

# TIC

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information





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Vicerreitoría de Comunicación e Relacións Institucionais  
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## *Presentation*

One of the main functions of the university is the transfer of knowledge to the productive sector and to companies, especially in their nearby environment. Thus, the link between the research carried out at the university and the economic and social progress is articulated, among other aspects, through the innovation, the competitiveness of companies, the improvement of the quality of life and the sustainable development. In recent years, the Information and Communication Technologies (ICT) has been one of the fastest growing sectors, and digitization has become a strategic pole for the transformation of the production model and economic recovery after the pandemic. Within the framework of the consolidation of the aforementioned transformation, there is a firm commitment from the regional and national governments in the plans "Digital Strategy 2030" and "Digital Spain 2025". Both aligned with the European strategies for the coming years, with the aim of promoting and reinforcing disruptive technologies such as artificial intelligence (AI), cybersecurity, the Internet of Things (IoT), Big Data, 5G, quantum, etc., and thus use digital transformation as a lever to transform the economy. This catalogue, therefore, arises with the aim of transferring to the companies and institutions in our environment, the R&D services and capacities, available at the University of Vigo, within the framework of the ICT technologies. The information collected here organizes and structures the capacities from the point of view of its field of application, in such a way that it optimizes the search for them. Furthermore, it is necessary to explain that research, knowledge transfer and innovation at the University of Vigo, is structured in groups, institutes and research centers, due to the specialization and diversity of fields and areas. The catalogue, therefore, lists the R+D+i capacities and services provided, sorted by research group, which are the basic functional units of the university with sufficient specialization to offer them. Finally, I would like to highlight my gratitude, on the one hand, to our Knowledge Transfer Office (OTRI) for the time and effort dedicated to this initiative and, on the other, to the research groups involved, for the collaboration and facilities provided to carry it out. I hope this publication is useful and enhances public-private collaboration, and ultimately benefits society.

**Belén Rubio**  
Vice-Rector of Research,  
knowledge transfer and Innovation  
November 2022





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**TELEMATICS SYSTEMS ENGINEERING  
GROUP - GIST (ET1)**

**Researchers**

- Martín Llamas Nistal
- Luis Eulogio Anido Rifón
- Manuel Caeiro Rodríguez
- Luis Modesto Álvarez Sabucedo
- Christian Delgado von Eitzen
- Amr Elsayed
- Manuel José Fernández Iglesias
- Francisco Fernández Masaguer
- Martín Liz Domínguez
- Adrián Lugalde López
- Mario Manso Vázquez
- Ricardo Manuel Meira Ferrao Luis
- Fernando Ariel Mikic Fonte
- Moisés Rubén Pacheco Lorenzo
- Juan Manuel Santos Gago

**Offer**

- Artificial Intelligence and serious games for the early-detection of diseases ageing-related diseases.
- Digital TV services for seniors.
- Intelligent systems and machine learning.
- E-health process mining. Monitoring, process control, traceability and adherence to protocols in the health domain.
- Multimodal learning analytics. Analysis of data collected from different sources (LMS systems, mobile and wearables devices) in order to obtain a holistic understanding of the learning process. Modelling and data analysis in e-learning.
- E-assessment.
- E-learning focused on open educational resources, assessment systems and self-regulated learning.

Services:

- AI demonstrator/ AI pilot. Application of IA techniques for knowledge extraction from unstructured data. Knowledge generation from implicit data. Generation of classification and clustering systems. Development of dashboards and advanced reporting tools for decision-making. Validation against different types of ground truth.
- Digital Office. Development and improvement of interfaces. Service focused on HCI (Human-Computer Interaction) through different types of interfaces and interaction

- environments.
- Data collection and processing system. Data collection from heterogeneous sources. Data transmission using standardised protocols (Web Services, Web Sockets or MQTT, CoAP and similar depending on the particular context. Information extraction and pattern discovery through multimodal analysis. Data enhancement and interrelation with other repositories based on semantic technologies and LinkedData techniques. Development of dashboards, alert and recommendation services.

**Keywords**

Multimodal Learning Analytics, e-assessment, e-learning, artificial intelligence, serious games, e-health, e-health process mining, digital TV services, open educational resources.

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**INFORMATION SOCIETY SERVICES  
GROUP - GSSI (ET2)**

**Researchers**

- José Juan Pazos Arias
- Martín López Nores
- Jorge García Duque
- Alberto Gil Solla
- Roi Martínez Portela
- Yolanda Blanco Fernández
- Roi Martínez Portela
- Sergio Arcay Mallo

**Offer**

- Semantic Web.
- User modelling.
- Context awareness.
- Recommender systems.
- Personalization, crowdsourcing and crowd computing.
- Traditional and sporadic social networks.
- Wide cloud and near cloud computing.

Services

- Artificial Intelligence applications in education, tourism, cultural heritage and health care: recommender systems, expert systems, planning, optimization, natural language processing, etc.

- Digital Humanities: knowledge management systems (CMS) for cultural heritage and points of tourist-cultural interest; digitization and semantic annotation; support for the development of multimedia narratives.
- Support systems for diagnosis and therapy of cognitive, communication and autism spectrum disorders: profile management, generation and monitoring of therapy plans, adapted interaction systems, interaction mediated by avatars.
- Consulting on information and communications systems for industry 4.0.

**Keywords**

Personalization, semantic recommendation, ontologies, digital humanities, natural language processing, applied artificial intelligence, crowdsourcing and crowd computing, e-health, cognitive disorders, communication, autism spectrum.

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**NETWORK LABORATORY - NETLAB  
(ET3)**

**Researchers**

- Cándido Antonio López García
- Sergio Herrería Alonso
- José Carlos López Ardao
- Miguel Rodríguez Pérez
- Raúl Fernando Rodríguez Rubio
- María Estrella Sousa Vieira
- Andrés Suárez González

**Offer**

- Data networks energy efficiency.
- IoT networks.
- Performance analysis of communication networks.
- Application of Social Networks, informal learning and gamification in Education and Knowledge Management.
- Information-centric networks.
- Satellite networks.

Services

- Training in computer network technologies.
- Design, deployment and optimization of data networks (operators, data centers, corporate networks, content providers, etc.): Virtualization and orchestration of network resources and services, security audits, performance analysis, etc.

- Design and implementation of corporate platforms for training, group work and knowledge management.
- Design of gamification-based solutions for multiple fields (training, marketing, health, knowledge management, etc.).
- Design and development of complete IoT solutions, including the deployment of sensor networks.
- Design and development of Big Data solutions: data acquisition systems, pre-processing and processing of large amounts of data, deep data analysis.

**Keywords**

Ethernet, 5G, IoT, gamification, ICN, MAC, LEO.

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**INFORMATION & COMPUTING LAB  
(ICLAB)**

**Researchers**

- Rebeca Pilar Díaz Redondo
- Ana Fernández Vilas
- Manuel Fernández Veiga

**Offer**

- Privacy and security in distributed and collaborative DL/ML (Deep Learning/Machine Learning).
- Incremental learning and xAI (eXplainable Artificial Intelligence).
- IoT (internet of things): protocols and distributed computing on combined architectures (Cloud/Fog/Mist/Edge computing).
- E-learning: new techniques using conversational bots (assistants) and smart speakers. Application of micro-learning and learning analytics in different contexts.

Services

- ML/DL (Deep Learning/Machine Learning) solutions for pattern inference and early detection of anomalies (sensing networks, HPC, etc.).
- Solutions for IoT (Internet of Things) in industrial environments.
- AI (Artificial Intelligence) solutions for IoT (Internet of Things) environments: distributed computing of Machine

- Learning (ML) algorithms.
- Micro-learning solutions for informal learning, awareness and corporate environments: solutions based on bots (conversational assistants) and on forgetting curves.
- Learning analytics solutions applied to hybrid training and corporate solutions.
- Smart retail. Intelligent management based on data analytics techniques, of product catalogues in the field of e-commerce and, especially, in the food sector.
- Securing highly sensorised and distributed environments. IoT security support through distributed and collaborative anomaly detection techniques (equipment failure, operational degradation, attacks, etc.).

**Keywords**

- IoT, Machine Learning (ML), Deep Learning (DL), edge/fog/mist computing, distributed computing, ciber-crime, privacy, federated learning, xAI, conversational bots, e-learning.

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**SIGNAL PROCESSING IN  
COMMUNICATIONS GROUP - GPSC  
(SC10)**

**Researchers**

- Fernando Pérez González
- Carlos Mosquera Nartallo
- Roberto López Valcarce
- Pedro Comesaña Alfaro
- Domingo Docampo Amoedo
- Felipe Gómez Cuba
- Alberto Pedrouzo Ulloa
- David Vázquez Padín

**Offer**

- Multimedia security.
- Image and video forensic analysis.
- Digital watermarking.
- Privacy enhancing technologies.
- Signal processing in the encrypted domain.
- Postquantum cryptography.
- Federated learning.
- Digital communications.
- Channel estimation.
- Cognitive radio.
- Satellite communications.
- Efficiency improvement in digital communications.
- Adaptive signal processing.
- Full-duplex communications.
- Sensor networks.
- MmWave and wideband channel.
- Hybrid Massive MIMO.
- Radio devices mobility and location.
- Integrated Access and Backhaul (IAB).
- Cross-layer Scheduling and Slicing.
- Full-Stack Network Simulation
- IoT, Smart Grid/City and CPS.
- Digital baseband design.
- Interference cancellation schemes.
- Optimization and measurement of the physical layer of communication systems.
- Steganalysis.

