



# UC3M R&D IN THE disability and dependency area

RESEARCH ACTIVITY, TECHNOLOGIES,  
PATENTS, INFRASTRUCTURES  
AND OTHER UC3M CAPABILITIES

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Universidad **Carlos III** de Madrid

Vicerrectorado de Política Científica

Parque Científico



The Science Park of Universidad Carlos III de Madrid (UC3M) wants to present the potential of the university in this "knowledge map" through the research areas developed in the frame of R&D projects, both national and international, patents and other results of UC3M investigators, in the Disability and Dependency Area.

The global knowledge obtained, the experience of collaborating with the industry, the existence of infrastructures and proper laboratories and, above all, the multidisciplinary nature of UC3M are characteristics that provide an added value so that our support towards the innovation of institutions, big companies and SMEs has an integral quality.

We invite you to deepen the knowledge of the UC3M and to collaborate in new R&D and innovation projects.

**Entrepreneurship and Innovation Service–Science Park  
Universidad Carlos III de Madrid**

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R&D GROUP	LINES OF RESEARCH	RESEARCH PROJECTS	TECHNOLOGICAL OFFER / OTHERS
TECHNOLOGY CENTER FOR DISABILITY AND DEPENDENCY			
<p><b><u>Audiovisual Accessibility Laboratory (ACCESAUDIO)</u></b></p> <p><b>PI: Belén Ruiz Mezcuá</b></p>	<p><b>Description:</b></p> <p>The Audiovisual Accessibility Laboratory works to provide services that can be accessible for people with a hearing and visual impairment.</p>	<p><b>Research Lines:</b></p> <p>Computer technology to make all audiovisual content formats, as well as conventional cultural content such as the theater or museums accessible.</p> <p>Monitoring subtitle and sign language signals during television broadcasts.</p>	<p><b>Scientific-Technical Services:</b></p> <ul style="list-style-type: none"> <li>• Web accessibility:               <ul style="list-style-type: none"> <li>· Structure</li> <li>· Content</li> <li>· Audiovisual contents</li> <li>· Accessible players</li> </ul> </li> <li>• Film and theater accessibility:               <ul style="list-style-type: none"> <li>· Subtitling prototypes</li> <li>· Tools</li> <li>· Accessible cultural agenda</li> <li>· Culture accessibility quality indicators</li> </ul> </li> <li>• Live accessibility in classes for the deaf:               <ul style="list-style-type: none"> <li>· Room</li> <li>· APEINTA</li> <li>· Information storage</li> </ul> </li> </ul> <p><b>Technological Offer:</b></p> <ul style="list-style-type: none"> <li>• Accessible TV: SincroSub</li> <li>• SAVAT: accessible television signal monitoring</li> <li>• GVAM: accessibility in mobile devices for museums</li> <li>• Room: Live teaching accessibility for the deaf</li> <li>• BLAS: Live interaction systems for the blind or for people speaking other languages</li> <li>• Blappy: Face to face communication for people with functional diversity</li> <li>• ATAD: Technical aid for autonomous movement</li> <li>• Tool for deaf athletes</li> </ul>

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TECHNOLOGY CENTER FOR DISABILITY AND DEPENDENCY			
<p><u>Audiovisual Accessibility Laboratory (ACCESAUDIO)</u></p> <p>PI: Belén Ruiz Mezcuá</p>			<p><b>CESyA: Spanish Centre for Subtitling and Audio Description:</b></p> <p>The Spanish Centre for Subtitling and Audio Description works towards audiovisual accessibility in the areas of culture and television, education and social inclusion for the purpose of achieving the inclusion of people with a sensory impairment.</p> <p><b>CESyA Services:</b></p> <ul style="list-style-type: none"> <li>• Automatic monitoring of the subtitle, audio description and sign language broadcast on DTTV</li> <li>• Information about the cultural offer accessible through the Accessible Cultural Agenda</li> <li>• BLAS, live subtitling service: transcription, speech synthesis and translation tool for the purpose of offering audiovisual accessibility services and making communication easier</li> <li>• Consultancy service for businesses, users and administrations in all aspects relating to audiovisual accessibility</li> <li>• Citizen care services</li> <li>• Training</li> <li>• Quality certification through the CESyA Seal. The CESyA Seal guarantees audiovisual accessibility quality in various areas: cinema, film, theater, theatrical production, television channel, exhibition or museum, web, DVD or others</li> </ul>

