



**Alba Rodríguez Lorente**

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## Summary of CV

This section describes briefly a summary of your career in science, academic and research; the main scientific and technological achievements and goals in your line of research in the medium -and long- term. It also includes other important aspects or peculiarities.

After completing the Bachelor's degree in Industrial Electronics and Automation Engineering in 2014 at Universidad Carlos III de Madrid (UC3M), I finished the Final Degree Project (TFG) with honors. In the academic year 2015/16 I take part in the first promotion of the Master in Electronic Systems and Applications at the same university, which I finish with an average grade of 8.35. I enjoyed this period with a scholarship for the Study of University Master by which I teach associated with the Department of Electronic Technology. Later, I am part of the first academic committee of this master's. Both the Bachelor's and the Master's Final Projects were in the framework of Help for Disability in the GDAF (Displays and Photonic Applications) in collaboration with the Hospital San Rafael de Madrid. From 2017 to 2021 I do my Ph.D. at UC3M in the research group GSEP (Power Electronic Systems) in the Ph.D. Program of Electrical, Electronics, and Automation, obtaining a grade of outstanding cum-laude and international mention for the thesis called "Analysis, design, and optimization of bidirectional DC-DC converter reducer-elevator with magnetic coupling". The converter of the thesis is the subject of a patent. During the doctorate, I spend 4 months at the Università degli Studi di Padova. During this period: - I publish a total of 3 journal articles (2Q1 + Q2) and a last one under review. - I participate in 11 congresses: 6 international, 4 national, and in a symposium in Estonia where I was awarded the prize for the best presentation. - I collaborate on 5 research projects in the field of power electronics, financed with both public and private funds. - I develop teaching material for courses given to companies and I develop a manual for the use of Advanced Design Systems software for use by undergraduate and master students, in the Electromagnetic Compatibility course. - I develop Matlab applications for the design of converters and magnetic components, currently in use in the designs of the group. - In the 2018/19 academic year I am granted a Venia Docendi from the department for which I teach laboratory in undergraduate subjects. From January 2020 to December 2021 I am hired part-time by the company Power Smart Control SL, where I design control solutions and optimization of power converters for private companies, and I am in charge of the theoretical development of the update of the Smart Control Software tool.

I start my teaching career in the Electronics Department of the Universidad Rey Juan Carlos in Decembe3 2021. To Jaunary 2024, six journal papers' have been released (3Q1 + 2Q2 + Q3), two conference paper have been added and I've participate in two privately funded research projects in the field of converter modeling and control. B.1. Breve descripción del Trabajo de Fin de Grado (TFG) y puntuación obtenida The final degree project is carried out in collaboration with the Special Education School associated with the San Rafael Hospital in Madrid.

The project consists of the design and construction of an aid to dependency in the form of a game for students, intending to stimulate their cause-effect perception. For this purpose, a game is designed and built consisting of a controller and a panel with moving parts and visual and auditory stimuli that interact with the player creating different games.



The score obtained was 10.B.2. Breve descripción del Trabajo de Fin de Máster (TFM) y puntuación obtenida The master's degree final project is carried out in collaboration with the Special Education School associated with the San Rafael Hospital in Madrid.

The project consists of the design and construction of an aid to dependency in the form of a game for students, intending to stimulate their cause-effect perception. To this end, a collaborative game and its interface are designed and built, capable of recognizing contact between participants and using it to generate auditory and visual responses at the request of the center.

The score obtained was 9.25.



## General quality indicators of scientific research

This section describes briefly the main quality indicators of scientific production (periods of research activity, experience in supervising doctoral theses, total citations, articles in journals of the first quartile, H index...). It also includes other important aspects or peculiarities.

The field of Power Electronics promises to be interesting from a research point of view linked to the development of electric transport and the efficient use of renewable energies. In this regard, 6 journal articles have been published (3Q1 + 2Q2 + Q3) until 2024. The research carried out has allowed me to participate in a total of 13 congresses (8 international, 5 national). Also, a 4-month stay at the Università degli studi di Padova.

To highlight, I have participated in the innovations on a new bidirectional DC-DC converter topology (which gives body to a patent), with the proposal of a multivariable control strategy that optimizes the operation of this converter, susceptible to be used in related proposals. Also, I have proposed new modeling equations for the magnetic flux dispersion in integrated magnetic components.

Also noteworthy is the leadership and training activity, as I was in charge of master's and bachelor's students collaborating with the research group. In addition, the converter and magnetic component design algorithms I developed are used by teachers and students at the Universidad Carlos III de Madrid.

