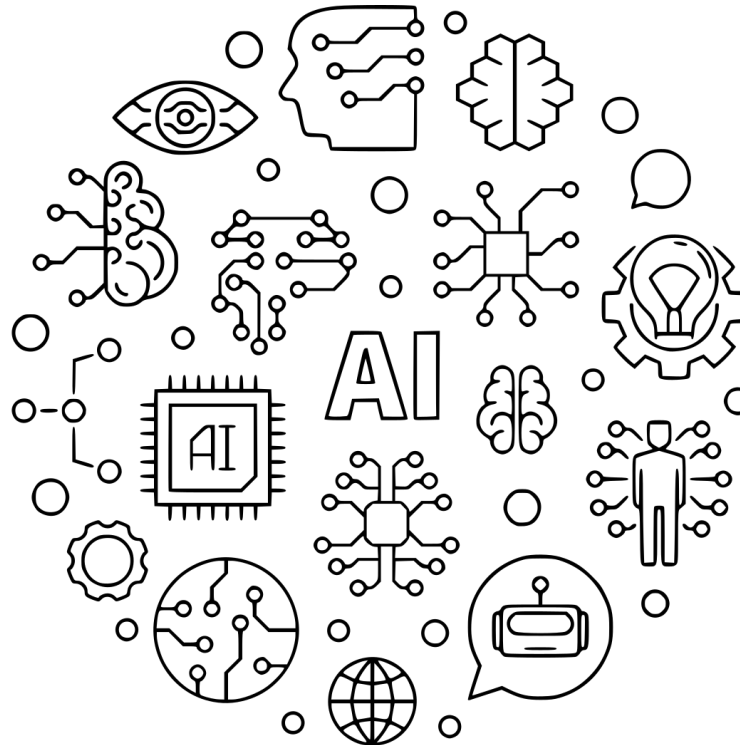


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ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI) refers to the simulation of human intelligence processes by machines



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ARTIFICIAL INTELLIGENCE is important

because ...

- Its versatility
- Use of data



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AI VS. MACHINE LEARNING VS. DEEP LEARNING



- Machine learning (ML) is a subfield of AI,
- while Deep Learning (DL) is a subfield of ML.



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AI APPLICATIONS

- Expert systems
- Speech recognition
- Understanding natural language
- Computer vision
- Gaming Industry
- Heavy industries
- Weather Forecasting