**Keywords**

Multimedia security, forensics, anonymity, privacy, encryption, federated learning, watermarking, digital communications, radio communications, satellites, repeaters, relays, adaptive algorithms, interference cancellation, estimation and detection, 5G, massive MIMO.

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**HIGH-FREQUENCY DEVICES GROUP -  
GDAF (SC2)**

**Researchers**

- Mónica Fernández Barciela
- Fernando Isasi Vicente
- Fernando Martín Rodríguez

**Offer**

- Linear and nonlinear modelling, and experimental characterization of microwave semiconductor active devices and MIC circuits, both on wafer and packaged.
- Large-signal microwave measurements (vector-calibrated) in different terminal impedance environments (passive load-pull).  
Design of hybrid and monolithic MIC circuits for communications applications.  
Design of radio frequency circuits for radio communications: power amplifiers, filters, combiners, duplexers, etc.  
Image processing, computer vision and remote sensing.

Services

- RF and Microwave Hybrid circuit prototypes design. RF sub-systems design.
- MMIC design for communications.
- Linear and nonlinear vector calibrated characterization of microwave devices and circuits (on die or packaged).
- Nonlinear microwave transistor model development.
- Consultants in RF and microwave communications sub-systems.
- Image processing, computer vision and remote sensing.

**Keywords**

Semiconductors, microwaves, amplifiers, RF sub-systems, MIC design, nonlinear characterization, nonlinear modelling.

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**BIOENGINEERING AND  
CHRONOBIOLOGY LABORATORY - LBC  
(SC4)**

**Researchers**

- Ramón Carmelo Hermida Domínguez
- José Ramón Fernández Bernárdez
- Ignacio Alonso Alonso
- Artemio Mojón Ojea
- Pedro Antonio Callejas Cabanillas
- Sonia María Gómara Villabona
- María del Carmen Castiñeira Pérez
- María Teresa Ríos Rey
- Juan José Crespo Sabarís
- Lorenzo Pousa Estévez

**Offer**

Development of new methods of data analysis and application of statistical methodology and biomedical signal processing techniques to improve people's health, especially in the fields of cardiovascular diseases and hypertension, diabetes, kidney disease, ageing, epidemiology, pharmacology, and endocrinology.

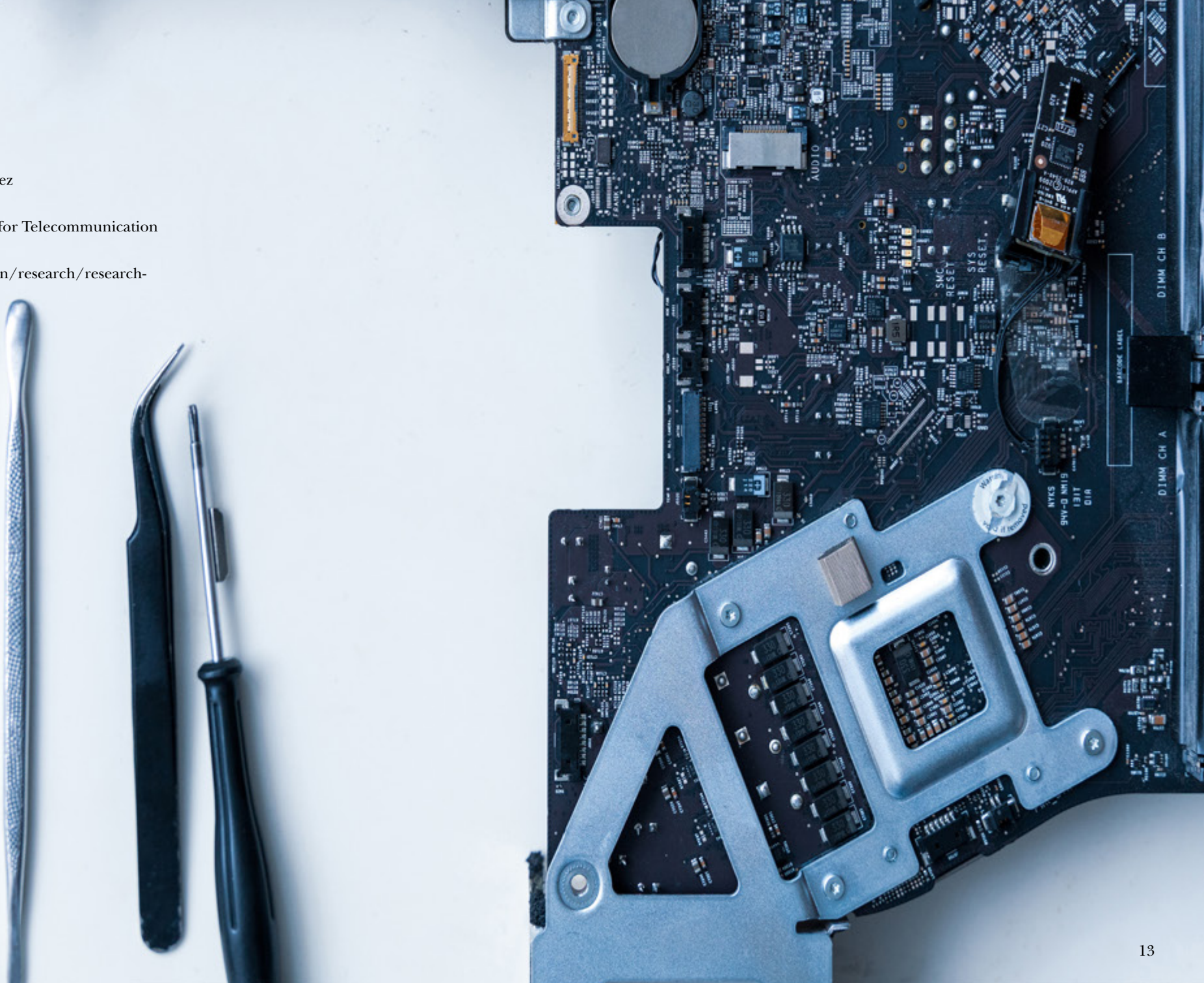
- Chronobiology and chronotherapy. Development of new methods for the characterisation and analysis of physiological variables applied to improve the treatment of hypertension, diabetes, and kidney disease.
- Hypertension diagnoses and management.
- Individualized assessment of cardiovascular, metabolic, and renal risk.
- Efficacy and safety assessment of antihypertensive therapy.
- Early detection of hypertensive complications in pregnancy (gestational hypertension and pre-eclampsia).

**Keywords**

Hypertension, cardiovascular risk, diabetes, kidney disease, chronotherapy, ABPM, circadian rhythms.

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**ANTENNA, RADAR AND OPTICAL COMMUNICATIONS GROUP- COM (SC7)**

**Researchers**

- Antonio Pino García
- Francisco Javier Fraile Peláez
- Fernando Obelleiro Basteiro
- José Oscar Rubiños López
- José Luis Rodríguez Rodríguez
- Alberto Marcos Arias Acuña
- Maria del Pilar Hortensia García Soidán
- Marcos Curty Alonso
- Inés García-Tuñón Blanca
- Marta Gómez Araújo
- Francisco Javier Díaz Otero
- Borja González Valdés
- Yolanda Rodríguez Vaqueiro
- José Vázquez Cabo
- Lorena María Pérez Eijo
- Alvaro Navarrete Rodríguez
- Víctor Zapatero Castrillo

**Offer**

- Millimeter wave sensing systems for (static or on-the-move) security imaging.
- Analysis and synthesis of antennas (multireflector systems, + reconfigurable reflectarrays transmitarrays,) for scanning and satellite applications.
- Characterization, identification, and non-destructive detection of materials and substances by THz spectroscopy.
- Quantum communication. Quantum cryptography. Quantum information.
- Fast integral-equation methods and supercomputing techniques applied to computational electromagnetics.
- Parallel High Performance Computing (HPC).
- Electromagnetic compatibility (EMC), simulation and measurement.
- Electromagnetic interferences between systems (EMI), radiations hazards (EMR).
- Design of antennas and matching networks onboard real platforms (ships, airplanes, etc.) with complex environments.
- Electromagnetic simulation of advanced artificial materials (metamaterials) and complex plasmonic systems (colloids of nanoparticles, nano-antennas, etc.)
- Surface-enhanced Raman spectroscopy (SERS) and other nanoplasmonic biosensing and biomedicine applications.
- Electronic Warfare.