R&D GROUP	LINES OF RESEARCH	RESEARCH PROJECTS	TECHNOLOGICAL OFFER / OTHERS
TECHNOLOGY CENTER FOR DISABILITY AND DEPENDENCY			
<p><u>Assistive Technologies Laboratory (TECASIST)</u></p> <p>PI: José Manuel Sánchez Pena</p>	<p><b>Description:</b></p> <p>The Assistive Technologies Laboratory makes knowledge and electronic, optical and photonic technology available to society as key tools in new devices to facilitate the participation of the sensory impaired, particularly in the areas of education, culture and sports.</p>	<p><b>Research Lines:</b></p> <ul style="list-style-type: none"> <li>• <b>Assistive Technologies.</b> Investigation and prototypes in technologies relating to health and well-being: <ul style="list-style-type: none"> <li>· Audiovisual accessibility for the sensory impaired</li> <li>· Support products for low vision/blindness (AR, VR)</li> <li>· Augmentative and alternative communication systems</li> <li>· Adapted wheelchairs</li> <li>· Assistive domotics</li> <li>· Leisure and adapted toys</li> </ul> </li> </ul>	<p><b>Scientific-Technical Services:</b></p> <ul style="list-style-type: none"> <li>• Development of systems to allow audiovisual accessibility to the sensory impaired in the following areas: <ul style="list-style-type: none"> <li>· Cinema, theaters, cultural events, etc.</li> <li>· Accessible on-line education</li> <li>· Sports</li> </ul> </li> <li>• Development of systems for helping people with low vision problems: <ul style="list-style-type: none"> <li>· Design and implementation of electronic technical aids for light modulation</li> <li>· Design and implementation of augmented reality systems to improve mobility</li> </ul> </li> <li>• Development of portable systems for biomedical applications (sensing physiological magnitudes, alarms, drug dosage, etc.)</li> </ul> <p><b>Technological Offer:</b></p> <p>Technological solutions for low vision and hearing problems: design, physical implementation of the system, of the training and of the tests with the end users.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>· Subtitling glasses (in collaboration with CESyA)</li> <li>· APUNTA system. Software solution for the hearing impaired, used primarily in educational settings</li> </ul> <p>See <a href="#">CESyA</a></p>

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<b>TECHNOLOGY CENTER FOR DISABILITY AND DEPENDENCY</b>			
<p><b><u>Assistive Robotics Laboratory (ASROBLab)</u></b></p> <hr/> <p><b>PI: Carlos Balaguer, Alberto Jardón</b></p>	<p><b>Description:</b></p> <p>The Assistive Robotics Laboratory (ASROBLab) develops and discloses breakthroughs in assistive robotics technologies that can be integrated in a home, clinical or hospital setting, for the benefit of everyone and for better integration of special needs people.</p> <p>The ASROBLab seeks to provide robotic solutions closer to reality and market needs.</p>	<p><b>Research Lines:</b></p> <ul style="list-style-type: none"> <li>• Service and assistive robots</li> <li>• Design of cooperative control systems</li> <li>• Exoskeletons and motor rehabilitation</li> <li>• Dependency and disability</li> <li>• Accessible home automation and interaction with the environment</li> <li>• Assistive sector, rehabilitation and hospital</li> </ul>	<p><b>Scientific-Technical Services:</b></p> <ul style="list-style-type: none"> <li>• Functional restoration and augmented capacity systems</li> <li>• Design of lightweight free-standing manipulators and/or climbing robots</li> <li>• Development of shared control systems and their application to assistive and domestic robots</li> <li>• Development of multimodal control interfaces (vision, voice, touch, etc....)</li> <li>• Design of technical aids under the design for everyone paradigm</li> <li>• Design of actuators, systems integration, modular drives compatible with physical person-robot interaction</li> <li>• Basic and applied research in improving usability of systems and benchmarking applied to assistive and rehabilitation robots</li> <li>• Ample experience and knowledge in design, manufacture and integration of systems for the development of proprietary platforms and adaptation of commercial systems</li> </ul> <p><b>Technological Offer:</b></p> <ul style="list-style-type: none"> <li>• Portable robots, artificial muscles, personalized technical aids</li> <li>• Development of Man-Machine shared control software</li> <li>• Voice- or vision-activated multimodal interaction systems</li> <li>• Capture and positioning and monitoring systems</li> </ul>