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AI APPLICATIONS

- **Expert systems**

- Speech recognition

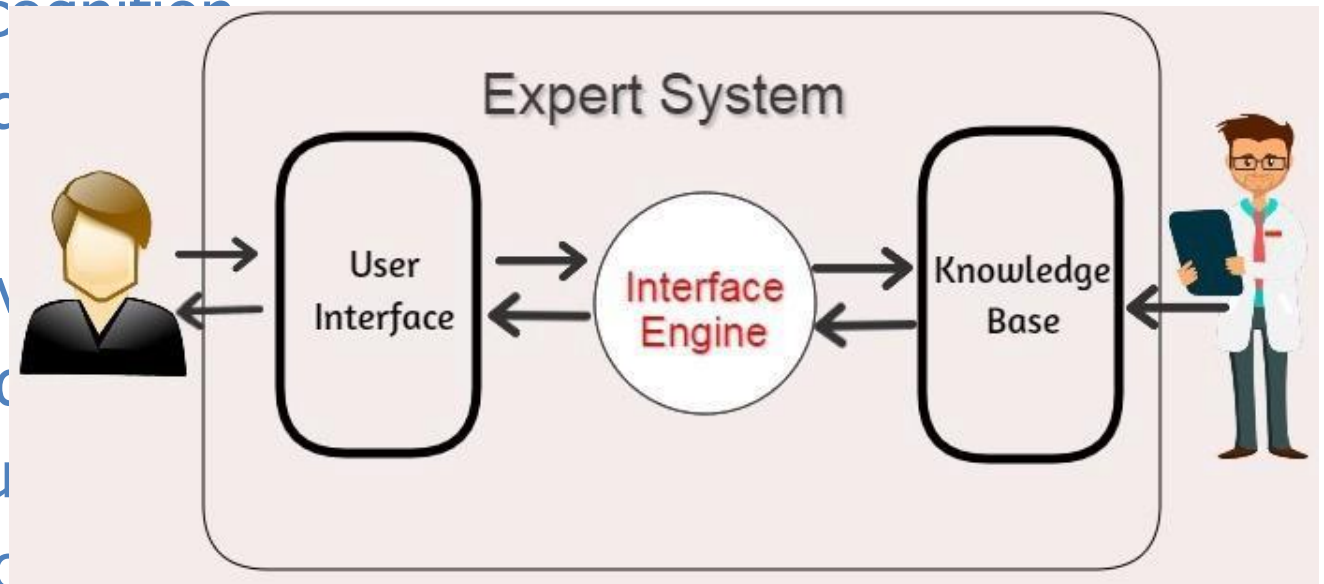
- Understanding
language

- Computer vision

- Gaming Industry

- Heavy industry

- Weather Forecasting



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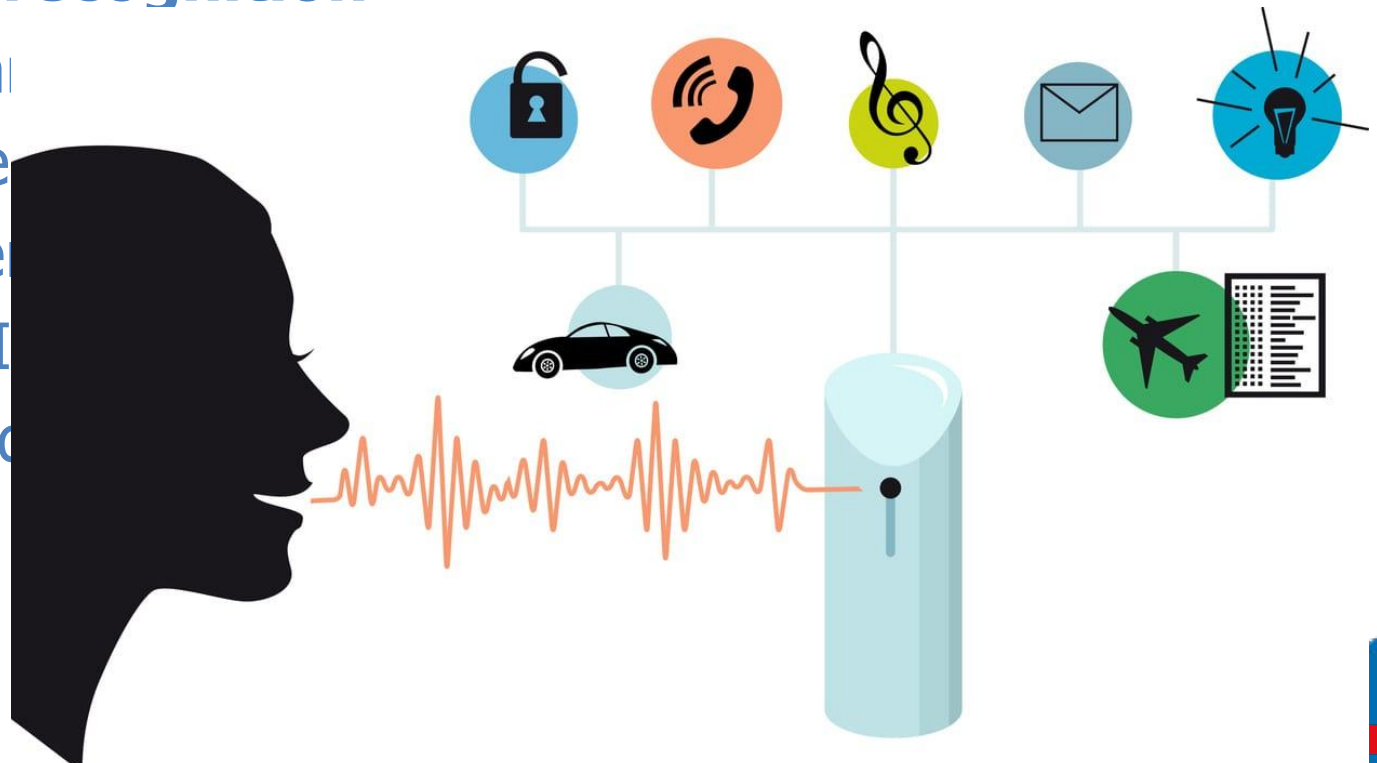


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AI APPLICATIONS

- Expert systems
- **Speech recognition**
- Understanding language
- Computer
- Gaming I
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- Weather



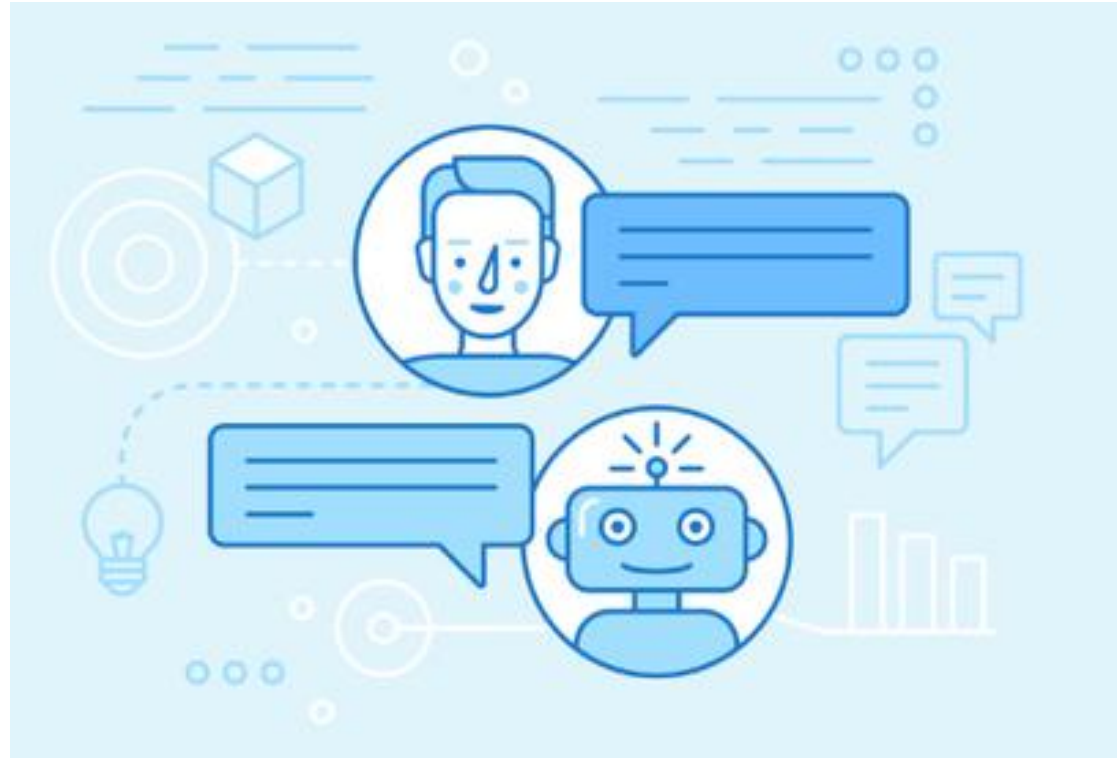
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AI APPLICATIONS