- Ship signature management (measurement, simulation and control), both Radar signature and infrared (IR) signature.
- Radar Cross Section (RCS), simulation, measurement and control. Radar imaging. Synthetic Aperture Radar (SAR), Inverse Synthetic Aperture Radar (ISAR), tomography, etc.
- Automotive radar systems.
- Application of electromagnetic fields to food freezing technologies. Cell Alive System (CAS).
- Integrated photonics.
- Satellites.
- Civil Security.

**Services**

- Design and characterization of 3D high-resolution radar systems for real-time image reconstruction (static or on-the-move) for detection of concealed objects applied to security, food industry, etc.
- Electromagnetic consulting: analysis and synthesis of reflector antenna systems, electromagnetic compatibility studies and interference for radiant systems in complex scenarios.
- THz spectroscopy: complete characterization of materials (estimation of electrical parameters: refractive index and absorption coefficient), transmission channels or high-resolution antennas, THz imaging of samples.
- Simulation of the electromagnetic behaviour of platforms with multiple radiating systems (warships, aircraft, ground vehicles, etc.). This process may include design and optimization of the location of antennas; simulation, reduction and control of the radar section (SER/RCS); or the complete modelling of E3 problems (Electromagnetic Environmental Effects). E3 encompasses fundamental disciplines such as electromagnetic compatibility (EMC), electromagnetic interference (EMI), or dangerous radiations (EMR/RADHAZ) both for personnel (HERP) as well as for weapons (HERO) and fuels (HERF).
- Pre-certification of systems to verify compliance with Electromagnetic Compatibility (EMC/EMI) regulations.
- Electromagnetic simulation of advanced metamaterials and frequency selective surfaces (FSS), applied to low observable radar.
- Simulation of complex plasmonic systems (nanoparticle colloids, nano-antennas, etc.). Surface enhanced simulations, Raman Spectroscopy (SERS) and other applications of nanoplasmonics in biomedicine and biosensing.
- Design and manufacture of radar and infrared signature measurement systems, and diagnostic and training systems for electronic warfare equipment.

- Cybersecurity of systems and network virtualization on board ships or complex environments, digital twins, artificial intelligence, 5G networks, etc.
- Miniaturization of HF antennas on military ships.
- Design of automotive radar systems.
- Application of electromagnetic fields to food freezing techniques. CAS freezing system.
- Quantum cryptography systems security analysis.
- Quantum technologies consultancy.
- Electromagnetic measurements:
  - a) Up to 24GHz antennas characterization.
  - b) Electromagnetic compatibility measurements and tests (radiated emissions/immunity and conducted emissions) according to the test conditions of the UNE-EN 61000 and CISPR16 standards, in low-consumption single-phase systems.
  - c) Coverage measurements and analysis of signals in wireless communications.
  - d) Electromagnetic signature measurement for ships, land, and air vehicles; both radar signature (RCS, ISAR, SAR, tomography, etc.) and infrared signature (IR).
- Training courses, seminars and conferences related to electromagnetic radiation (interaction with living beings, materials or complex structures; electromagnetic compatibility).

**Keywords**

Electromagnetic fields, radiofrequency, electromagnetic compatibility, electromagnetic simulation, spectrometry, security, instrumental demonstrator, signal processing, communications, calibration, signal measurement and emulation, integrated services system, monostatic, multistatic, antennas, scanning antennas, reflector antennas, naval antennas, radiation pattern, antenna miniaturization, radar systems, radar imaging, millimeter wave scanners, detection of improvised explosive devices, radar equivalent section, radar signature, infrared signature, ground penetrating radar, quantum communications, quantum cryptography, quantum key distribution, communications security, biosensing, biomedicine, electronic warfare, radar signature, infrared signature, remotely piloted aircraft, drone.

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**MULTIMEDIA TECHNOLOGIES GROUP**  
**- GTM (SC9)**

**Researchers**

- Carmen García Mateo
- José Luis Alba Castro
- Antonio José Cardenal López
- Laura Docío Fernández
- Antonio Salvador Pena Giménez
- Eduardo Rodríguez Banga
- Manuel Ángel Sobreira Seoane
- María Soledad Torres Guijarro

**Offer**

- Image and video processing: event detection and classification, face analysis and recognition, computer vision, automatic sign language recognition.
- Pattern recognition, machine learning, multimodal biometric identification.
- Speech processing: speech and speaker recognition, analysis and search on speech, speech-to-text and text-to-speech conversion, voice transformation, disease detection, automatic subtitling.
- Acoustics: architectural acoustics, marine acoustics, measurements and numerical methods for acoustics, low-cost acquisition and processing acoustic systems and audio quality.

Services

- Acoustic measurements of sound pressure level, acoustic intensity, etc.

- Room acoustic consulting, acoustic isolation, diagnosis and noise control, aerial and underwater noise pollution, associated legislation, etc.
- Design of computer vision systems.
- Video analytics solutions.
- Speech technology for Galician.
- Prototyping of disease detection by voice processing. Speech recognition and synthesis systems in Spanish and Galician. Emotion recognition systems.
- Biometric control systems based on voice and/or facial characteristics, both for access control and time control. Facial verification software.

**Keywords**

Speech technology, image and video analysis, acoustics and audio processing, pattern recognition, sign language technology.

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**RADIO SYSTEMS (SR)**

**Researchers**

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- María Verónica Santalla del Río
- Iñigo Cuiñas Gómez
- Paula Gómez Pérez
- María Edita de Lorenzo Rodríguez
- Rubén Nocelo López
- Pablo Torío Gómez
- Ana Vázquez Alejos

**Offer**

- Radio systems.
- Mobile communications.
- Wireless LANs.
- Point-to-multipoint networks.
- Digital television (terrestrial, satellite).
- Analysis of the radio channel.
- Characterization of propagation degradation.
- Noise and interference and the design of techniques to mitigate these problems.
- Design, manufacturing and measurement of antennas for different applications.
- Radar, with emphasis on polarimetric measurement techniques for weather radar and SAR.
- Passive radar.

Services

- Communication solutions using wireless networks.
- Analysis and design of reflector antennas for satellite communications and new radio services.
- Analysis and design of antennas for wireless communications.
- Analysis and design of on-board antennas.
- Antenna measurements.
- Measurement, characterization and antennas mimicking.
- Measurements of the exposure levels to electromagnetic fields produced by high power lines, telephone base stations or other communication systems.
- Certification of radio stations.
- Instrumentation control.
- Planning of radio communication systems.
- Pre-certification of electromagnetic compatibility.
- Measurement and characterization of impulsive noise.
- Measurement and characterization of electromagnetic attenuation by hydrometeor (rain, fog, etc.).
- Measurement and electromagnetic characterization of materials.

- Measurement and characterization of indoor propagation of waves.
- Measurement and coverage calculations of analogue and digital television (DVB-T).
- Measurements of mobile phone coverage (GSM - UMTS) and other wireless systems.
- Numerical simulation of applied electromagnetism problems.
- Data collection and processing system. Automation of data collection. Automated data management. Integration with vertical traceability. Digitisation of traceability. Paperless.
- Autonomous sensors. Analysis of the environment and determination of needs. Selection of optimal technology to implement.
- Radio coverage simulation and/or measurement.
- Prototyping. Design support of anechoic chambers. Determination of compliance with design requirements, standards and regulations. Design support for improvement and optimisation.

**Keywords**

Radio systems, mobile communications, wireless networks, sensor networks, radiofrequency, satellite navigation systems, antenna, radar, 5G.

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**INFORMATION TECHNOLOGIES GROUP**  
**- GTI (TC1)**

**Researchers**

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- Juan Carlos Burguillo Rial
- Enrique Costa Montenegro
- Francisco de Arriba Pérez
- Pablo Fondo Ferreiro
- Silvia García Méndez
- Pedro Salvador Rodríguez Hernández

**Offer**

- Intelligent networks, including 5G and beyond.
- Data analytics.
- Wireless networks and embedded systems.
- Intelligent services.
- Cyberphysical systems.

Services

- 5G communication networks and beyond: SDN, NFV, virtualization and orchestration of network resources, virtualization and orchestration of services, protocol design, network optimization, private networks, industrial networks, tactical networks, economic models.
- Private cellular operators. Identification of communication requirements of industries. Analysis of existing infrastructures. Optimised solution design with latest generation technology according to the needs of the company. Implementation and testing.
- Embedded systems: sensors and intelligent systems for networked autonomous robots.
- Artificial intelligence technologies for the solution of large-scale problems. Agent technologies.
- Data analytics: natural language processing, natural language generation, conversational technologies, network data analytics, service data analytics, social media analytics, Industry 4.0 data analytics.
- AI platforms in the cloud, edge or local deployments for industrial applications. Transition to 5G. Computational offloading to edge and/or cloud. Computational offshoring. Flexible implementation of new processes. Flexible integration of new machinery.
- Multimedia distribution technologies: scalable protocols, intelligent network services.
- Wireless networks: intelligent access networks, cooperative

- networks, cognitive networks.
- Development of conversational agents for specific applications. Conversion of industrial and business data to coherent natural language. Multi-language support. Integration with management and customer relationship systems. Mobile applications for communication with people with diversity. Conversational assistants for the elderly.

