CURRICULUM VITAE ABREVIADO (CVA)

Part A. PERSONAL INFORMATION

First name	José Cristóbal		
Family name	Riquelme Santos		
Gender (*)	Male	Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number		URL Web https://prisma.us.es/	
e-mail		investigador/3554	
Open Researcher and Contributor ID (ORCID) (*)		0000-0002-8243-2186 *(*) Mandatory*	

A.1. Current position

Position	Full Professor			
Initial date	15/10/1987			
Institution	Universidad de Sevilla			
Department/Center	LSI	ETS Ingeniería Informática		
Country	España		Teleph. number	
Key words	Data Science; Time Series; Machine Learning			

A.2. Previous positions (research activity interruptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
1987-1997	Profesor Titular de Escuela Universitaria / U. de Sevilla
1997-2007	Profesor Titular de Universidad / U. de Sevilla

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licensed Mathematics	U. de Sevilla	1985
PhD Computer Science	U. de Sevilla	1996

Part B. CV SUMMARY

Quantitative indicators

- Four six-year term (sexenios) of research (last 2019)
- One six-year term (sexenio) of research transfer
- Director of fourteen PhD theses (3 with Extraordinary Awards). Two ongoing theses more.
- Total papers JCR indexed: **73** [**42 (Q1),** 17 (Q2), 9 (Q3), 5 (Q4)]
- Documents in Scopus: **187.** Total Cites Scopus: 4567. Scopus h-index: 35
- Scopus cites five last years (2020-2024): 329, 400, 415, 527, 549.
- GS cites: 7733, h-index: 44
- 18,3% number of publications in the top 10% most cited publications worldwide
- 31,1% number of publications in the top 10% journals by CiteScore
- PI of fifteen research projects with public funding and a budget of more than 1.2 million euros.
- PI of ten contracts/project with private companies with a budget of more than 1.1 million euros.

Qualitative indicators

I obtained my doctorate in 1996, and I have been IP in a consecutive way of seven projects of the national plan since 2001. I have directed a total of 14 doctoral theses, two of which are already University Full Professors. I have been co-author of 69 articles indexed in JCR journals with near of

80% Q1-Q2. I have been a promoter of Data Science in Spain when in 2002 I established the Spanish Network of Data Mining and Machine Learning, having organized the TAMIDA symposium at both CEDI and CAEPIA since then. The main Spanish groups that began to investigate in what was then called Data Mining were grouped in TAMIDA and since then Data Science is one of the research lines with the greatest projection in Computer Science in Spain. The group that I formed in the US was divided into 2 and one part constituted the EPS in 2002 at the Pablo de Olavide University in Seville, although we have continued to collaborate in almost all activities as if we were a single group. My research objectives in the medium/long term are focused on the field of smart grids. The power systems sector has all the ideal characteristics for intelligent data analysis. In addition to its importance in topics such as smart cities, new mobility and climate change, the generation of clean electricity needs Data Science in multiple tasks: generation prediction, prices and demand, predictive and preventive maintenance of facilities such as wind turbines and photovoltaic panels, demand response in generation distributed, etc, all in a field of large volumes of data. Techniques such as deep learning, transfer learning, and image analysis will allow the renewable energy industry to improve its efficiency. I am currently the IP of two autonomous funding projects in this field and we have requested transfer projects at national and regional level on this line of research.
Project management: Principal investigator of seven consecutive projects of the National Plan and five of the Andalusian Autonomous Community. Coordinator of four complementary actions of the National Plan. Principal investigator of the TIC-134 group of PAIDI for 10 years.
Transfer Research contracts: Participation in research contracts with companies such as ENDESA, Telefónica, Red Eléctrica de España, EGMASA, TECNOVA, AYESA, etc. FEDER-INTERCONECTA project with INDRA Software Labs. Three Challenges-Collaboration projects. Several contracts with companies as IP.
Doctoral Theses: Direction of fourteen doctoral theses, of which three have obtained the Extraordinary Doctorate Award from the University of Seville, one the Ibero-American "José Cuena" award and the other "Sevillana Electricity Foundation Award".
Research Evaluator: ANEP Evaluator since 2003. Member of Project Evaluation Commissions of the National Plan in calls for projects, Project Follow-up Days and Ramón y Cajal and Juan de la Cierva scholarships. Autonomous Communities project evaluator. Member of the EQA and SGS expert panel.
Organization of Research Activities: Promoter and coordinator of the Spanish Data Mining Network with more than 40 groups for 10 years, in which I have organized six meetings of the TAMIDA symposium, associated with CEDI or CAEPIA. I have been co-chair of the organizing committee of the IBERAMIA conference. Chairman of the JISBD and CAEPIA Program Committee.
Organizer of Doctoral Consortium in CAEPIA since 2013 (Five editions), and JISBD from 2014 to 2020 (Six editions).
Editing Activities: Editor of nine conference proceedings and four special issues of international journals. Editor-in-chief of the Ibero-American Journal of Artificial Intelligence.
Management activities. I have been Department director for nine years, Master's director for seven years and doctoral program coordinator for four years. Secretary of AEPIA from 2022. Director of I3US from 2024.