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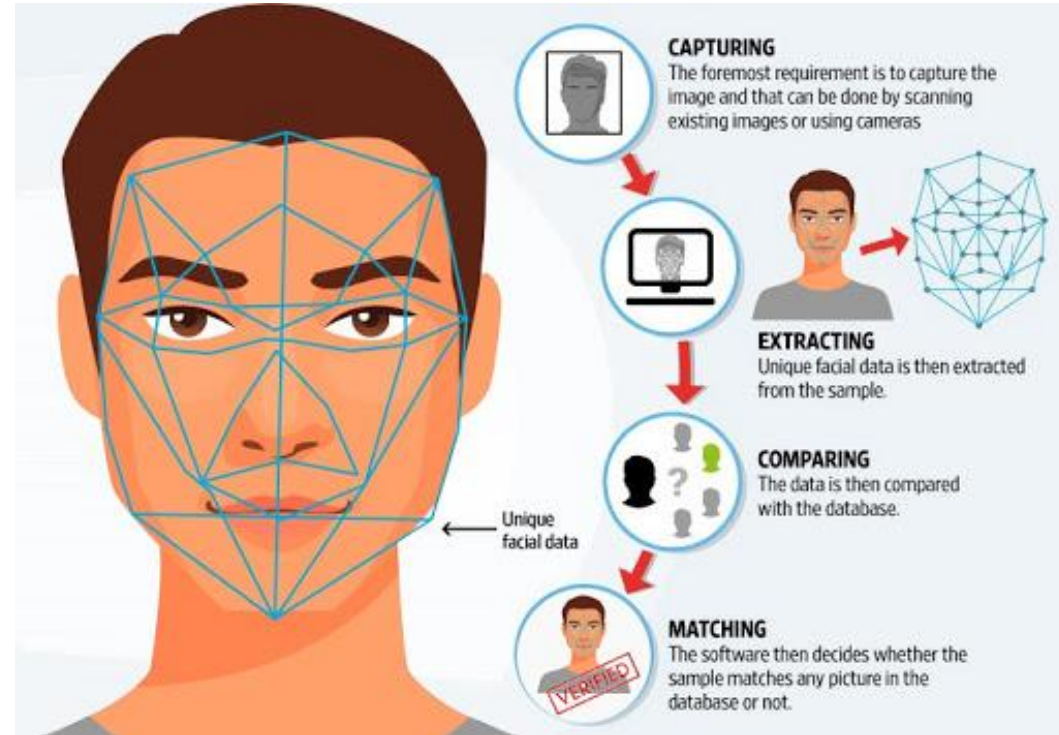
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AI APPLICATIONS IN HEALTH

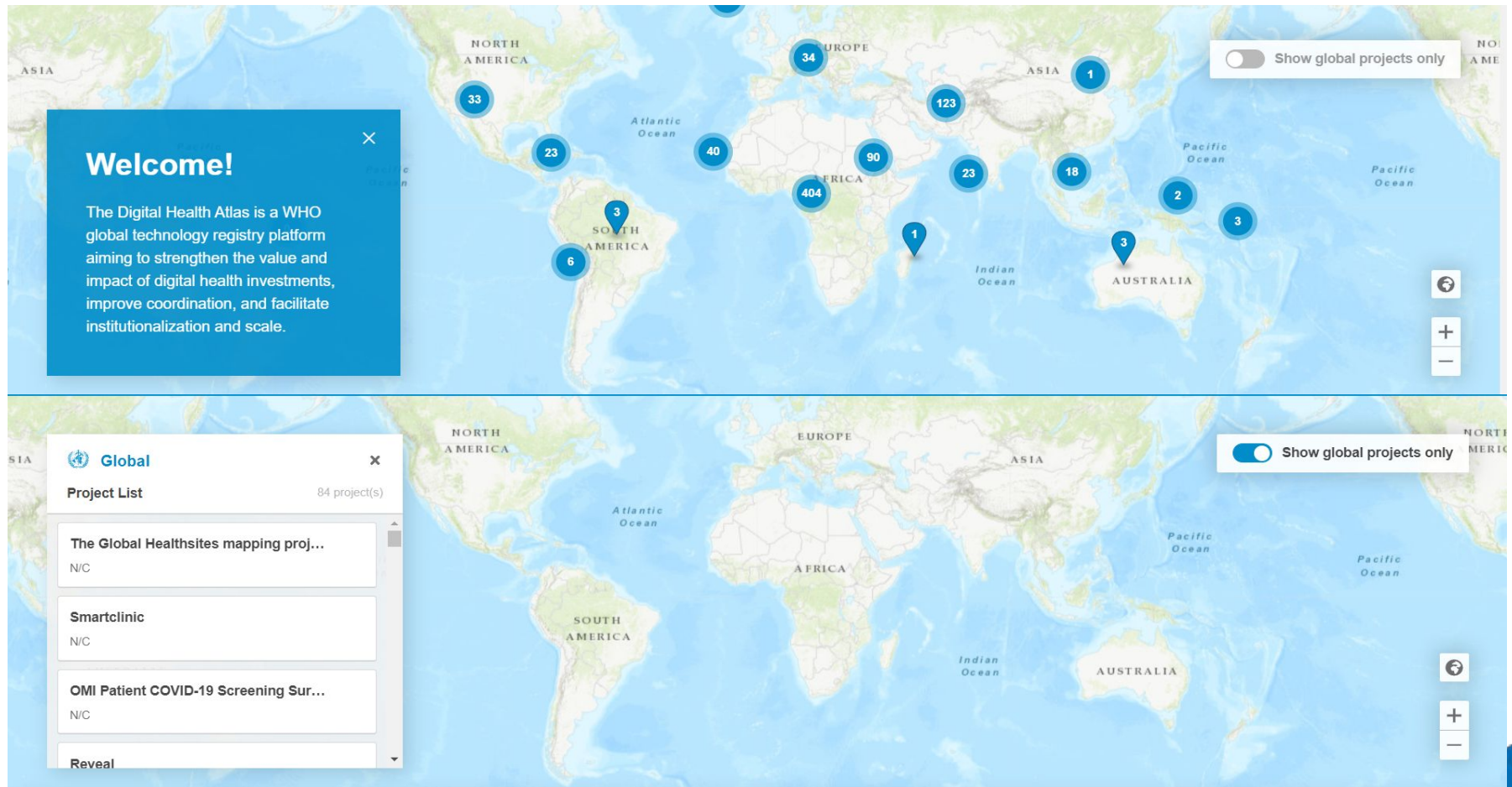


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DIGITAL HEALTH ATLAS - WHO



AI APPLICATIONS IN HEALTH... IN COLOMBIA



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CORONAPP - MINSALUD



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ARKANGEL AI - GOOGLE FOR STARTUPS