From the industrial point of view, power electronics is essential as a link between electrical engineering applications and electronics. In this regard, I have participate in many projects in collaboration with companies (health, transport, telecommunications) seeking to develop their products and improve their performance by focusing on the power stage. In addition to a part-time contract with the company Power Smart Control SL where I contribute to the design of control solutions and optimization of power converters and I am part of the development team of the software tool "Smart control" sold as a plug-in to the well-known simulation software PSIM (for private use and also in the university by researchers and students).

**Alba Rodríguez Lorente**

Surname(s): **Rodríguez Lorente**  
 Name: **Alba**  
 DNI: **53717579K**  
 ORCID: **0000-0002-7592-9514**  
 Google Scholar: **tfFATM0AAAAJ**  
 Date of birth: **01/11/1991**  
 Gender: **Female**  
 Nationality: **Spain**  
 Country of birth: **Spain**  
 Aut. region/reg. of birth: **Community of Madrid**  
 Contact province: **Madrid**  
 City of birth: **Madrid**  
 Contact address: **Avenida de la Paz, 15**  
 Rest of contact address: **Bloque 2, 3°C**  
 Postcode: **28907**  
 Contact country: **Spain**  
 Contact aut. region/reg.: **Community of Madrid**  
 Contact city: **Getafe**  
 Land line phone: **(+34) 914884584 - 4584**  
 Email: **alba.rodriguez@urjc.es**  
 Mobile phone: **653741591**

**Current professional situation****Employing entity:** Universidad Rey Juan Carlos**Professional category:** Assistant professor**Start date:** 11/04/2023**Type of contract:** Temporary employment contract**Dedication regime:** Full time**Employing entity:** Universidad Rey Juan Carlos**Professional category:** Visiting professor**Start date:** 01/12/2021**Type of contract:** Temporary employment contract**Dedication regime:** Full time**Primary (UNESCO code):** 330703 - Circuit design; 330706 - Filter design; 330714 - Semi-conductor devices; 330719 - Transistors**Secondary (UNESCO code):** 330601 - Direct current power utilization; 330602 - Electricity applications; 330608 - Switchgear**Performed tasks:** Teaching in various undergraduate courses in the field of electrical engineering and power electronics. Research in related projects**Identify key words:** Advanced control of converters of potency; Modeled of reactive elements in electronic converters; Modeled of electronic converters of power; Electronic converters for distribution of electrical energy; Electric energy transportation; Transformation of the electric energy



**Previous positions and activities**

	<b>Employing entity</b>	<b>Professional category</b>	<b>Start date</b>
<b>1</b>	Power Smart Control SL	Developing engineering	20/01/2020
<b>2</b>	Universidad Carlos III de Madrid	Project-based researcher	01/01/2019
<b>3</b>	Universidad Carlos III de Madrid	Project-based research fellow	

- 1** **Employing entity:** Power Smart Control SL      **Type of entity:** Business  
**Professional category:** Developing engineering  
**Start-End date:** 20/01/2020 - 30/11/2021      **Duration:** 22 months  
**Type of contract:** Temporary employment contract  
**Performed tasks:** Design of control solutions and optimization of power converters for projects with private companies. Updating of software tool "Smart control" with new power topologies
- 2** **Employing entity:** Universidad Carlos III de Madrid      **Type of entity:** University  
**Department:** Tecnología electrónica  
**Professional category:** Project-based researcher  
**Start-End date:** 01/01/2019 - 30/11/2021      **Duration:** 23 months  
**Type of contract:** Temporary employment contract  
**Performed tasks:** Design of electronic systems, sizing of converters, design and construction of magnetic components.
- 3** **Employing entity:** Universidad Carlos III de Madrid      **Type of entity:** University  
**Professional category:** Project-based research fellow  
**Duration:** 3 years



## Education

### University education

#### 1st and 2nd cycle studies and pre-Bologna degrees

- 1** **Name of qualification:** Master's Degree in Electronic Systems and Applications Engineering  
**Degree awarding entity:** Universidad Carlos III de Madrid **Type of entity:** University  
**Date of qualification:** 26/09/2015
- 2** **University degree:** Higher degree  
**Name of qualification:** Graduate in Industrial Electronics and Automation Engineering  
**Degree awarding entity:** Universidad Carlos III de Madrid **Type of entity:** University  
**Date of qualification:** 09/07/2014