Interdisciplinary profile
During the almost 30 years that I have been working in AI research, my main contributions have been in two lines. On the one hand the development of new models and techniques for optimization, classification, ordinal regression, association rules and clustering especially for streaming data and time series. On the other hand, I have always developed an important research activity in the application of our techniques to problems in application areas, mainly biomedical, environmental and clean energy.
In the medical field we have analyzed gene data patterns for early diagnosis of Alzheimer's disease, breast cancer or COVID, and analyzed clinical data for prostate cancer or liver transplants.
In the environmental field we have worked estimating the state of forests or soil degradation from LiDAR images. In the field of air pollution we have predicted surface level ozone concentrations. In recent years, work has been done to improve autonomous vehicle vision systems. In the field of clean energy we have developed models for wind energy prediction, solar, optimization of smart grids, electric vehicle, and predictive maintenance of wind and photovoltaic farms.

Part C. RELEVANT MERITS *(sorted by typology)*

C.1. Publications (Last five years)

[1] Lara-Benítez P, M Carranza-García, J García-Gutiérrez, **JC Riquelme**. Asynchronous dual-pipeline deep learning framework for online data stream classification. Integrated Computer-Aided Engineering, vol 27 (2), pp. 1-19, 2020, https://doi.org/10.3233/ICA-200617.

[2] Lara-Benítez P, M Carranza-García, JM Luna-Romera, **JC Riquelme**. Temporal Convolutional Networks Applied to Energy-Related Time Series Forecasting. Applied Sciences, vol 10(7), 2322, 2020. https://doi.org/10.3390/app10072322.

[3] Martínez-Álvarez F, G Asencio, JF Torres, D Gutiérrez, L Melgar, R Pérez, C Rubio, **JC Riquelme** and A Troncoso. Coronavirus Optimization Algorithm: A Bioinspired Metaheuristic Based on the COVID-19 Propagation Model. Big Data, vol 8(4), 2020. 10.1089/big.2020.0051.

[4] Macías-García, L, Martínez-Ballesteros M, Luna-Romera JM, García-Heredia JM, García-Gutiérrez J, **Riquelme JC**. Autoencoded DNA methylation data to predict breast cancer recurrence: Machine learning models and gene-weight significance. Artificial Intelligence in Medicine. Vol 110, 101976, 2020. 10.1016/j.artmed.2020.101976.