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SCHOOL OF ENGINEERING - COMPUTER SCIENCE			
<p><b>Group of Advanced Databases (LABDA)</b></p> <hr/> <p><b>PI: Paloma Martínez</b></p>	<p>Extraction and retrieval of information in the biomedical domain in different media (scientific publications, social networks, clinical notes).</p>	<p><b>R&amp;D National Plan Projects:</b></p> <ul style="list-style-type: none"> <li>• eGovernAbility-AccessSupport: Framework based on models for the development of accessible services in e-Administration</li> <li>• SAGAS. Advanced Automatic Subtitle Generating System</li> <li>• Thuban: Natural interaction platform for virtual accompaniment in real settings</li> <li>• DISUIPA: Development of a customizable platform for public access to the Internet for people with a disability</li> <li>• APEINTA: Commitment to Inclusive Teaching: use of new technologies in and out of the classroom</li> <li>• SOPAT: Service for personalized and accessible orientation for tourism</li> </ul> <p><b>Internal Projects (UC3M Funding):</b></p> <ul style="list-style-type: none"> <li>• Strategic Action in Accessibility and Usability in user applications and interfaces</li> </ul>	<p><b>Technological Offer:</b></p> <ul style="list-style-type: none"> <li>• Accessibility in web applications for the elimination of network access barriers</li> </ul>

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SCHOOL OF ENGINEERING - COMPUTER SCIENCE			
<p><u>Knowledge Reusing</u></p> <hr/> <p>PI: Juan Llorens</p>	<ul style="list-style-type: none"> <li>• Information and documentation science</li> <li>• Reusing information (and knowledge)</li> <li>• Software engineering</li> </ul>	<p><b>R&amp;D National Plan Projects:</b></p> <ul style="list-style-type: none"> <li>• CISVI: Investigative Communities for Health and Independent Living</li> </ul>	<p><b>Technological Offer:</b></p> <ul style="list-style-type: none"> <li>• Electronic management of clinical data:             <ul style="list-style-type: none"> <li>· Implementation of search engines</li> <li>· Development of data-intensive software applications</li> </ul> </li> <li>• Improvement to software:             <ul style="list-style-type: none"> <li>· Support and consultancy in: CMMI, INCOSE, PMI</li> <li>· Requirements engineering</li> <li>· TDD</li> </ul> </li> <li>• Handling a large quantity of data:             <ul style="list-style-type: none"> <li>· Complex technologies for representing structured information</li> <li>· Search engines</li> <li>· Decision support systems</li> </ul> </li> </ul>

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SCHOOL OF ENGINEERING - COMPUTER SCIENCE			
<p><u>Systems Control, Learning and Optimisation Laboratory (CAOS)</u></p> <hr/> <p>PI: Araceli Sanchis</p>	<ul style="list-style-type: none"> <li>• Health and active aging:               <ul style="list-style-type: none"> <li>· Big data in health</li> <li>· Ambient assisted living</li> <li>· Predictive models</li> <li>· Electronic medical assistance</li> <li>· Personal medical assistance systems</li> </ul> </li> </ul>	<p><b>European Projects:</b></p> <ul style="list-style-type: none"> <li>• Trainutri. Training and Nutrition senior social platform</li> </ul> <p><b>Internal Projects (UC3M Funding):</b></p> <ul style="list-style-type: none"> <li>• Aid for preparing the European project HiPass: (H)ealthy Age(i)ng through (P)ersonalised Cyber (Ass)istance Systems</li> </ul>	<p><b>Technological Offer:</b></p> <ul style="list-style-type: none"> <li>• Ambient assisted living: systems and algorithms for behavior supervision, activity recognition and anomaly detection for elderly patients who live alone</li> <li>• Predictive models: predictive models in medical assistance</li> <li>• Electronic medical assistance: recording models and interoperability of medical assistance information systems</li> <li>• Personal medical assistance systems: devices and algorithms for remotely supervising patients who live with chronic disease</li> </ul>