#### Doctorates

**Doctorate programme:** Electrical, Electronics and Automation  
**Degree awarding entity:** Universidad Carlos III de Madrid **Type of entity:** University  
**Date of degree:** 30/09/2021  
**European doctorate:** Yes **Date of certificate:** 30/09/2021  
**Thesis title:** Análisis, diseño y optimización del convertidor CC-CC bidireccional reductor-elevador con acoplamiento magnético  
**Thesis director:** Andrés Barrado Bautista  
**Obtained qualification:** Sobresaliente Cum Laude

### Language skills

Language	Listening skills	Reading skills	Spoken interaction	Speaking skills	Writing skills
Italian	B2	B2	B2	B2	B1
English	C1	C1	B2	C1	C1

## Teaching experience



## General teaching experience

- 1** **Name of the course:** Electronics Technology  
**Type of teaching:** Laboratory work  
**University degree:** Bachelor's degree in Industrial Technologies  
**Start date:** 19/09/2022 **End date:** 17/01/2023  
**Type of hours/ ECTS credits:** Credits  
**Hours/ECTS credits:** 36  
**Entity:** Universidad Rey Juan Carlos **Type of entity:** University  
**Faculty, institute or centre:** Escuela Superior de Ciencias Experimentales y Tecnología
- 2** **Name of the course:** Electrical machines  
**University degree:** Bachelor's Degree in Industrial Electronic and Automatic Engineering  
**Start date:** 19/09/2022 **End date:** 09/01/2023  
**Entity:** Universidad Rey Juan Carlos **Type of entity:** University  
**Faculty, institute or centre:** Escuela Superior de Ciencias Experimentales y Tecnología
- 3** **Name of the course:** Analog Electronics  
**Type of teaching:** Laboratory work  
**University degree:** Bachelor's Degree in Electronic, Industrial and Automation Engineering  
**Course given:** 2  
**End date:** 2022  
**Type of hours/ ECTS credits:** Credits  
**Hours/ECTS credits:** 20  
**Entity:** Universidad Rey Juan Carlos **Type of entity:** University
- 4** **Name of the course:** Basic legal principles  
**University degree:** Bachelor's Degree in Electronic, Industrial and Automation Engineering  
**Course given:** 1  
**End date:** 2022  
**Type of hours/ ECTS credits:** Credits  
**Hours/ECTS credits:** 10  
**Entity:** Universidad Rey Juan Carlos **Type of entity:** University
- 5** **Name of the course:** Electrical Engineering  
**Type of teaching:** In person theory  
**University degree:** Bachelor's degree in Industrial Technology Engineering  
**Course given:** 2  
**End date:** 2022  
**Type of hours/ ECTS credits:** Credits  
**Hours/ECTS credits:** 65  
**Entity:** Universidad Rey Juan Carlos **Type of entity:** University  
**Mark obtained:** 4.1 **Top mark possible:** 5
- 6** **Name of the course:** Fundamentos de ingeniería eléctrica  
**Type of teaching:** In person theory  
**University degree:** Bachelor's Degree in Industrial Electronics and Automation Engineering  
**Course given:** 2  
**End date:** 2022





**Type of hours/ ECTS credits:** Credits  
**Hours/ECTS credits:** 38  
**Entity:** Universidad Rey Juan Carlos  
**Mark obtained:** 4.6

**Type of entity:** University  
**Top mark possible:** 5

**7** **Name of the course:** Power Electronics  
**Type of teaching:** Laboratory work  
**University degree:** Bachelor's Degree in Electronic, Industrial and Automation Engineering  
**Course given:** 3  
**End date:** 2022  
**Type of hours/ ECTS credits:** Credits  
**Hours/ECTS credits:** 24  
**Entity:** Universidad Rey Juan Carlos

**Type of entity:** University

**8** **Name of the course:** Tecnología Eléctrica y Electrónica  
**Type of teaching:** In person theory  
**University degree:** Bachelor's or Graduate Degree in Energy Engineering  
**Course given:** 3  
**End date:** 2022  
**Type of hours/ ECTS credits:** Credits  
**Hours/ECTS credits:** 84  
**Entity:** Universidad Rey Juan Carlos  
**Mark obtained:** 4.2

**Type of entity:** University  
**Top mark possible:** 5

**9** **Name of the course:** Power Electronics  
**Assessment type:** Survey  
**University degree:** Bachelor's Degree in Electronic, Industrial and Automation Engineering  
**Course given:** 3  
**End date:** 2019  
**Type of hours/ ECTS credits:** Credits  
**Hours/ECTS credits:** 8  
**Entity:** Universidad Carlos III de Madrid  
**Assessment type:** Survey  
**Mark obtained:** 4.43

