



Part A. PERSONAL INFORMATION

CV date	12/3/2025
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First name	Manuel		
Family name	Díaz Rodríguez		
Gender (*)	M	Birth date (dd/mm/yyyy)	18/11/1966
Social Security, Passport, ID number	33353687F		
e-mail	mdr@lcc.uma.es	URL Web http://www.lcc.uma.es/~mdr/	
Open Research and Contributor ID (ORCID)(*)		0000-0002-0625-2730	

A.1. Current position

Position	Full Professor		
Initial date	28/06/2010		
Institution	Universidad de Málaga		
Departament/Center	Dept. Lenguajes y Ciencias de la Computación		
Country		Teleph. number	
Key words	IoT, Digital Twins, Edge-cloud 5G, Intelligent Systems, Real-Time		

A.2. Previous positions (research activity interruptions, art. 45.2.c))

Period	Position/Institution/Country/Interruption cause
16/11/1994 -5/4/1999	Assistant Professor – Universidad de Málaga
6/4/1999-27/6/2010	Associate Professor – Universidad de Málaga

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Bachelor Informatics	Universidad de Málaga	88
Master Informatics	Universidad de Málaga	90
PhD Informatics	Universidad de Málaga	95

Part B. CV SUMMARY (max. 5000 characters, including spaces)

Manuel Díaz is Full Professor in the Department of Languages and Computer Sciences at the University of Malaga, where he directs the research group ERTIS (Software Engineering for Embedded and Real-time Systems <http://ertis.uma.es>), integrated within the Research Institute on Software Technology and Engineering of the University of Malaga. From 2016 he is also the CEO of Software for Critical Systems, S. L. of which he was co-founder in 2009.

Between 1987 and 1991 he worked in Olivetti Spain and the R&D department of Fujitsu Spain. Since 1991 he belongs to the Dept. of Languages and Computer Sciences of the University of Málaga.

His research interests include Digital Twins and Real-time Simulation, IoT, Intelligent Systems. In the last years he has worked in the area on real-time distributed intelligent systems and digital twins.

He has been a principal researcher in 40 research contracts (>2 MEUR), with private companies (Tecnomat-Westinghouse, Abengoa, Indra, Adif, ...), 7 National Plan projects and 7 European projects (two of them as coordinator). Most of these projects are related to the development of software for

critical systems (specifically, smartgrid, real-time simulation in the nuclear sector, water infrastructures and railway monitoring systems).

He has published more than 40 journal articles and supervised 10 PhD theses. He has been awarded with 6 research *sexenios* and 6 *quinquenios* and has worked as evaluator and reviewer for the European Commission in the Framework Programs V, VI, VII, H2020 and Horizon Europe in the areas of FET, Embedded Systems, Critical Infrastructures and Environment and for the ARTEMIS, ECSEL JTI and EIT Pathfinder. Since 2016, he is the director of the Ada Byron Research Center at the University of Málaga.

Part C. RELEVANT MERITS (sorted by typology)

Research Quality Indicators

- National *Sexenios* **6** (1992-97, 1998-03, 2004-09, 2010-15, 2016-2021
Technology Transfer 2006-2011)
- Ph D Thesis Directed (last 10 years): **7**
- Total Citations: 2628 (Scopus)/ 5000 (Google Scholar)
- Average cites/year last 5 years: **239**
- First quartile publications 5 years(Q1):**13**

C.1. Publications

Sergio Infante; Julia Robles; Cristian Martín; Bartolomé Rubio; Manuel Díaz. Distributed digital twins on the open-source OpenTwins framework. Advanced Engineering Informatics 2025-03 DOI: 10.1016/j.aei.2024.102970

Antonio Jesús Chaves; Cristian Martín; Luis Llopis Torres; Manuel Díaz; Jaime Fernández-Ortega; Juan Antonio Barberá; Bartolomé Andreo. A soft sensor open-source methodology for inexpensive monitoring of water quality: A case study of NO₃⁻ concentrations. Journal of Computational Science 2025-02 DOI: 10.1016/j.jocs.2024.102522

