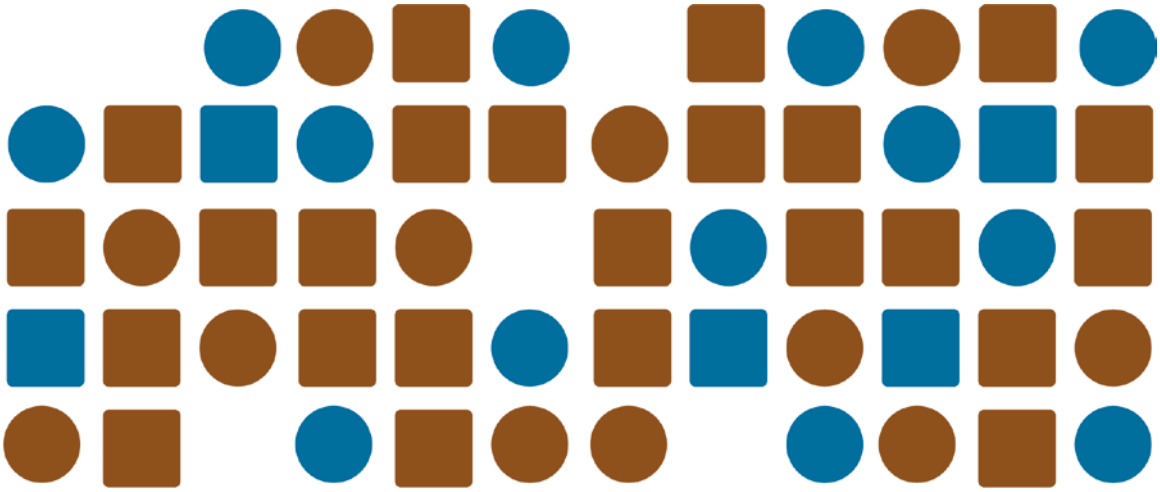


IOC

Institute of Industrial and Control Engineering

Activities Report 2017

UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH
Institute of Industrial and Control Engineering

Table of contents

1. Organisational structure and governing bodies

Management

Director	ROBERT GRIÑÓ CUBERO
Assistant director	ERNEST BENEDITO BENET
Secretary	JAN ROSELL GRATACÓS
Technical and Management Support Area - UTGAEIB	M. LOURDES DURANY VIDAL

The Board

Management	ROBERT GRIÑÓ CUBERO
Assistant director	ERNEST BENEDITO BENET
Secretary	JAN ROSELL GRATACÓS
Representative of the Control division	DOMINGO BIEL SOLÉ
Representative of the Supply chain and operations management (SCOM) division	AMAIA LUSA GARCÍA
Representative of the Robotics division	RAÚL SUÀREZ FEIJÓO
Technical and Management Support Area - UTGAEIB	M. LOURDES DURANY VIDAL
Representative of teaching and research staff who hold a PhD	Vacancy
Representative of teaching and research staff who do not hold a PhD	Vacancy
Representative of administrative and service staff	LEOPOLD PALOMO AVELLANEDA

The Council

Arias Pujol, Antoni	
Batlle Arnau, Carles	
Basañez Villaluenga, Luís	
Bautista Valhondo, Joaquin	
Benedito Benet, Ernest	Assistant director
Biel Solé, Domingo	Representative of the Control division
Corominas Subias, Albert	
Domenech Lega, Bruno	
Dòria Cerezo, Arnau	
Durany Vidal, Ma Lourdes	Technical and Management Support Area UTGAEIB
Ferrer Llop, Josep	
Ferrer Martí, Laia	
Fossas Colet, Enric	
García Villoria, Alberto	
Griñó Cubero, Robert	Director
Lusa Garcia, Amaia	Representative of the Supply Chain and Operations Management-SCOM division
Martínez Costa, M. Carme	
Mas Casals, Orestes	
Mateo Doll, Manel	
Montaño Sarria, Andrés Felipe	
Olivella Nadal, Jordi	
Olm Miras, Josep Maria	
Palomo Avellaneda, Leopold	Representative of administrative andservice staff
Pastor Moreno, Rafael	
Peña Pitarch, Esteban	
Rosell Gratacòs, Jan	Secretary
Suarez Feijoo, Raul	Representative of the Robotics division

2. Staff

NAME		DIVISIONS/ SERVICE	CATEGORIES
Akbari	Aliakbar	ROB	BR
Arias Pujol	Antoni	CTL	TU
Arocas Pérez	José	CTL	BR
Baradari	Mohsen	SCOM	BR
Basañez Villaluenga	Luis	ROB	EMERITUS
Batlle Arnau	Carles	CTL	TU
Bautista Valhondo	Joaquin	ROB	CU
Benedito Benet	Ernest	SCOM	AG
Biel Solé	Domingo	CTL	TU
Calleja Sanz	Gema	SCOM	AJ
Cardoner Parpal	Rafel	SSR	LT
Claret Robert	Josep Arnau	ROB	BR
Corominas Subias	Albert	SCOM	EMERITUS
Domènech Lega	Bruno	SCOM	LT
Dòria Cerezo	Arnau	CTL	AG
Ferrer Llop	Josep	CTL	CU
Ferrer Martí	Laia	SCOM	AG
Fossas Colet	Enric	CTL	CU
Garcia Hidalgo	Nèstor	ROB	BR
García Villoria	Alberto	SCOM	AG
Griñó Cubero	Robert	CTL	TU
Lusa García	Amaia	SCOM	TU
Martínez Costa	Carme	SCOM	TU
Mas Casals	Orestes	ROB	TU
Mateo Doll	Manuel	SCOM	TU
Miró Valero	Enric	SSR	LT
Montaño Sarria	Andrés F.	ROB	BR
Olivella Nadal	Jordi	SCOM	TU

NAME		DIVISIONS/ SERVICE	CATEGORIES
Olm Miras	Josep M.	CTL	AG
Orellana Barcelo	Marcos	CTL	BR
Palomo Avellaneda	Leopold	SSR	LT
Pastor Moreno	Rafael	SCOM	CU
Peña Pitarch	Esteban	ROB	TU
Portilla Rodriguez	Henry	ROB	BR
Repecho Del Corral	Victor	CTL	LT
Rojas De Silva González	Fco. Abiud	ROB	BR
Rosell Gratacòs	Jan	ROB	TU
Rúa Costa	Carles	SCOM	PAL
Shafieijam	Amir	SCOM	BR
Sharafeldeen	Mohammed	ROB	BR
Suárez Feijóo	Raúl	ROB	DI
Taherimashhadi	Mehrsa	SCOM	BR
Ud Din	Muhayy	ROB	BR
Zaplana Agut	Isiah	ROB	BR

Visiting Staff

NAME		DIVISIONS	UNIVERSITY
De Lellis	Pietro	CTL	Federico Ii - Nàpols
Fridman	Leonid	CTL	Unam - Mèxic
Machado	J.Eduardo	CTL	LZS, CNRS-GERPELEC - França
Martín	Federico	CTL	Nacional – San Luís
Parra	Vicente	ROB	Cinvestav - Mèxic