SOFTWARE QUE REVOLUCIONA LA DETECCIÓN DE ENFERMEDADES



Arkangel AI detecta enfermedades en segundos con inteligencia artificial



56% de las personas en el mundo muere por enfermedades que se pueden prevenir

La compañía contempla planes de expansión en México, Reino Unido y España este año



Inscribió una patente en machine learning



Trabaja en colaboración con entidades como Google y McGill University Canadá



Detecta enfermedades parasitarias, respiratorias, oculares y algunos tipos de cáncer
Analiza cambio de hábitos



Arkangel ha realizado más de 21.000 detecciones



Son aliados de Novartis, una farmacéutica con una capitalización bursátil de aproximadamente US\$204.000 millones



Proyecta triplicar las ventas en 2022 y alcanzar US\$1 millón



Laura Velásquez
Fundadora de Arkangel AI

Fuente: Arkangel AI Gráfico: LR, VT



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SAHLI - MACONDOLAB EN ALIANZA CON LA CLÍNICA OFTALMOLÓGICA DEL CARIBE



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EXOTECHNO



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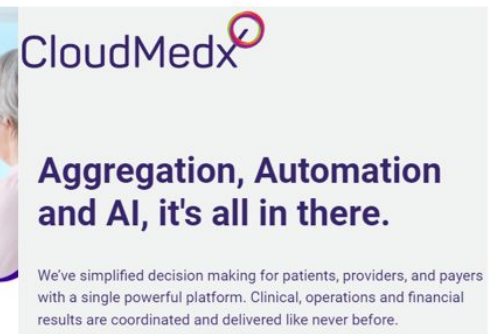
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AI COMPANIES IN HEALTHCARE



Artificial intelligence to empower patient engagement

A smooth AI-powered foundation for all patient calls, reducing workload, removing mistakes, and streamlining service.



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AI COMPANIES IN HEALTHCARE

Remedy
HEALTH MEDIA

InformAI 

 SUBTLE MEDICAL

 **SENSELY**

 **BioSymetrics**

 **OWKIN**



binah.ai
Health. Care. Anywhere.



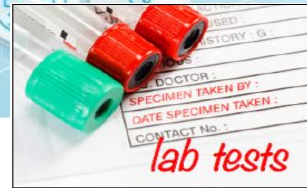
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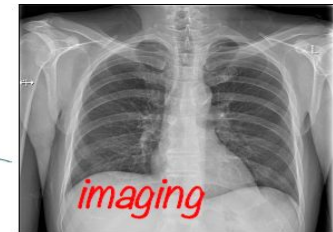
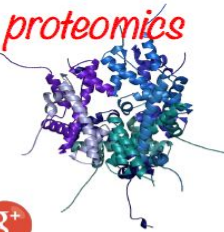
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DATA IN HEALTH



proteomics



social media



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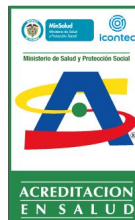
BIO-SIGNAL DATA

- Electrocardiogram (ECG)
- Electromyogram (EMG)
- Electroencephalogram (EEG)
- The galvanic skin response (GSR) or electrodermal activity (EDA)

