Instituto Universitario de Investigación
en Ingeniería de Aragón
Universidad Zaragoza

20 Aniversario
2002 -2022

20 años investigando juntos

Technology Transfer

2022, November

I3A University of Zaragoza

Placed at Campus Río Ebro (Zaragoza) next to the Engineering and Architecture Faculty (EINA)

OUR OBJECTIVES:

- **The promotion of scientific research related to diverse fields of engineering.**
- **Contribute to economic development through TECHNOLOGY TRANSFER to the industrial sector.**
- **Support of high qualification education, at postgraduate and doctoral level.**
- **The dissemination of science and technology in society.**

2021 FIGURES

THE CORE OF OUR WORK IS RESEARCH, TECHNOLOGY TRANSFER AND EDUCATION IN A UNIVERSITY ENVIRONMENT

RESEARCH LINES

Organized in 4 strategic divisions:

- BIOMEDICAL ENGINEERING
- INFORMATION & COMMUNICATION TECHNOLOGIES
- PROCESSES & RECYCLING
- INDUSTRIAL TECHNOLOGIES

Gathered in 8 cutting-edge laboratories:

- CIRCULAR ECONOMY
- INDUSTRY 4.0
- ARTIFICIAL INTELLIGENCE
- VIRTUAL & ARTIFICIAL REALITY
- PERSONALIZED MEDICINE
- APPLIANCE TECHNOLOGY
- PHOTONICS
- SMART CITIES

Out of more than 500 employees of the I3A, 281 are seniors researchers, 64 postdoctoral researchers, 118 predoctoral trainees, with 10 technicians and 5 administrative and service staff. Additionally, 40 researchers from others institutions has a joing appointement with I3A.

>500 PEOPLE

34 RESEARCH GROUPS

329 NEW PROJECTS

328 JCR PAPERS

54% IN Q1

38 DOCTORAL THESIS

12 NEW EUROPEAN PROJECTS

From 28 proposals submitted, 12 projects are granted, from the EU programs.

19 CHAIRS UNIZAR-I3A

Chairs are an instrument to seed the collaboration between University and Industry or institutions. Zaragoza University has 19 chairs leaded by I3A researchers.

12 PATENTS

The number of patents granted this year was 12.

BUDGET

15,5M€ TOTAL TURNOVER 2021

6,9M€ WITH INDUSTRY

4,8M€ NATIONAL PROJECTS

2,8M€ EUROPEAN PROJECTS

1,0M€ OTHER

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Research divisions

We structure our research lines into 4 strategic research divisions

ICT Division

Technologies for the knowledge society

Chemical Processes & Recycling Division

Engineering to improve the environment

Industrial Technologies Division

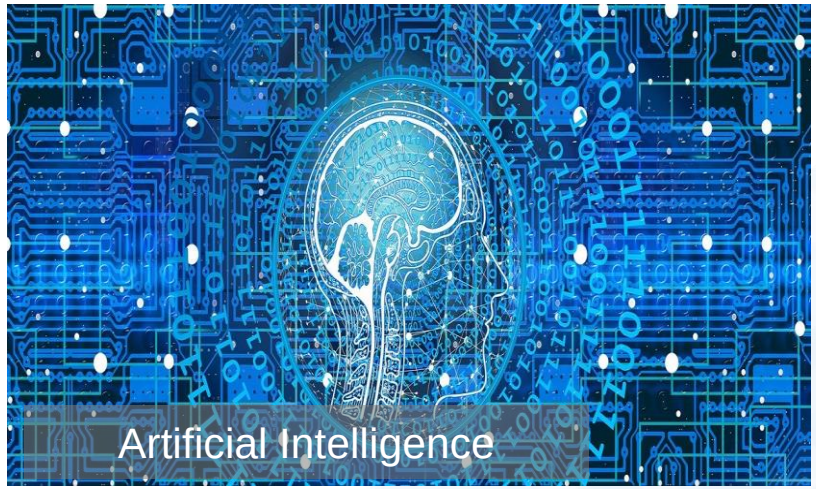
Technologies for the factories of the future