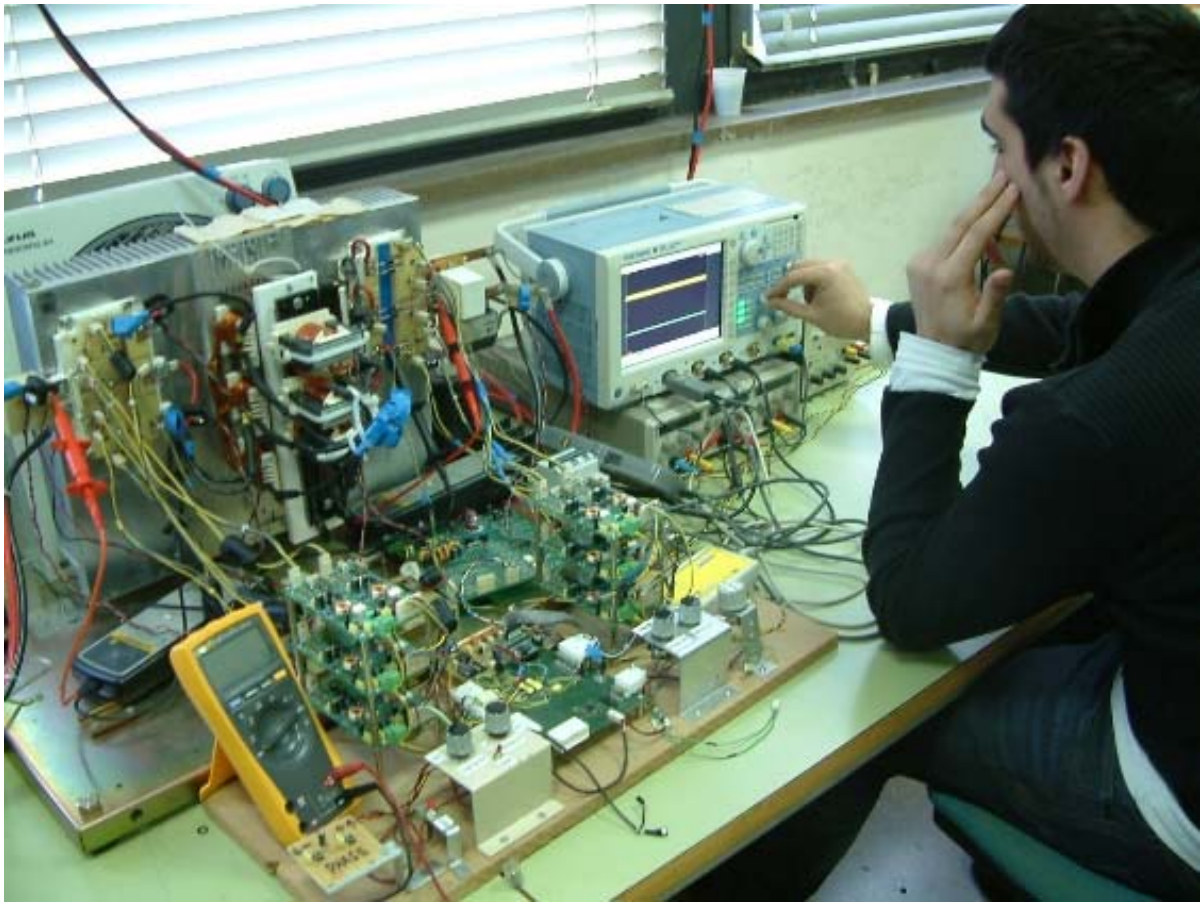
GLOSSARY

DIVISIONS/SERVICE	**ADM**	Administration
	CTL	Division of Automatic Control
	SCOM	Division Supply Chain&Operations Management
	ROB	Division of Robotics
	SI	Computer Services
	SSR	Resarch Support Services
CATEGORY	**AG**	Senior Lecturer
	AJ	Assistant professor
	BR	Research grantholder
	CU	Professor
	DI	Research supervisor
	EV	Students linked to the IOC
	LT	Technical staff
	PAL	Assistant lecturer
	PL	Assistant lectures
	TU	Lecturer

3. Divisions

Research at the IOC is conducted through three divisions:

Division of Automatic Control



The principal projects in this division are set in the following thematic areas: research area of Control Theory, research area of Energy Systems and research area of Automotive Applications.

Head: DOMINGO BIEL SOLÉ

Research fields:

- Advanced linear controllers (Resonant and repetitive control).
- Nonlinear control techniques (Passivity-based control, Adaptive control, Sliding mode control).
- Complex dynamical networks.
- Modelling and control of electronic power systems (generation and conversion).
- Control algorithms for an overall improvement of the vehicle performance.
- Autonomous and cooperative driving applications.

Division of Supply Chain & Operations Management

The Division of Supply Chain and Operations Management covers the design and management of the supply chain, namely production and logistic systems to generate goods and services, as well as the necessary techniques for solving efficiently its derived problems.

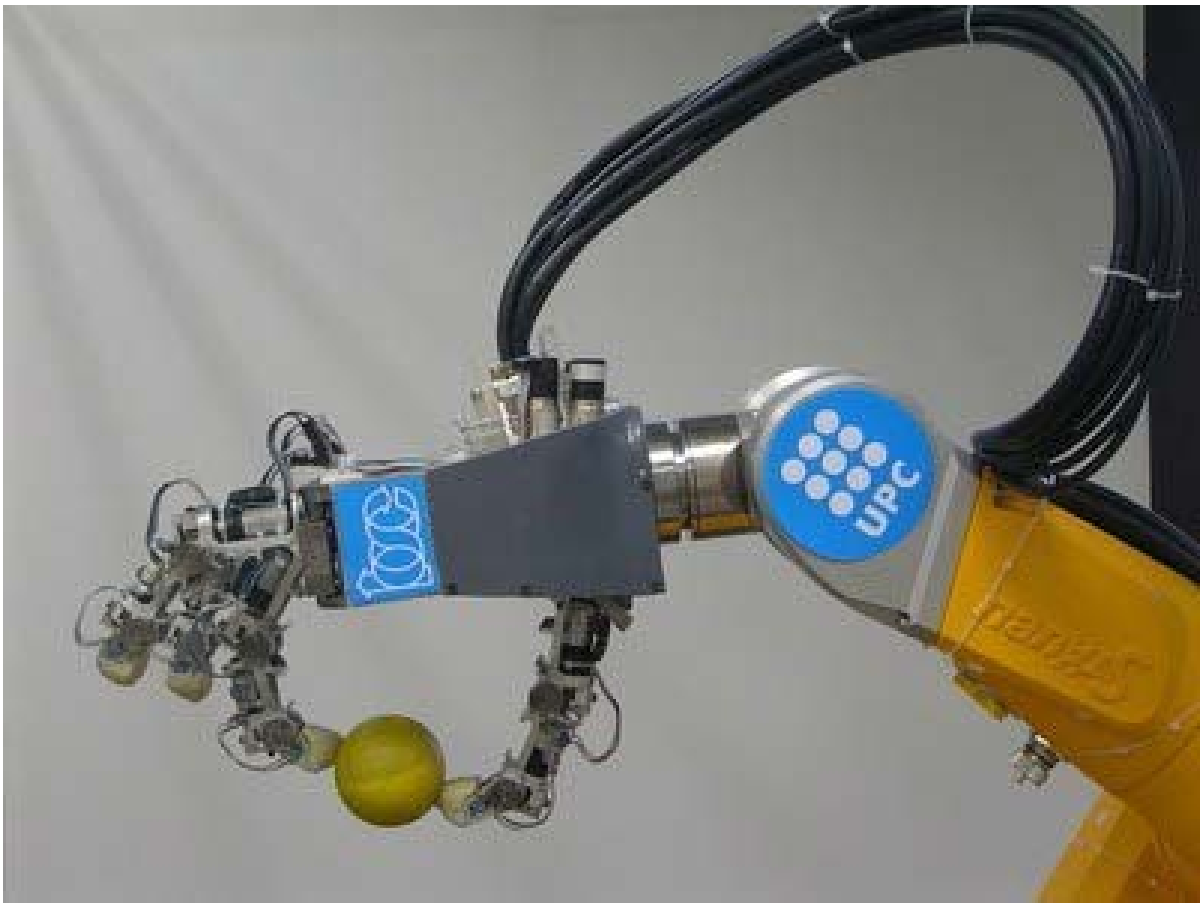
Head: AMAIA LUSA GARCÍA

Research lines:

- Supply Chain management and design
- Operations management
- Scheduling
- Assembly line design and balancing
- Working time planning and scheduling
- LEAN management
- Integrated aggregate planning
- Strategic capacity planning
- Urban logistics
- Sustainability in transportation and distribution
- Rural electrification with renewable energy and sustainable development in isolated areas

Research group linked with the Division: Supply Chain and Operations Management

Division of Robotics



The Division of Robotics of the IOC deals with basic and applied research on different aspects of robotics, either considering the robot as a single machine or integrated with other elements and devices within a robotized system. The research extends to different application fields in both the industrial and service areas.

Head: RAÚL SUÁREZ FEIJÓO

Main fields of activity

- Task and motion planning
- Grasping and dexterous manipulation
- Mobile manipulators
- Robot co-workers
- Human-robot interaction
- Teleoperation and haptic systems
- Control and programming of robots
- Perception systems and sensor integration
- Computer vision
- Simulation of robotized systems
- Industrial applications of robotics
- Service robots

4. Facilities

The IOC is located on the 11th floor of building H of the Barcelona School of Industrial Engineering (ETSEIB).

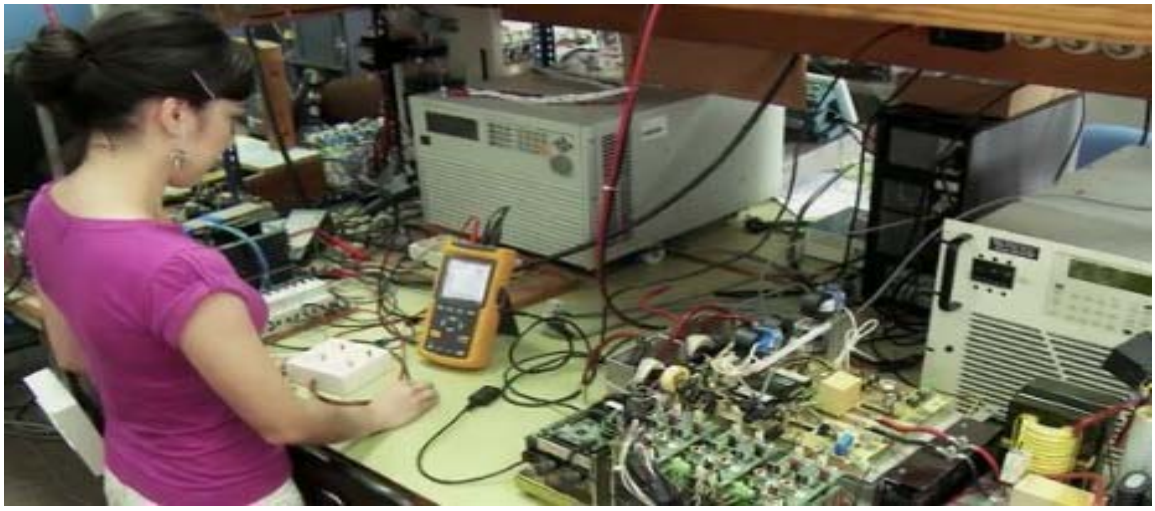
The Institute has a robotics laboratory; a control and electronics laboratory; a remote control laboratory; a logistics laboratory; a computer network equipped with servers, workstations, PCs and software; a WiFi network; a specialised library with around 6,000 books and numerous journals; a classroom that can hold 25 people; and a meeting room with a digital blackboard and a projector with a capacity for 10 people.