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SCHOOL OF ENGINEERING - COMPUTER SCIENCE			
<p><u>Planning and Learning Group</u></p> <p>PI: Daniel Borrajo</p>	<ul style="list-style-type: none"> <li>Social Robotics and Assistive Robotics</li> </ul>	<p><b>European Projects:</b></p> <ul style="list-style-type: none"> <li>CLARK Purpose: geriatric evaluation with social and assistive robots</li> </ul> <p><b>R&amp;D National Plan Projects:</b></p> <ul style="list-style-type: none"> <li>THERAPIST Purpose: socially interactive robot for giving and receiving assistance in pediatric neuro-rehabilitation</li> </ul>	<p><b>Technological Offer:</b></p> <p>Development of Motor Rehabilitation Therapies with Humanoid Robots</p> <p>Coordinator: Fernando Fernández Rebollo</p> <ul style="list-style-type: none"> <li>NAO Therapist: NAO Therapist proposes a new therapeutic motor rehabilitation tool for children which includes a social, interactive and completely autonomous therapeutic robot that is able to sense patient reactions and determine if the patient is doing their exercises correctly. It is an innovative method that would help improve patient recovery time and streamline the work of medical professionals.</li> <li>CLARK: Clark is a project that proposes the development of a hospital infrastructure that allows the geriatric evaluation of patients. The infrastructure consists of a social and interactive robot, together with the information system required for daily management of the infrastructure, generation of reports, etc.</li> </ul>

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SCHOOL OF ENGINEERING - COMPUTER SCIENCE			
<p><b>SoftLab</b></p> <hr/> <p>PI: Ángel García Crespo</p>	<ul style="list-style-type: none"> <li>• Audiovisual accessibility</li> <li>• HCI and Accessibility</li> </ul>	<p><b>R&amp;D National Plan Projects:</b></p> <ul style="list-style-type: none"> <li>• Platform in mobility of contents for video games with augmented reality. MOVRA</li> <li>• Proposal for a significant learning platform based on subtitling and collaborative audio description</li> </ul> <p><b>Internal Projects (UC3M Funding):</b></p> <ul style="list-style-type: none"> <li>• Aid for the preparation of the European project PEOPLE-SEC-EU: Multi-device Accessible Framework for providing Digital Inclusion to Citizens with Secure Services</li> </ul> <p><b>Private Funding:</b></p> <ul style="list-style-type: none"> <li>• Accessibility to the San Juan Film Festival Gala for people with sensory diversity</li> <li>• PervasiveSub: DTV subtitle extraction and display system</li> <li>• Synchronization of accessibility elements</li> <li>• Server synchronization systems by means of free-to-air audio for accessibility elements</li> </ul>	<p><b>Technological Offer (Tools):</b></p> <ul style="list-style-type: none"> <li>• WhatsCine: Accessibility system for cultural events based on mobile platforms</li> <li>• UC3M Titling: UC3MTitling allows the titling of events in real time without the need for highly qualified staff</li> </ul> <p><b>Patents and Software:</b></p> <ul style="list-style-type: none"> <li>• Accessory for viewing in projection rooms accessibility elements associated with audiovisual content. Patent ES2540029 (Licensed)</li> <li>• Broadcasting method. Patent ES2370900</li> <li>• Server synchronization system by means of free-to-air audio for accessibility elements. M-003491/2016</li> <li>• Intelligent system for generating accessibility elements. M-009148/2011</li> </ul>