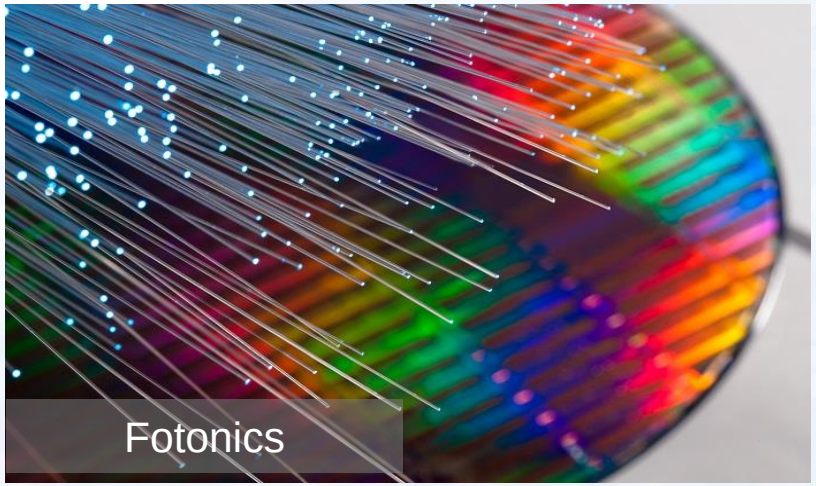
Biomedical Engineering Division

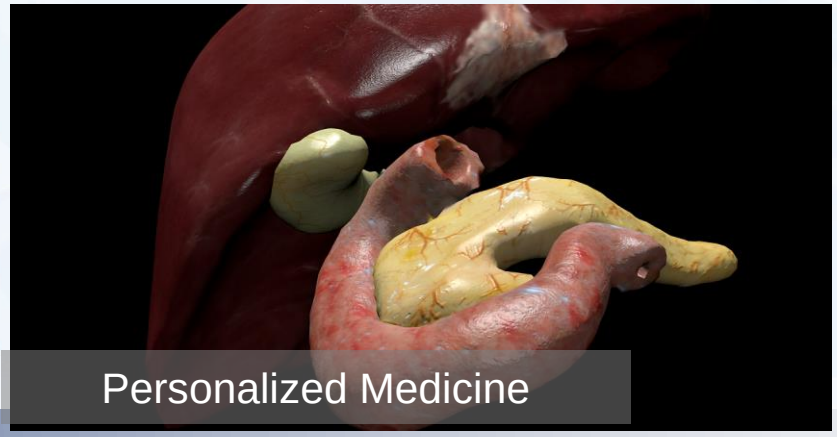
Engineering techniques for the improvement of health

Cutting-edge Labs

We have recently created 8 cutting-edge labs







Industrial Technologies

Power Electronics and Microelectronics:

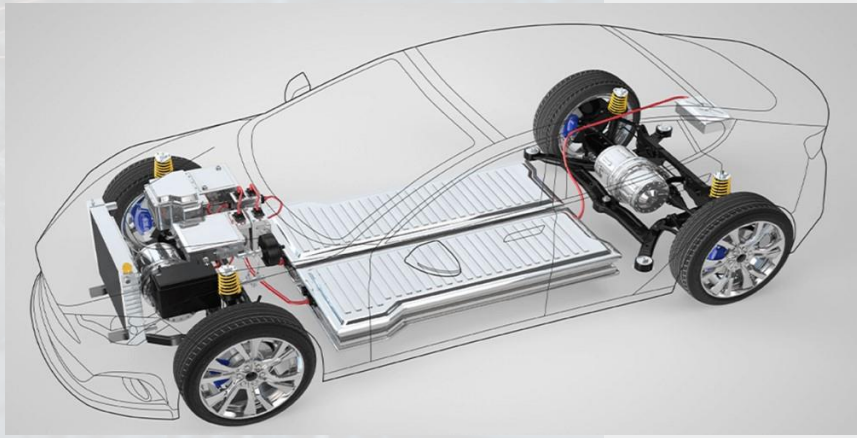
- High-efficiency power electronic converters.
- Digital control systems
- Electromagnetic modeling