Alejandro Carnero; Cristian Martín; Gwanggil Jeon; Manuel Díaz. Online learning and continuous model upgrading with data streams through the Kafka-ML framework. Future Generation Computer Systems 2024-11 DOI: 10.1016/j.future.2024.06.001

Bueno A, Rubio B, Martín C, Díaz M. Functions as a service for distributed deep neural network inference over the cloud-to-things continuum. Softw: Pract Exper. 2024; 1-15. doi: 10.1002/spe.3318

Infante S, Martín C, Robles J, et al. Integrating FMI and ML/AI models on the open-source digital twin framework OpenTwins. Softw: Pract Exper. 2024; 1-21. doi: 10.1002/spe.3322

AJ Chaves, C Martín, M Díaz. Towards flexible data stream collaboration: Federated Learning in Kafka-ML. Internet of Things, 101036, 2024

Chaves, A.J., Martín, C., Torres, L.L. et al. Pollen recognition through an open-source web-based system: automated particle counting for aerobiological analysis. Earth Sci Inform(2023). <https://doi.org/10.1007/s12145-023-01189-z>

Robles J., Martín C., Díaz M. OpenTwins: An open-source framework for the development of next-gen compositional digital twins (2023) Computers in Industry, 152, art. no. 104007, DOI: 10.1016/j.compind.2023.104007

Gallego F., Martín C., Díaz M., Garrido D. Maintaining flexibility in smart grid consumption through deep learning and deep reinforcement learning (2023) Energy and AI, 13, art. no. 100241, DOI: 10.1016/j.egyai.2023.100241

Chaves A.J., Martín C., Torres L.L., Soler E., Díaz M. A Methodology for the Development of Soft Sensors with Kafka-ML (2023) Internet of Things, Part F1443, pp. 307 - 324, DOI: 10.1007/978-3-031-33808-3_17

Chaves A.J., Martín C., Díaz M. The orchestration of Machine Learning frameworks with data streams and GPU acceleration in Kafka-ML: A deep-learning performance comparative(2023) Expert Systems, Cited 0 times. DOI: 10.1111/exsy.13287

A. Carnero, C. Martin M. Díaz. Portable motorized telescope system for wind turbine blades damage detection. Engineering reports. E12618. 2023.

C. Martín, D. Garrido, L. Llopis, B. Rubio and M. Díaz.. Facilitating the Monitoring and Management of Structural Health in Civil Infrastructures with an Edge/Fog/Cloud Architecture. *Computer Standards and Interfaces*, 2022, 81, 103600

Cristian Martín, Peter Langendoerfer, Pouya Soltani Zarrin, Manuel Díaz, Bartolomé Rubio. Kafka-ML: Connecting the data stream with ML/AI frameworks. *Future Gener. Comput. Syst.* 126: 15-33 (2022)

Alejandro Carnero, Cristian Martín, Daniel R. Torres, Daniel Garrido, Manuel Díaz, Bartolomé Rubio: Managing and Deploying Distributed and Deep Neural Models Through Kafka-ML in the Cloud-to-Things Continuum. *IEEE Access* 9: 125478-125495 (2021)

Daniel R. Torres, Cristian Martín, Bartolomé Rubio, Manuel Díaz. An open source framework based on Kafka-ML for Distributed DNN inference over the Cloud-to-Things continuum. *Journal of Systems Architecture*. Volume 118, 2021 <https://doi.org/10.1016/j.sysarc.2021.102214>

M. Díaz, E. Soler, L. Llopis. J. Trillo. Integrating Blockchain in Safety-Critical Systems: An Application to the Nuclear Industry. *IEEE Access* 8: 190605-190619 (2020)

E. Cañete, J. Chen, M. Díaz, L. Llopis and B. Rubio. Wireless sensor networks and structural health monitoring: Experiences with slab track infrastructures. *IJDSN*, Vol. 15, N. 3, 2019 (Impacto: 1.787 Q2)

J. Chen, E. Cañete, D. Garrido, M. Díaz, K. Piotrowsky. PICO: A platform Independent communications middleware for heterogeneous devices in smart grids. *Computer Standard and Interfaces*, 65, 1-14. 2019 (Impacto: 1.465 Q2)