**Keywords**

5G, IoT, Industry 4 0, intelligent networks, autonomous vehicles, Big Data, natural language processing, data analytics, wireless networks, intelligent networked services, cyberphysical systems.

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**DIGITAL COMMUNICATIONS AND INSTRUMENTATION - CDI (TE3)**

**Researchers**

- Fernando Machado Domínguez
- Francisco Poza González
- Fernando Pérez Fontán
- Miguel Ángel Domínguez Gómez
- Vicente Pastoriza Santos

**Offer**

- Electronic instrumentation systems.
- Sensor networks.
- Software defined radio systems.
- Radio communications.
- Radio channel modelling and tropospheric effects.
- Field buses and industrial communications.
- Automated test equipment.
- Embedded processors and programmable logic devices.

Services

- Physical systems measurement with sensors or actuators.
- Design and implementation of automated measurement systems with LabVIEW.
- Design and implementation of software defined radio devices.
- Design and assembly of satellite receivers.
- Study and modelling of the radio channel.
- Design and implementation of test benches using automated test equipment (ATE).
- Courses on radio measurements for different systems and applications.
- Courses on visual programming and data acquisition with LabVIEW.
- Courses on embedded processors with FPGAs and SoCs.

**Keywords**

Instrumentation, distributed sensor networks (DSN), software defined radio (SDR), radio communications, automated test equipment (ATE), LabVIEW, field buses, embedded systems (SoC and FPGA).

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***AEROSPACE TECHNOLOGIES GROUP -  
GTA (TGTA)***

***Researchers***

- Fernando Antonio Aguado Agelet
- Fermín Navarro Medina
- Carlos Ulloa Sande
- Pedro Orgeira Crespo
- Guillermo David Rey González
- Uxía García Luis
- Alejandro Camanzo Mariño
- Alejandro Manuel Gómez San Juan
- José María Núñez Ortuño

***Offer***

- Software engineering in aerospace systems: analysis, architecture design, development and implementation, unit tests, integration and validation tests. All this under “agile” criteria, with SCRUM methodology oriented with CMMI criteria.
- Development of embedded software for UAVs, oriented to scientific and industrial missions with specifically designed payloads.
- Development of real-time applications for critical systems: hard/soft-RT. Implementation of control algorithms under RTS point of view.
- Development of solutions based on artificial vision, with application to industrial or scientific fields, using cameras in several ranges, including hyperspectral.
- Implementation of artificial intelligence solutions under classification algorithms, neural networks (especially RNN, ML and DL).
- Development of natural language processing applications for HMI interaction.
- Engineering of software-operated automatic electronic control systems.
- Digital twins. Implementation of simulation software in different fields, especially industrial and space ones.

***Keywords***

Real-time systems, artificial vision, machine learning, deep learning, natural language processing (NLP), artificial intelligence, neural networks, HMI, digital twins, systems engineering, control systems, attitude control systems.

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COMPUTATIONAL LEARNIG - COLE  
(IA1)

Researchers

- Manuel Vilares Ferro
- Lino José Álvarez Vázquez
- Víctor Manuel Darriba Bilbao
- Francisco José Ribadas Pena
- Áurea María Martínez Varela

Offer

- Natural language processing and language technologies.
- Text mining and sentiment analysis. Supervision in decision-making.
- Information recovery/extraction. Question Answering.
- Machine learning and reasoning. Knowledge representation.
- Computational models. Language models.
- Mathematical models. Environmental models. Numerical control, simulation and optimization systems.

Keywords

Natural language processing, language technologies, machine learning, knowledge representation, automatic reasoning, information extraction, information retrieval, question answering, text and opinion mining, modelling, language modelling, environmental modelling, numerical optimisation, numerical simulation, control systems.

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APPLIED COMPUTATION LABORATORY  
(LIA2)

Researchers

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- Juan Francisco Gálvez Gálvez
- Baltasar García Perez-Schofield
- Alma María Gómez Rodríguez
- Juan Carlos González Moreno
- María Encarnación González Rufino
- Regina Ibáñez Paz
- María José Lado Touriño
- Arturo José Méndez Penín
- Víctor Mondelo Visuña
- Lorena Otero Cerdeira
- María Rodríguez Damián
- Leandro Rodríguez Liñares
- Francisco Javier Rodríguez Martínez
- Xosé Antón Vila Sobrino

Offer

- Image processing
- Image and video processing.
  - Pattern recognition.
- Simulation, optimization and approximation. Data science and engineering.
- Simulation of processes using digital twins.
  - Internet of things and big data.
  - Modelling, simulation and optimization of processes.
  - Data mining and information recovery.
  - Mathematical analysis of differential equation models.
  - Algorithmics and high-performance computing.
  - Machine learning.
  - Functional and spatial data analysis.
  - Evolutionary computing.
- Space engineering
- Monitoring systems.
  - Design and implementation of on-board software.
  - Satellite simulation and monitoring.
- Intelligent software systems
- Artificial intelligence.
  - Traceability/blockchain.
  - Multi-agent software systems.
  - Information systems.
- Biomedical informatics
- Analysis of biomedical signals.
  - Analysis of biological systems.
  - Analysis of microscope and X-ray images.

- Services
- Image processing
- Approximation of sets of points to geometric shapes in 2D and 3D.
  - Image processing of all types of images including hyperspectral images.
- Simulation, optimization and approximation
- Hydrological modelling and simulation.
  - Simulation and modelling with particles
- Intelligent software systems
- Logistics 4.0, vehicle routing problem.
  - Applications in agri-food research.
- Space engineering
- Satellite on-board software development.
- Biomedical informatics
- Application of computer methods to immunology and pathology.
  - Heartbeat analysis.

Keywords

Image processing, simulation, optimization, computer graphics, software engineering, multi-agent systems, intelligent software, internet of things (IoT), big data, software engineering for space, satellites, blockchain, digital twins, biomedical informatics, artificial intelligence (AI), software design, data engineering, data mining, evolutionary computing, high performance computing (HPC) and simulation, machine learning, logistics 4.0, algorithms.

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**NEXT GENERATION COMPUTER  
SYSTEMS GROUP - SING (SI4)**

**Researchers**

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- María Novo Lourés
- María Lourdes Borrajo Diz
- Rosalía Laza Fidalgo
- Pedro Celard Pérez
- Adrián Seara Vieira
- José Manuel Sorribes Fernández
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- Miguel Reboiro Jato
- Martín Pérez Pérez
- Miguel Ferreiro Díaz
- Alba Nogueira Rodríguez
- Guillermo Blanco González
- José Ramón Méndez Reboredo
- Rubén Romero González
- Analía María García Lourenço
- Nancy Marisol Ocampo Quintero

**Offer**

- Artificial intelligence (AI): development and application of techniques and algorithms, case-based reasoning, knowledge representation, intelligent agents and evolutionary computation for solving optimisation problems.
- Machine learning: development of automatic classification and prediction models from large amounts of data. Image processing using deep learning.
- Text and database mining (data analytics): development and application of techniques for natural language recognition applied to spam filtering or automatic information extraction. Generation of knowledge graphs.
- Software development and bioinformatics analysis (genomics, proteomics, metabolomics, phylogenetics, metagenomics). Design and deployment of massive information analysis processes (high throughput).
- Clinical decision support systems: development of clinical decision support systems based on AI, machine learning and deep learning techniques for the exploitation of electronic medical records (including structured and unstructured information). Development of CAD (Computer-Aided Diagnosis) systems based on medical images.

- Cybersecurity: audit and implementation of secure computer systems in communication networks (VoIP, spam, cyber-attacks, etc.).

**Keywords**

Artificial intelligence, case-based reasoning, agents and multi-agent systems, evolutionary computing, machine learning, knowledge representation and acquisition, machine learning, classification, clustering, classifier combination, continuous learning, deep learning, neural networks, natural language processing, anti-spam filtering, biomedical text mining, large-scale integration of biological and clinical data, bioinformatics, genomics, proteomics, metagenomics, clinical decision support systems, automatic medical image analysis, cybersecurity, data analytics, Computer-Aided Diagnosis.

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**GRAPHIC AND MULTIMEDIA  
COMPUTING - GIG (SI6)**

**Researchers**

- Javier Rodeiro Iglesias
- Celso Campos Bastos
- Enrique Barreiro Alonso
- Silvana Gómez Meire
- José Luis Martínez Orge

**Offer**

- Graphics and vision technologies
- Advanced computer graphics applications.
  - Development of 3D environments, virtual reality and augmented reality.
  - Geometric modelling.
  - Distributed visualisation.
  - Development of scientific visualisation simulators.
  - Stereoscopic and autostereoscopic content generation.
  - Advanced manufacturing: prototyping and evaluation of visual and industrial interfaces.
- Cybersecurity
- Data flow analysis and early intrusion detection techniques.
- Geoinformatics
- Generation of models and navigation on Google Earth.
  - Design and implementation of geographic information systems.