Equipping research laboratories

Robotics Laboratory

- 2 Stäubli TX90 robots, one is mounted on a motorised rail.
- 2 Kuka LWR robots with 7 axes, each one mounted on a mobile platform (BMM1 and BMM2).
- Several grippers and robotic hands: Schunk SAH, Schunk SDH and 3 Allegro hands.
- Haptic devices: Phantom Omni, Phantom Premium 1.5/6DOF and Phantom Premium 1.5/6DOF High force.
- Capture systems such as video cameras, trackers, force sensors, tactile sensors and 3D cameras.
- A 3D projector with the corresponding glasses.
- A bimanual robotic system composed of a two Universal UR5 arms.
- 1 YuMi ABB robot.
- Several servers, PCs, monitors.
- 2 virtual reality glasses Oculus Rift
- 1 Drone DJI Phantom 2 Vision+
- 1 Drone Parrot AR.Drone 2.0
- 1 Pal Robotics TIAGo

Control and Electronic Laboratory



- Oscilloscopes
- Analyzers and signal generators
- Sources and power loads (e.g. sources ac, dc and programmable power load)
- Measuring instrumentation (the multimeter, differential probes, current probes)
- Emulators microprocessors and digital signal processors
- Computers
- The hardware and software for the design and implementation of electronic circuits
- Tools and equipment essential to the realization of small-scale mechanical assemblies
- Thermographic camera

Logistic Laboratory

- 15 computers: 12 which are designed to make computing experiments; the other 3 are reserved for doctoral, masters and designers
- 1 server for more computationally intensive problems
- 16 SAIs
- 6 screens
- 3 switches for keyboards/screens
- Specialized software: IBM ILOG CPLEX Optimization Studio 12.7

5. University masters

Master's Degree in Automatic Control and Robotics

The Master's degree in Automatic Control and Robotics is an official degree adapted to European Higher Education Area (EHEA) offered by the Technical University of Catalonia (UPC) since the academic course 2006-07. The Masters is managed by the Department of Systems Engineering, Automation and Industrial Informatics (ESAII) and the Institute for Systems and Control Engineering (IOC). It is a research oriented master in the area of Automatic Control and Robotics.

The UPC is considered the first Spanish university in the discipline of Automatic Control and Robotics in the 5th edition (2014) of I-UGR Ranquing over the period 2009-2013. Selected by the Catalunya-La Pedrera Foundation for it's scholarships programme for Masters of Excellence

Master's degree in Supply Chain, Transport and Mobility

The Master in Supply Chain, Transport and Mobility is a master's degree approved by the Government of Catalonia and is part of the master has the Technical University of Catalonia in the field of industrial engineering. Being professional and research orientation and is divided into three areas: logistics, transport and mobility.

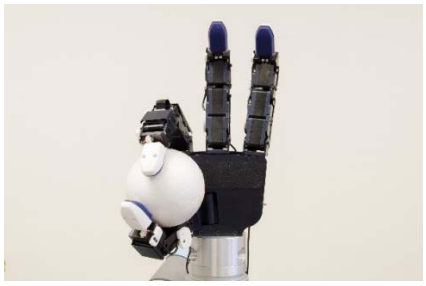
The course is taught in coordination between l'Escola Tècnica Superior d'Enginyers de Camins, Canals i Ports de Barcelona (ETSECCPB) and l'Escola Tècnica Superior d'Enginyeria Industrial de Barcelona (ETSEIB).

The trend towards globalization gives more importance to the areas related to the master because of transport issues lie at the heart of business decisions, and highlight recent developments in the figures of mobility of people and goods. These are skills highly valued by the workplace, both from the standpoint of the private sector and public sector, in addition, has a great potential in terms of research. To ensure that our graduates, the degree of excellence sought, has designed a curriculum intended to provide them with broad powers.

6. Doctoral degrees

The Institute of Industrial and Control Engineering (IOC) was set up for the purposes of conducting research and training researchers to a high level of specialisation. It is actively involved in teaching master and doctoral degrees.

Doctoral programme in Automatic Control, Robotics and Computer Vision (ARV)



The Doctoral programme in Automatic Control, Robotics and Computer Vision (ARV) emerged in 2006 from the fusion of the Doctoral programme in Advanced Automation and Robotics of the Institute of Industrial and Control Engineering (IOC) and of the Doctoral programme in Control, Vision and Robotics of the Automatic Control Department (ESAII), both with Quality Mention of the Spanish Ministry of Education (MEC). The fusion was fruit of an increasing thematic affinity and convergence between both programmes, and was carried out taking advantage of the opportunity to adapt the programme to the new syllabus of the Official Postgraduate Programmes in the framework of the European Higher Education Area.

The ARV Doctoral programme achieved from the beginning the Quality Mention, from the academic year 2007-2008 until 2010-2011. Then this award was replaced by the Excellence Mention by the Spanish Ministery of Education, with code MEE2011-0453. This mention was awarded from the academic years 2011-2012 until 2013-2014, and the programme ARV always obtained it.

Units involved in the program are:

- Automatic Control Department (ESAII)
- Institute of Industrial and Control Engineering (IOC)

Doctoral Committee for the doctoral degree in Automatic Control, Robotics and Computer Vision (ARV)

- Dr. Suárez Feijóo, Raúl (Coordinator PhD ARV)
- Dra. Alícia Casals Gelpí (before course 2017-18 Dr. Antonio Benito Martínez Velasco)
- Dr. Andreu Català Mallofré (before course 2017-18 Dr. Cecilio Angulo Bahon)
- Dr. Robert Griñó Cubero
- Dr. Rafael Pastor Moreno
- Dr. Vicenç Puig Cayuela
- Dr. Jan Rosell Gratacòs
- Dr. Alberto Sanfeliu Cortés

Doctoral data 2017

A. Coordination program	**RAÚL SUÁREZ FEIJÓO**
B. Number of students	**88** (registration 2017/2018)

Date	21/02/2017
Title	**Learning relational models with human interaction for planning in robotics**
Author	MARTÍNEZ MARTÍNEZ, DAVID
Thesis Director	ALENYÀ RIBAS, GUILLEM
Thesis Codirector	TORRAS GENIS, CARMEN
Qualification	Excellent Cum Laude

Date	27/02/2017
Title	**Development of control systems and state observers for efficiency and durability improvement in PEM fuel cell based**
Author	LUNA PACHO, JULIO ALBERTO
Thesis Director	SERRA PRAT, MARIA
Thesis Codirector	HUSAR, ATTILA PETER
Qualification	Excellent Cum Laude

Date	07/04/2017
Title	**3D Pose Estimation in Complex Environments**
Author	PEÑATE SÁNCHEZ, ADRIÁN
Thesis Director	ANDRADE CETTO, JUAN
Thesis Codirector	MORENO NOGUER, FRANCESC D'ASSIS
Qualification	Excellent Cum Laude

Date	24/04/2017
Title	**Visual Guidance of Unmanned Aerial Manipulators**
Author	SANTAMARIA NAVARRO, ANGEL
Thesis Director	ANDRADE CETTO, JUAN
Qualification	Excellent Cum Laude

Date	17/05/2017
Title	**The role of population games in the design of optimization-based**
Author	BARREIRO GÓMEZ, JULIÁN
Thesis Director	OCAMPO MARTINEZ, CARLOS AUGUSTO
Thesis Codirector	QUIJANO SILVA, NICANOR
Qualification	Excellent Cum Laude

Date	18/05/2017
Title	**Estimating and Understanding Motion: From Diagnostic to Robotic Surgery**
Author	AVILÉS RIVERO, ANGÉLICA IVONE
Thesis Director	CASALS GELPI, ALICIA
Qualification	Excellent Cum Laude

Date	30/06/2017
Title	**Contribution to big data analytics in water networks**
Author	GARCÍA VALVERDE, DIEGO
Thesis Director	PUIG CAYUELA,VICENÇ / QUEVEDO CASIN, JOSEBA-JOKIN
Qualification	Excellent Cum Laude

Date	14/07/2017
Title	**Bimanual robot skills: MP encoding, dimensionality reduction and reinforcement learning**
Author	COLOMÉ FIGUERAS, ADRIÀ
Thesis Director	TORRAS GENIS, CARMEN
Qualification	Excellent Cum Laude

Date	17/07/2017
Title	**Monocular SLAM: Data association and sensing through a human-assisted uncalibrated visual system**
Author	GUERRA PARADAS, EDMUNDO
Thesis Director	GRAU SALDES, ANTONI / MUNGUÍA ALCALÁ, RODRIGO FRANCISCO
Qualification	Excellent Cum Laude

Date	21/07/2017
Title	**Prognostics and health aware model predictive control of wind predictive control of wind turbines**
Author	SANCHEZ SARDI, HECTOR ELOY
Thesis Director	ESCOBET CANAL, TERESA / PUIG CAYUELA, VICENÇ
Qualification	Excellent Cum Laude

Date	21/09/2017
Title	**Searching and Tracking of Humans in Urban Environments with Humanoid Robots**
Author	GOLDHOORN, ALEX
Thesis Director	SANFELIU CORTES, ALBERTO / ALQUEZAR MANCHO, RENATO
Qualification	Excellent

Date	22/09/2017
Title	**Modelling and Control of PEM Fuel Cells**
Author	SARMIENTO CARNEVALI, MARÍA LAURA
Thesis	BATLLE ARNAU, CARLES / SERRA PRAT, MARIA
Qualification	Excellent Cum Laude

Doctoral programme Supply chain and operations management (SCOM)

The aim of the doctoral program SCOM (Supply Chain & Operations Management) is to promote and develop research into the supply chain and thus contribute to improve the economic and environmental efficiency of all kind of organizations.