E. Cañete, J. Chen, M. Díaz, B. Rubio, . M. Troya. Performance analysis of WSN and priority queue systems. *International Journal of Distributed Sensor Networks*. 30(2), 126-139 2019 (Impacto 1.787 Q2)

A. Reyna, C. Martín, J. Chen, E. Solery M. Díaz. On blockchain and its integration with IoT. Challenges and opportunities. *Future Generation Computer Systems* Volume 88, November 2018, Pages 173-190 (Impacto: 6.411 7/103 Q1)

C. Martín, J. Hoebeke, J. Rossey, M. Díaz, B. Rubio y F. V. Abeele. *Appdaptivity: An Internet of Things Device-decoupled System for Portable Applications in Changing Contexts*. *Sensors*, 18(5), April 2018.

L. Alonso, J. Barbarán, J. Chen, M. Díaz, L. Llopis, y B. Rubio. Middleware and Communication Technologies for Structural Health Monitoring of Critical Infrastructures: A Survey. *Computer Standards & Interfaces*. Volume 56, pp. 83-100. February 2018.(Impacto: 1.633 40/ 106-Q2)

M. Díaz, C. Martín, B. Rubio. State-of-the-art, challenges, and open issues in the integration of Internet of things and cloud computing. *J. Network and Computer Applications* 67: 99-117, 2016 (Impacto: 3.500 6/106-Q1)

E. Cañete, J. Chen, M. Díaz, L. Llopis and B. Rubio. Sensor4PRI: A Sensor Platform for the Protection of Railway Infrastructures. *Sensors*, 15(7), 15101-15126,2015.(Impacto: 2.033 12 /56 - Q1)

E. Cañete, J. Chen, M. Díaz, L. Llopis, A. Reyna and B. Rubio. Using Wireless Sensor Networks and Trains as Data Mules to Monitor Slab Track Infrastructures. *Sensors*, 15(7), 15101-15126,, 2015. (Q1)

G. S. Ramachandran, W. Daniels, N. Matthys, Christophe Huygens, Sam Michiels, Wouter Joosen, James Meneghello, Kevin Lee, Eduardo Cañete, Manuel Diaz Rodriguez, and Danny Hughes. Measuring and Modeling the Energy Cost of Reconfiguration in Sensor Networks. *IEEE Sensors Journal*, 15(6), 3381-3389, 2015. (Q2)

C.3. Research projects (as Principal Investigator last 10 years)

European

EVOLVE: Electric Vehicles Point Location Optimisation via Vehicular Communications. H220-MSCA-RISE2020. January 2023 – January 2027. 694.600 EUR.

E-Balance+ : Energy balancing and resilience solutions to unlock the flexibility and increase market options for distribution grid . European Commission. H2020 IA 864283. Febraury 2020 – July 2023. 507.740 EUR

E-BALANCE: Balancing energy production and consumption in energy efficient smart neighbourhoods. European Commission. STREP FP7-ICT-SEC-2007-1 September 2013 - September 2017. 496.240 EUR

SAID: SmArt water management with Integrated Decision support systems. European Commission. STREP ENV.2013.WATER INNO&DEMO-1. January 2014 - December 2017. 210.400 EUR

MACSYS: Development of an objective method to perform quality classification of comminuted poultry meat. FP7-SME. January 2014- March 2016. 603.000 EUR.

SEEDS: Self Learning Energy Efficient Buildings an Open Spaces. European Commission STREP EeB-ICT-2011.6.4 ICT. September 2011 – Febraury 2015. 357.600 EUR

National Projects

DiTaS: A framework for agnostic compositional and cognitive digital twin services. PID2022-141705OB-C21. Proyectos de Generación de Conocimiento 20223-2026.

ZeroVision. Enabling Zero impact wastewater treatment through Computer Vision and Federated AI. Retos Colaboración. Hidralia, EMASAGRA, CETAQUA. 126.580.

GEDIER: Smart Fm Digital Twin Framework for Precision Farming. Proyectos de Transición Ecológica y Transición Digital. Ministerio de Ciencia e Innovación. December 2022- January 2025. 146.060 EUR.