**Services**

- Design and testing of visualisation equipment (smart factory).
- Design and testing of scientific equipment.
- IT security consulting and auditing.
- Systems integration and corporate information purification.
- Analysis and optimisation of business information systems.

**Keywords**

3D environments, virtual reality, augmented reality, cybersecurity, prototyping, visual interfaces, advanced manufacturing.

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**COMPUTER SYSTEMS AND SOFTWARE  
(SI1)**

**Researchers**

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- Amparo Rodríguez Damián
- Ana Isabel Díez Sánchez
- Emilio García Roselló
- Jacinto González Dacosta
- Miguel Ramón González Castro

**Offer**

Industrial Informatics

- Design of Industrial Computer Systems.
- 3D visualization.
- Virtualization.
- Industrial Computer Security Systems.
- Industrial Computing 4.0.

Information Systems

- Information Systems Management.
- Relationship Systems.
- Development of Computer Security Systems.
- Cybersecurity

Human-Computer Interaction (HCI)

- Usability studies.
- Website validation.
- Consulting on the design of interactive systems for personnel with special needs, industrial environments, administrative environments, and for the creation of new devices.
- Information capture systems in personal mobility vehicles.

Computer Assisted Teaching

- Assisted and cooperative learning systems.
- Direct, distance, blended and inverted educational computing.

**Keywords**

Industrial Computing, Information Systems, IoT (Internet of Things), e-learning, Computer-Assisted Learning, educational software, reuse, HCI.

**Contact**

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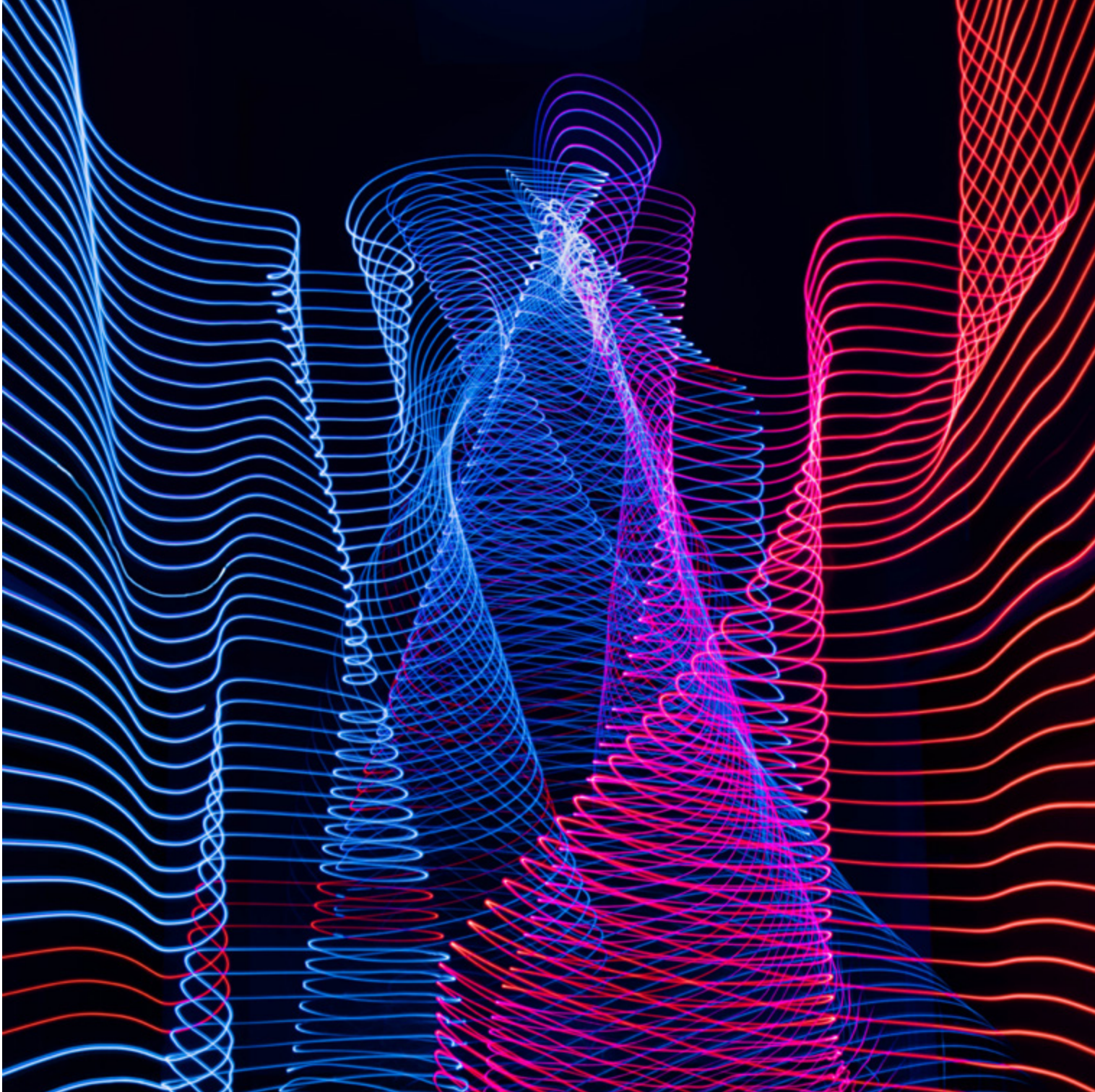
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CIMA GROUP (EG6)

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- Joaquín López Fernández
- Eva María Legido Mariño
- Enrique Paz Domonte
- Pablo Alexandre Sánchez Vilariño
- Pablo Yáñez Alfonso
- Pablo Izquierdo Belmonte
- Carlos Riveiro Cedeira
- Gabriel Fontenla Carrera
- Ricardo Samaniego López
- Carlos Parrilla García
- Carlos Campos Garrido

Offer

- Aerospace engineering, applied to small satellites.
- European specific installations in the integration of particle detectors.
- Biomedical: osteosynthesis plates designed from new thermoplastic materials developed for the aeronautics industry. Early prediction system for epileptic seizures. Haptic VR/AR system in human surgery.
- Product engineering: application to mechanical engineering of 2D/3D CAD techniques, dynamic simulation and optimisation, FEM and rendering, from conceptual design to the manufactured and marketed product, including the creation of prototypes.
- Simulation: linear and non-linear FEM, static and dynamic, multy-body system (MBS), impact, stochastic, fatigue calculation, breakage simulation, calculation of composites and advanced materials, thermal-structural CFD, BEM, FSI electromagnetism.
- Industrial automation: hydraulic systems, pneumatic systems, electrical systems, electronic systems, mechatronics, 4.0 technologies, robotics, artificial vision, machine learning, deep learning.

Services

- Product engineering: application to mechanical, automatic and mechatronic engineering of ICT techniques oriented to 2D/3D CAD, simulation and optimisation, FEM, rendering, from conceptual design to the manufactured and marketed product, including the creation of prototypes.
- Virtual reality and augmented reality for visualisation and simulation of complex mechanical and biomedical systems. Application in a web environment.
- Advanced haptic systems for remote operation of 3D systems (real/virtual).

Keywords

Mechanical design, FEM, virtual reality (VR), augmented reality (AR), multibody systems (MBS), mechatronics, biomechanics, aerospace, composite materials, hyper-elastic materials, nonlinear viscoelastic materials, virtual tests, haptic systems.

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ENGINEERING PHYSICS LAB (OF1)

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- José Benito Vázquez Dorrio
- Jesús Blanco García
- Eduardo Balvis Outeiriño
- Alicia Vázquez Carpentier
- Enrique Aldao Pensado
- Luis Miguel González de Santos

Offer

- Aerospace engineering: analysis, architecture design, development and implementation, integration and validation testing.
- Observation and navigation system.
- Geospatial technology.
- Unmanned Aerial Systems (UAVs): development of on-board software. Lab-on-drone device construction.
- Advanced computing and artificial intelligence (AI).