R&D GROUP	LINES OF RESEARCH	RESEARCH PROJECTS	TECHNOLOGICAL OFFER / OTHERS
SCHOOL OF ENGINEERING - SYSTEMS ENGINEERING AND AUTOMATION			
<p><b>Robotics Lab</b></p> <hr/> <p><b>PI: Carlos Balaguer, Miguel A. Salichs, Luis Moreno</b></p>	<ul style="list-style-type: none"> <li>• Advanced actuators:               <ul style="list-style-type: none"> <li>· Actuator control based on SMAs, Ultrasonic Motors, EAPs</li> </ul> </li> <li>• Exoskeletons and exos rehabilitation:               <ul style="list-style-type: none"> <li>· Exoskeletons of lower limb and upper limb based on SMAs</li> </ul> </li> <li>• Humanoids:               <ul style="list-style-type: none"> <li>· Humanoids for hospital use</li> </ul> </li> <li>• Implantable devices:               <ul style="list-style-type: none"> <li>· Urinary incontinence control valves based on SMAs (patent being drafted)</li> </ul> </li> <li>• Assistive robots for the disabled:               <ul style="list-style-type: none"> <li>· Assistive robots for the elderly with disability, for children, for Alzheimer's patients, etc.</li> </ul> </li> </ul>	<p><b>European Projects:</b></p> <ul style="list-style-type: none"> <li>• STAMAS: SMAs in Space. Artificial Muscles and other robotic applications</li> <li>• MONARCH: Multi-Robot Cognitive Systems Operating in Hospitals (MGMT)</li> </ul> <p><b>R&amp;D National Plan Projects:</b></p> <ul style="list-style-type: none"> <li>• Applications of Social Robots</li> <li>• ARCADIA: Cognitive robotic assistant for special needs people</li> <li>• ROBOHEALTH: Development of assistive and rehabilitation robots for the improvement of patients' well-being.</li> <li>• HYPER: Neuroprosthetic and neurobotic hybrid devices for functional compensation and rehabilitation</li> <li>• Assistive robot for National Paraplegic Hospital of Toledo</li> <li>• Development of robotic exoskeletons for rehabilitation of the upper limb</li> <li>• Development of social robots for aiding the elderly with cognitive deterioration</li> </ul>	<p><b>Technological Offer:</b></p> <ul style="list-style-type: none"> <li>• Assistive robotics for improving quality of life of the disabled and the elderly in hospital settings (eating, drinking, handling things, personal hygiene) by means of "accessible robots":               <ul style="list-style-type: none"> <li>· <i>Asibot: Assistive robot for the disabled.</i> For increasing the quality of life of the disabled in home settings, an autonomous climbing robot has been developed which allows feeding, washing and putting makeup on the patient</li> <li>· <i>Maggie: Personal assistive robot.</i> Multisensory mobile robot with the capability to interact in an intelligent manner with humans and its surroundings, for assisting adults, children and the elderly in their daily activities</li> </ul> </li> <li>• Flexible hand exoskeletons for EVA suits:               <ul style="list-style-type: none"> <li>· This is a real device. Development of a version for rehabilitation is set to commence</li> </ul> </li> <li>• Wearable rehabilitation suit:               <ul style="list-style-type: none"> <li>· This is a real device. Development of a version for rehabilitation is set to commence</li> </ul> </li> <li>• Exoskeletons for rehabilitation based on SMAs</li> <li>• Robohealth (being developed):               <ul style="list-style-type: none"> <li>· Exoskeleton for hand rehabilitation</li> <li>· Exoskeleton for elbow rehabilitation</li> <li>· Exoskeleton for shoulder rehabilitation</li> <li>· Wearable</li> </ul> </li> </ul>