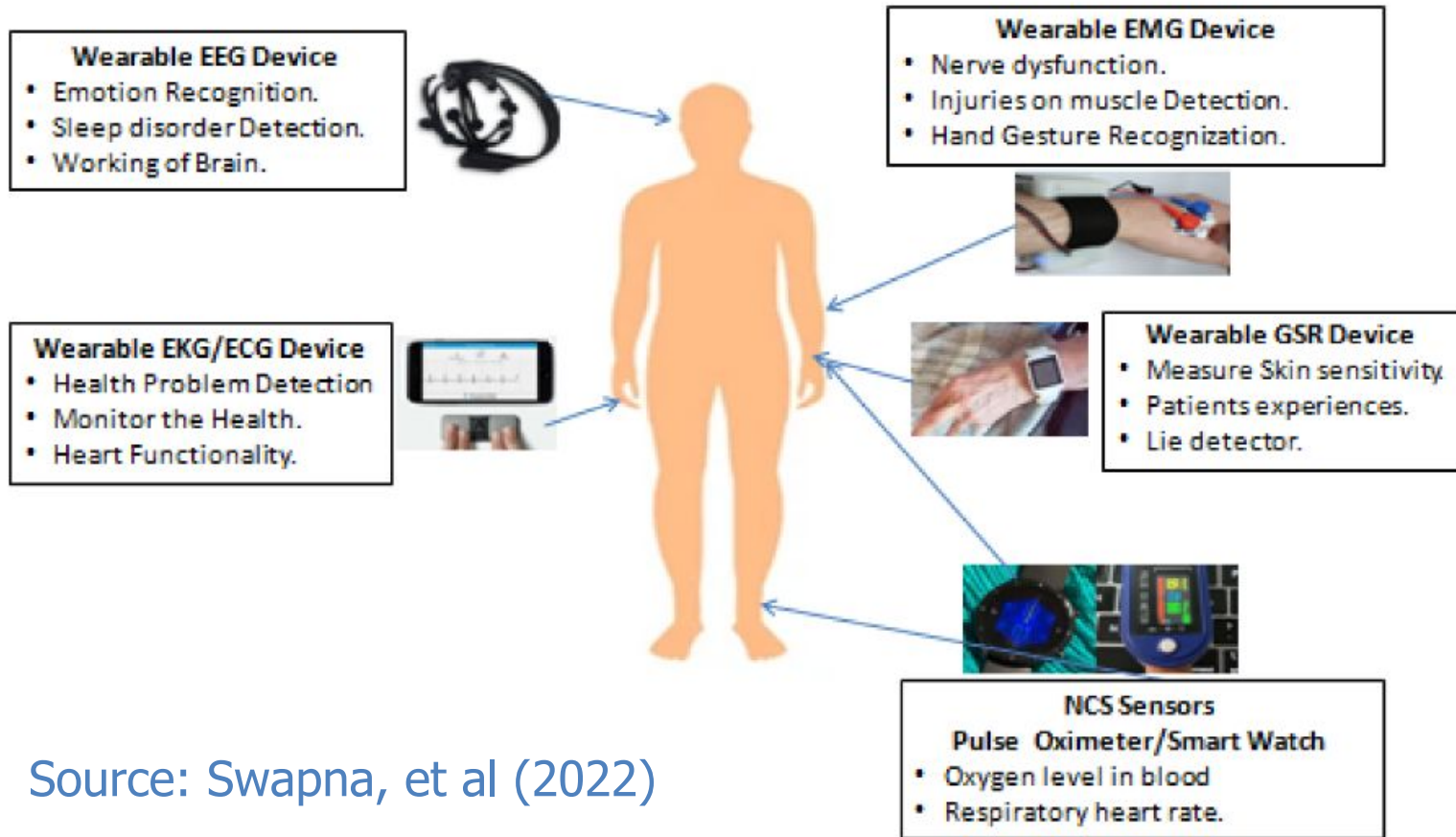


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BIO-SIGNAL DATA



Source: Swapna, et al (2022)



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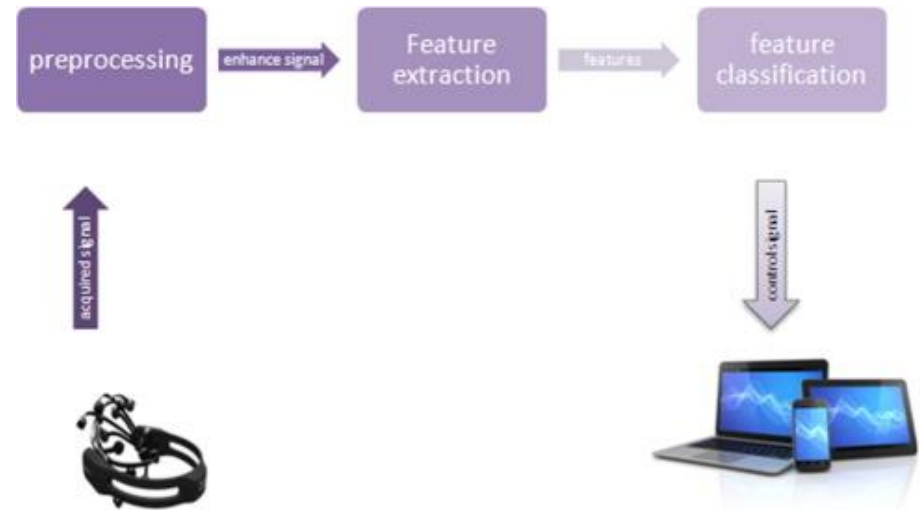
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RESEARCH

Brain-Computer Interface (BCI) is applied in the study of different cognitive processes or clinical conditions:

- Physical therapy
- Rehabilitation
- Assistive technologies.



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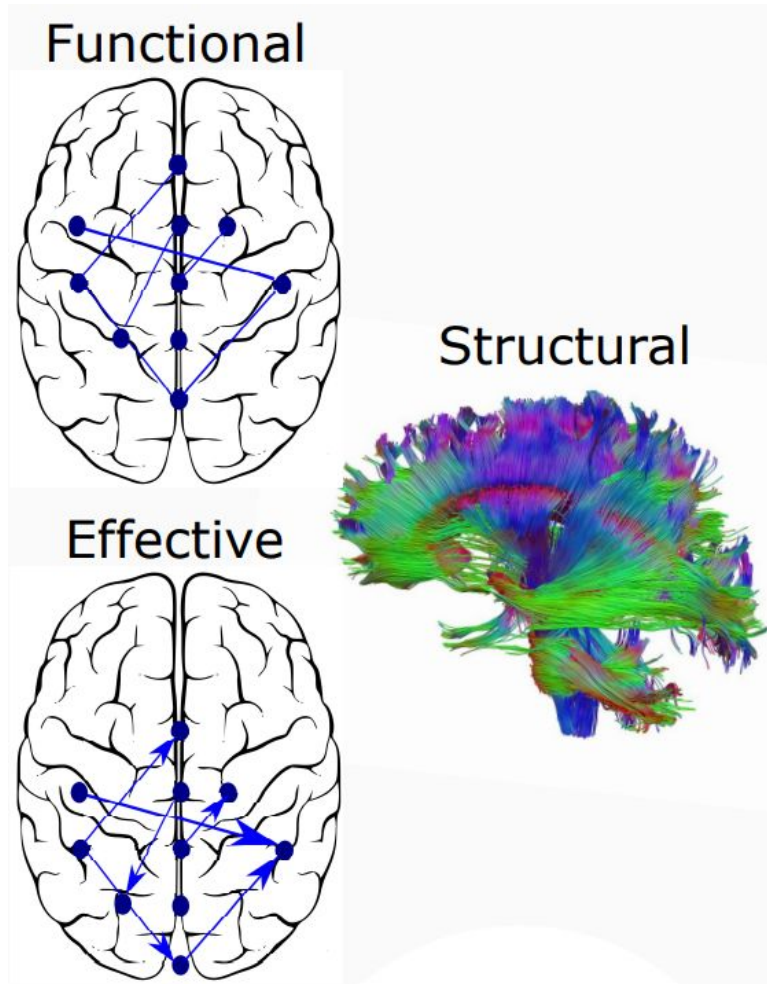
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BRAIN CONNECTIVITY



- Brain connectivity focuses on studying the interactions among neuronal networks through their structural, functional, and effective links.
- Understanding brain dynamics help to improve the diagnosis and treatment of various neurological diseases and mental health disorders [Chang et al., 2018].