**Type of entity:** University  
**Top mark possible:** 5

**10** **Name of the course:** Digital Electronics  
**Type of teaching:** Laboratory work  
**University degree:** Bachelor's Degree in Audiovisual Systems Engineering  
**Course given:** 1  
**End date:** 2019  
**Type of hours/ ECTS credits:** Credits  
**Hours/ECTS credits:** 20  
**Entity:** Universidad Carlos III de Madrid  
**Mark obtained:** 4.69

**Top mark possible:** 5

**11** **Name of the course:** Analog Electronics  
**Type of teaching:** Laboratory work  
**University degree:** Bachelor's Degree in Industrial Electronics and Automation Engineering  
**Course given:** 3  
**End date:** 2015  
**Type of hours/ ECTS credits:** Credits



**Hours/ECTS credits:** 10

**Entity:** Universidad Carlos III de Madrid

**Type of entity:** University

**12 Name of the course:** Computer technology

**Type of teaching:** Laboratory work

**University degree:** Bachelor's Degree in Computer Engineering

**End date:** 2015

**Type of hours/ ECTS credits:** Credits

**Hours/ECTS credits:** 4

**Entity:** Universidad Carlos III de Madrid

**Type of entity:** University

**13 Name of the course:** Computer technology

**Type of teaching:** Laboratory work

**University degree:** Bachelor's Degree in Electronic, Industrial and Automation Engineering

**End date:** 2015

**Type of hours/ ECTS credits:** Credits

**Hours/ECTS credits:** 4

**Entity:** Universidad Carlos III de Madrid

**Type of entity:** University

**14 Name of the course:** Fundamentals of Electronic Engineering

**Type of teaching:** Laboratory work

**Assessment type:** Survey

**University degree:** Bachelor's Degree in Industrial Electronic and Automatic Engineering

**End date:** 2015

**Type of hours/ ECTS credits:** Credits

**Hours/ECTS credits:** 10

**Entity:** Universidad Carlos III de Madrid

**Type of entity:** University

**Assessment type:** Survey

**Mark obtained:** 4.33

**Top mark possible:** 5

**Subject language:** English

**15 Name of the course:** Measuring Instrumentation

**Type of teaching:** Laboratory work

**University degree:** Bachelor's Degree in Biomedical Engineering

**Course given:** 3

**End date:** 2015

**Type of hours/ ECTS credits:** Credits

**Hours/ECTS credits:** 15

**Entity:** Universidad Carlos III de Madrid

**Type of entity:** University

**Subject language:** English

## Teaching experience in courses and seminars for university teacher training

**Type of event:** Seminar

**Name of the event:** Expo proyectos integradores de ingeniería electrónica internacional

**Organising entity:** Instituto tecnológico superior del sur de Guanajuato

**Hours of teaching:** 1

**Teaching date:** 23/11/2022



## Participation in innovative teaching projects

**Project title:** Fomento de adquisición de las competencias específicas del Grado en Ingeniería Electrónica Industrial y Automática y el Grado en Ingeniería de Tecnologías Industriales y el Máster Universitario en Ingeniería Industrial a través de la coordinación transversal entre asignaturas: aplicación al control de máquinas eléctricas

**Type of participation:** Team member

**Time of working relationship:** For an undetermined time

**Funding entity:** Universidad Rey Juan Carlos

**Type of entity:** University

**Start-End date:** 13/09/2022 - 13/09/2023

**Duration:** 1 year

## Other activities/achievements not included above

**1 Description of the activity:** Coordination of the 1st year of the Bachelor's Degree in Industrial Electronics and Automation Engineering.

**Organising entity:** Universidad Rey Juan Carlos

**Type of entity:** University

**End date:** 01/08/2024

**2 Description of the activity:** Coordination of the 2nd year of the Bachelor's Degree in Industrial Electronics and Automation Engineering.