Currently, the concept of supply chain, which includes and exceeds operations management and logistics, articulates the research on supply, production, distribution and recovery. Although, strictly speaking, the concept of supply chain management includes operations management, the fact of joining them in the name of the PhD program indicates which is the aspect of the SC management in which the program focuses most.

SCOM begins in 2016 with the participation of the academic staff of the Department of Management (OE) and the Institute of Industrial Engineering of Control (IOC) has recognized extensive teaching, research and thesis experience in the monitoring program. Moreover, the participation of these personnel in conferences and research projects and publications in high impact journals, show their own experience of research on the item of SCOM.

Doctoral Committee for the doctoral degree:

- Dr Joaquin Bautista Valhondo
- Dr Albert Corominas Subias
- Dr Laia Ferrer Martí
- Dr Amaia Lusa Garcia
- Dr Rafael Pastor Moreno
- Dr Imma Ribas Vila

Doctoral data 2017

C.	**Coordination program**	**AMAIA LUSA GARCIA**
D.	**Number of students**	**4** (registration 2017/2018)

7. Projects and agreements

Public funding projects

Head researcher	BAUTISTA VALHONDO, JOAQUÍN
Title	Convenio marco European Centre for Soft Computing (ECSC) - Cátedra Nissan UPC
Funding institution	European Centre for Soft Computing
Reference	C-ECSC A-00715
Amount	0 €
Start-up date	19.03.2007
Completion date	31.01.2016

Head researcher	BAUTISTA VALHONDO, JOAQUÍN
Title	Factor humano e incertidumbre sobre la secuenciación y el equilibrado en líneas de modelos mixtos
Funding instution	Ministerio de Economía, Indústria y Competitividad
Reference	TIN2014-57497-P
Amount	38.478 €
Start-up date	01.01.2015
Completion date	31.12.2017

Head researcher	DOMENECH LEGA, BRUNO
Title	Metodologies i aplicatius per a l'elaboració de plans d'electrificació rural i l'avaluació de projectes energètics a l'Amèrica Llatina
Funding institution	Centre de Cooperació per al Desenvolupament
Reference	CCD2017-U012
Amount	11292.00 €.
Start-up date	01.06.2017
Completion date	31.12.2017

Head researcher	FERRER MARTI, LAIA / BLANCO ROMERO, M.ELENA / DOMENECH MESTRES, CARLES
Title	Disseny d'una trituradora apropiada per a l'obtenció d'adob natural pels agricultors de cafè de la zona de Cariamanga (Ecuador)
Funding institution	Centre Cooperació per al Desenvolupament
Reference	
Amount	5000.00 €
Start-up date	30.03.2017
Completion date	30.09.2017

Head researcher	FERRER-MARTI, LAIA
Title	Desenvolupament de metodologies i aplicatius pel disseny de projectes i la planificació energètica amb energies renovables en diferents contextos i països II
Funding institution	Centre de Cooperació per al Desenvolupament
Reference	2016-U015
Amount	9600.00 €.
Start-up date	01.06.2016
Completion date	30.09.2017

Head researcher	LUSA GARCIA, AMAIA
Title	Gender Equality in Engineering through Communication and Commitment
Funding institution	European Commission
Reference	H2020-741128-GEECCO
Amount	131.441,00 €
Start-up date	01.05.2017
Completion date	31.12.2017

Summary

The underrepresentation of women continues to characterise the STEM field (Science, Technology, Engineering, and Mathematics). Whereas in Europe approximately half of the PhD students are female, only 21% of PhD graduates in computing and 25% of PhD graduates in engineering are women. Given the relevance of technologies in our societies an adequate participation of all genders in the STEM field is of outstanding importance. With technologies, we shape structures that have long-term impacts on how people live, work, communicate, travel, and consume. Therefore, the gender dimension in research and innovation, their contexts and their outcomes, is significant. GEECCO is an EU funded project, which brings together a consortium that is characterised by the focus on the STEM field. GEECCO will increase the number of Research Performing Organizations (RPOs) and Research Funding Organizations (RFOs) that start to implement gender equality plans (GEP) pursuing the 3 objectives mentioned in the challenge, namely: (1) Removing barriers to the recruitment, retention and career progression of female researchers; (2) Addressing gender imbalances in decision making processes; (3) Strengthening the gender dimension in research programmes. GEECCO will be a step forward to a new way of establishing tailor-made GEPs in RPOs and implementing the gender dimension in research funding programmes. An effective and efficient dissemination and exploitation strategy has the aim of making the GEECCO approach accessible to other actors.

Head researcher	OLIVELLA NADAL, JORDI / AGUILAR PÉREZ, MARTA
Title	Entitat on es desenvolupa: Institut d'Organització i Control de Sistemes Industrials
Funding institution	EUROPEAN INST OF INNOV.& TECHNOL
Reference	Q-00209
Amount	5000.00 €
Start-up date	01.02.2014
Completion date	31.12.2017

Head researcher	ROSELL GRATACÓS, JAN / SUÁREZ FEIJÓO, RAÚL
Title	Robots autónomos diestros como co-trabajadores con operadores humanos.
Funding institution	Ministerio de Economía, Indústria y Competitividad.
Reference	DPI2016-80077-R
Amount	223.850 €
Start-up date	30.12.2016
Completion date	29.12.2020

Summary

The robotics field-of-application is constantly growing as the technological advances allow new capabilities and an increment and strength of the already existing ones. Among the new applications, it is worth mentioning, due to their potential significance from the productive and social point of view, those in which the robots work jointly with the humans, originating the concept of “coworker robots”. In this type of applications, the robots require some special features. On the one hand, they must have certain level of autonomy and capacity of decision, as their role is no longer doing repetitive tasks in the classical way but on the contrary, they must adapt themselves with swiftness to changing conditions, especially to those produced by the humans in the same workspace. This adaptation implies an interaction with the human operators that constraint the robot movements and actions with the aim of avoiding potential injuries to humans, but without affecting the robot efficiency. In order for the coworker robots to be useful for the human operators, it is necessary that they have an important level of dexterity so that they can perform a number of different actions usually required in the human activities. In this context, the project aims for solutions that increment the performance of the coworker robots to allow their permanent establishment in our society, and, at the same time, facilitate their acceptance by the humans. With this aim, the project will deal with the topics mentioned above, developing algorithms and procedures that make easy the efficient cooperation between coworker robots and humans. Specifically, contributions are expected in relevant topics, as: the increment of the robot capability to autonomously manage the required tasks and the movements to execute them, using ontologies to represent the knowledge; the increment of the dexterous and bimanual manipulation capabilities, monitoring the movements to prevent potential failures; and the improvement of the interaction with the human operators regarding reactive, cooperative and exchange-objects movements, considering approaches based on demonstrations or on teleoperation. All the theoretical developments will be checked and validated experimentally using the systems specifically prepared for it in the project. Besides, as usual in the developments of the group, the mentioned problems will be addressed with the intention of providing general solutions, valid for both industrial and service robotics, taking care of the productive and social components.

Head researcher	BIEL SOLE, DOMINGO
Title	Eines per a la gestionabilitat de les plantes de generació elèctrica amb fonts
Funding institution	ACC10
Reference	RIS3CAT COMRDI15-1-0043-02
Amount	5683.59 €.
Start-up date	01.03.2016
Completion date	15.10.2018

Head researcher	OLIVELLA NADAL, JORDI
Title	La modularitat dels conjunts de muntatge com a sistema de millora de la productivitat.
Funding institution	Agència de Gestió d'Ajuts Universitaris i de Recerca.
Reference	2015 DI 045
Amount	8974.95 €.
Start-up date	16.02.2016
Completion date	31.12.2017

Head researcher	FERRER MARTÍ, LAIA
Title	Optimización de sistemas de electrificación con energías renovables y microrredes
Funding institution	Ministerio de Economía, Indústria y Competitividad.
Reference	ENE2015-67253-R
Amount	78.650 €.
Start-up date	01.01.2016
Completion date	31.12.2018

Summary

Electrification systems based on the use of renewable energy sources have proved adequate to provide electricity to isolated communities autonomously and also produce electricity in a sustainable and respectful way with the environment. Nowadays, models and design tools in the literature to design these systems do not consider some of its features and/or key constraints. In the previous project ENE2010 - 15509 (Rural Electrification with Solar and Wind Energy) some of these issues were addressed, and models to design wind and/or solar systems were developed, considering local microgrids. As a continuation and expansion of this project, and to increase its applicability, the overall objective of this proposal, OSEERyM, is to optimize the design of rural electrification systems based on the use of wind, solar and also microhydro energy and bioenergy, with inter-community distribuction grids at a regional scale. In addition, a management system will be design to be in charge of the operation, mantainance and technical and economical sustainability of the project.

