

PhD research lines open to CSC scholarship applicants under cooperative agreement*

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* If you are unable to find what you are looking for on this list, please contact us at incoming.asia@upm.es. We will be happy to assist you.

Agroengineering

- 1) [Circular economy transition with socio-civic commitment](#)
Supervisor: Justo García Navarro
Email: justo.gnavarro@upm.es
- 2) [Circular governance](#)
Supervisor: Justo García Navarro
Email: justo.gnavarro@upm.es
- 3) [Storage and discharge of bulk solids in bins and hoppers](#)
Supervisor: Álvaro Ramírez Gómez
Email: alvaro.ramirez@upm.es

Biotechnology and bioinformatics

- 1) [Epigenetic regulation of gene expression in plants](#)
Supervisor: Pedro Crevillén Lomas; Eduardo Mateo Bonmatí
Email: crevillen.pedro@inia.csic.es; eduardo.mateo@upm.es
- 2) [Evolution-proof engineering approaches for plant-associated bacteria](#)
Supervisor: Alejandro Couce & Emilia López-Solanilla
Email: a.couce@upm.es; emilia.lopez@upm.es
- 3) [Discovery and characterization of wild genomic fragments in the tomato genome](#)
Supervisor: José M. Jiménez-Gómez
Email: jose.jimenez.gomez@csic.es
- 4) [Agro-morphological, biochemical and nutritional analysis of wild relatives of crops. Nutraceutical application](#)
Supervisor: Eva Miedes Vicente
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Computational systems biology and genomics

- 1) [Evolution-proof engineering approaches for plant-associated bacteria](#)
Supervisor: Alejandro Couce & Emilia López-Solanilla
Email: a.couce@upm.es; emilia.lopez@upm.es
- 2) [Genomic assisted breeding applied to a wheat breeding program](#)
Supervisor: Julio Isidro y Sánchez
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Interactions of plants with environment

- 1) [Optimized rhizosphere microbial communities for enhanced plant productivity and stress resilience](#)
Supervisor: Stephan Pollmann
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- 2) [Understanding the effects of environmental conditions on plant-pest interactions](#)
Supervisor: Manuel Martínez Muñoz
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- 3) [Integration of nutrient and water availabilities into the plant developmental program](#)
Supervisor: Joaquín Medina
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- 4) [Associations of symbiotic bacteria with plants](#)
Supervisor: Luis Rey
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- 5) [Epigenetic regulation of gene expression in plants](#)
Supervisor: Pedro Crevillén Lomas; Eduardo Mateo Bonmatí
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Plant development

- 1) [Epigenetic regulation of gene expression in plants](#)
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Applied Mathematics

- 1) [Design of geometric integrators via retraction maps](#)
Supervisor: María Barbero Liñán
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- 2) [Molecular Simulation of Self and Directed Organization of Complex Systems based on Polymers](#)
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- 3) [Aerodynamic and aeroacoustic optimization of critical parts of high-speed trains](#)
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- 4) [Nonlinear analysis techniques to explore high multiplicity of solutions in elliptic PDEs](#)
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- 5) [Inverse problems](#)
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- 6) [Dynamics of cosmological models](#)
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- 7) [Numerical approximation and control for systems governed by partial differential equations](#)
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- 8) [Decoding Human Behavior](#)
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- 9) [Mathematical models in epidemiology and eco-epidemiology](#)
Supervisor: Luis Sanz Lorenzo
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- 10) [Solving Combinatorial Problems through Reinforcement Learning](#)
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Biomedical Engineering