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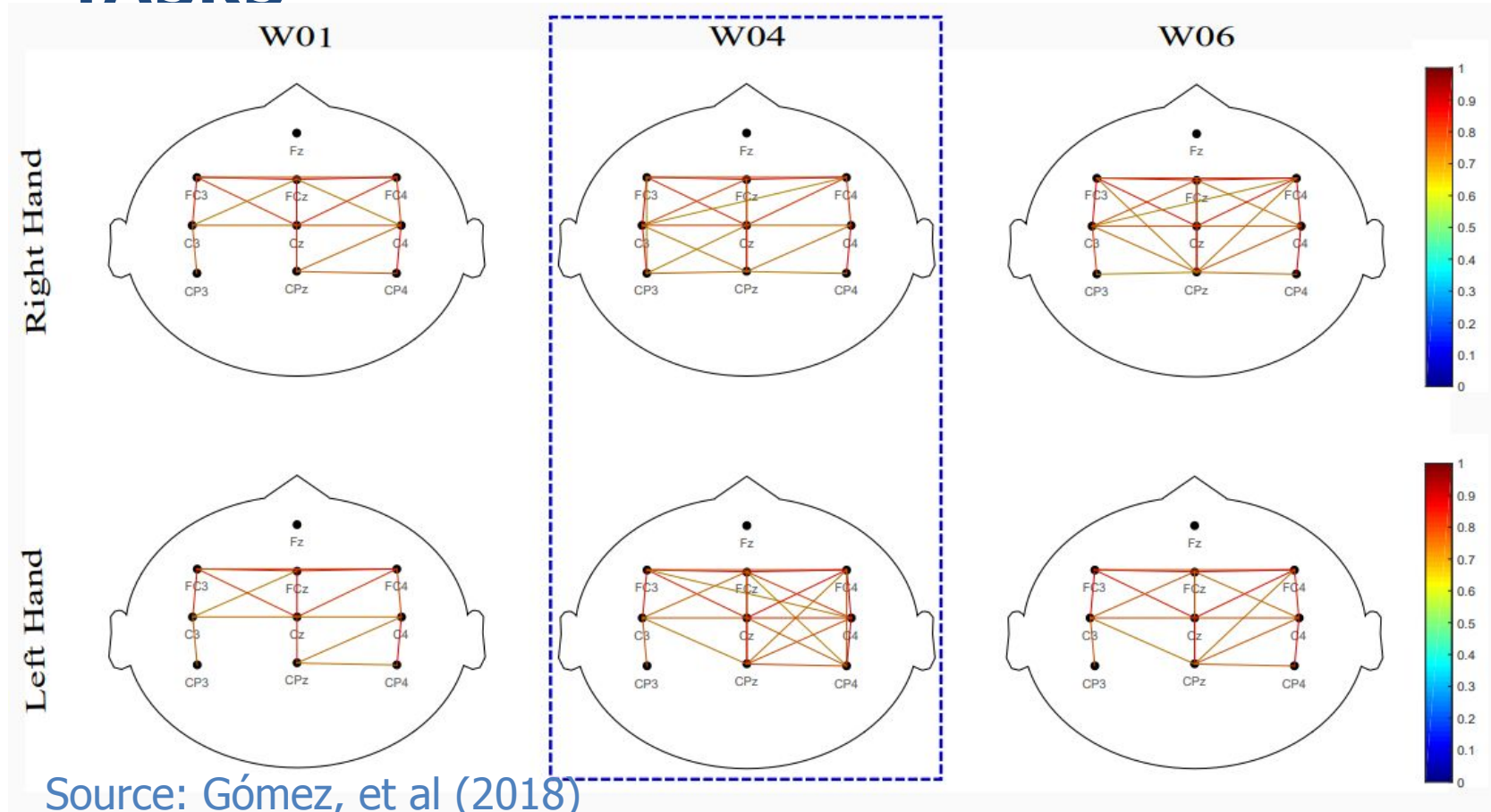
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BRAIN CONNECTIVITY ANALYSIS DURING MOTOR IMAGERY (MI) TASKS



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ADHD DIAGNOSTIC SUPPORT SYSTEM

