MINISTERIO DE CIENCIA E INNOVACIÓN

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Plan de Recuperación, Transformación y Resiliencia

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE (CVA)

DATE CVA	04/09/2023

Part A. Personal Information

Name	Jesus		
Family Name	Riquelme Santos		
Sex	Man	Birth Date	
DNI			
Email	jsantos@us.es	URL Web	https://investigacion.us.es/sisius/sis_showpub.php?idpers=3043
Open Researcher and Contributor ID (ORCID)			0000-0001-6280-6796

A.1. Current position

Current position	Catedrático de Universidad		
Department	Departamento Ingeniería Eléctrica/ Escuela Superior de Ingeniería		
País	España	Phone number	954481274
Keywords	Power System, renewable energy		

AA.2. General indicators of quality of scientific production

- Four six-year term (sexenios) of research
- One six-year term (sexenio) of research transfer
- Total papers JCR indexed: 84 Papers in JCR quartiles: 18 (Q1), 21 (Q2), 11 (Q3) y 5 (Q4)
- Papers in Scopus: 93 Total Cites Scopus: 2561. Scopus h-index: 25 Scopus cites five last years (2018-2022): 233, 202, 202, 239, 192

Part B. CV SUMMARY

My main line of research concerns the field of Power Systems. Within this area of knowledge I have worked mainly in prediction, planning and electricity market. Within this field, I am part of one of the most relevant research groups at national level and which teaches the only interuniversity PhD course in electrical energy systems in Spain.

During almost 25 years of scientific work, I have supervised 6 doctoral theses. My former PhD students, now graduated, currently carry out their work at University of Cadiz or University of Sevilla, as well as in the private sector.

I have participated and directed more than 43 research projects, including projects funded by the Spanish National plan as well as financed by the CDTI in collaboration with different companies in the sector. This fact has resulted in obtaining own grants of more than €5 million, for example, as the HySGrid+ project, shown in the section below.

As part of the work carried out in these projects, 60 contributions have been made in indexed journals, 7 non-indexed, 4 international book chapters, 3 teaching books and 57 conferences.

Finally, in terms of national and international collaborations, I take part in different national network associations (FUTURED, REOLTEC, etc.) and international committees, either of conferences such as PSCC or as members of international committees. I am also a member of the European Distributed Energy Resources Laboratories (DERlab) and the Ibero-American Network for the Development and Integration of Small Wind Generators (MICRO-EOLO). The first network includes 34 members from

Europe and the United States. The second network, which I direct, is funded by CYTED (Network 718RT0564), and includes 112 researchers from 11 different countries. The consortium involves 14 research groups and two companies. These collaborations allow our researchers to carry out pre- and postdoctoral stays at different foreign universities.

Contributions to society

In addition to subsidized research projects where I have collaborated with private companies, I have also participated contracts “68/83”, exceeding €1M in turnover. I would like to highlight the European Market Simulator (GEMS) project developed under my supervision and marketed by ISOTROL (https://www.isotrol.com/gestion-energia-mercados-mayoristas/). This software has been acquired by the Operations and Market departments of companies such as ENDESA, GNF and Iberdrola. Other projects that have resulted in commercial software implemented in companies are CECOVEL and the Secondary Market Simulator marketed by ISOTROL and acquired by ENDESA.

Finally, I am a founding partner of the technology-based company INGELECTUS (https://ingelectus.com/) which, among other products, markets its own PPC, which can control the different elements of a solar or wind plant so that it reaches the requirements of the operator of the transmission and distribution system at the point of connection. Currently, this PPC controls plants (PV and WT) with a total installed power of 1GW distributed throughout America and Europe and 700 MW of hybrid plants in the USA and Mexico. In the last two years, this company has invoiced a total of more than €2 million and has 7 highly qualified employees.

Contributions in Management and Evaluation

For 5 years, I have been Secretary of the Department of Electrical Engineering at the University of Seville and Director of this department for 8 years. In addition, since 2005, I have been director of the Master's Degree in Electrical Energy Systems and Coordinator of the Ibero-American Network P717RT0148 for the Development and Integration of Small Wind Generators, since 2018. I currently hold both positions. Regarding my work in Evaluation, for 4 years, I was a Member of the Engineering and Architecture Committee, as part of the Evaluation board of the Agency for the Quality of the University System of Castilla y León. I have also been an external evaluator for the AUIP Awards for the Quality of the Postgraduate and Doctorate in Ibero-America. I have also been an evaluator of different evaluation agencies of research projects (ACIE, EQA), as well as the Ministry itself. Finally, I have been a member and president of multiple doctoral thesis panels all over Spain, as well as Chairman in many conferences.

Part C. Interdisciplinary profile

During the almost 25 years that I have been working in energy systems, my main contributions have been in two main areas: application of optimisation techniques and forecasting techniques.
In both fields, I have applied AI techniques. For example, in the field of optimisation, work on GA-based wind farm planning has resulted in highly cited publications, such as "Optimisation of wind farm turbines layout using an evolutionary algorithm" (279 citations).
In the field of forecasting, we developed one of the first articles dedicated to daily electricity market price forecasting, “Electricity market price forecasting based on weighted nearest neighbours techniques” with 192 citations.