- 1) [Mobile Robotics for Gait Analysis](#)
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Email: alberto.brunete@upm.es
- 2) [Applications for multiple collaborative robots in industry 5.0](#)
Supervisor: Alberto Brunete
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- 3) [Intelligent therapeutic exergames](#)
Supervisor: Martina Eckert
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- 4) [Artificial intelligence and signal/image processing for biomedical and health applications](#)
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- 5) [Artificial intelligence and signal/image processing for the evaluation of neurodegenerative disorders](#)
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- 6) [Artificial intelligence and image processing for the evaluation of COVID-19 disease](#)
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- 7) [Complexity analysis of biomedical signals](#)
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- 8) [Radar technology for monitoring biomedical signs in biomedical and health applications](#)
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Email: ignacio.godino@upm.es
- 9) [Microfluidics-based devices for mechanical characterization of living cells and biological applications](#)
Supervisor: Gustavo R. Plaza
Email: Gustavo.plaza@upm.es
- 10) [Computational biomechanics of cardiovascular tissue and blood flow](#)
Supervisor: Jose M Goicolea
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- 11) [Development of low-cost device technology for monitoring human joint movements for sports and rehabilitation applications](#)
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- 12) [Development of improved methodologies based on quartz crystal resonators for measuring biological fluid viscosity: application to bacterial adhesion studies](#)
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Email: josejavier.serrano@upm.es
- 13) [Development of new Hyperthermic Oncology Strategies](#)
Supervisor: José Javier Serrano-Olmedo
Email: josejavier.serrano@upm.es
- 14) [Theoretical prediction of liquid-liquid phase separation in protein solutions and prevention of ageing in condensates](#)
Supervisor: Jorge Ramírez
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- 15) [ICT for personalized medicine](#)
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- 16) [Surgical Training and Image Guided Surgery](#)
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- 17) [New advances in biomedical images processing for clinical decision support systems](#)
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- 18) [Neurorehabilitation and Brain Health Engineering](#)
Supervisor: Enrique J. Gómez Aguilera
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- 19) [Digital assessment for Multiple Sclerosis \(MS\) patients](#)
Supervisor: Joaquín Ordieres-Meré
Email: j.ordieres@upm.es
- 20) [Laser bioprinting for tissue engineering](#)
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Chemical Engineering

- 1) [Wastewater treatment by advanced oxidation processes: photocatalysis and electrochemical oxidation](#)
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- 2) [Numerical simulation of air quality and interactions with climate](#)
Supervisor: Rafael Borge
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- 3) [Molecular Simulation of Self and Directed Organization of Complex Systems based on Polymers](#)
Supervisor: Nikolaos Karagiannis
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- 4) [Valorization of organic wastes towards green hydrogen production](#)
Supervisor: Antonio Juan Dos Santos-García
Email: aj.dossantos@upm.es
- 5) [Development and assessment of wastewater treatment strategies coupling advanced oxidation processes to bio-based treatment technologies](#)
Supervisor: Daphne Hermosilla & Antonio Gasco
Email: daphne.hermosilla@upm.es; antonio.gasco@upm.es
- 6) [Design and evaluation of urban rainwater management and treatment strategies](#)
Supervisor: Antonio Gasco & Daphne Hermosilla
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7) [Optimized bacterial nanocellulose production from wastes](#)

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Civil Engineering and Architecture

1) [Dynamics of railway bridges under high speed traffic](#)

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2) [Circular economy transition with socio-civic commitment](#)

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3) [Circular governance](#)

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4) [Geomechanics of carbon dioxide underground storage: numerical approach](#)

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5) [Digital integration of assets in BIM: Intelligent asset management](#)

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6) [Human-structure interaction in the comfort assessment of light-weight footbridges](#)

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7) [Dynamic analysis of railway bridges subject to high-speed train loading](#)

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8) [Spatial variability effects on the seismic response of bridges](#)

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9) [Novel Lattice Boltzmann techniques for bridge engineering and their application to the design of wind barriers](#)

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10) [Seismic behaviour of tall metal wind turbine towers with realistic welding imperfections](#)

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Electrical & Electronic Engineering

- 1) [Infrared and THz photonics: plasmonic and phononic metamaterials and sensor development](#)
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- 2) [Magnetic-free isolated power converters](#)
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- 3) [Power Electronics Transformer Modelling based on AI for Future Electric Transportation](#)
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- 4) [Cost-effective stability services in highly renewable electricity grids](#)
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Environmental Engineering & Energy