[5] Lara-Benítez P, M Carranza-García, **JC Riquelme**. An Experimental Review on Deep Learning Architectures for Time Series Forecasting. International Journal of Neural Systems, vol. 31(3), pp. 1-28, 2021. https://doi.org/10.1142/S0129065721300011

[6] Carranza-García M, P Lara-Benítez, J García-Gutiérrez, **JC Riquelme**. Enhancing Object Detection for Autonomous Driving by Optimizing Anchor Generation and Addressing Class Imbalance. Neurocomputing. Volume 449, pp. 229-244, 2021. https://doi.org/10.1016/j.neucom.2021.04.001

[7] Vega-Márquez B, Nepomuceno I, Rubio C, **Riquelme JC**. OCEAn: Ordinal Classification with an Ensemble Approach. Information Sciences, vol. 580, pp. 221-242, 2021. 10.1016/j.ins.2021.08.081.

[8] Wen H, Luna-Romera JM, **Riquelme JC**, Dwyer C, Chang SLY. Statistically representative metrology of nanoparticles via unsupervised machine learning of TEM images. Nanomaterials, 11, 2706, 2021. 10.3390/nano11102706

[9] Carranza-García M, P Lara-Benítez, JM Luna Romera, **JC Riquelme**. Object detection using depth completion and camera-LiDAR fusion for autonomous driving. Integrated Computer-Aided Engineering. vol. 29, no. 3, pp. 241-258, 2022 10.3233/ICA-22068.

[10] Carranza-García M, P Lara-Benítez, D Gutiérrez-Avilés, **JC Riquelme**. Data Streams Classification Using Deep Learning under Different Speeds and Drifts. Logic Journal of the IGPL, Vol 31 (4), pp. 688–700, 2023. https://doi.org/10.1093/jigpal/jzac033.

[11] Lara-Benítez P, Carranza-García M, JM Luna Romera, **JC Riquelme**. Short-term solar irradiance forecasting in streaming with deep learning. Neurocomputing, 546, 126312, 2023. 10.1016/j.neucom.2023.126312.

[12] Cabello-López, T, Carranza-García M, **JC Riquelme**, J García-Gutiérrez. Forecasting Solar Energy Production in Spain: A Comparison of Univariate and Multivariate Models at the National Level. Applied Energy, Vol 350, 121645, 2023. 10.1016/j.apenergy.2023.121645

[13] Solís-García J, Vega-Márquez B, Nepomuceno JA, Riquelme JC; Nepomuceno IA. Comparing artificial intelligence strategies for early sepsis detection in the ICU: an experimental study. Applied Intelligence, Vol 53, pp. 30691–30705, 2023. 10.1007/s10489-023-05124-z.

[14] Sanchez-Lopez JE, Solís-García J, **Riquelme JC**. Semi-real-time decision tree ensemble algorithms for very short-term solar irradiance forecasting. International Journal of Electrical Power & Energy Systems. Vol 158, 109947, 2024. 10.1016/j.ijepes.2024.109947.

[15] Luna-Romera JM, Carranza-García M, Arcos-Vargas A, **Riquelme JC**. An empirical analysis of the relationship among price, demand and CO2 emissions in the Spanish electricity market. Heliyon, Vol. 10 (3), e25838, 2024. 10.1016/j.heliyon.2024.e25838.

[16] Aldarraji M, Vega-Márquez B, Pontes B, Mahmood B, **Riquelme JC**. Addressing energy challenges in Iraq: Forecasting power supply and demand using artificial intelligence models. Heliyon, Vol. 10 (4), e25821, 2024. 10.1016/j.heliyon.2024.e25821.

[17] Campos-Romero M; Carranza-García M; **Riquelme JC**. Advancing unsupervised anomaly detection with normalizing flow and multi-scale ensemble learning. Engineering Applications of Artificial Intelligence. Vol 137, Part A, 109088. 10.1016/j.engappai.2024.109088