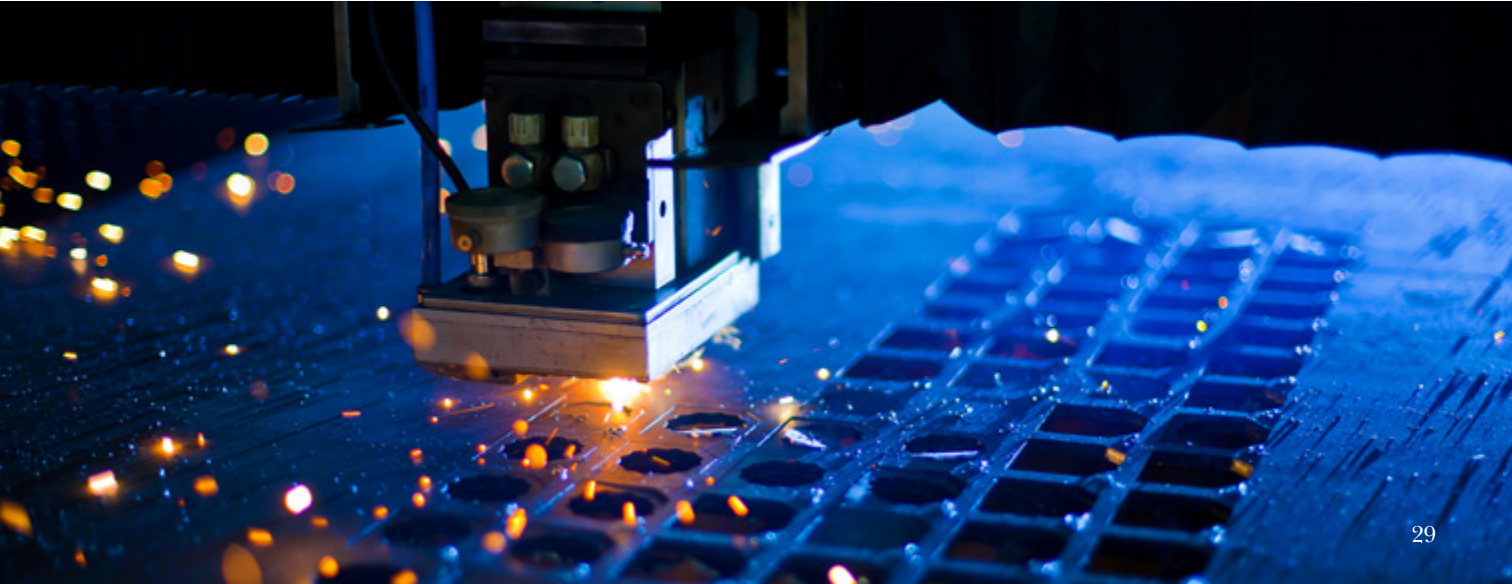
- Internet of things (IoT), sensor technology and its applications in energy efficiency, industry 4.0, smart cities and buildings, ecosystem monitoring, design of intelligent lighting systems.
- Mathematical engineering: digital twin, simulation, modelling and mathematical analysis of processes, products in different fields of health, energy efficiency.
- Photonics and quantum technologies: fibre optics, ultra-intense lasers, applications in nanotechnology and metrology devices.

Keywords

Numerical simulation, quantum technologies, optical communications, ultra-intense lasers, photonic crystals, plasmonics, terahertz photonics, drones, unmanned aerial systems, LiDAR, artificial intelligence, advanced computing, intelligent systems, internet of things (IoT), intelligent systems, aerospace engineering, modelling.

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## ELECTRONIC EQUIPMENT ENGINEERING - EEE (E03)

### Researchers

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- María Dolores Valdés Peña
- Andrés Augusto Nogueiras Meléndez
- María José Moure Rodríguez
- Alfonso Lago Ferreiro
- Jorge Marcos Acevedo
- Luis Eduardo Eguizábal Gándara
- Francisco Rodríguez Castro

### Offer

- Sensors and electronic signal conditioning circuits.
- Digital signal processing.
- Electrical energy converters for high and low (micropower) power applications.
- Charge control of electric accumulators.
- Reliability of electronic components, circuits and systems.
- IoT systems, Internet of Things.
- Low power embedded systems.
- Capture and storage of residual energy (energy harvesting).
- Educational innovation.

### Services

- Development of electronic boards for analogic, digital and mixed applications.
- Programming of microcontrollers for real-time applications and configuration of FPGAs for acceleration of digital signal processing.
- Development of electronic systems for measuring variables. Smart sensors.
- Design of electronic conditioners for sensors and actuators, and wireless data communication.
- Design of electronic power converters for specific applications.
- Design of solutions for powering low-consumption systems

- by capturing energy from the environment.
- Modelling, control and supervision of electrical energy storage devices (batteries, supercapacitors).
- Reliability studies on electronic components and systems (temperature, humidity, ageing tests).
- Design of systems in the field of ICT to improve teaching.
- Specific training courses in electronic technology.

### Keywords

Signal conditioners, actuators, energy storage, battery, wireless communication, power converter, energy harvesting, learning, reliability, FPGAs, IoT, microcontrollers, signal processing, sensor networks, sensors, smart sensors, embedded systems, wireless systems, supercapacitors.

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## DESIGN AND MANUFACTURING ENGINEERING GROUP - GEDEFA (EG1)

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- Juan José Areal Alonso
- José Luis Diéguez Quintas
- José Carlos Troncoso Saracho
- Mahdi Naderi
- Antonio Fernández Ulloa
- Primo Hernández Martín
- Iván Iglesias Sánchez
- José Luis Rivas López
- Juan Francisco Cantano Boyano

### Offer

- Development and application of methodologies, procedures and tools for the analysis of efficiency, sustainability, working conditions and social return in Industry 4.0.
- Design and management of processes in 4.0 manufacturing companies.
- Product design, tools and manufacturing processes in PLM / PDM environments. Plastic injection and plastic deformation processes, design and manufacture of moulds. Machining studies and cutting conditions in the Industry 4.0 scope: turning, milling, EDM, etc.
- Forming by foundry. Model elaboration. Near net shape casting. Analysis of forming processes. Implementation and adaptation of 4.0 technologies, methods and systems (CAD / CAM / CAE / CAX). CAM programming of machines with numerical control.
- Quality systems in Industry 4.0. Dimensional metrology, analysis and study of surface quality.
- Product development in fast prototyping machines by molten ABS deposition. Rapid manufacturing and additive manufacturing technologies.
- Integrated manufacturing systems. Project management application, integral project management.
- Capture and integration of manufacturing data using IoT technologies in edge computing, fog computing and cloud computing architectures.
- Analysis and exploitation of data with cloud data, big data, machine learning and artificial intelligence systems.
- Simulation and prediction of systems with manufacturing 4.0 processes through the integration of manufacturing data in real time.

### Services

- Simulation of processes using digital twins.
- Economic, environmental and social assessment of the efficiency of manufacturing processes.
- Training: Design and Manufacturing, Integrated Manufacturing Systems and Project Management application courses. Proposals for specific courses.
- Other R&D services and activities related to the above lines of research, upon request.

### Keywords

Industry 4.0, Sustainable & competitive manufacturing, ICT applied to manufacturing processes, CAx (CAD, CAM, CAE, CIM), Quality, Simulation, Robots, Mechatronics, Real-time, Integrated manufacturing systems, Monitoring, control and optimization of the use of energy and production flows.

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***EFFICIENT AND DIGITAL ENGINEERING  
(EN.EDI)***

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- Eloy Díaz Dorado
- José Ignacio Armesto Quiroga
- Blanca Nieves Miranda Blanco
- Ana Belén Albo López
- Concepción Pérez Rodríguez
- Enrique Riveiro Fernández
- David Santos Esterán
- Juan Sáez López
- Miguel Angel Silva Ucha

***Offer***

- Industrial Motion Control Systems and Special Robotics
- Industrial digitalization. Integration of industrial services.
  - Production control.
  - Traceability, data capture in the plant.
  - Maintenance, etc.
- Process/machine and process/management integration.
- Industrial IoT.
- Industrial digital twins.
- Simulation of industrial processes.
- Automatic tools for the rapid generation of simulations.
- Industrial Informatics.
- Integrated development of handling, logistics and industrial production systems.
- Renewable energies: simulation and integration in electrical networks.
- Electrical energy networks: planning, analysis, control and protection.
- Electrical technology.
- Power quality.
- Evaluation of energy efficiency in installations. Infrared thermography of electrical installations.
- Energy efficiency systems.

***Keywords***

Industrial digitization, simulation, digital twins, IoT, integration, automation and robotics, microgeneration and energy storage for remote systems, power quality and high frequency harmonic components, analysis of energy variables and interaction with users.

***Contact***

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***INARDESIGN (INAR01)***

***Researchers***

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- José Antonio Alonso Rodríguez
- José Luis González Cespón

***Offer***

- Architecture and energy: energy efficiency, BIM technology, architectural design, acoustics design and prevention, analysis and solution of pathologies.
- Cartographic engineering: airborne, UAV and terrestrial LiDAR, image technologies, development of multi-sensor systems, forestry applications.
- Energy efficiency, integrated inspection, as-built BIM modelling.
- Integral project management: application of predictive methodologies (PMBOK).

Services

- Engineering and construction.
- Industrial design.
- Architectural design.
- Pathology analysis.
- Energy efficiency.
- Cartography, image.
- Acoustics.

***Keywords***

Sustainability, innovation in construction, energy control, lighting efficiency, cartography, acoustics.