**Organising entity:** Universidad Rey Juan Carlos

**Type of entity:** University

**End date:** 05/07/2023

## Scientific and technological experience

### Scientific or technological activities

#### R&D projects funded through competitive calls of public or private entities

**1 Name of the project:** Control de Convertidores Conectados a Red por Modelos Predictivos implementados en FPGA

**Entity where project took place:** Universidad Autónoma de Madrid

**Type of entity:** University

**City of entity:** Madrid, Community of Madrid, Spain

**Name principal investigator (PI, Co-PI....):** César A. Limones Pozos; Ángel de Castro Martín; Joaquín Vaquero López; Alberto Sánchez González; Alba Rodríguez Lorente; Javier Garrido Salas; M. Sofía Martínez García; Nimrod Vázquez Nava; Elyas Zamiri; Leonel Estrada Rojo; Marina Yushkova

**Nº of researchers:** 11

**Start-End date:** 02/10/2023 - 30/09/2026

**Total amount:** 53.150 €

**2 Name of the project:** SISTEMA DE DISTRIBUCION DE ENERGÍA ELÉCTRICA PARA DRONES PROPULSADOS CON HIDRÓGENO

**Entity where project took place:** Universidad Carlos III de Madrid

**Type of entity:** University

**Start-End date:** 01/07/2021 - 01/07/2024



- 3 Name of the project:** Adquisición de un equipo completo de desarrollo (Tech-MCS 16 IMUs + Batería Extendida + Trigger , Kit de evaluación Zynq UltraScale+ MPSoC ZCU102, equipamiento informático de alto rendimiento (PC Sobremesa y portátil)), procesamiento, medida y validación basado en sensores inerciales de alta precisión para adquisición de datos de la marcha humana y así abordar la mejora en la interacción física entre el hombre y el exoesqueleto. Se proporciona un equipamiento importante al grupo de investigación para desarrollar líneas de investigación relacionadas con la mejora de la rehabilitación y tratamientos con pacientes con patologías neurológicas.
- Entity where project took place:** Universidad Rey Juan Carlos **Type of entity:** University
- City of entity:** Móstoles, Community of Madrid, Spain
- Name principal investigator (PI, Co-PI...):** Rubén Nieto Capuchino; Gonzalo del Pozo Melero; Imene Yahyaoui; Enrique Hernández Balaguera; Alexander Cuadrado Conde; David Casillas Pérez; Borja Rodríguez Vila; Alba Rodríguez Lorente; Juan Alejandro Castaño Peña; Julio Salvador Lora Millán; Verónica García Vázquez
- Nº of researchers:** 11
- Start-End date:** 01/01/2023 - 30/06/2023
- Total amount:** 25.599,76 €
- 4 Name of the project:** ELECTRA: Electric Aircraft Platform
- City of entity:** Universidad Carlos III de Madrid,
- Funding entity or bodies:** Ministerio de ciencia, innovación y universidades **Type of entity:** Public Research Body
- Start-End date:** 01/09/2018 - 30/11/2021
- Applicant's contribution:** Diseño de la etapa de potencia, control y dimensionamiento del cargador de baterías interno (convertidor reductor-elevador bidireccional) y externo (convertidor resonante LLC) de un avión híbrido. También en la parte de diseño, optimización y montaje de componentes magnéticos y montaje del prototipo final.
- 5 Name of the project:** Estrategias de modelado y control para la estabilización de la InterCONEXión de convertidores electrónicos de POTencia
- Entity where project took place:** Universidad Carlos III de Madrid **Type of entity:** University
- Name principal investigator (PI, Co-PI...):** Lázaro Blanco; Sanz García
- Funding entity or bodies:** MINISTERIO DE ASUNTOS ECONÓMICOS Y TRANSFORMACIÓN DIGITAL **Type of entity:** Public Research Body
- Start-End date:** 01/01/2018 - 30/09/2021
- Applicant's contribution:** Diseño y simulación de las topologías participantes
- 6 Name of the project:** Sistema de almacenamiento y gestión de la energía para coche eléctrico híbrido basado en pila de combustible, batería y supercondensadores
- Entity where project took place:** Universidad Carlos III de Madrid **Type of entity:** University
- Nº of researchers:** 7
- Funding entity or bodies:** MINISTERIO DE ASUNTOS ECONÓMICOS Y TRANSFORMACIÓN DIGITAL **Type of entity:** Public Research Body
- Start-End date:** 01/01/2015 - 30/06/2018
- Applicant's contribution:** Desarrollo de software específico (programas de diseño y optimización de componentes magnéticos), dimensionamiento del sistema, estudio teórico de las topologías CC-CC participantes, aporte de una topología nueva reductora-elevadora, colaboración en tareas de diseño de PCB y montaje de prototipos