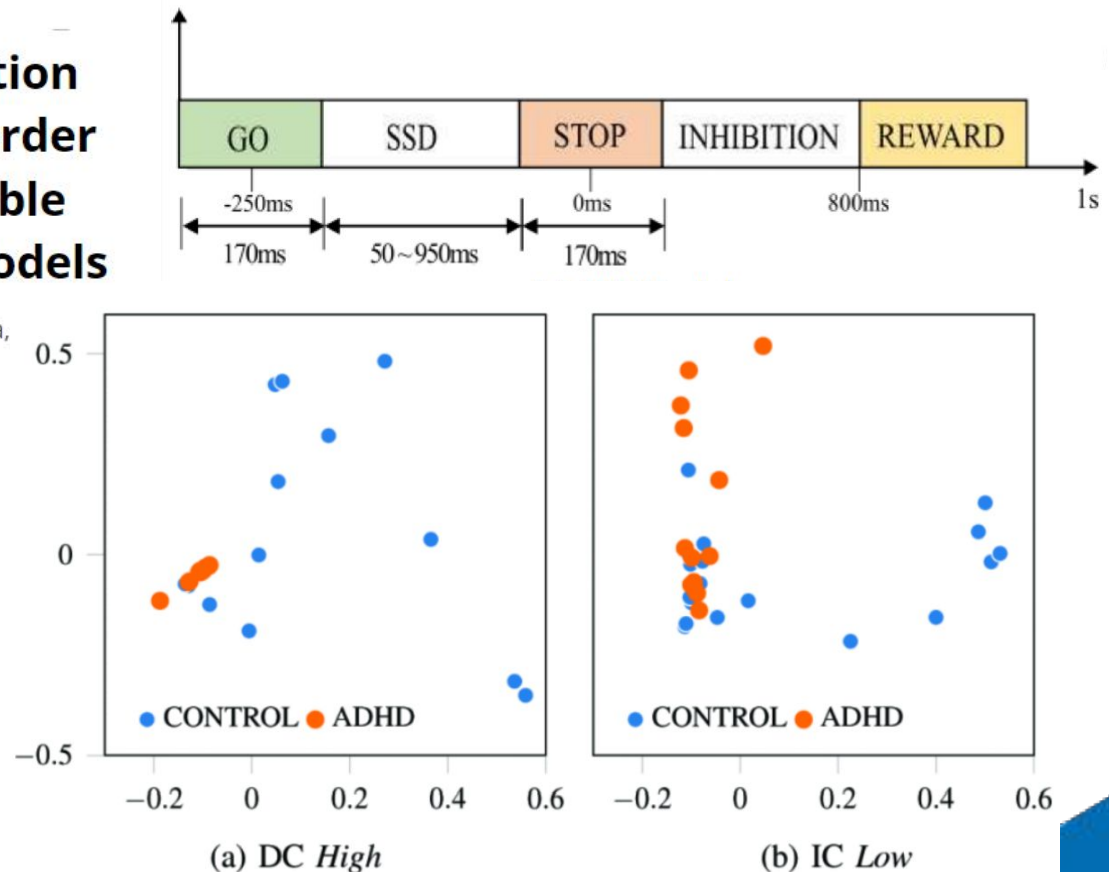
International Journal of Neural Systems | Vol. 32, No. 03, 2250008 (2022)

| Research Article

Supported Diagnosis of Attention Deficit and Hyperactivity Disorder from EEG Based on Interpretable Kernels for Hidden Markov Models

M. C. Maya-Piedrahita, P. M. Herrera-Gomez, L. Berrío-Mesa,
D. A. Cárdenas-Peña and A. A. Orozco-Gutierrez

<https://doi.org/10.1142/S0129065722500083> | Cited by: 0



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Development
 Data analysis
 Stimuli delivery

Works with **OpenBCI** for the data acquisition and the external stimuli synchronization.

Use **Python** and the built-in development environment to code

[CREATE PROJECT](#)

Integrate all Python scientific environment (**Numpy, Scipy, Matplotlib, MNE**) to develop real-time data analysis and visualizations.

Implement **distributed** process to create a new kind of data for streaming through the

[RUN DATA ANALYSIS](#)

Access to complete and offline **API documentation** with examples and use cases

[SHOW DOCUMENTATION](#)

Perform **remote stimuli delivery experiments** with real-time

[STIMULI DELIVERY](#)

[CONFIGURATION...](#)

[ABOUT...](#)

NEW EXTENSION

REMOVE

/home/yeison/Development/gcpds/Software_Tesis/bci-framework/bci_framework/default_projects

Show tutorials

DATA ANALYSIS

Bare minimum

Tutorial | Fourier stream (consumer)

Tutorial | Fourier stream (producer)