- 1) [Wastewater treatment by advanced oxidation processes: photocatalysis and electrochemical oxidation](#)
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- 2) [Studies for the optimization of the photovoltaic power system of a grain mill](#) Supervisor:
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- 3) [Soiling effect on solar panels, consequences in the energy production, and application to agrivoltaic systems](#)
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- 4) [Photovoltaics and agriculture: Agrivoltaics. Strategies and design for the combination of solar plants and agriculture](#)
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- 5) [Numerical simulation of air quality and interactions with climate](#)
Supervisor: Rafael Borge
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- 6) [Offshore Wind Energy.Floating structures: mooring line studies](#)
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- 7) [Offshore Wind Energy. Analysis of different types of fixed foundations](#)
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- 8) [Offshore Wind Energy. Scour protection and design expressions in monopiles foundations](#)
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- 9) [Geomechanics of carbon dioxide underground storage: numerical approach](#)
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- 10) [Development of additive manufacturing applications based on Laser Induced Forward Transfer processes](#)
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- 11) [Valorization of organic wastes towards green hydrogen production](#)
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- 12) [Development and assessment of wastewater treatment strategies coupling advanced oxidation processes to bio-based treatment technologies](#)
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- 13) [Design and evaluation of urban rainwater management and treatment strategies](#)
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- 14) [Advanced hydrometallurgical processes for the recovery of metals from refractory sulphides and wastes](#)
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- 15) [Optimized bacterial nanocellulose production from wastes](#)
Supervisor: Noemí Merayo Cuevas
Email: n.merayo@upm.es
- 16) [Fluvial Landscape Impacts: Balancing Effects on Riparian Landscapes and Hydro-Electricity Production](#)
Supervisor: Joaquin Solana-Gutierrez & M Dolores Bejarano
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ICTs

Artificial intelligence and cognitive technologies

- 1) [Mobile Robotics for Gait Analysis](#)
Supervisor: Alberto Brunete
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- 2) [Applications for multiple collaborative robots in industry 5.0](#)
Supervisor: Alberto Brunete
Email: alberto.brunete@upm.es
- 3) [Drone autonomy in hazardous industrial environments](#)
Supervisor: Pascual Campoy
Email: pascual.campoy@upm.es
- 4) [Intelligent therapeutic exergames](#)
Supervisor: Martina Eckert
Email: martina.eckert@upm.es
- 5) [Artificial intelligence and signal/image processing for biomedical and health applications](#)
Supervisor: Juan Ignacio Godino-Llorente
Email: ignacio.godino@upm.es
- 6) [Artificial intelligence and signal/image processing for the evaluation of neurodegenerative disorders](#)
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- 7) [Artificial intelligence and image processing for the evaluation of COVID-19 disease](#)
Supervisor: Juan Ignacio Godino-Llorente
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- 8) [Radar technology for monitoring biomedical signs in biomedical and health applications](#)
Supervisor: Juan Ignacio Godino-Llorente
Email: ignacio.godino@upm.es
- 9) [Ontology certification](#)
Supervisor: Raúl García
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- 10) [Quality assessment of knowledge graphs](#)
Supervisor: Raúl García
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- 11) [Ontology-based policy interoperability](#)
Supervisor: Raúl García
Email: rgarcia@fi.upm.es
- 12) [Affective Computing for People-Centric IoT](#)
Supervisor: Andrés Otero
Email: joseandres.otero@upm.es
- 13) [Neuroevolutionary Algorithms and Neuromorphic Architectures](#)
Supervisor: Andrés Otero
Email: joseandres.otero@upm.es
- 14) [Digital assessment for Multiple Sclerosis \(MS\) patients](#)
Supervisor: Joaquín Ordieres-Meré
Email: j.ordieres@upm.es
- 15) [Construction of models for the progression of neurodegenerative diseases using Artificial Intelligence techniques](#)
Supervisor: Carlos Platero Dueñas
Email: carlos.platero@upm.es
- 16) [Artificial Intelligence of Things for Healthcare \(AIoTHC\)](#)
Supervisor: Miguel García Remesal
Email: miguel.garcia.remesal@upm.es
- 17) [Synergistic Fusion of Deep Learning and Symbolic AI for Cognitive Neurosymbolic Computation](#)
Supervisor: Emilio Serrano
Email: emilio.serrano@upm.es
- 18) [Explainable Artificial Intelligence](#)
Supervisor: Esteban García-Cuesta
Email: esteban.garcia@upm.es
- 19) [Natural Language Dialogue systems for cybersecurity](#)
Supervisor: Iván Pau de la Cruz & Mario Vega Barbas
Email: ivan.pau@upm.es & mario.vega@upm.es