Head researcher	LUSA GARCIA, AMAIA
Title	Conceptos, instrumentos, modelos y algoritmos para el diseño de la supply chain.
Funding institution	Ministerio de Economía, Indústria y Competitividad.
Reference	DPI2015-67740-P
Amount	46.706 €
Start-up date	01.01.2016
Completion date	31.12.2019

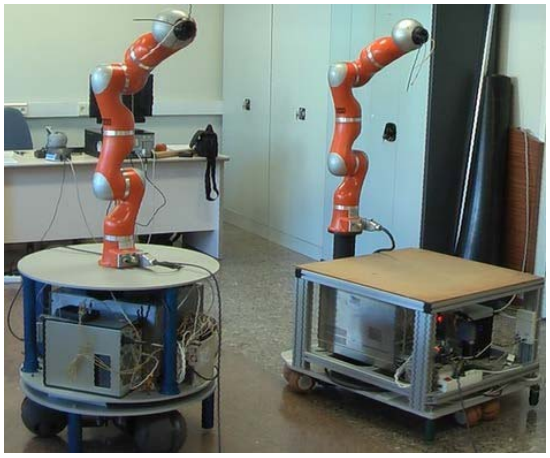
Summary

The purpose of this project is to develop tools and concepts for an efficient and correct design of supply chains (SC), under the SCOP method (Supply Chain Outline Process). The design of the SC consists of determining what elements are to be present in the SC and the relationships between them and includes decisions that are highly irreversible once implemented, and with associated significant costs and long-term implications. SCOP comprises five stages: the first one involves the definition of the object of the SC, the analysis of the environment and the formalization of objectives (the decisions made at this stage –such as a lean or an agile SC- determine the subsequent stages); the second, third and fourth respectively correspond to the definitions of the structure of the SC at a macro level (large blocks that comprise it), meso level (product structure and activities taking place in the SC; for each activity an option must be chosen from those available) and micro (includes defining and optimizing, by means of mathematical programming, the relations between the facilities in which the activities can potentially be carried out) level; in the fifth stage the configuration of the SC is selected, the protocols to apply in case of incidents are defined and the implementation of the SC is done. The proposed elements to be developed in this project are closely related, and are inserted into the framework defined in SCOP and help developing and strengthening the method.

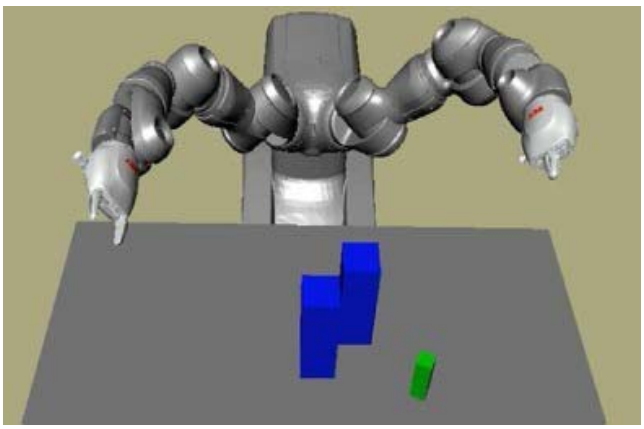
Head researcher	BIEL SOLÉ, DOMINGO
Title	Software battery Management Controller (BMC)
Funding institution	AGAUR. Agència de Gestió d'Ajuts Universitaris i de Recerca
Reference	2014 DI 069
Amount	3268.96 €
Start-up date	09.02.2015
Completion date	08.02.2017

Head researcher	ROSELL GRATACOS, JAN
Title	Robots manipuladores móviles como co-operarios: autonomía e interacción en la colaboración humano-robot
Funding institution	Ministerio de Economía, Indústria y Competitividad.
Reference	DPI2014-57757-R
Amount	94.985,00 €
Start-up date	01.01.2015
Completion date	31.06.2017

Summary



Mobile manipulators with dexterous manipulation capabilities already exist and they can assist man in simple tasks in a versatile manner. In work environments its use as co-workers is possible, acting as logistic transporters and as versatile and dexterous manipulators, to cooperate with human operators to improve the efficiency of the work done. Nevertheless, to make this reality, some improvements in hardware and software are still required in order to allow a higher degree of adaptability. This project pursues a system composed of several mobile manipulators capable of acting in indoor semi-structured environments executing handling and assembly tasks in collaboration with human operators. The system must facilitate the human-robot collaboration that, on the one hand, can be done in an autonomous way (i.e. the mobile manipulators are required to cooperate with humans by performing autonomously complementary tasks while moving around in the human environment and in their presence) and, on the other hand, can be done through interaction (i.e. with a virtual interaction via teleoperation, or with a physical interaction through an object jointly handled). The project focuses on the development of planning, reasoning and control algorithms, and in the development of the necessary software to provide mobile manipulators with the autonomy and the capacity of interaction to allow the cooperation with humans. In the sought horizon, robot co-workers must provide support to humans and integrate into their tasks and movements in a natural, fluid, safe and minimally invasive way, facilitating the acceptance by human workers of the changes that may result. Upon completion of the project, it will be available a test bed that should allow to investigate the behavior of humans in front of the work jointly carried out with robot co-workers, as well as the perceptions and the possible social acceptance of the changes involved.



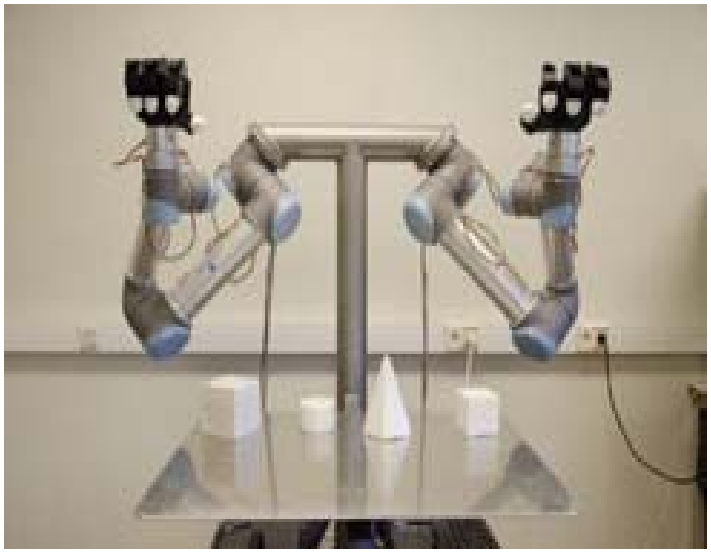
Head researcher	GRIÑÓ CUBERO, ROBERT
Title	Técnicas de control para la mejora de la estabilidad en redes eléctricas con convertidores electrónicos operando a potencia constante
Funding institution	Ministerio de Economía y Competitividad.
Reference	DPI2013-41224-P
Amount	145.200,00 €
Start-up date	01.01.2014
Completion date	31.12.2017

Summary

Currently, there are a significant number of power electronic converters – operating at constant power – connected to the electrical grid and this situation is likely to proliferate further. This operation mode of the converters deviates from the usual mode of operation of the traditional electrical devices and, in certain circumstances, may lead to stability problems in the point of common coupling. Given this scenario, the project's objective is the appropriate modification of the control algorithms of static converters to help reduce or minimize the adverse effects on the stability of the network while maintaining adequate operating characteristics in the converters. That is, contribute to improving the stability of the grid with a minimum affectation of the normal function and operation of the converters. To fulfil this objective, the project intends to make theoretical developments in: AFC digital control, sliding mode control, adaptive and model reference adaptive/repetitive control and control of complex systems applied to electric power networks. These developments will specialize to meet the primary objective. In this sense, the project serves the dual purpose of providing solutions, implementable in power converters, to improve stability of the network and to obtain theoretical results in the field of the control techniques that are proposed to work.
Another objective of the project is to ensure that the designed controllers will be interesting, by their complexity and their hardware implementation cost, for the industrial sector.

Head researcher	SUÁREZ FEIJÓO, RAÚL
Title	Prensión y manipulación diestra, móvil y cooperativa (DEMCO)
Funding institution	Ministerio de Economía, Indústria y Competitividad.
Reference	DPI2013-40882-P
Amount	102.850,00 €
Start-up date	01.01.2014
Completion date	31.12.2017

Summary



In recent years there have been significant advances in the area of object grasping and manipulating using robots, both from the point of view of developing new mechanical hands with anthropomorphic structure as in terms of algorithms to search for an efficient use of these hands. However, the actual implementation of these hands in tasks that require some skill is still quite limited and it is still common the use of grippers specially designed for a certain application, and even the use of very simple grippers with only two opposite fingers when looking for usefulness and robustness. One of the main causes of this limitation is the difficulty in determining the appropriate movements to perform a task in the presence of several uncertainty sources, a problem that can be tackled by making greater use of tactile information in all the phases of the grasping and manipulation tasks. On the other hand, mobile robotics has also advanced significantly, to the point of defining its own work field with mYear different applications, but when the mobile device is provided with a device for grasping and dexterous manipulation they generally work in uncoupled way, the mobile device is positioned according to certain criteria and then the grasping device acts as an static one. In this context, the overall objective of the project is to advance towards the elimination of these deficiencies. The robotics group of the IOC has extensive experience in the area of grasping and manipulation objects with robotic hands, planning and optimizing the movements of both the hand and the arm that supports it, and now it is intended to extend that experience in two directions. Basically, on one hand, deepening in the problems concerning the use of dexterous hands with mYear degrees of freedom when there exist different sources of uncertainty, for which there will be special emphasis on the use of tactile information, and, on the other hand, addressing the problem of determining efficient actions when the whole dexterous manipulation device is mounted on a mobile element. As a complementary topic it is also considered the cooperative action of more than one manipulator. Thus, the project aims to make contributions in the three typical levels of these systems: hand level, arm level and body level. As in previous projects of the group, the above problems are addressed with the intention to provide general solutions that are valid both in industrial and service robotics.