In addition, this research has led to commercial developments such as the CECOVEL project or research projects "Optimal Planning and Operation of Wind Farms" (ENE2007-66072/ALT).

Part D. RELEVANT MERITS D.1. Publications (Selected last ten years) citas en Scopus)

1) J. Serrano González, M. Burgos Payán, J.M. Riquelme Santos y F. González-Longatt. A review and recent developments in the optimal wind-turbine micro-siting problem. **Renewable and Sustainable Energy Reviews**. Elsevier. ISSN: 1364-0321, Vol. 30, pp. 133-144, 2014 10.1016/j.rser.2013.09.02. Índice de impacto (SJR): 2.98**. Citas: 148**
2) J. Serrano González, Á. Gaspar González Rodríguez, J. Castro Mora, J.M. Riquelme Santos y M. Burgos Payán. Overall Design Optimization of Wind Farms. **Renewable Energy. Elsevier**. Vol. 36 pp. 1973-1982, 2011. doi.org/10.1016/j.renene.2010.10.034. Í. impacto (SJR): 1.96. **Citas: 104**
3) H.A. Gil, C. Gomez-Quiles, J.M. Riquelme. "Large-scale wind power integration and wholesale electricity trading benefits: Estimation via an ex post approach. **Energy Policy Electric**. Elsevier. Vol. 41, pp. 849-859, 2012. doi: 10.1016/j.enpol.2011.11.067. Ind. Impacto (SJR): 2.07. **Citas: 61**
4) J. Serrano González, M. Burgos Payán, J.M. Riquelme Santos y Á.G. González Rodríguez. Maximizing the overall production of wind farms by setting the individual operating point of wind turbines. **Renewable Energy. Elsevier**. ISSN: 0960-148. Volumen: 80 Página 219-229, 2015. http://dx.doi.org/10.1016/j.renene.2015.02.009. Índice de impacto (SJR): 2.98**. Citas: 61**
5) J. Serrano González, M. Burgos Payán y J. Riquelme Santos. Optimization of Wind Farm Turbine Layout Including Decision Making Under Risk". **IEEE System Journal**. 6(1), 2012. Índice de impacto (SJR): 3. **Citas: 60**
6) J. Serrano González, M. Burgos Payán y J. Riquelme Santos. "A New and Efficient Method for Optimal Design of Large Offshore Wind Power Plants". **IEEE Trans. on Power Systems.** Vol. 28, Issue 3, pp.3075-3084, Fecha: Aug. 2013. 10.1109/TPWRS.2013.2251014. Í.I. (SJR): 3.01. Citas: **58**
7) M. Burgos-Payán, J.M. Roldán-Fernández, Á.L. Trigo-García, J.M. Bermúdez-Ríos, J.M. Riquelme-Santos. Costs and Benefits of the Renewable Production of Electricity in Spain. **Energy Policy Electric**. Vol. 56, pp. 259-270. 2013. 10.1016/j.enpol.2012.12.047 Citas: **52**
8) J. Serrano González, M. Burgos Payán, J.M. Riquelme Santos. Optimum design of transmissions systems for offshore wind farms including decision making under risk. **Renewable Energy. Elsevier**. Vol. 59, pp.115-127, 2013. DOI:/10.1016/j.renene.2013.03.024. Í. I. (SJR): 1.96. Citas: **35.**
9) Gómez Quiles, C., Asencio Cortes, G., Gastalver Rubio, A., Martínez Álvarez, F, Troncoso Lora, A., et. Al. A Novel Ensemble Method for Electric Vehicle Power Consumption Forecasting: Application to the Spanish System. IEEE Access, 2019. Vol. 7. pp. 120840-120856 10.1109/Access.2019.2936478. **Citas: 18**
10) J.M. Roldan-Fernandez, M Burgos-Payán, J.M. Riquelme-Santos. Profitability of household photovoltaic self-consumption in Spain. Journal of Cleaner Production (0959-6526). Volume 279, 2021, 123439. https://doi.org/10.1016/j.jclepro.2020.123439. **Citas27**

D.2. Research projects

- Solar to Vehicle (S2V): Maximización de sinergias entre generación fotovoltaica distribuida y vehículo eléctrico (US-1265887). Administration Financing: Proyectos de I+D+i en el marco del Programa Operativo FEDER Andalucía 2014-2020. Duration from: january 2019 to november 2020. Main researchers: Antonio Gómez y Jesús Riquelme Santos. Total budget: 80.000,00 €

- Optimización de la Planificación de las Interconexiones para la Integración del Mercado Europeo con gran Penetración Renovable. Administration Financing: ENE2016-77650-R. Min. de Ciencia y Tecnología. Duration from: 30-12-2016 to 29-12-2019. Main researcher: Jesús M. Riquelme Santos. Total budget: 70.000,00 €.