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SCHOOL OF ENGINEERING - SYSTEMS ENGINEERING AND AUTOMATION			
<p><u>Robotics Lab</u></p> <hr/> <p>PI: Carlos Balaguer, Miguel A. Salichs, Luis Moreno</p>		<p><b>R&amp;D Regional Plan Projects:</b></p> <ul style="list-style-type: none"> <li>• COMANDER: Secure and multimodal cooperation with robotic assistants for special needs people</li> <li>• Internal Projects (UC3M Funding)</li> <li>• APTITUDE: Advanced robotic systems integration in intelligent home and hospital environments to improve the independence of the elderly in DLAs</li> <li>• CORWEL: Cognitive Robots Living With The Elderly</li> <li>• ACCORD. Assistive Robot for Stimulation of People with Cognitive Disabilities</li> </ul> <p><b>Private Funding:</b></p> <ul style="list-style-type: none"> <li>• Development of a surgical system for positioning and guiding through non-linear trajectories, controlled by means of stereotactic techniques</li> </ul>	<p><b>Patents and Software:</b></p> <ul style="list-style-type: none"> <li>• Electromechanical portable assistance device. Patent: P201132082</li> <li>• Indicator device, relating to a device for people in wheelchairs for handling a computer or PDA. ES2325976</li> <li>• Three-axis tactile sensor. ES2358655</li> </ul>

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SCHOOL OF ENGINEERING - TELEMATIC ENGINEERING			
<p><b><u>Telematic Applications and Services Group (GAST)</u></b></p> <hr/> <p><b>PI: Carlos Delgado Kloos</b></p>	<ul style="list-style-type: none"> <li>• Ubiquitous computing</li> <li>• Web technologies</li> </ul>	<p><b>Private Funding:</b></p> <ul style="list-style-type: none"> <li>• Nokia Chair</li> <li>• Study to quantitatively analyze the information on Twitter regarding disability</li> </ul>	<p><b>Ubiquitous Computing Laboratory:</b></p> <ul style="list-style-type: none"> <li>• Development and design of applications for mobile telephones that improve the quality of life of the disabled</li> <li>• Development and design of applications for mobile telephones adapted for the visually impaired</li> <li>• Wheelchair simulator</li> </ul> <p><b>Web technologies:</b></p> <ul style="list-style-type: none"> <li>• Monitoring the use of social networks in the area of the disability</li> </ul>



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SCHOOL OF ENGINEERING - TELEMATIC ENGINEERING			
<p><b><u>ADSCOM</u></b>  <b><u>(Advanced Switching and Communication Systems)</u></b></p> <hr/> <p>PI: David Larrabeiti</p>	<ul style="list-style-type: none"> <li>• Design of communication middleware for adaptive systems</li> </ul>	<p><b>European Projects:</b></p> <ul style="list-style-type: none"> <li>• Mainstreaming Accessibility through Synergistic User Modelling and Adaptability (MyUI FP7)</li> </ul>	<p><b>Technological Offer:</b></p> <ul style="list-style-type: none"> <li>• Development of middleware for distributed adaptive accessible systems</li> <li>• Network user modeling for adaptive applications in television sets, computers and mobile terminals</li> </ul>