Head researcher	OLM MIRAS, JOSEP MARIA
Title	Control avançat de sistemes d'energia
Funding institution	Agency de Gestió d'Ajuts Universitaris i de Recerca
Reference	2014 SGR 267
Amount	30.000,00 €
Start-up date	01.01.2014
Completion date	31.12.2016

Summary

The generic goal of SGR financial supports is to recognise and promote high quality research, technology transfer, and internationalization of the scientific activities of catalan research groups. As regards ACES group, the support is assigne dto complement pre and/or post-doc research contracts, grants for Master Theses Projects, visiting professors and mobilities of the members of the group.

The project aims, therefore, to contribute to the resolution of the problem posed by the introduction of robots as co-workers, for the change that it may represent at the social level, and for its individual and collective perception, since the early consideration of these aspects will contribute to the acceptance of robots as an integral part of our lives and to its use without delay.

Among the new applications in robotics, those in which the robots work jointly with the humans, originating the concept of “coworker robots”, have a potential significance from the productive and social point of view. These robots must have, on the one hand, certain level of autonomy and capacity of decision, as their role is no longer doing repetitive tasks in the classical way but on the contrary, they must adapt themselves with swiftness to changing conditions, especially to those produced by the humans in the same workspace. On the other hand, it is necessary that they have an important level of dexterity so that they can perform a number of different actions usually required in the human activities. In this context, the project aims for solutions that increment the performance of the coworker robots to allow their permanent establishment in our society. With this aim, the project will deal with the topics mentioned above, developing algorithms and procedures that make easy the efficient cooperation between coworker robots and humans.

Head researcher	SUÁREZ FEIJÓO, RAÚL /
Title	SIR: Service and industrial robotics
Funding institution	Agency de Gestió d'Ajuts Universitaris i de Recerca
Reference	2014 SGR 1433
Amount	18.000,00 €
Start-up date	01.01.2014
Completion date	30.04.2017

Summary

The group SIR performs the research activity in industrial and service robotics following traditional approaches as well as new paradigms where the robots are allowed to work safely alongside humans in such a way that they become collaborative coworkers and fellows in the factory floor and at home. In this scope, the research work of the group is mainly focused on transversal tools for dexterous, mobile and cooperative manipulation as well as for robot teleoperation. The list of addressed topics includes control and communications through the Internet, relational positioning, vision systems and 3D augmented reality, automatic synthesis of grasps, telemanipulation, programming by demonstration, human-like motion planning, simultaneous task and motion planning, and physics-based manipulation planning. Typical tools used in this research are haptic devices, mobile platforms, industrial robots, dual-arm robots, mechanical hands and sensory systems.

Head researcher	FERRER, I – FERRER, L.
Title	HIGHWAY IBERIA SERVICES. GEMMA
Funding institution	EUROPEAN INST OF INNOV.& TECHNOL
Reference	
Amount	1470.42 €
Start-up date	01.01.2013
Completion date	31.12.2017

Head researcher	BAUTISTA VALHONDO, JOAQUIN
Title	Convenio marco European Centre for Soft Computing (ECSC) Cátedra Nissan UPC
Funding institution	Ministerio de Ciencia e Innovación
Reference	C-ECSC
Amount	1470.42 €
Start-up date	19/03/2007
Completion date	31/01/2016

Agreements with companies

Head researcher	ARIAS PUJOL, ANTONI
Title	Assess d'algororament el disseny i posterior implementació en microprocessadors ismes digitals pel control d'altres prestacions de motors pas a pas.
Funding institution	MICROPAP ENGINEERING SL
Reference	C10722
Amount	3.000 €
Start-up date	31.10.2016
Completion date	30.10.2017

Summary

The main goal is the design and further implementation in digital microprocessors of state-of-the-art algorithms to improve the overall performance of the well-known stepper motors. On a second step, the use of a position transducer (typically and encoder) will be considered in order to develop field oriented control and therefore industrially compete with their counterparts (permanent magnet synchronous machines) in order to gain market.
It is also expected to publish the scientific results in prestigious international conferences and high impact factor journals.

Head researcher	GRIÑÓ CUBERO, ROBERT
Title	Diseño y control de un convertidor cc-ca trifásico, aislado galvánicamente, paralelable y de potencia nominal 6 Kva.
Funding institution	PREMIUM, S.A.
Reference	C10599
Amount	18.200 €
Start-up date	06.05.2016
Completion date	06.07.2019

Head researcher	OLIVELLA NADAL, JORDI
Title	Desarrollo de tareas sobre aspectos relacionados con la organización y evaluación del funcionamiento de los sistemas universitarios y educativos
Funding institution	FUNDACIÓ CYD
Reference	C10446
Amount	18.000 €
Start-up date	15.09.2015
Completion date	30.09.2018

Head researcher	PEÑA PITARCH, ESTEBAN
Title	Aparell per mesurar la força del sol pelvic.
Funding institution	FUNDACIÓ ALTHAIA.
Reference	P201130449
Amount	0.00 €
Start-up date	25.03.2011
Completion date	25.03.2031

8. Publications

Articles in Journals

1. Arocas, J.; **Griño**, **R**. A local stability condition for dc grids with constant power loads. *IFAC-PapersOnLine.* Any: 2017. Volum: 50. Número: 1. Pàgs: 7 ~ 12. Projecte o conveni finançador: Control avançat de sistemes d'energia; Técnicas de control para la mejora de la estabilidad en redes eléctricas con convertidores electrónicos operando a potencia constante. URL del text: http://www.sciencedirect.com/science/article/pii/S2405896317300137?via%3Dihub .

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4. **Batlle, C**.; Gomis, J.; Mezincescu, L.; Townsend, P. Tachyons in the Galilean limit. *Journal of high energy physics.* Any: 2017. Volum: 2017. Número: 4. Pàgs: 1 ~ 10. Nombre de citacions: 2. URL del text: https://link.springer.com/article/10.1007%2FJHEP04%282017%29120. DOI:10.1007/JHEP04(2017)120.

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6. **Bautista, J**.; Alfaro, R. A case study at the Nissan Barcelona factory to minimize the ergonomic risk and its standard deviation in a mixed-model assembly line. Progress in Artificial Intelligence. Any: 2017. Pàgs: 1 ~ 12. Projecte o conveni finançador: Factor humano e incertidumbre sobre la secuenciación y el equilibrado en líneas de modelos mixtos. URL del text: https://link.springer.com/article/10.1007%2Fs13748-018-0153-9#citeas. DOI:10.1007/s13748-018-0153-9.

7. **Bautista, J.**; Cano, A.; Alfaro, R. A hybrid dynamic programming for solving a mixed-model sequencing problem with production mix restriction and free interruptions. Progress in Artificial Intelligence. Any: 2017. Volum: 6. Número: 1. Pàgs: 27 ~ 39. Projecte o conveni finançador: Factor humano e incertidumbre sobre la secuenciación y el equilibrado en líneas de modelos mixtos. Nombre de citacions: 1. URL del text: http://link.springer.com/journal/13748. DOI:10.1007/s13748-016-0101-5.

8. **Bautista, J**.; Alfaro, R. Free and regular mixed-model sequences by a linear program-assisted hybrid algorithm GRASP-LP. Progress in Artificial Intelligence. Any: 2017. Volum: 6. Número: 2. Pàgs: 159 ~ 169. Projecte o conveni finançador: Factor humano e incertidumbre sobre la secuenciación y el equilibrado en líneas de modelos mixtos. Nombre de citacions: 1. URL del text: http://link.springer.com/article/10.1007/s13748-017-0110-z. DOI:10.1007/s13748-017-0110-z.

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10. **Benedito, E**.; del Puerto-Flores; **Doria-Cerezo, A**.; Scherpen, J. Optimal power flow for resistive DC networks: a port-hamiltonian approach. IFAC-PapersOnLine. Any: 2017. Volum: 50. Número: 1. Pàgs: 25 ~ 30. URL del text: http://www.sciencedirect.com/science/article/pii/S2405896317300162?via%3Dihub DOI:10.1016/j.ifacol.2017.08.005.

11. Bonet, C.; Martinez-seara, Tere; **Fossas, E**.; Jeffrey, M. A unified approach to explain contrary effects of hysteresis and smoothing in nonsmooth systems. Communications in nonlinear science and numerical simulation. Any: 2017. Volum: 50. Pàgs: 142 ~ 168. URL del text: http://www.sciencedirect.com/science/article/pii/S1007570417300618. DOI:10.1016/j.cnsns.2017.02.014.

12. **Calleja, G.**; **Corominas, A.**; Martinez, M.; De La Torre, R. Methodological approaches to supply chain design. International journal of production research. Any: 2017. Pàgs: 1 ~ 23. Projecte o conveni finançador: Conceptos, instrumentos, modelos y algoritmos para el diseño de la supply chain. URL del text:http://www.tandfonline.com/toc/tprs20/current. DOI:10.1080/00207543.2017.1412526.

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15. De La Torre, R.; **Lusa, A**.; **Mateo, M.** Evaluation of the impact of strategic staff planning in a university using a MILP model. European journal of industrial engineering. Any: 2017. Volum: 11. Número: 3. Pàgs: 328 ~ 352. URL del text: http://www.inderscience.com/offer.php?id=84879. DOI:10.1504/EJIE.2017.084879.

