

Host' programu Mobility visit: Jorge Sánchez Arciniegas, Valencia, Spain



Štvrtok 29.01.2026 o 10:30

Seminárna miestnosť

Pavilónu lekárskeho vied BMC SAV

ORCID: 0000-0002-0824-2691

### *Mathematical Modelling of Cardiac Electrophysiology: From Equations to Patient-Specific Predictions*

#### Abstract:

Mathematical modelling provides a principled way to connect cardiac structure, biophysics, and clinical data to explain normal and pathological physiology. In this talk, I will introduce key models used in computational cardiology, from reaction–diffusion formulations of electrical propagation to models of cardiac mechanics and electromechanical coupling, as well as simplified (0D/1D) representations of hemodynamics, highlighting how these frameworks can be calibrated and validated using patient-specific information. I will also present a pipeline for building subject-specific models (geometry, tissue properties, boundary conditions, and functional readouts) and discuss how simulations can be used to interpret mechanisms of arrhythmias and to explore in silico scenarios relevant to therapy planning. Finally, the presentation will outline current challenges and opportunities for reproducibility, uncertainty quantification, and clinical translation.

## Experience



Postdoctoral Researcher

UPV

Ci2B - Center for Research and Innovation in Bioengineering · Full-time  
Feb 2025 - Present



Postdoctoral Fellowship

Karlsruhe Institute of Technology (KIT)  
Oct 2024 - Present



Associate Professor

VIU - Universidad Internacional de Valencia  
Dec 2023 - Present

Machine learning and artificial intelligence

## Education



Karlsruhe Institute of Technology (KIT)

Doctor of Philosophy - PhD, Biomedical/Medical Engineering  
Jun 2018 - Jul 2021

Skills: Problem Solving · Communication · TensorFlow · Liderazgo de proyectos · Written Communication



Universitat Politècnica de València (UPV)

Master of Engineering (M.Eng.), Ingeniería biomédica/médica  
2014 - 2016

Skills: Problem Solving · Communication · Equipos de proyecto · Liderazgo de proyectos · Written Communication



Universidad de las Fuerzas Armadas - ESPE

Grado en Ingeniería, Mecatrónica  
2007 - 2014