C.3. Research projects

1. Cátedra en Inteligencia Artificial Sostenible US-Google. Cátedras ENIA. TSI-100930-2023-2. Financing: 823.278,7 euros. **Group leader.**
2. Digital Solutions for Predictive Maintenance of Wind Power Plants. MICIN TED2021-131311B. Financing 156,055 euros. **Principal Investigator.**
3. Efficient Deep Learning and Transfer Learning to Health and Mobility. MICINN PID2020-117954RB-C22. Financing 116,160 euros. **Principal Investigator.**
4. Adaptive hybrid models to predict the production of solar and wind renewable energy. P18-RT-2778 PAIDI-Junta de Andalucía. Financing 116,042 euros. Jan 2021-Dec 2023. **PI**
5. BIDASGRI: Big Data Technologies for Smart Grids. US-1263341. PAIDI- University of Sevilla. Financing 90,000 euros. Jan 2020-Dec 2021. **PI**
6. Big Data Streaming: Continuous Massive Data Analysis. Descriptive Models. National Plan. TIN2017-88209-C2-2-R. Financing: 116,039 euros. Jan 2018-Dec 2020. **PI**
7. Big Time-Aware Data: Analysis of Big Data Indexed in Time. Rules and Clustering. National Plan. TIN2014-55894-C2-1-R. Financing 124,751 euros. Jan 2015-Dec 2017. **PI**
8. HERCULES: Scalable Heuristics for the Extraction of Knowledge in Large Volumes of Information. TIN2007-68084-C02-02. Financing: 99,200 €. Jan 2008-Dec 2011. **PI**
9. MINERVA: Emerging techniques of data mining for the extraction of knowledge from large volumes of information: application to scientific and industrial data. National Plan.TIN2004-00159. Financing: 82,570 euros. Jan 2005-Dec 2007. **PI**

C.4. Contracts, technological or transfer merits

1. Program CPP2022-009912. Production Optimization of Complex Manufacturing Processes through Hybrid Artificial Intelligence and Operational Research Techniques (eIndustry). Company: Qosit Consulting SL. PIs: Emilio Carrizosa/**José C Riquelme**. Feb 2024-Dec 2025. Financing: 201,764 euros
2. Contract: Automatic identification of faults using artificial vision techniques in images taken by drones in solar thermal power generation plants. Company: Sol-ution. **PI José C Riquelme**. Dec 2023-Apr 2024. Financing 13.700 euros.
3. Contract: I-GROW: Scenarios and critical analysis of data from greenhouses. Company: TECNOVA. **PI: José C Riquelme**. Duration: July 2022- July 2023. Financing: 15,000 euros
4. Program Red.es: WinDIAG: Predictive models of failures in wind turbines through learning techniques based on artificial intelligence. Company: ISOTROL S.A. Duration: October 2022-May 2024. PIs: A. Troncoso/ **José C Riquelme**. Financing: 84,000 euros
5. Project PYC20 RE 078 USE: Deep Learning Models for Renewable Energy Systems: Generation Prediction and Preventive and Predictive Maintenance. Participating entities: U. de Sevilla, ISOTROL. **PI: José C Riquelme.** Duration: 2022-23. Financing: 126,700 €.
6. Program: CT. Proyect: SENSING_AI: Wearable platform for early diagnosis of emotional disorders and exacerbations in patients with chronic diseases through the use of AI. Company: SaluMedia Labs. PI: Cristina Rubio. Duration May 2021-May 2022. Financing: 60,390 €
7. Contract: Rayuela Inteligente. Data analysis of the Primary and Secondary Education System. Company: Ayesa AT. **PI: José C Riquelme.** Duration: 2019-20. Financing: € 201,500
8. Program: RTC-2016-5524-2. Artificial Intelligence applied to Pest Management. Duration: 2016-18. Company: AGC Market View Services. **PI: José C. Riquelme**. Financing: 38,672.6 €
9. Contract: CECOVEL. Development of a Demand Forecast for Electric Vehicles. Company: Red Eléctrica de España. Duration: 2015-16. **IP. J. Riquelme**. Financing: 120,000 euros.
10. Smart urban water supply and consumption management system (AQUASIG) Program: FEDER-INNTERCONECTA ITC-20161178. Leading company: ISOIN. IP: Francisco Martínez. Total financing: € 797,224.80 US: 78,166 euros