16. de-Felipe, D.; **Benedito, E.** Monitoring high complex production processes using process capability indices. International journal of advanced manufacturing technology. Any: 2017. Volum: 93. Número: 1-4. Pàgs: 1257 ~ 1267. URL del text: https://link.springer.com/article/10.1007%2Fs00170-017-0591-8. DOI:10.1007/s00170-017- 0591-8.

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20. García, N.; **Rosell, J**.; **Suarez, R.** Motion planning by demonstration with human-likeness evaluation for dual-arm robots. IEEE Transactions on Systems, Man, and Cybernetics. Systems. Any: 2017. Volum: PP. Número: 99. Pàgs: 1 ~ 10. Projecte o conveni finançador: Prensión y manipulación diestra, móvil y cooperativa; Robots manipuladores móviles como co-operarios: autonomía e interacción en la colaboración humano-robot; Robots autónomos diestros como co-trabajadores con operadores humanos. URL del text: http://ieeexplore.ieee.org/document/8089669/.DOI:10.1109/TSMC.2017.2756856.

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23. Gómez Hernández, D.F.; **Domenech, B**.; **Ferrer-Martí, L.** Evaluación de alternativas de la electrificación rural, un análisis de competitividad tecnológica para Chiapas. Staobil lekilal ta lekil abtel. Administración para el desarrollo. Any: 2017. Número: 12. Pàgs: 21 ~ 37. URL del text: http://www.revistaadministracionfcaunach.mx/?s=revista&revista=1&numero=12.

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27. **Mateo, M.;** Teghem, J.; Tuyttens, D. A bi-objective parallel machine problem with eligibility, release dates and delivery times of the jobs. International journal of production research. Any: 2017. Volum: 52. Número: 3. Pàgs: 1030 ~ 1053. Nombre de citacions: 1. URL del text: http://www.tandfonline.com/doi/full/10.1080/00207543.2017.1351634. DOI:10.1080/00207543.2017.1351634.

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2. **Bautista, J.**; Alfaro, R. Minimizing the ergonomic risk and its dispersion in a mixed model assembly line using GRASP. Metaheuristics: Proceeding of the MIC and MAEB 2017 Conferences. Lloc de publicació: Barcelona, Espanya. Editorial: Universitat Pompeu Fabra. Any: 2017. Pàgs: 943 ~ 952. ISBN/ISSN: 978-84-697-4275-1. URL del text: http://mic2017.upf.edu/proceedings/.

3. **Bautista, J.**; Alfaro, R. GRASP para secuencias regulares de modelos mixtos con sobrecarga mínima e interrupción forzada de operaciones. Metaheuristics: Proceeding of the MIC and MAEB 2017 Conferences. Lloc de publicació: Barcelona, Espanya. Editorial: Universitat Pompeu Fabra. Any: 2017. Pàgs: 973 ~ 982. ISBN/ISSN: 978-84-697- 4275-1. URL del text: http://mic2017.upf.edu/proceedings/.

4. **Benedito, E.**; del Puerto-Flores; **Doria-Cerezo, A.**; Scherpen, J. Optimal power flow for resistive DC networks: a port-hamiltonian approach. IFAC Proceedings Volumes (IFAC-PapersOnline), 50-1 (2017), 20th IFAC World Congress, Toulosse, France, 9-14 July 2017: proceedings. Lloc de publicació: Toulouse, França. Editorial: Elsevier. Any: 2017. Pàgs: 25 ~ 30. ISBN/ISSN: 2405-8963. URL del text: https://www.sciencedirect.com/journal/ifac-papersonline/vol/50/issue/1.

5. **Biel, D**.; Scherpen, J. Passivity-based control of active and reactive power in single-phase PV inverters. 36th Benelux Meeting on Systems and Control: Book of abstracts. Lloc de publicació: Spa, Bèlgica. Editorial: Université Catholique de Louvain. Any: 2017. Pàgs: 90 ~ 90. URL del text: http://www.beneluxmeeting.nl/2017/uploads/boaComplet.pdf.

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7. Diab, M.; Ud Din, M.; Akbari, A.; **Rosell, J.** An Ontology Framework for Physics-Based Manipulation Planning. ROBOT 2017: Third Iberian Robotics Conference, vol. 1. Lloc de publicació: Sevilla, Espanya. Editorial: Springer. Any: 2017. Pàgs: 452 ~ 464. ISBN/ISSN: 978-3-319-70833-1. URL del text: https://link.springer.com/book/10.1007/978-3-319-70833-1.

8. **Ferrer-Martí, L.; Domenech, B.; Pastor, R.**. Electrificación rural con energías renovables para países en desarrollo en asignaturas básicas, especializadas y proyectos final de carrera. La Universidad y los Objetivos de Desarrollo Sostenible: Actas del VII Congreso Universidad y Cooperación al Desarrollo: Madrid, España: Marzo 29-31, 2017. Lloc de publicació: Madrid, Espanya. Any: 2017. Pàgs: 144 ~ 144. ISBN/ISSN: 978-84-8344-570-9.

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10. **García, N.; Rosell, J.; Suarez, R.** Aplicación de algoritmos RRT en la planificación de movimientos óptimos en robótica. Proceedings of the 12th Metaheuristics International Conference. Lloc de publicació: Barcelona, Espanya. Any: 2017. Pàgs: 953 ~ 962. ISBN/ISSN: 978-84-697-4275-1.

11. López-González, A.; **Domenech, B.; Ferrer-Martí, L.** Rural electrification with renewable energy and sustainable development in isolated, indigenous and frontier communities of Venezuela. International Conference on Energy Research and Social Science. Lloc de publicació: Sitges, Espanya. Any: 2017.

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13. **Mateo, M.**; Teghem, J.; Camps, J. Exploración de vecindarios mediante búsqueda ramificada para un problema bicriterio con elegibilidad en máquinas paralelas. Metaheuristics: Proceeding of the MIC and MAEB 2017 Conferences. Lloc de publicació: Barcelona, Espanya. Editorial: Universitat Pompeu Fabra. Any: 2017. Pàgs: 953 ~ 962. ISBN/ISSN: 978-84-697-4275-1. URL del text: http://mic2017.upf.edu/proceedings/.

14. **Peña-Pitarch, E.**; Ticó, N. Simulation of virtual human hand evolution after stroke. The 16th International Conference on Modeling and Applied Simulation: September 18-20, 2017, Barcelona, Spain. Lloc de publicació: Barcelona, Espanya. Editorial: Università degli Studi di Genova. Any: 2017. Pàgs: 123 ~ 127. ISBN/ISSN: 978-88-97999-91-1.

15. Perez, J.; Cóbreces, S.; Wang, X.; Blaabjerg, F.; **Griño, R.** A robust grid current controller with grid harmonic and filter resonance damping capabilities using a closed-loop admittance shaping. Proceedings of the 2017 IEEE Applied Power Electronics Conference and Exposition 2017 (APEC 2017). Lloc de publicació: Tampa, Florida, Estats Units d'Amèrica. Editorial: IEEE Press. Any: 2017. Pàgs: 2625 ~ 2632. ISBN/ISSN: 978-1-5090-5366-7.

16. Rojas de Silva, F.; **Suarez, R.** Contact force computation for bimanual grasps. Proceedings of the 22nd IEEE International Conference on Emerging Technologies and Factory Automation (ETFA 2017). Lloc de publicació: Limassol, Chipre. Editorial: Institute of Electrical and Electronics Engineers (IEEE). Any: 2017. Pàgs: 1 ~ 6.

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18. **Rosell, J.**; Nuño, E.; Claret, J.; Zaplana, I.; Garcia, N.; Akbari, A.; Ud Din, M.; Palomo, L.; Pérez, A.; Mas, Orestes; Basañez, L. Mobile manipulators as robot co-workers: autonomy and interaction in the human-robot collaboration. Libro de actas de las Jornadas Nacionales de Robótica 2017. Lloc de publicació: Valènica, Espanya. Editorial: Comité Español de Automática (CEA-IFAC). Any: 2017. Pàgs: 1 ~ 6. ISBN/ISSN: 978-84-697-3742-2.

19. Sanz, V.; Costa-Castelló, R.; **Batlle, C.** Combined heat and power using high temperature proton exchange membrane fuel cells for comfort applications. XV Simposio CEA de Ingeniería de Control. Lloc de publicació: SALAMANCA, Espanya. Any: 2017. Pàgs: 29 ~ 33.

20. Soler, F.; Rojas-de-Silva, A.; **Suarez, R.** Grasp quality measures for transferring objects. ROBOT 2017: Third Iberian Robotics Conference, vol. 2º. Lloc de publicació: Sevilla, Espanya. Editorial: Springer. Any: 2017. Pàgs: 28 ~ 39. ISBN/ISSN: 978-3-319-70835-5. URL del text: https://www.springer.com/gp/book/9783319708355.

21. **Suarez, R**. Prensión y manipulación diestra, móvil y cooperativa. Libro de actas de las Jornadas Nacionales de Robótica 2017. Lloc de publicació: Valènica, Espanya. Editorial: Comité Español de Automática (CEA-IFAC). Any: 2017. Pàgs: 1 ~ 6. ISBN/ISSN: 978-84-697-3742-2.

22. Trancho, E.; Ibarra, E.; **Arias, A.;** Kortabarria, I. Control óptimo de par para máquinas SynRM aplicadas a vehículo eléctrico. SAAEI'17: XXIV Seminario Anual de Automática, Electrónica Industrial e Instrumentación: Valencia: 5, 6 y 7 de Julio de 2017. Lloc de publicació: Valencia, Espanya. Any: 2017.