**R&D non-competitive contracts, agreements or projects with public or private entities**

- 1** **Name of the project:** Ayuda al desarrollo y optimización de convertidores CC-CC para el software de diseño de sistemas electrónicos de potencia SmartControl  
**Degree of contribution:** Researcher  
**Name principal investigator (PI, Co-PI....):** Alba Rodríguez Lorente; Joaquín Vaquero  
**Nº of researchers:** 2  
**Funding entity or bodies:**  
Power Smart Control SL **Type of entity:** Business  
**Start date:** 02/05/2022 **Duration:** 9 months  
**Total amount:** 8.000 €
- 2** **Name of the project:** CONtroles Avanzados para convertidores Bidireccionales (CONABI)  
**Degree of contribution:** Researcher  
**Name principal investigator (PI, Co-PI....):** Joaquín López; Alba Rodríguez Lorente  
**Nº of researchers:** 7  
**Funding entity or bodies:**  
ARQUIMEA AEROSPACE, DEFENCE AND SECURITY S.L.U. **Type of entity:** Business  
**Start date:** 03/01/2022 **Duration:** 1 year  
**Total amount:** 53.150 €
- 3** **Name of the project:** Convertidor CC-CC resonante de calefacción para equipos portátiles de rayos X, según Pedido nº2701059044  
**Degree of contribution:** Technician  
**Name principal investigator (PI, Co-PI....):** Barrado Bautista; Zúmel Vaquero  
**Nº of researchers:** 9  
**Funding entity or bodies:**  
SIEMENS HEALTHCARE, S.L.U, **Type of entity:** Business  
**Start date:** 20/11/2017 **Duration:** 8 months
- 4** **Name of the project:** Convertidor CC-CC Resonante de 30kW y 40kV-130kV para Equipos Portátiles de Rayos X  
**Degree of contribution:** Technician  
**Name principal investigator (PI, Co-PI....):** Barrado Bautista; Zúmel Vaquero  
**Nº of researchers:** 10  
**Funding entity or bodies:**  
SIEMENS HEALTHCARE, S.L.U, **Type of entity:** Business  
**Start date:** 19/02/2016 **Duration:** 9 months
- 5** **Name of the project:** Convertidor CA-CC de elevado rendimiento basado en SIC para transmisores de TV y RADIO  
**Degree of contribution:** Technician  
**Name principal investigator (PI, Co-PI....):** Barrado Bautista; Lázaro Blanco  
**Nº of researchers:** 9  
**Funding entity or bodies:**  
BTESA BROAD TELECOM **Type of entity:** Business



Start date: 01/09/2014

Duration: 34 months

## Scientific and technological activities

### Scientific production

#### Publications, scientific and technical documents

- 1 Helder R.O. Rocha; Rodrigo Fiorotti; Jussara F. Fardin; Hilel García Pereira; Yann E. Yann E. Bouvier; Alba Rodríguez Lorente; Imene Yahyaoui. Application of AI for Short-Term PV Generation Forecast. Sensors. 24 - 85, pp. 1 - 16. MDPI, 23/12/2023.  
**Type of production:** Scientific paper **Format:** Journal  
**Corresponding author:** No
- 2 Alba Rodríguez Lorente; Andrés Barrado Bautista; Giorgio Spiazzi; Paolo Mattavelli; Jaime López López; Antonio Lázaro Blanco. A novel window reluctance calculation to improve leakage inductance estimation of "E3E" Integrated Magnetic Components. Transactions on Industrial Electronics. IEEE, 2022. ISSN 1557-9948  
**Type of production:** Scientific paper **Format:** Journal  
**Corresponding author:** Yes
- 3 Alba Rodríguez Lorente; Andrés Barrado Bautista; Antonio Lázaro Blanco; Carlos Calderon Benavente; Pablo Zúmel Vaquero. Magnetically Coupled Buck-Boost Bidirectional DC-DC Converter. Transactions on Industrial Electronics. 68, pp. 9493 - 9504. IEEE, 2020.  
**Type of production:** Scientific paper **Format:** Journal  
**Corresponding author:** Yes
- 4 Alba Rodríguez Lorente; Andrés Barrado Bautista; Carlos Calderon Benavente; Antonio Lázaro Blanco. Non-Inverting and Non-Isolated Magnetically Coupled Buck-Boost Bidirectional DC-DC Converter. Transactions on Power Electronics. 35, pp. 11942 - 11954. IEEE, 2020.  
**Type of production:** Scientific paper **Format:** Journal  
**Corresponding author:** Yes
- 5 Carlos Calderon Benavente; Andrés Barrado Bautista; Alba Rodríguez Lorente; Pedro Alou; Antonio Lázaro Blanco; Cristina Fernández Herrero; Pablo Zúmel Vaquero. General Analysis of Switching Modes in a Dual Active Bridge with Triple Phase Shift Modulation. Energies. 11, MDPI, 2018.  
**Type of production:** Scientific paper  
**Corresponding author:** No
- 6 Leonel Estrada; Joaquín Vaquero; Alba Rodríguez-Lorente; Jaime Arau; Angel de Castro; Alberto Sánchez; Nimrod Vázquez. Asynchronous and decoupled HIL simulation of a DC nanogrid. Electronics.  
**Type of production:** Scientific paper