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**SAFE AND SUSTAINABLE MANAGEMENT  
OF MINERAL RESOURCES - GESSMIN  
(CI5)**

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- Elena de las Mercedes Alonso Prieto
- María Angeles Saavedra González
- José María Matías Fernández
- María Teresa Rivas Brea
- María Araújo Fernández
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- Xián Estévez Ventosa
- Enrique Manuel Alonso Villar
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- Xurxo Rigueira Díaz
- Daniel José Jiménez Desmond
- Ana Solares Canal
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- Javier Martínez Torres
- José Joaquín Sancho Val
- Javier Arzúa Touriño
- Fernando Carrera Ramírez
- Saki Gerassis Davite

**Offer**

- Geotechnical engineering: Simulation of underground excavation behaviour and geotechnical problems. Determination by means of advanced mathematical models of the risks of falling blocks in quarries. Slope stability analysis using numerical simulation.
- Cartographic engineering: Image technologies, 3D laser scanner. Multisensor system development in terrestrial platforms and UAV for surroundings measurement and inspection.
- Environmental modelling: models of mineral extraction,

mining restoration, floods and natural risks.

**Services**

- Consultancy and preparation of technical reports related to all research lines.
- Environmental modelling.
- Applications of advanced mathematical models (machine learning, Bayesian models, etc.) for the modelling of environmental engineering problems.
- Design and coupling of artificial vision and automatic prediction systems for the improvement of production processes and quality in the transformation process of construction materials (natural stone and ceramics).
- Application of cartographic technologies to the digitalisation, measurement, evaluation and diagnosis of forests (LiDAR UAV, Sentinel multispectral images, Digital Twin, etc.) to determine forest masses, severity of forest fires, influence of physiographic factors of the territory. Cartographic products for decision-making and forest management.

**Keywords**

Mining planning, environmental modelling, geotechnics, cartography, machine learning, Bayesian model, artificial vision, laser scanner, digital twin of the forest environment.

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**APPLIED GEOTECHNOLOGIES  
RESEARCH GROUP - GEOTECH (TF1)**

**Researchers**

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- Jesús Balado Frías
- José Carlos Caamaño Martínez
- Manuel Cabaleiro Núñez
- Natalia Caparrini Marín
- Borja Conde Carnero
- Lucía Díaz Vilarinho
- Antonio Fernández Álvarez
- María Elena González Rodríguez
- Henrique Lorenzo Cimadevila
- Joaquín Martínez Sánchez
- Belén Riveiro Rodríguez
- Mercedes Solla Carracelas

**Offer**

Use of different geomatics technologies and innovative methods based on artificial intelligence to solve problems in different areas.

- Smart cities and spaces.
- Smart infrastructures.
- Mobile mapping systems.
- Indoor modelling systems.
- Deformation monitoring.
- Road management systems.
- Bridge management systems.
- Energy and efficiency for buildings.
- BIM.
- LiDAR.
- GPR.
- Short range photogrammetry.
- Remote sensing.
- Unmanned aerial vehicles (UAVs).
- Infrared thermography.
- Industry, energy and environment.
- Infrastructure assessment.
- Architecture and construction.
- Geoinformatics.
- Remote sensing.

**Keywords**

Geoinformatics, geospatial intelligence, smart cities, resilient infrastructures, 3D mobile mapping

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**AGROFORESTRY ENGINEERING (AF4)**

**Researchers**

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- Carolina Acuña Alonso
- Xana Alvarez Bermúdez
- Óscar González Prieto
- Juan Luis Rodríguez Somoza
- Antonio Vázquez Torres

**Offer**

- Integrated management of watersheds.
- Mapping technologies in forestry applications and environmental LIDAR.

Services

- Assessment and management of natural resources: forest inventories, wildlife population management, continental water fish populations census and ecology, land management plans, game management plans, sustainable forestry management, protected areas management.
- Effects of human activities and specifically the effects of land use change on the conservation of biodiversity.
- Water quality of reservoirs and rivers, and determining its influence on the proliferation of the cyanobacterium Microcystis spp. (eutrophication), taking into account factors that may influence.
- Methodologies to assess the effectiveness of environmental restoration measures.

**Keywords**

GIS, environmental planning, e-learning.

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APPLIED PHYSICS 2 (FA2)

Researchers

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- Marta Hermida Leira
- Francisco Bellas Aláez
- Luis González Vilas
- Laura González
- Alberto Lorenzo González

Offer

- Prediction systems based on machine learning algorithms, field data and remote sensing.
- Development of preventive detection systems for contaminants in continental and oceanic waters.
- Use of microalgae for bioremediation of emerging pollutants.
- Photogrammetry and geographic information systems (GIS).
- Process automation for environmental monitoring.
- Marine mammal monitoring systems.

Services

- Prediction of toxic algae (FANS) in the Galician Rias using satellite images and environmental data.
- Calculation of boat routes, with minimum energy cost.
- Autonomous monitoring systems for water quality and pollution.
- Development of sensors and autonomous systems for pollutant detection.
- Cartographic and environmental study with photogrammetry, multiband drone flights and geographic information systems (GIS).
- Bivalve opening detectors, growth control and water quality systems for fish farms.
- Creation of environmental data servers from multiple sources and platforms.

Keywords

Red tide prediction, contaminant detection, microalgae bioremediation, GIS, fish farm monitoring systems, environmental data servers.

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ENVIRONMENTAL PHYSICS  
LABORATORY - EPHYSLAB (FA9)

Researchers

- María Teresa de Castro Rodríguez
- Luis Gimeno Presa
- Ramón Gómez Gesteira
- Raquel Olalla Nieto Muñiz
- Laura de la Torre Ramos
- María de las Nieves Lorenzo González
- María Inés Álvarez Fernández
- Alejandro Jacobo Cabrera Crespo
- Juan Antonio Añel Cabanelas
- José Manuel Domínguez Alonso
- Jorge Costoya Noguerol
- Marta Vázquez Domínguez
- Rogert Sorì Gómez
- Rubén Varela Rodríguez
- Diego Fernández Novoa
- Milica Stojanovic
- Marisela Des Villanueva
- Orlando García Feal
- Coral Salvador Gimeno
- Santiago Salvador Gimeno
- José González Cao
- Iván Martínez Estévez
- Albenis Pérez Alarcón
- José Carlos Fernández Álvarez
- Luis Gimeno Sotelo
- Patricia Páscoa de Oliveira Ramos
- Patricia Coll Hidalgo
- Ana Catarina Redondo Gonçalves
- Adrián Castro Olivares
- Beatriz Arguilé Pérez
- Susana Bayo Besteiro
- Michael García Rodríguez

Offer

- Earth physics: atmosphere and ocean
- Numerical simulation and optimisation of fluids:
    - Computational fluid dynamics (CFD).
    - Analysis and simulation of interaction of waves, coastal structures and floating bodies.
  - Hydraulic and hydrological simulation. Study of fluvial and urban flood zones.
  - Renewable energies.

- High performance computing (HPC) and cloud computing:
  - Complex problem solving using internal and external hardware.
- Climate change, applied computational sciences:
  - Data analysis, simulation and climate change impact studies in sectors such as renewable energies.
  - Impact of future climate conditions on aquaculture.
  - Study of climate-related mortality and/or diseases.
- Artificial neural networks:
  - Prediction, data analysis, simulation and intelligent management of reservoirs and water resources.

Services

- Design and optimization of offshore renewable energy devices.
- Design and optimization of coastal structures.
- Training in fluid simulation, CFD techniques.
- Impact of future climatic conditions on aquaculture.
- Study of flood zones: fluvial and urban (including hydraulic and hydrological simulation).
- Intelligent management of reservoirs and water resources based on neural networks.
- HPC and cloud computing. Calculation and modelling services and/or access to the use of our CPD.
- Study of climate-related mortality and/or diseases.
- Study of the hydrological cycle and atmospheric rivers.

Keywords

HPC, cloud computing, numerical simulation, neural networks, climate change, renewable energies, high-performance computing, floods, droughts, coastal engineering.

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**STATISTICAL INFERENCE, DECISION AND OPERATIONS RESEARCH - SIDOR (IO1)**

**Researchers**

- Jacobo de Uña Álvarez
- Javier Roca Pardiñas
- María Gloria Fiestras Janeiro
- Tomás Raimundo Cotos Yáñez
- Martín Fernández Pérez
- Susana Rafaela Guimaraes Martins
- María del Carmen Iglesias Pérez
- Adrián Lago Balseiro
- Francisco de Asís López Álvarez
- Nora Martínez Villanueva
- Manuel Alfredo Mosquera Rodríguez
- Iago Núñez Lugilde
- Ana Panduro Martín
- Juan Carlos Pardo Fernández
- Ana Pérez González
- María José Rodríguez Álvarez
- María Celia Rodríguez Campos
- María Estela Sánchez Rodríguez
- Marta Sestelo Pérez

**Offer**

- Data analysis. Statistical consulting.
- Big data.
- Biostatistics and epidemiology.
- Statistical methods.
- Operations research.
- Game theory.
- Decision theory.
- Software development.

Services

- Statistical and bioinformatics consultancy: technical reports, data modelling, data mining and analysis, interpretation of statistical analysis and reasoning, communication of statistical results adapted to the audience, design of questionnaires and data collection methods, design of studies for experiments and surveys, choice of sample size, data management and verification, analysis strategies.
- Data analysis and decision-making.
- Statistical-mathematical modelling.
- Statistical inference (non-parametric, semi-parametric).
- Decision theory.
- Statistical software development.
- Operations research, computational mathematics and game theory.
- Training:
  - Methods for data analysis and statistical inference.
  - Statistical packages.