23. Ud Din, M.; Akbari, A.; **Rosell, J**. Knowledge-Oriented Physics-Based Motion Planning for Grasping Under Uncertainty. ROBOT 2017: Third Iberian Robotics Conference, vol. 1. Lloc de publicació: Sevilla. Editorial: Springer. Any: 2017. Pàgs: 502 ~ 515. ISBN/ISSN: 978-3-319-70832-4. URL del text:https://link.springer.com/book/10.1007/978-3-319-70833-1.

Invited talks

1. Conferenciat: **Rosell, J.** Títol de la conferència: Manipulation planning for robot co-workers. Entitat: Workshop on Integrated Task and Motion Planning (Robotics: Sience and Systems). Data: 15/07/2017. Localitat: Cambridge, Massachusetts. País: Estats Units d'Amèrica.

Books

1. **Corominas, A**. *Research into the area of supply chain.* Editorial: OmniaScience. Any: 2017. ISBN: 978-84-946352- 8-1.

2. **Corominas, A**. *Introducció a la recerca en l'àmbit de la cadena de subministrament.* Editorial: OmniScience. Any: 2017. ISBN: 978-84-946352-2-9.

Book chapters

1. **Bautista, J**.; Fortuny-Santos, J. Time-based conditions for synchronized procurement in Douki Seisan. Closing the gap between practice and research in industrial engineering. Lecture Notes in Management and Industrial Engineering. Editorial: Springer. Any: 2017. Pàgs: 231 ~ 238. ISBN: 978-3-319-58409-6.

2. **Bautista, J**.; Batalla, C.; Alfaro, R. Comparative models for minimizing ergonomic risk in assembly Lines. Closing the gap between practice and research in industrial engineering. Lecture Notes in Management and Industrial Engineering. Editorial: Springer. Any: 2017. Pàgs: 223 ~ 230. ISBN: 978-3-319-58409-6.

3. **Bautista, J**.; Alfaro, R.; Batalla, C. Minimizing lost-work costs in a mixed-model assembly line. Closing the gap between practice and research in industrial engineering. Lecture Notes in Management and Industrial Engineering. Editorial: Springer. Any: 2017. Pàgs: 213 ~ 221. ISBN: 978-3-319-58409-6

4. **Bautista, J**.; Alfaro, R. Minimizing the ergonomic risk and its dispersion in a mixed model assembly line using GRASP. Metaheuristics: Proceeding of the MIC and MAEB 2017 Conferences. Editorial: Universitat Pompeu Fabra. Any: 2017. Pàgs: 943 ~ 952. ISBN: 978-84-697-4275-1.

5. **Bautista, J.**; Alfaro, R. GRASP para secuencias regulares de modelos mixtos con sobrecarga mínima e interrupción forzada de operaciones. Metaheuristics: Proceeding of the MIC and MAEB 2017 Conferences. Editorial: Universitat Pompeu Fabra. Any: 2017. Pàgs: 973 ~ 982. ISBN: 978-84-697-4275-1.

6. **Bautista, J.**; Alfaro, R.; Batalla, C. Productivity improvement, considering legal conditions and just in time principles in the mixed-model sequencing problem. Engineering systems and networks. Editorial: Springer. Any: 2017. Pàgs: 205 ~ 214. ISBN: 978-3-319-45746-8.

7. **Benedito, E.** Material wait time problem. Proceedings of the 115th European Study Group with Industry. Any: 2017. Pàgs: 57 ~ 64. ISBN: 978-84-697-5163-3.

8. **Lusa, A.;** de Miranda, J. An Introduction to the resource constrained project scheduling problem solving techniques. Optimization and decision support systems for supply chains. Editorial: Springer. Any: 2017. Pàgs: 151 ~ 169. ISBN: 978-3-319-42419-4.

9. **Olivella, J.** Lean management and supply chain management: common practices. Optimization and decision support systems for supply chains. Editorial: Springer. Any: 2017. Pàgs: 117 ~ 129. ISBN: 978-3-319-42419-4.

Sofware

1. **Rosell, J.** *The Kautham Project.* Llenguatge de programació: C++. Plataforma que ho soporta: Linux. Any: 2017.

9. Organization of congresses

1. **Bautista, J.** - Organizador Sesión invitada: Metaheurísticas en Producción. XII Congreso Español de Metaheurísticas, Algoritmos Evolutivos y Bioinspirados (MAEB 2017). Any: 2017. Localitat: Barcelona. País: Espanya.

2. **Bautista, J.** - Organizador Sesión invitada: Metaheurísticas en Producción. XII Congreso Español de Metaheurísticas, Algoritmos Evolutivos y Bioinspirados (MAEB 2017). Any: 2017. Localitat: Barcelona. País: Espanya.

10. International stays and visits

1. Participant: **Mateo, M.** Tipus de participació: Convidat. Nom del centre: Ecole National d'Ingénieurs de Tarbes. Finalitat de l'estada: Recerca. Tasques contrastables: Programa ERASMUS+ de mobilitat de professorat per a missions docents KA103 (STA) 2016/17. Data d'inici: 27/09/2017. Data de fi: 29/09/2017.

2. Participant: **Mateo, M.** Tipus de participació: Convidat. Nom del centre: Gent University. Finalitat de l'estada: Impartició docència. Tasques contrastables: Programa ERASMUS+ de mobilitat de professorat per a missions docents KA103 (STA) 2016/17. Data d'inici: 17/05/2017. Data de fi: 18/05/2017.

3. Participant: **Suárez, R.** Tipus de participació: Convidat. Nom del centre: Universidad de la Punta, San Luis, Argentina. Finalitat de l'estada: Estància d'assessorament al programa de Robótica de la Universidad. Data d'inici: 25/10/2017 Data de fi: 6/11/2017

4. Participant: **Zaplana, I.** Tipus de participació: Convidat. Nom del centre: Department of Engineering of the University of Cambridge. Finalitat de l'estada: Recerca. Tasques contrastables: Estancia de Investigación en colaboración con la profesora Joan Lasenby. Data d'inici: 25/01/2017. Data de fi: 25/04/2017.

11. Prizes and awards

1. Premiats: Rojas de Silva, F.; **Suarez, R**. Nom del premi (edició): Premio ROBOTNIK a la mejor comunicación/poster del Grupo de Robótica presentado en las XXXVIII Jornadas de Automática 2017. Any: 2017. Motiu/treball reconegut: Premio otorgado por el Comité Español de Automática con el auspicio de la empresa ROBOTNIK a la mejor comunicación/poster del Grupo de Robótica presentado en las XXXVIII Jornadas de Automática llevadas a cabo en Gijón del 6 al 8 de septiembre de 2017.El trabajo ganador, lleva por título: "Cálculo de fuerzas de contacto para prensiones bimanuales" y fue realizado por Abiud Rojas-de-Silva y Raúl Suárez. Data de resolució: 08/09/2017. Resultat: Primer premi. Entitat que ho concedeix: Comité Español de Automática.

12. Extracurricular activities

Executive en Lean Supply Chain Management. Direcció d'Operacions I Logística - Master's degree. Face-to-face.

Academic management: Rúa Costa, Carles

Presentation

16th year

Traditional functions in companies such as production, distribution, planning or logistics have evolved with the change in economic cycles. The productive function has adapted to the new needs of markets, incorporating new trends such as Lean Manufacturing¿ and embracing quality control, training or staff motivation as part of its tasks. Likewise, logistics have also changed, and the concept Integrated Logistics has come to comprise all the value chain between the customer and the supplier, as well as the flow of information and materials.

Integrated management of the distribution chain, production and supplies is now known as Supply Chain Management. The emergence of logistics has forced governments to work on improving and updating infrastructures roads, railway, ports and airports and this, together with staff training and research and innovation as key aspects to increase the level of competitiveness in the business fabric.

This Masters Degree aims to be unique and exclusive, a reference point for all professionals aiming to develop their career in the areas of logistics, distribution, supplies and, in general, Year aspect relating to the supply chain management and design. To make this possible, the course has included prestigious professionals from the main European universities (CRANFIELD) and leading schools in specific areas (European Short Sea Shipping School). For this Masters we also have the collaboration of managers from the leading logistics companies in Spain, who will transmit their experiences to the students.

AIMS

- TO PUT INTO QUESTION THE CURRENT ORGANISATIONAL AND MANAGEMENT SYSTEMS IN THE LOGISTICS CHAIN.
- TO STRATEGICALLY ANALYSE, ORIENT AND DEFINE THE ENTIRE LOGISTICS CHAIN AND ALL OF ITS DIFFERENT SECTORS, IMPLEMENTING AND ADAPTING NEW TECHNOLOGIES TO BOOST COMPANIES LOGISTICS SERVICES.
- TO DESIGN AND IMPLEMENT NEW SYSTEMS AND METHODOLOGIES TO IMPROVE THE MANAGEMENT OF THE RELATIONSHIPS AMONG PROVIDERS, BUSINESSES, OPERATORS AND END CLIENTS.
- TO EFFECTIVELY MANAGE PERSONNEL TEAMS THAT NEED TO COLLABORATE WITH THE CULTURAL CHANGE IMPLIED IN IMPLANTING AN INTEGRATED STRATEGY OF SUPPLY CHAIN MANAGEMENT

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http://www.talent.upc.edu/cat/professionals/presentacio/codi/203200/executive-lean-supply-chain-management-direccio-operacions-logistica/