Electrical energy processing:

- Efficient processing of electrical energy

Applications:

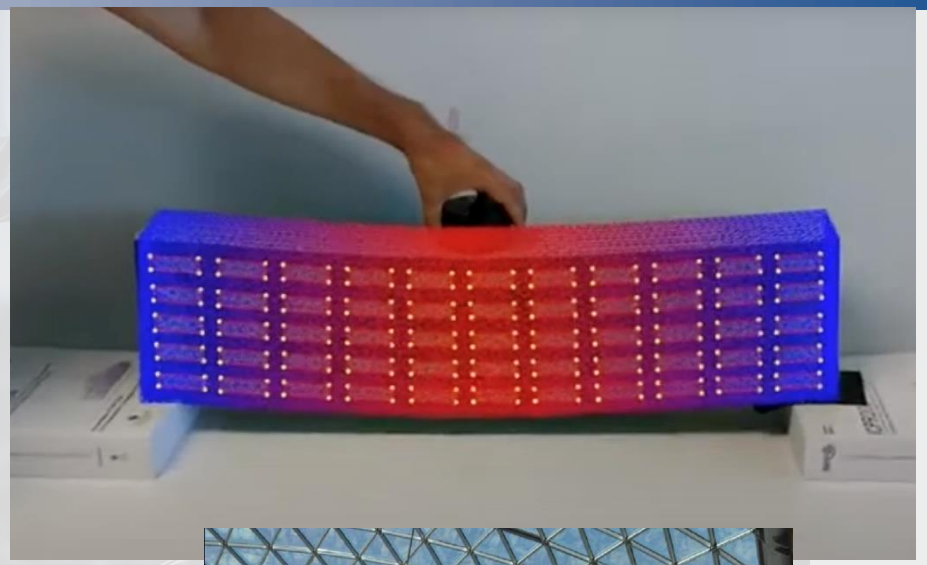
- Induction heating
- Battery charging and discharging systems
- Electric vehicles
- Elevators
- Energy recovery systems



Industrial Technologies

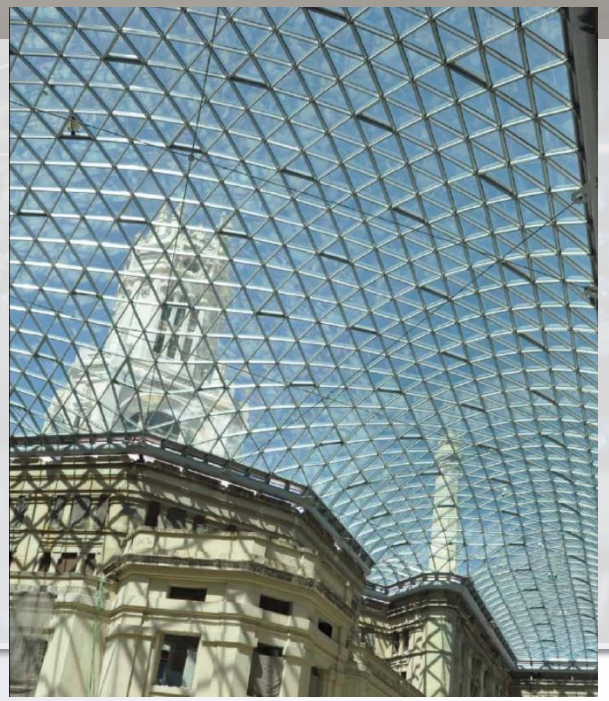
Mechanic Modeling:

- **Digital Twins**



Photonic Technologies:

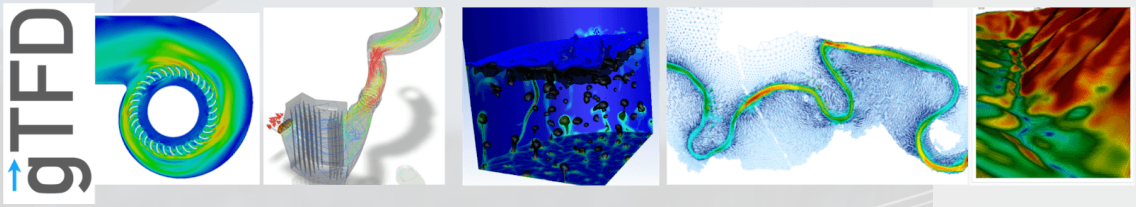
- **Optoelectronics**
- **Optic and energy control in architecture and transportation**
- **Optic Sensors**
- **Renewable Energies and Electric distribution**



Industrial Technologies

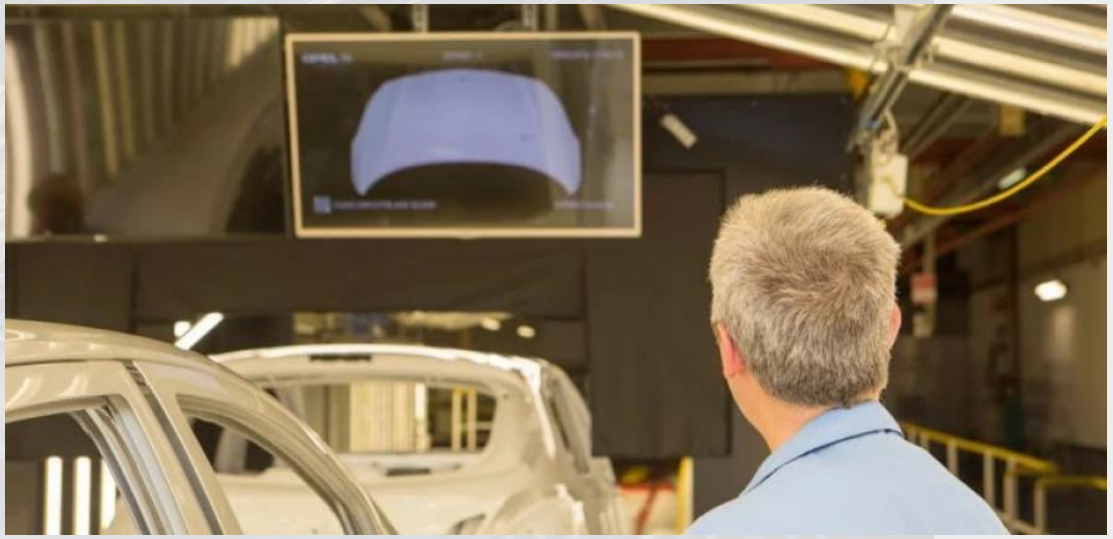
Fluid dynamics:

- Turbomachinery Design and Optimization
- Fluid dynamics of home appliances
- Computational simulation



Manufacturing Engineering & Metrology:

- Innovative manufacturing
- Precision measurement systems
- On-line inspection



Chemical Processes & Recycling

Chemical Industry:

- Chemical Reactor Engineering
- Fuel Conversion Minimization of Emissions
- Bioproducts & Biofuels from Biomass and waste
- Kinetic modeling for combustion processes

Modeling, simulation and design of energy systems.:

- Thermal energy storage
- Thermoeconomics and Eco-efficiency
- Solar energy

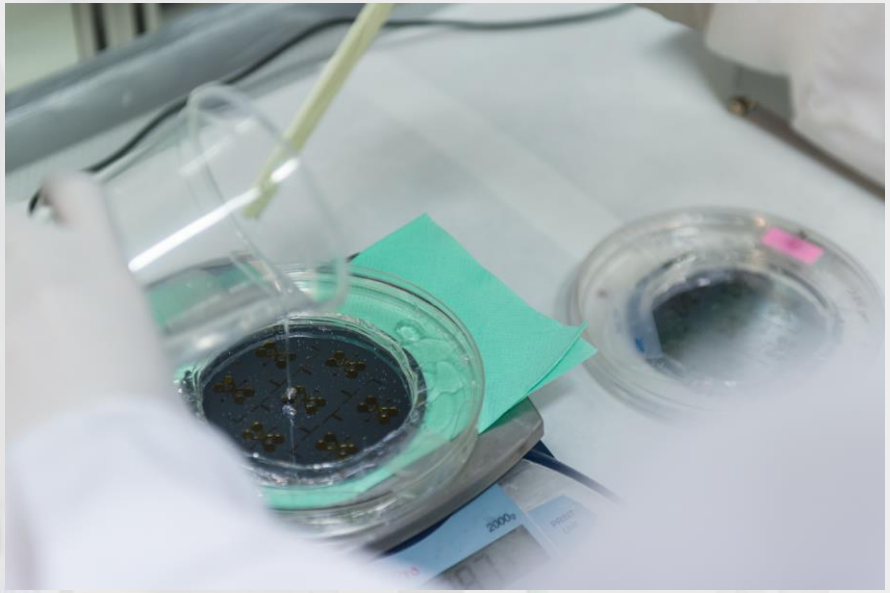
Chemical Processes & Recycling

Hydrogen Technologies:

- **Production and use of Hydrogen**

Food safety of materials

- **Food safety, migration, NIAS, etc.**
- **Active and smart materials**



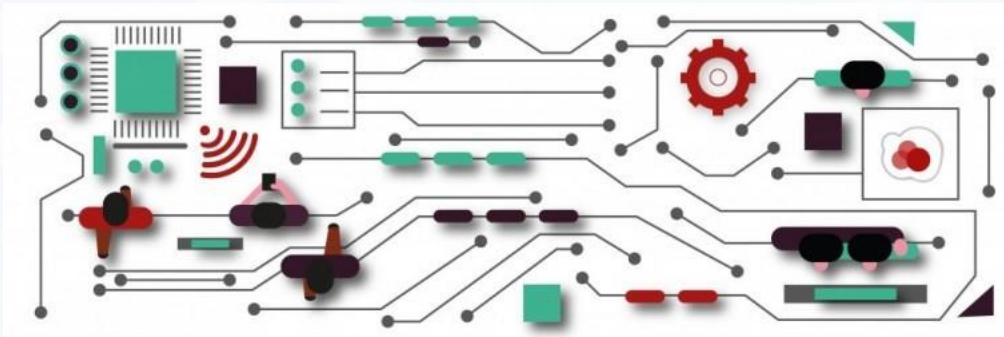
ICT

Robotics:

- **Simultaneous Position and Mappin (SLAM)**
- **Motion planning and navigation systems**
- **Computer Vision & Perception**

Internet of Things (IoT)

- **Enabling Technologies for IoT**
- **Product and service design methodologies**



Navigation robotics

ICT

Artificial Intelligence:

- **Human-machine Interaction**
- **Natural Language Processing**
- **Biometrics**
- **Audiovisual Information Processing**

Cybersecurity

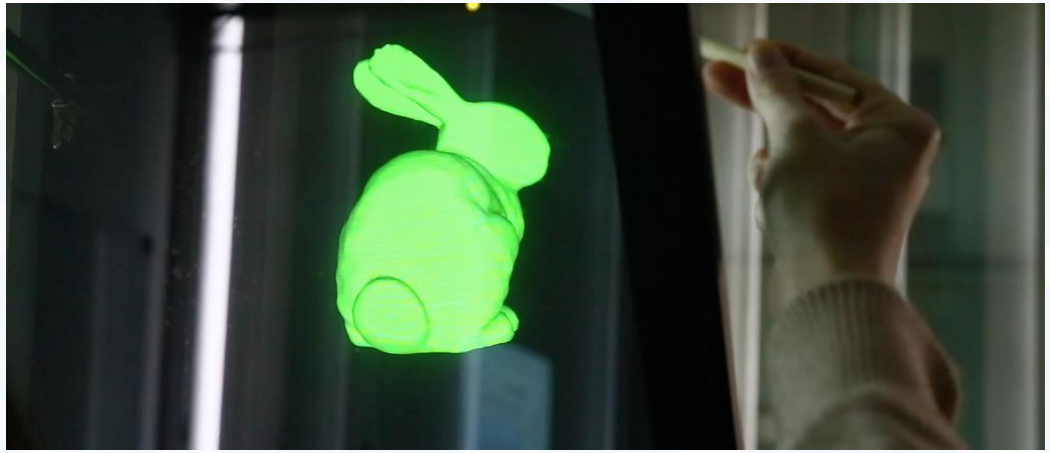
- **Enabling Technologies for IoT**
- **Product and service design methodologies**