Electronic engineering and telecommunications technologies

- 1) [Short-Range Wireless Communications \(SRWC\)](#)
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- 2) [Communications, Positioning and Sensing in 5G and 6G Networks](#)
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- 3) [Spintronic nanodevices based on strain induced movement of magnetic domain walls in ferrimagnetic materials](#)
Supervisor: José Luis Prieto Martín
Email: joseluis.prieto@upm.es
- 4) [Development and implementation of Decode&Forward \(D&F\) Relay Node \(Layer 2\) using FPGAs in mmWaves](#)
Supervisor: José Ignacio Alonso Montes
E-mail: joseignacio.alonso@upm.es
- 5) [Integrated Access Backhaul \(IAB\) Networks: Implementation of Small Cell in mmWaves using a SDR Platform](#)
Supervisor: José Ignacio Alonso Montes
E-mail: joseignacio.alonso@upm.es
- 6) [Straintronics and Piezotronics in 2D Materials using Surface Acoustic Waves](#)
Supervisor: Jorge Pedrós
Email: j.pedros@upm.es
- 7) [Single Photon Sources in 2D Materials](#)
Supervisor: Jorge Pedrós
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- 8) [Complexity analysis of biomedical signals](#)
Supervisor: Juan Ignacio Godino-Llorente
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- 9) [Radar technology for monitoring biomedical signs in biomedical and health applications](#)
Supervisor: Juan Ignacio Godino-Llorente
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- 10) [Natural Language Dialogue systems for cybersecurity](#)
Supervisor: Iván Pau de la Cruz & Mario Vega Barbas
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- 11) [Future railway mobile communications system \(FRMCS\)](#)
Supervisor: Cesar Briso Rodríguez
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- 12) [2D & Graphene Solar Cells for Green Energy](#)
Supervisor: Javier Martínez Rodrigo
Email: javier.martinez@upm.es
- 13) [2D & Graphene Supercapacitors for Green Energy](#)
Supervisor: Javier Martínez Rodrigo
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14) [Nanomanipulation of nanomaterials with atomic force microscope \(AFM\) and scanning electron microscope \(SEM\)](#)

Supervisor: Javier Martínez Rodrigo

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Human-computer interacion

1) [Natural Language Dialogue systems for cybersecurity](#)

Supervisor: Iván Pau de la Cruz & Mario Vega Barbas

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Internet of Things (IoT)

1) [Digital assessment for Multiple Sclerosis \(MS\) patients](#)

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Email: j.ordieres@upm.es

2) [Digital integration of assets in BIM: Intelligent asset management](#)

Supervisor: Joaquín Ordieres-Meré

Email: j.ordieres@upm.es

3) [Edge distributed algorithms for making decisions for IoT systems in key domain applications \(smart domains\)](#)

Supervisor: José-Fernán MARTÍNEZ-ORTEGA

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4) [Security and privacy in applications for Multi-access Edge Computing \(MEC\) in 5G network deployments](#)

Supervisor: José-Fernán MARTÍNEZ-ORTEGA

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5) [AI-Driven Adaptive Mission Management at the Edge for Autonomous Agents in key domain applications \(smart domains\)](#)

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Open Hardware and Novel Processing Architectures

1) [RISC-V based Adaptable Systems-on-a-Chip](#)

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Software engineering and applications software

1) [Intelligent therapeutic exergames](#)

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- 2) [Natural Language Dialogue systems for cybersecurity](#)
Supervisor: Iván Pau de la Cruz & Mario Vega Barbas
Email: ivan.pau@upm.es & mario.vega@upm.es
- 3) [Evaluating Deep Neural Networks](#)
Supervisor: Sira Vegas
Email: sira.vegas@upm.es
- 4) [Solving Combinatorial Problems though Reinforcement Learning](#)
Supervisor: Álvaro García
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Spintronics

- 1) [Designing magnetic nanowires for racetrack storage device](#)
Supervisor: Mariana de Jesus Paiva Proença
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Industrial Management

- 1) [Flexible manufacturing systems optimization](#)
Supervisor: Roque Calvo
Email: roque.calvo@upm.es
- 2) [Integration of Artificial Intelligence technology in quality assurance for industrial production](#)
Supervisor: Joaquín Ordieres-Meré
Email: j.ordieres@upm.es
- 3) [Solving Combinatorial Problems though Reinforcement Learning](#)
Supervisor: Álvaro García
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Materials Engineering