R&D GROUP	LINES OF RESEARCH	RESEARCH PROJECTS	TECHNOLOGICAL OFFER / OTHERS
SCHOOL OF ENGINEERING - ELECTRONIC TECHNOLOGY			
<p><u>Displays and Photonic Applications Group (GDAF)</u></p> <p><b>PI: Carmen Vázquez, José Manuel Sánchez Pena</b></p>	<ul style="list-style-type: none"> <li>• <b>Assistive Technologies.</b> Investigation and prototypes in technologies relating to health and well-being:               <ul style="list-style-type: none"> <li>· Audiovisual accessibility for the sensory impaired</li> <li>· Support products for low vision/blindness (AR, VR)</li> <li>· Augmentative and alternative communication systems</li> <li>· Adapted wheelchairs</li> <li>· Assistive domotics</li> <li>· Leisure and adapted toys</li> </ul> </li> <li>• Electro-optical devices and applications</li> <li>• Photonic devices for optical networks</li> <li>• Advanced instruments and sensors</li> </ul>	<p><b>R&amp;D National Plan Projects:</b></p> <ul style="list-style-type: none"> <li>• Advanced liquid crystal and electroluminescent organic diode devices. Hybrid applications for 3D vision</li> <li>• <i>Assistive domotics:</i> Development of a pilot project for automating several homes with dependent users with different disability/dependency profiles</li> </ul> <p><b>R&amp;D Regional Plan Projects (C. Madrid):</b></p> <ul style="list-style-type: none"> <li>• Portable and accessible integrated technical aids for the visually impaired</li> <li>• Advanced optoelectric system for measuring deaf athlete reaction time (FACTOTEM-2 program)</li> </ul> <p><b>Internal Projects (UC3M Funding):</b></p> <ul style="list-style-type: none"> <li>• Assistive domotics for people with dependency</li> <li>• Strategic Action in the development of electro-optical systems for biomedical, assistive and industrial applications</li> </ul>	<p><b>Technological Offer:</b></p> <ul style="list-style-type: none"> <li>• Development of systems, products and technical aids for motor, sensorial and mental disability profiles, offering disability support technologies</li> </ul> <p><b>Patents and Software Registrations:</b></p> <ul style="list-style-type: none"> <li>• Device for assisting and protecting vision. Co-owned with UVA and CIDETEC. Patent US2011/0164215</li> <li>• Method and system for generating a transport stream corrected from an original digital television transport stream. Patent ES2358145</li> <li>• Television receiver interface. Patent ES2358144</li> </ul> <p><b>Experience and Capabilities:</b></p> <ul style="list-style-type: none"> <li>• Active filters: electrochromic (EC) filters. Application: EC glasses for low vision patients</li> <li>• Augmented reality for patients with sight remaining and anopsias. Application: visual rehabilitation</li> </ul> <p>See <a href="#">CESyA</a></p>

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SCHOOL OF ENGINEERING - ELECTRONIC TECHNOLOGY			
<p><u>Displays and Photonic Applications Group (GDAF)</u></p> <hr/> <p>PI: Carmen Vázquez, José Manuel Sánchez Pena</p>		<p><b>Private Funding:</b></p> <ul style="list-style-type: none"> <li>• <i>CRM Social</i>: Design, analysis and prototyping of a TIC platform for dependent citizens</li> <li>• Output signaling system based on LEDs for athletes with hearing impairment</li> <li>• Electrochromic filters in patients with hereditary retinal diseases: electro-optical characterization and development of prototypes</li> <li>• Autonomous optoelectronic color identification system based on a microcontroller for people with visual deficiencies</li> <li>• Indra-Adecco Foundation Chair for accessible technology</li> <li>• EADS-Adecco Foundation Chair for the occupational integration of the disabled in aeronautic settings</li> <li>• Photonic systems applied to viewing, communications, biomedicine and instruments and sensors (FAVICOBIS)</li> </ul>	

R&D GROUP	LINES OF RESEARCH	RESEARCH PROJECTS	TECHNOLOGICAL OFFER / OTHERS
SCHOOL OF ENGINEERING - ELECTRONIC TECHNOLOGY			
<p><b>Electronic Power Systems Group (GSEP)</b></p> <hr/> <p>PI: Andrés Barrado, Emilio Olías</p>	<ul style="list-style-type: none"> <li>• Electronic power system analysis, design and optimisation</li> <li>• Magnetic component analysis, design and optimisation</li> <li>• Photovoltaic and hybrid energy system design and optimisation</li> <li>• Electromagnetic interference measurement and correction in equipment and systems. Electromagnetic compatibility</li> </ul>	<p><b>Private Funding:</b></p> <ul style="list-style-type: none"> <li>• Design, development and implementation of the control drivers of the solenoids used in Braille printers</li> <li>• Characterisation and parameterisation of the solenoids used in Braille printers</li> <li>• Digital magnifying glass project</li> <li>• Systems for aiding with mobility and communication of people with serious physical and/or mental disabilities</li> </ul>	<p><b>Experience and Capabilities:</b></p> <p>The Electronic Power Systems (GSEP) group provides comprehensive services in the consultation, analysis, custom design, and optimisation of electronic power systems and magnetic components, as well as photovoltaic and hybrid energy systems, and electromagnetic compatibility.</p> <p><b>Energy conversion systems:</b></p> <ul style="list-style-type: none"> <li>• Converter design, modeling, and optimisation</li> <li>• Design of prototypes</li> <li>• Modeling of DC supply systems, including a behavioural model of converters and stability analysis.</li> <li>• CAD tools for electronic power system and equipment design</li> </ul> <p><b>Magnetic components:</b></p> <ul style="list-style-type: none"> <li>• Design of magnetic components</li> <li>• Optimisation of magnetic component volume, losses, and temperature</li> <li>• Finite element-based analytical models of high-frequency magnetic components</li> <li>• Contactless power supply systems</li> </ul>