Navigation robotics

ICT

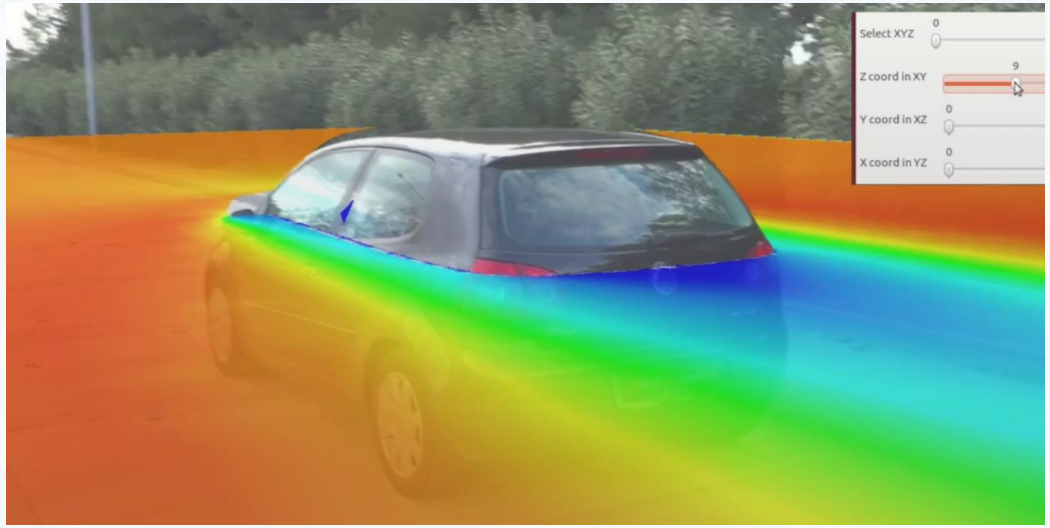
Augmented & Virtual Reality:

- **Physically-based rendering**
- **Visual appearance**
- **Physics-based AR**



Communication Systems

- **5G Wireless Networks**
- **Telemedicine and e-Health**
- **Microservices**
- **Interoperability**