## Works submitted to national or international conferences

- 1** **Title of the work:** Optimización del Convertidor CC-CC Reductor-Elevador Bidireccional con Acoplamiento Magnético no-ideal  
**Name of the conference:** Seminario Anual de Automática, Electrónica industrial e Instrumentación  
**Corresponding author:** Yes  
**City of event:** Sevilla, Andalusia, Spain  
**Date of event:** 05/07/2023  
**End date:** 07/07/2023  
**Organising entity:** Universidad de Sevilla **Type of entity:** University  
**City organizing entity:** Sevilla, Andalusia, Spain  
Alba Rodríguez Lorente; Andrés Barrado Bautista.
- 2** **Title of the work:** Optimization of Bidirectional DC-DC Buck-Boost Converter with Non-ideal Magnetic Coupling  
**Name of the conference:** 2023 International Conference on Clean Electrical Power (ICCEP)  
**Corresponding author:** Yes  
**City of event:** Terrasini, Italy  
**Date of event:** 27/06/2023  
**End date:** 29/06/2023  
**Organising entity:** Politecnico di Milano  
Alba Rodríguez Lorente; Andrés Barrado Bautista. "Optimization of Bidirectional DC-DC Buck-Boost Converter with Non-ideal Magnetic Coupling".
- 3** **Title of the work:** High efficiency capacitive power transfer converter  
**Name of the conference:** 2018 IEEE Applied Power Electronics Conference and Exposition (APEC)  
**Corresponding author:** No  
**City of event:** San Antonio, TX,, United States of America  
**Date of event:** 2018  
Jaime López López; Carlos Salto; Pablo Zúmel Vaquero; Cristina Fernández Herrero.
- 4** **Title of the work:** Modified Dual Active Bridge Bidirectional Converter  
**Name of the conference:** International Symposium "Topical Problems in the Field of Electrical and Power Engineering"  
**Corresponding author:** Yes  
**City of event:** Kuressaare, Estonia  
**Date of event:** 2018  
**Organising entity:** Tallin University of Technology  
Alba Rodríguez Lorente; Andrés Barrado Bautista; Carlos Calderon Benavente; Antonio Lázaro Blanco; Pablo Zúmel Vaquero; Cristina Fernández Herrero.
- 5** **Title of the work:** Convertidor CC-CC bidireccional de doble Puente Activo (MDAB)  
**Name of the conference:** Seminario Anual de Automática, Electrónica Industrial e Instrumentación  
**Corresponding author:** Yes  
**City of event:** Valencia, Spain  
**Date of event:** 2017  
**Organising entity:** Universitat de València  
Alba Rodríguez Lorente; Andrés Barrado Bautista; Carlos Calderon Benavente; Pablo Zúmel Vaquero; Antonio Lázaro Blanco.