- Digital Solutions for Predictive Maintenance of Wind Power Plants. Administration Financing: MICIN TED2021-131311B. Main researchers:José Riquelme Santos y Jesús Riquelme Santos Financing 156,055 euros.

D.3. Contracts, technological or transfer merits

- "Nuevo modelo de gestión de distribuidoras eléctricas basado en IA" (NUMODIA) Companies: Corporación Tecnológica De Andalucía (CTA) and CIBERNOS. Duration from January 2023 to June 2025. Own budget: 100.000 €. Main researcher Jesús M. Riquelme Santos
- Desarrollo de Comunidades Locales Energéticamente Positivas con Sistemas Híbridos de Generación Renovable y Almacenamiento (HySGrid+). Administration Financing: Centro de Excelencia Cervera en la Tecnología Transición Energética. (CER-20191019). Participating Technology Center: Instituto Tecnológico de la Energía - Asociación Instituto de Tecnología Eléctrica, Asociación de Investigación y Cooperación Industrial de Andalucía, FUNDACION CARTIF, Fundación Instituto Tecnológico de Galicia y IK4-IKERLAN. Duration from: enero 2020 to 2023. Total budget: 3.738.200,00 €. AICIA Main researcher: Jesús M. Riquelme Santos. Own budget (AICIA): 648.947,00 €
- Tecnologías para la optimización de las estrategias de participación de las energías renovables en mercado (STM). Company/Administration Financing Company:: Corporación Tecnológica de Andalucía (CTA) y CDTI Participating companies: ISOTROL. Duración enero 2017 - diciembre 2019. Cuantía de la subvención: 69.900 €. Investigador Principal: Jesús M. Riquelme Santos
- Tecnologías para la optimización de las estrategias de participación de las energías renovables en mercados mayoristas (SIBILA). Administration Financing: CDTI (Centro para el Desarrollo Tecnológico Industrial Feder-Interconnecta. Participating companies: ISOTROL, GAS NATURAL y GREEN POWER. Duration from: september 2016-march 2018. Own budget: 110.000 €. Main researcher:: Jesús M. Riquelme Santos
- RENEWYIELD – Sistema avanzado de gestión económica para la integración a gran escala de las renovables en los sistemas energéticos. Administration Financing: Corporación Tecnológica de Andalucía (CTA). Participating companies: ISOTROL. Duration from: january 2015 to december 2016. Own budget: 110.000 €. Main researcher: Jesús M. Riquelme Santos.
- Sistema de calentamiento y mantenimiento de temperatura para espejos cilindro parabólicos con fluido caloportadores (COMPOSOL). Administration Financing: FEDER-INNTERCONECTA. ITC-2011106. Participating companies: AKO ELECTROMECÁNICA S.A.L., ABENGOA Solar New Technologies SA, AICIA. Duration from: april 2012 to april 2015. Own budget: 150.000 €. Main researcher: Jesús M. Riquelme Santos
- MONICA: Monitorización y Control Avanzado de Redes de Distribución MT y BT. Administration Financing: CDTI (Centro para el Desarrollo Tecnológico Industrial Feder-Interconnecta. Participating companies: Endesa, Ayesa AT, Ingelectus Innovative Electrical Solutions, Ormazábal Media Tensión. Duration from: november 2016 to march 2017. Own budget: 200.000 €. Main researcher: Antonio Gómez Expósito.
- Desarrollo de un Previsor de Demanda para Vehículo Eléctrico CECOVEL I & II. Financing Company: Red Eléctrica de España. Duración desde: mayo 2015 hasta: enero 2020. Investigador Responsable: Jesús Riquelme Santos. Own budget: 215.000 €
- Análisis de la operación y mantenimiento del equipo ALMACENA (PI-1448/2015) Financing Company: Red Eléctrica de España, S.A. Duration from: julio 2015 to febrero 2017. Main researcher: Esther Romero Ramos. Own budget: de 175.000 €.
- Algoritmo de casación de ofertas del Mercado Diario en sistemas interconectados, Grid-constrained Electric Market Simulator (GEMS). Financing Companies: ENDESA, GNF, IBERDROLA. Duration from: septiembre 2011 and actually it is continued. Main researcher: Jesús Riquelme Santos. Own budget: 258.289 €
- PV Grid Integration Project. Financing Company: ABENGOA SOLAR. Duration from: may 2012 to: 2013. Main researcher: Jesús Riquelme Santos. Own budget: 146.159 €.

Commercial Software

- GEMS: European Market Simulator developed under my supervision and marketed by ISOTROL. Used in the Operations and Market departments of ENDESA and GNF companies.
- Secondary market simulator, marketed by Isotrol, acquired by Endesa
- Smart PCC is a software marketed by Ingelectus that controls and optimizes the power flows of wind and photovoltaic farms, installed in plants in Europe and America..