- 1) [Infrared and THz photonics: plasmonic and phononic metamaterials and sensor development](#)
Supervisor: Adrian Hierro
Email: adrian.hierro@upm.es
- 2) [Microfluidics-based devices for mechanical characterization of living cells and biological applications](#)
Supervisor: Gustavo R. Plaza
Email: Gustavo.plaza@upm.es

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- 5) [Theoretical prediction of liquid-liquid phase separation in protein solutions and prevention of ageing in condensates](#)
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- 6) [Valorization of organic wastes towards green hydrogen production](#)
Supervisor: Antonio Juan Dos Santos-García
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- 7) [Ultracold atomic gases](#)
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- 8) [Geometry of atomic and molecular systems](#)
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- 9) [Straintronics and Piezotronics in 2D Materials using Surface Acoustic Waves](#)
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- 10) [Single Photon Sources in 2D Materials](#)
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- 11) [Laser processing of materials for energy storage](#)
Supervisor: Carlos Molpeceres
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- 12) [Metasurfaces based on bidimensional materials](#)
Supervisor: Fernando Calle & Juan Luis García-Pomar
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- 13) [Advanced hydrometallurgical processes for the recovery of metals from refractory sulphides and wastes](#)
Supervisor: Ana María Méndez Lázaro
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- 14) [Development of soft skin for a bioinspired underwater robot](#)
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- 15) [2D & Graphene Solar Cells for Green Energy](#)
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- 16) [2D & Graphene Supercapacitors for Green Energy](#)
Supervisor: Javier Martínez Rodrigo
Email: javier.martinez@upm.es
- 17) [Nanomanipulation of nanomaterials with atomic force microscope \(AFM\) and scanning electron microscope \(SEM\)](#)
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Mechanical Engineering

- 1) [Microfluidics-based devices for mechanical characterization of living cells and biological applications](#)
Supervisor: Gustavo R. Plaza
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- 2) [Storage and discharge of bulk solids in bins and hoppers](#)
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Mechatronics

- 1) [Mobile Robotics for Gait Analysis](#)
Supervisor: Alberto Brunete
Email: alberto.brunete@upm.es
- 2) [Applications for multiple collaborative robots in industry 5.0](#)
Supervisor: Alberto Brunete
Email: alberto.brunete@upm.es
- 3) [Drone autonomy in hazardous industrial environments](#)
Supervisor: Pascual Campoy
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- 4) [Integration of Artificial Intelligence technology in quality assurance for industrial production](#)
Supervisor: Joaquín Ordieres-Meré
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5) [Development of soft skin for a bioinspired underwater robot](#)

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Operations Research and Operations Management

1) [Decoding Human Behavior](#)

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2) [Mathematical Programming and Simulation in Production and Logistics](#)

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5) [Cost-effective stability services in highly renewable electricity grids](#)

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6) [Solving Combinatorial Problems through Reinforcement Learning](#)

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Physics

1) [Designing magnetic nanowires for racetrack storage device](#)

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2) [Decoding Human Behavior](#)

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3) [Acquisition and modelling of Nuclear Magnetic Resonance Dispersion Spectra](#)

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Sport Sciences

- 1) [Intelligent therapeutic exergames](#)
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- 2) [Education through sport \(school and after-school programs\)](#)
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- 3) [Evaluation in physical education](#)
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- 4) [The role of maturation in youth sport: the concept of bio-banding](#)
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- 5) [Exercise for improving health and performance](#)
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- 7) [Individualized physical activity](#)
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- 10) [Dual career and sport](#)
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- 11) [Thermography applied to the quantification of the training load](#)
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- 12) [Influence of apnea duration during underwater swimming on the perceptive, biomechanical and physiological parameters of elite swimmers. Effect of moderate hypoxia. \(U-SWIM\)](#)
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- 13) [Football performance](#)
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- 1) [Sustainability impact assessment of micro mobility systems](#)
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- 2) [Impact of the growth of e-commerce on urban mobility patterns](#)
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- 3) [Channel Modeling Propagation Mobility Outdoor Scenarios in Millimeter Bands](#)
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- 4) [Developments of 5G Systems in Millimeter Bands in Railways Scenarios: Application to Channel Modeling Propagation and Virtual Coupling](#)
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- 5) [Aerodynamic and aeroacoustic optimization of critical parts of high-speed trains](#)
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