**Keywords**

Survival analysis, cost allocation, big data, goodness of fit, multiple comparisons, ROC curves, censored data, high dimensional data, functional data, truncated data, multivariate statistics, diagnostic and prognostic test evaluation, inventory management, cooperative games, resampling methods, smoothing methods, missing data methods, data mining, multi-state models, resource optimisation, prediction and classification, routing problems, mathematical programming, pattern recognition, dimensionality reduction, non-parametric and semi-parametric regression, model selection, statistical software.

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**GALICIAN OBSERVATORY FOR MEDIA ACCESSIBILITY (GALMA)**

**Researchers**

- Pablo Romero Fresco
- Luis Alonso Bacigalupe
- Ana Tamayo Masero
- María Elena Sánchez Trigo
- María Susana Cruces Colado
- María Rico Vázquez
- Priscila Santos Rey
- Jesús Meiriño Gómez
- Rebeca Cristina López González
- Tamara Varela Vila
- Rocío Inés Varela Tarabal
- Shaza Hamza

**Offer**

- Study of preferences of user groups (elderly, migrants, users with hearing loss) in the reading of live subtitles.
- Eye-tracking analysis of live subtitle reception by user groups.
- Evaluation of the quality of materials produced by intralingual (without translation) and interlingual (with translation, also called speech-to-text interpreting) respaking as media accessibility tools for vulnerable groups and for the general public.
- Assessment of the efficiency of live subtitling systems and their different combinations: (i) automatic speech recognition programs, (ii) automatic translation programs, and (iii) mixed systems (combining human agents with automatic systems) for the production of live subtitles.

- Development and improvement of models for measuring the quality of live subtitling.

Services

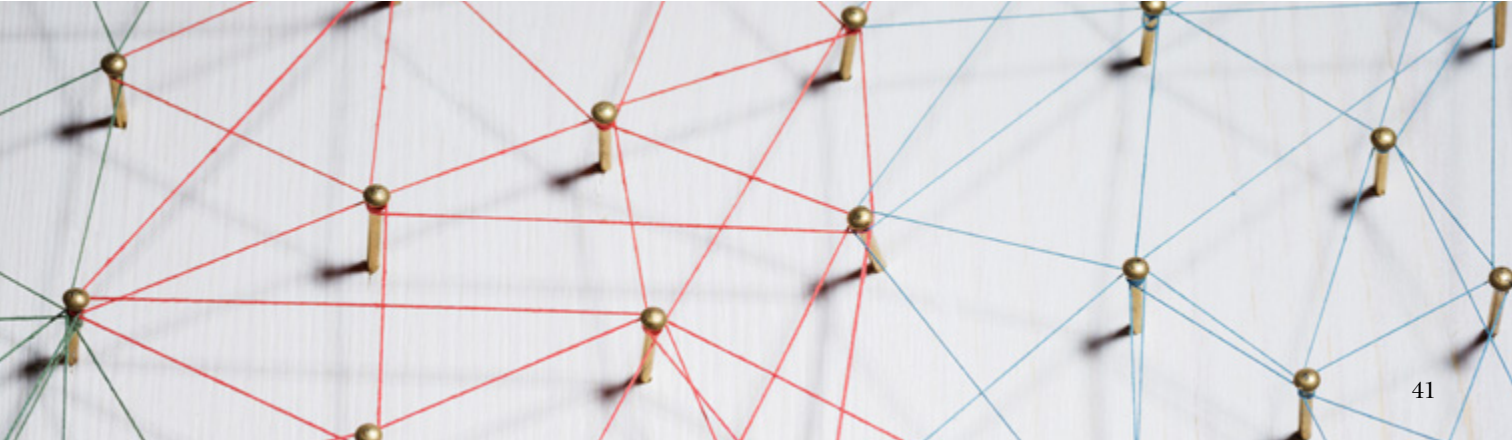
- Development of computer tools for the automatic and semi-automatic evaluation of live subtitles.
- Business and institutional consultancy on online systems using assisted systems for the provision of accessibility and/or translation services for audiovisual products and international conferences, courses or sessions of political entities and institutions.
- Advice and design of accessible filmmaking solutions for the integration of accessibility and translation in the audiovisual production process using ICT.

**Keywords**

Audiovisual translation, live subtitling, speech-to-text interpreting, interlingual respaking, intralingual respaking, automatic speech recognition programs, machine translation, audio description, sign language interpreting, accessible filmmaking

**Contact**

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**INFORMATION SYSTEMS AND  
TECHNOLOGIES FOR BUSINESS (OE4)**

**Researchers**

- María Ángeles Sandoval Pérez
- Irene Garrido Valenzuela
- Fernando Comesaña Benavides
- Vanessa María Suárez Porto
- María Montserrat Cruz González
- Francisco Javier Sánchez Sello

**Offer**

- Application of ICT solutions in different sectors: tourism, services, audiovisual, higher education.
- Digitalisation strategies in companies.
- Innovation: new business models based on ICTs.
- Information management in companies.
- Trends in data and business intelligence.
- Surveillance and business intelligence.
- Coaching/technology facilitation.
- New ways of teaching learning based on ICTs.

Services

- Digital transformation consulting services; use of ICT tools to improve efficiency and flexibility in the company.
- Digital strategic consultancy projects.
- Design of business solutions:
  - Data storage and management
  - Design of dashboards
  - Big data analysis
  - Project management
  - Automation of business processes
  - Implementation of strategic monitoring systems
- Copywriting of tourism content.
- ICT training activities for companies and professionals:
- Creation of training contents in business software solutions.
- Development of training workshops and promotion of digitalisation

**Keyword**

Digital transformation, disruptive technologies, corporate information systems, databases, ERP, BI, Big Data, dashboards, No-Code tools, ICT training, E-Learning.

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**VIDEOGAMES, NARRATIVE,  
PERSUASION AND CREATIVITY (VNPC)**

**Researchers**

- Beatriz Legerén Lago
- Carmen López de Aguilera Clemente
- Julinda Molares Cardoso
- Vicente Badenes Pla
- Jaime Martínez Barahona
- Mercedes García Betegón
- Francisco Javier Gayo Santacecilia
- Marcos Antón Roncero

**Offer**

- Interactive entertainment product design (videogames), narrative, persuasion.
- Graphics design, branding, creativity and videogames.
- Business Entertainment. Videogames.

Services

- Advice on the design and development of interactive entertainment products.
- Direction and coordination of activities related to the gaming sector (gamejams, e-sports tournaments).
- Analysis of communication campaigns in the field of E-sports.
- Analysis of the communication and advertising of the different video game platforms and products.
- Analysis of the creativity of interactive products.
- Analysis of business models for entertainment products.

**Keyword**

Video games, narrative, persuasion, creativity.

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	AF4	CI5	E03	EG1	EG6	EN.EDI	ET1	ET2	ET3	FA2	FA9	GALMA	IA1	ICLab	INAR01	IO1	LIA2
Acoustics															*		
Cybersecurity														*			
Communications and networks			*	*			*	*	*								
Quantum																	
Data				*					*	*						*	*
Economics and business				*								*				*	
Energy			*	*		*			*	*	*				*		
Gamification									*								
Digital twin		*		*		*											*
Digital humanities								*				*					
Image and video		*										*			*		*
Industry 4.0			*	*	*	*		*						*	*		*
Educational innovation	*		*				*							*			
Artificial intelligence		*		*	*		*	*			*			*			*
IoT			*	*		*			*					*			*
Language								*				*	*				
Environment	*	*								*	*						
Modelling and simulation	*	*		*		*	*	*		*	*	*	*		*	*	*
Programming												*				*	*
Health					*		*	*								*	*
Aerospace sector		*			*					*					*		
Sensors		*	*						*	*				*	*		
XR technologies					*												
5G									*								



	OE4	OF1	SC10	SC2	SC4	SC7	SC9	SI1	SI4	SI6	SR	TC1	TE3	TF1	TGTA	VNPC
Acoustics							*				*					
Cybersecurity			*			*			*	*						
Communications and networks		*	*	*		*			*		*	*	*			
Quantum			*			*										
Data	*								*			*				
Economics and business	*									*		*				
Energy		*												*		
Gamification																*
Digital twin		*				*									*	
Digital humanities																
Image and video			*	*		*	*									*
Industry 4.0		*				*		*		*		*	*		*	*
Educational innovation	*							*								
Artificial intelligence		*	*			*	*		*			*		*	*	
IoT		*	*					*				*				
Language							*	*	*			*			*	
Environment														*		
Modelling and simulation	*	*		*		*			*	*		*	*	*		
Programming	*	*					*	*	*				*		*	
Health		*			*	*	*		*							
Aerospace sector		*				*					*	*		*	*	
Sensors			*		*						*	*	*			
XR technologies										*						
5G			*			*					*	*				