_default_data_analysis

VISUALIZATIONS

STIMULI DELIVERY

Disconnected

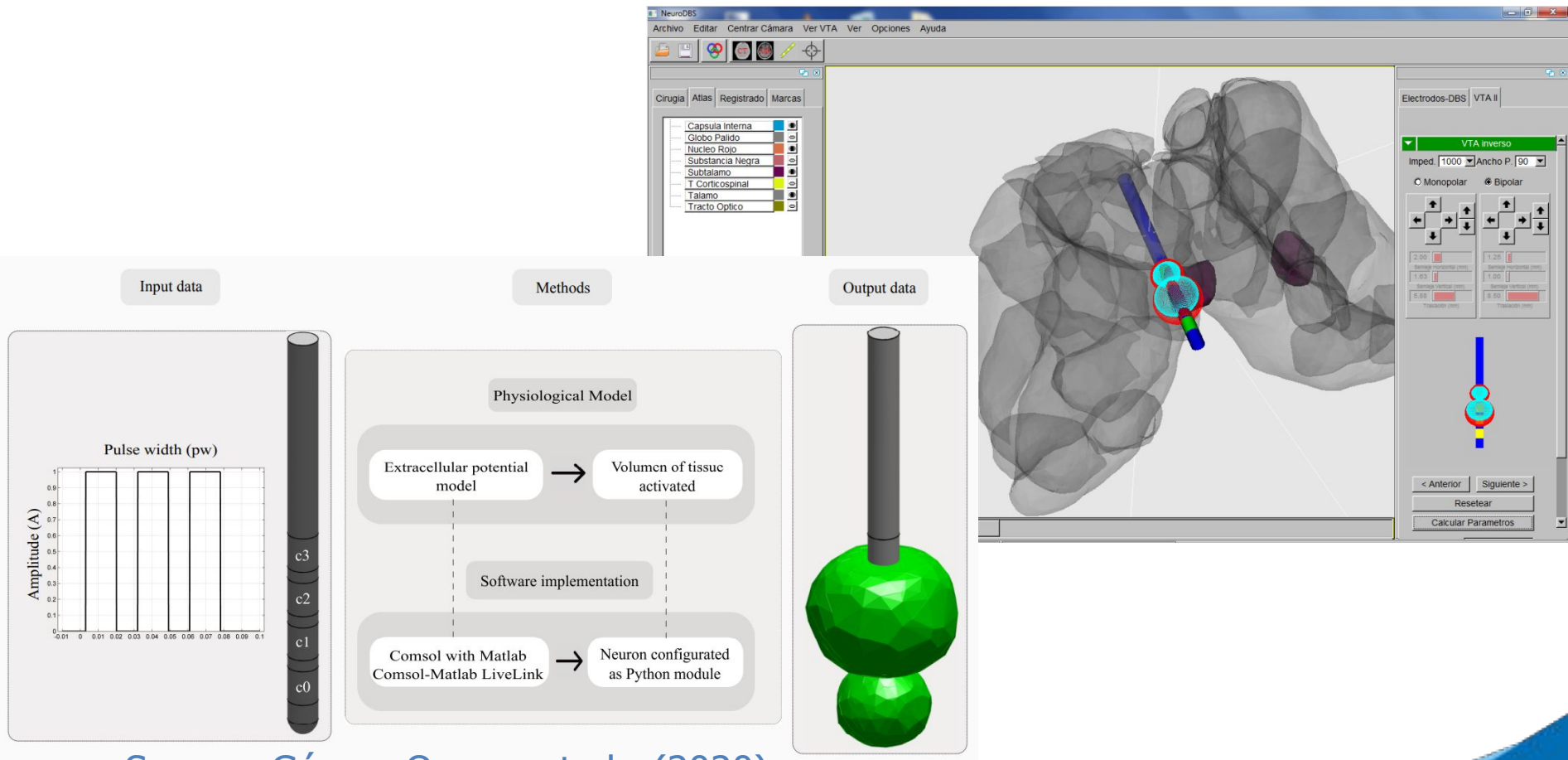


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DEEP BRAIN STIMULATION (DBS)



Source: Gómez-Orozco et al., (2020)



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

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ULTRASOUND IMAGING TECHNIQUES FOR NERVE STRUCTURE SEGMENTATION

Open Access Article

Random Fourier Features-Based Deep Learning Improvement with Class Activation Interpretability for Nerve Structure Segmentation

by  Cristian Alfonso Jimenez-Castaño ^{1,*}  ,
 Andrés Marino Álvarez-Meza ²  ,  Oscar David Aguirre-Ospina ³ ,
 David Augusto Cárdenas-Peña ¹   and
 Álvaro Angel Orozco-Gutiérrez ¹  

¹ Automatic Research Group, Universidad Tecnológica de Pereira, Pereira 660003, Colombia

² Signal Processing and Recognition Group, Universidad Nacional de Colombia, Manizales 170003, Colombia

³ Medicina Hospitalaria, Servicios Especiales de Salud (SES) Hospital de Caldas, Manizales 170003, Colombia

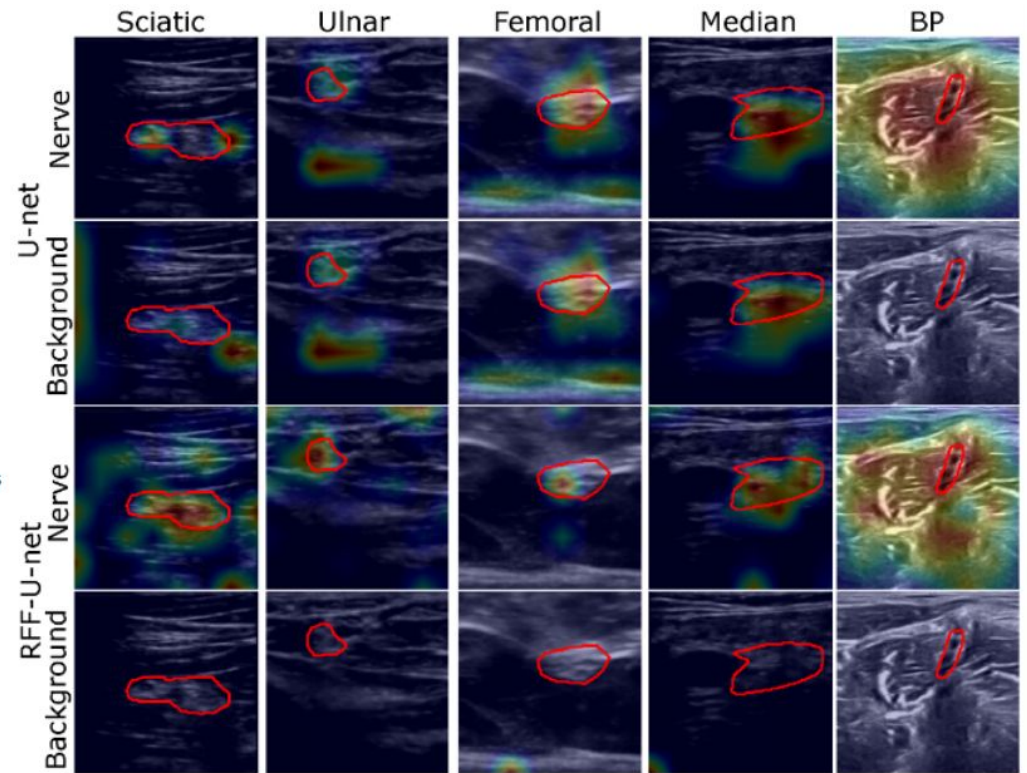
* Author to whom correspondence should be addressed.

Academic Editors: Jorge Camacho, Linas Svilainis and Tomás Gómez Álvarez-Arenas

Sensors **2021**, *21*(22), 7741; <https://doi.org/10.3390/s21227741>

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El conocimiento
es de todos

Minciencias

Desde el proyecto “Desarrollo de una herramienta de seguimiento de aguja y segmentación de estructuras nerviosas en imágenes de ultrasonido”...

MUCHAS GRACIAS!



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