- 6** **Title of the work:** Dual Active Bridge (TPS - DAB) with Soft Switching in the whole output power range  
**Name of the conference:** IEEE CPE-POWERENG 2017  
**Corresponding author:** No  
**City of event:** Cádiz, Spain  
**Date of event:** 2017  
Carlos Calderon Benavente; Andrés Barrado Bautista; Alba Rodríguez Lorente; Antonio Lázaro Blanco; Cristina Fernández Herrero; Pablo Zúmez Vaquero.
- 7** **Title of the work:** Dual Active Bridge with triple phase shift by obtaining soft switching in all operating range  
**Name of the conference:** 2017 IEEE Energy Conversion Congress and Exposition (ECCE)  
**Corresponding author:** No  
**Date of event:** 2017  
**City organizing entity:** Cincinnati, United States of America  
Carlos Calderon Benavente; Andrés Barrado Bautista; Alba Rodríguez Lorente; Antonio Lázaro Blanco; Cristina Fernández Herrero; Pablo Zúmel Vaquero.
- 8** **Title of the work:** Dual active bridge with triple phase shift, soft switching and minimum RMS current for the whole operating range  
**Name of the conference:** IECON 2017 - 43rd Annual Conference of the IEEE Industrial Electronics Society  
**Corresponding author:** No  
**City of event:** Beijing, China  
**Date of event:** 2017  
Carlos Calderon Benavente; Andrés Barrado Bautista; Alba Rodríguez Lorente; Antonio Lázaro Blanco; Marina Sanz; Emilio Olías.
- 9** **Title of the work:** Convertidor Bidireccional Dual Active Bridge No Aislado  
**Name of the conference:** Seminario Anual de Automática, Electrónica Industrial e Instrumentación  
**Corresponding author:** Yes  
**City of event:** Barcelona, Spain  
**End date:** 2018  
**Organising entity:** Universitat Politècnica de Catalunya  
Alba Rodríguez Lorente; Andrés Barrado Bautista; Carlos Calderon Benavente; Pablo Zúmel Vaquero; Antonio Lázaro Blanco; Cristina Fernández Herrero.
- 10** **Title of the work:** Diseño paso a paso de un componente magnético integrado con Núcleo E y triple entrehierro  
**Name of the conference:** Seminario Anual de Automática, Electrónica Industrial e Instrumentación  
**Corresponding author:** Yes  
**City of event:** Córdoba, Spain  
**End date:** 04/07/2019  
**Organising entity:** Universidad de Córdoba  
Alba Rodríguez Lorente; Andrés Barrado Bautista; Antonio Lázaro Blanco; Cristina Fernández Herrero; Marina Sanz.
- 11** **Title of the work:** Energy Management System Optimization for a Fuel Cell Hybrid Vehicle based on Power Losses Minimization  
**Name of the conference:** 2020 IEEE 14th International Conference on Compatibility, Power Electronics and Power Engineering (CPE-POWERENG)  
**Corresponding author:** No  
**City of event:** Setúbal, Portugal  
**End date:** 08/07/2020





Cristina Fernández Herrero; Alberto Martín Lozano; Andrés Barrado Bautista; Alba Rodríguez Lorente; Antonio Lázaro Blanco.

- 12 Title of the work:** Estudio comparativo del convertidor Reductor- Elevador de Cuatro Interruptores (FSBB) y el convertidor Reductor-Elevador Bidireccional con Acoplamiento Magnético (MCB3)  
**Name of the conference:** Seminario Anual de Automática, Electrónica Industrial e Instrumentación  
**Corresponding author:** Yes  
**City of event:** Córdoba, Spain  
**End date:** 2019  
**Organising entity:** Universidad de Córdoba      **Type of entity:** University  
 Alba Rodríguez Lorente; Andrés Barrado Bautista; Carlos Calderon Benavente; Antonio Lázaro Blanco; Pablo Zúmel Vaquero.
- 13 Title of the work:** Modelado de un componente magnético integrado con estructura tipo EE y tres entrehierros (E3E)  
**Name of the conference:** Seminario Anual de Automática, Electrónica Industrial e Instrumentación  
**Corresponding author:** Yes  
**City of event:** Ciudad Real, Spain  
**End date:** 03/09/2020  
**Organising entity:** Universidad de Castilla-La Mancha  
 Alba Rodríguez Lorente; Andrés Barrado Bautista; Giorgio Spiazzi; Paolo Mattavelli; Jaime López López.
- 14 Title of the work:** Non-Inverting Magnetically Coupled Buck-Boost Bidirectional DC-DC Converter  
**Name of the conference:** 2020 IEEE 14th International Conference on Compatibility, Power Electronics and Power Engineering (CPE-POWERENG)  
**Corresponding author:** Yes  
**City of event:** Setúbal, Portugal  
**End date:** 08/10/2020  
**Organising entity:** Setúbal School of Technology & NOVA School of Science and Technology  
 Rodríguez Lorente Alba; Andrés Barrado Bautista; Antonio Lázaro Blanco; Pablo Zúmel Vaquero; Marina Sanz.

## Other achievements

### Stays in public or private R&D centres

**Entity:** Università degli studi di Padova  
**City of entity:** Padova, Italy  
**Start-End date:** 03/09/2018 - 18/12/2018      **Duration:** 3 months  
**Goals of the stay:** Doctorate