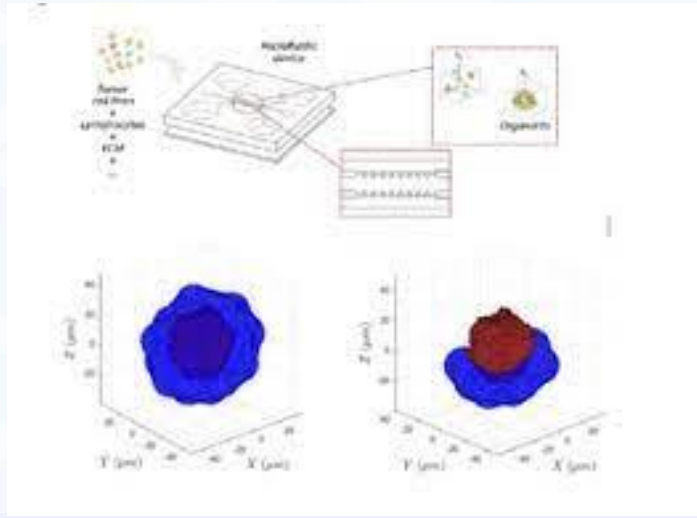
Biomedical Engineering

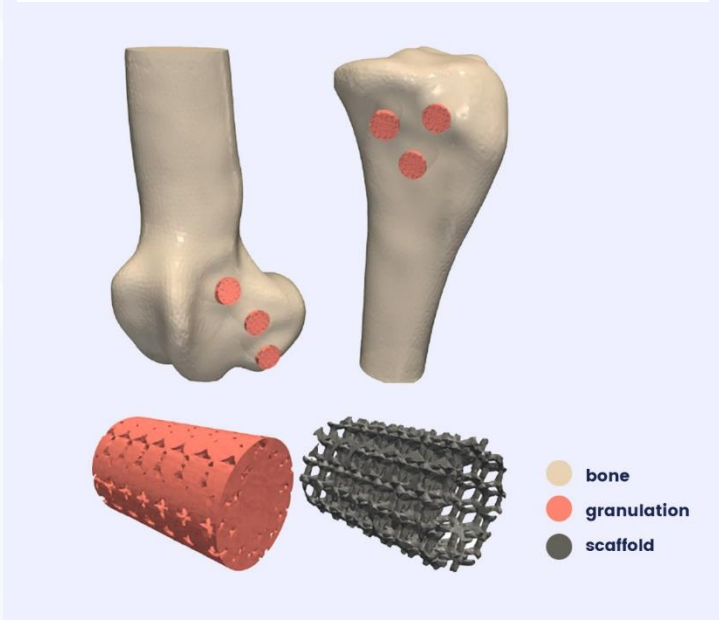
Microfluidic:

- **Biomimetic In-Vitro systems**

Biomechanical modelling

- **Cell and tissue mechanics**
- **Computational evaluation of prostheses and implants**

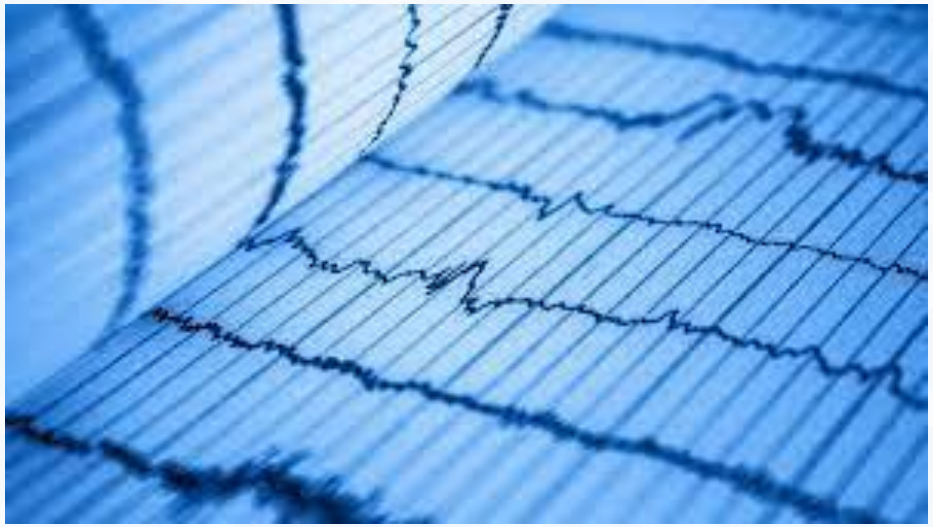




Biomedical Engineering

Biomedical Signal Interpretation:

- Modeling and simulation of biological systems
- Wearable devices
- Neural Interfaces
- Driver monitoring



Ergonomics

- Evaluation of functional capacity
- MoveHuman-Sensors (MH) Forces

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I3A - Edificio I+D+i, C/ Mariano Esquillor s/n
50018 Zaragoza, Spain
Phone. +34 976 76 27 07 Fax. +34 976 76 20 43
i3a@unizar.es
twitter: @I3Aunizar
facebook: i3aunizar
http://i3a.unizar.es

Universidad Zaragoza
1542