5G+TACTILE: Deterministic Communications for Tactile Internet over B5G with digital twins. Plan de Recuperación, Transformación y Resiliencia – Financiado por la Unión Europea – NextGenerationEU. TSI-063000- 2021-116. January 2022-January 2024. 554.194 EUR.

Integrados: Provision of Services in Real Time for the Internet of Things through the Integration of Sensors in the Cloud. Proyecto Excelencia Junta de Andalucía. P20-00788-R. June 2021- July 2024. 91.750 EUR

Advanced Monitoring Systems based on Deep Learning Services on the Fog. UMA18-FEDERJA-215 January 2019 – March 2022. 60.784 EUR

rFOG: Improving the Latency and Reliability of Delegated Computing in the Fog for Critical Applications. MINECO Retos Investigación RTI2018-099777-B-I00. June 2019 - Diciembre 2022. 198.223 EUR

Fog Computing-5G infrastructure for Internet of Things applications. MINECO Convocatoria Equipamiento Científico . January 2018 - Marzo 2021. 734.812 EUR

KAMIC: Development of a Self-Installable KIT for Structural Monitoring of Critical Information. UMA-CEMOSA-SOFTCRITS. July 2015- December 2018. 553.272 EUR

A Model-Driven Framework for the Design and Integration of Critical Infrastructure Management Systems MICINN (TIN2014-52034-R). January 2015 - December2018. 216.953 EUR

WimaCS: Wireless Critical Information Management Systems. MICINN (TIN2011-23795). January 2011–December 2014. 106.800 EUR

C.4. Contracts, technological or transfer merits (last 10 years)

Evaluación y mejora de procesos software y ayuda a la puesta en servicio del laboratorio TIC del CTF

COMPANY: Adif REFERENCE: 806/5.47.3705
DATE: 1/2011- 6/ 2014 AMOUNT: 150.000 EUR

CTC-Master Intelligent Platform for Centralized Railway Traffic Control

COMPANY: Indra Software Labs S.L.U. REFERENCE: 806/47.4209
DATE: 12/2013- 03/2015 AMOUNT: 279.000 EUR

FASTRACK: Structural health monitoring of high-speed railway infrastructures based on slab track (FEDER INTERCONNECTA Convocatoria 2013)

COMPANY: Sofcrits, S.L REFERENCE: 806/47.4073
DATE: 6/2013- 12/2014 AMOUNT: 60.000 EUR

TRACEFIRE: Early fire detection system and intelligent guidance using thermographic cameras and IR3 flame detectors

COMPANY: MESUREX, S. L. REFERENCE:
DATE: 01/09/2018 - 28/02/2020 AMOUNT: 36.000 EUR

Optimum control of urban lights by intelligent and sensorized pavement (OCULISP)

COMPANY: Softcrits, S. L. REFERENCE:806/47.4851
DATE: 01/06/2016 - 28/02/2019 AMOUNT: 58.000 EUR

CONFIT: Desarrollo de herramientas de conformidad conectadas para tecnologías IoT

COMPANY:Dekra Testing and Certification SAU REFERENCE:806/6.18.5927
DATE: 01/06/2021 - 31/12/2023 AMOUNT: 50.000 EUR

PEGASO: Inspection of advanced industrially optimized prepreg supporting surfaces

COMPANY: Tecnatom-Airbus REFERENCE:806/--
DATE: 01/06/2021 - 31/12/2023 AMOUNT: 45.000 EUR

GEDERA: Intelligent Management of Flexible Energy Demand in Coupled Hybrid Networks

COMPANIES: Softcrits, S. L and Astrom Technical Advisors S REFERENCE:806/47.6080
DATE: 31/12/2022 - 31/11/2025 AMOUNT: 215.000 EUR

DELFO: Herramienta para la Optimización del Dimensionado de Plantas de Activos Energéticos

COMPANY: Astrom Technical Advisors S.L. REFERENCE:806/--
DATE: 31/12/2022 - 31/03/2024 AMOUNT: 65.000 EUR

Data based Modelling of the CEPESA MEK and HDK units

COMPANY: Compañía Española de Petróleos, S.A.. REFERENCE: 806/6375
DATE: 30/9/2022 - 30/09/2023 AMOUNT: 172.000 EUR