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R&D GROUP	LINES OF RESEARCH	RESEARCH PROJECTS	TECHNOLOGICAL OFFER / OTHERS
SCHOOL OF ENGINEERING - ELECTRONIC TECHNOLOGY			
<p><u>Electronic Power Systems Group (GSEP)</u></p> <hr/> <p>PI: Andrés Barrado, Emilio Olías</p>			<p><b>Photovoltaic and hybrid energy systems:</b></p> <ul style="list-style-type: none"> <li>• Optimisation of power electronics in photovoltaic systems</li> <li>• Design of energy control, regulation, and conditioning systems for autonomous and networking systems</li> <li>• Hybrid systems</li> </ul> <p><b>Equipment electromagnetic compatibility:</b></p> <ul style="list-style-type: none"> <li>• Pre-certification testing of equipment electromagnetic compatibility</li> <li>• Development of EMI filters</li> <li>• Evaluation of environmental radiation level</li> </ul> <p><b>Training courses</b></p>

R&D GROUP	LINES OF RESEARCH	RESEARCH PROJECTS	TECHNOLOGICAL OFFER / OTHERS
SCHOOL OF LAW AND SOCIAL SCIENCES - JOURNALISM AND AUDIOVISUAL COMMUNICATION			
<p><b><u>Television- Cinema: memory, representation and industry (TECMERIN)</u></b></p> <hr/> <p><b>PI: Manuel Palacio</b></p>	<p><b>Research Lines:</b></p> <ul style="list-style-type: none"> <li>• Image technologies: multimedia and accessibility</li> </ul>	<p><b>Distinguished Collaborations:</b></p> <p>The group has collaborated with businesses and institutions from a very wide range of activity sectors, including the following among others:</p> <ul style="list-style-type: none"> <li>• Real Patronato sobre Discapacidad. Technical coordination of the Spanish Centre for Subtitling and Audio Description (CESyA)</li> </ul>	<p><b>Experience and Capabilities:</b></p> <p>The TECMERIN group has developed Research Lines relating to the application of new technologies through new audiovisual production, educational innovation and accessibility tools for the disabled.</p> <p><b>Technological Offer:</b></p> <ul style="list-style-type: none"> <li>• Sound capture system</li> <li>• HMVS. Tool for measuring subtitling speed</li> </ul>

R&D GROUP	LINES OF RESEARCH	RESEARCH PROJECTS	TECHNOLOGICAL OFFER / OTHERS
INTERNATIONAL LAW, ECCLESIASTICAL LAW AND PHILOSOPHY OF LAW			
<p><b><u>Human Rights, State of Law, and Democracy</u></b></p> <p><b>PI: Rafael de Asís, Francisco Ansuátegui</b></p>	<p><b>Research Lines:</b></p> <ul style="list-style-type: none"> <li>• Equality, non-discrimination and vulnerable groups</li> <li>• Rights of people with a disability</li> </ul>	<p><b>R&amp;D Regional Plan Projects (C. of Madrid):</b></p> <ul style="list-style-type: none"> <li>• Madrid without barriers</li> </ul>	<p><b>Experience and Capabilities:</b></p> <p>Six universities in Madrid, led by Universidad Carlos III of Madrid, are carrying out the project "Madrid Without Barriers" to favor social inclusion of the disabled. To that end, they analyze accessibility regulations in education, employment, mobility or participation, among other areas, for the purpose of improving the existing regulation. The project encompasses all the types of disability, from intellectual to physical disabilities, and including psychosocial or sensorial disabilities or impairments.</p>