

Part A. PERSONAL INFORMATION

CV date	08/01/2025
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First name	Susana		
Family name	Ladra González		
Gender	Female		
Social Security, Passport, ID number	[REDACTED]		
e-mail	susana.ladra@udc.es	lbd.udc.es/res/sladra	
ORCID: 0000-0003-4616-0774	ResearcherID: O-1972-2015	Scopus: 24332208900	

A.1. Current position

Position	Profesora Titular de Universidad (Associate Professor)		
Initial date	05/09/2019		
Institution	University of A Coruña		
Department/Center	CITIC/ Faculty of Computer Science		
Country	Spain	Teleph. number	0034881011218
Keywords	Data Structures, Algorithms, Data Compression, Indexation, Databases, Data Mining, Bioinformatics, GIS, Energy Efficiency		

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

Period	Position/Institution/Country/Interruption cause
05/2017 – 10/2017	Maternity (second child)
04/2015 – 09/2015	Maternity (first child)
08/2012-09/2019	Associate Professor, Department of Computer Sciences, University of A Coruña, Spain
12/2011-08/2012	Assistant Professor, Department of Computer Sciences, University of A Coruña, Spain
10/2008-12/2011	Assistant Lecturer, Department of Computer Sciences, University of A Coruña, Spain
09/2008-10/2008	FPU Predoctoral Fellow (awarded by the Spanish government), University of A Coruña, Spain
10/2007-08/2008	Predoctoral Fellow (awarded by Xunta de Galicia), University of A Coruña, Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
BSc + MSc in Computer Engineering	University of A Coruña, Spain	2007
PhD in Computer Science	University of A Coruña, Spain	2011
BSc in Mathematics	UNED, Spain	2014

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

Susana Ladra obtained her degree in Computer Science Engineering at the University of A Coruña in 2007, and was awarded the National Graduation Award by the Spanish Ministry of Education (top-1 student among all those completing Computer Science degrees in Spain in 2007). She got her PhD (European Doctor Accreditation) in Computer Science from the University of A Coruña in 2011, and was awarded with Extraordinary Doctorate Award in the field of Computer Sciences by the University of A Coruña. She also received her Bachelor on Mathematics from the National Distance Education University (UNED) in 2014. She has been an Associate Professor in the Computer Languages and Systems area of the University of A Coruña (UDC) since 2012 (civil servant – Prof. Titular- since 2019). In 2023, she obtained the positive accreditation as a Full Professor by the National Agency for Quality Assessment and Accreditation (ANECA). She has recognized three five-year teaching periods, two six-year research periods, and one six-year transfer period (the maximum possible). In addition to her

teaching and research activities, she was Vice-Dean of Academic Organization (2012-2018) of the Faculty of Computer Science, Director of Campus Innova (2018-2024) and she is now the Deputy to the Vice-Rector of Research for transfer issues at the University of A Coruña.

Her fields of interests include the design and analysis of algorithms and data structures, data compression and information retrieval, bioinformatics, data mining, energy efficiency, and also algebraic algorithms. Her research has been developed within the Database Laboratory and CITIC research center at UDC. In addition to publishing in more than 80 international journals and conferences, she is a member of the program committee of several top-ranked conferences, such as SIGIR, WWW, SIGKDD, or WSDM (CORE A*/ GGS A++). She has also been a member of evaluation committees for national and international research programs. She has performed several research stays in prestigious national and international institutions, such as the IIIA-CSIC, University of Chile (also collaborating with Yahoo! Research Chile), University of Helsinki (Finland), University of Waterloo (Canada), among others.

She has been the principal investigator of one H2020 project and five national research projects. She has been a member of more than 30 research programs and contracts with private companies. Moreover, she has collaborated in transfer of knowledge activities (PI in three projects related to the COVID-19 pandemic) and is a partner of a university spin-off company (Enxenio S.L).

Due to her trajectory, she obtained the following awards: runner-up RAGC-UIE Awards for young researchers, awarded by the Royal Galician Academy of Sciences (RAGC) in 2024, 2020 Ada Byron Award for Young Women Technologists by the University of Deusto (Spain), Marie Skłodowska-Curie Actions Awards 2018, category Bridging (career) paths, awarded by the European Commission and the Austrian Presidency of the Council of the EU, Ada Byron Award 2013 by the CPEIG, and the PhD Thesis Award for the best dissertation award in the field of Information Retrieval in the period 2010–2012, by Information Retrieval Spanish Society.

Susana Ladra leads a new line of research in its research center, focused on the efficient design of algorithms and compact structures for bioinformatics analysis, and more specifically, for the analysis of genomic Big Data. This line of research has generated collaborations with different national and international researchers, as well as joint work and projects with researchers from other fields. In the last years, she was the principal researcher at CITIC of several interdisciplinary projects, such as EPICOVIGAL (coordinated by David Posada from the University of Vigo, and involving all Galician hospitals and universities, as well as CESGA) or CO3 (in collaboration with biotechnology companies). She has also actively participated in the contracts linked to the COVIDBENS project for the monitoring of wastewater in the metropolitan area of A Coruña for the detection of the SARS-CoV-2 virus and the identification of variants. This project has been key during the management of the pandemic for the health authorities and has been presented as a success story by the European Commission. She is co-advising three interdisciplinary PhD theses, together with biologists; one of them within a COFUND MSCA project. In addition, he has also opened a new line linked to green memory-efficient algorithms, and is collaborating with researchers in the area of Artificial Intelligence to improve machine learning algorithms with compact data structures.

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

C.1. Publications

- Hermo, J.; Bolón-Canedo, V.; Ladra, S. (2024) Fed-mRMR: A lossless federated feature selection method. Information Sciences 669, 120609. DOI: 10.1016/j.ins.2024.120609 (JCR: D1). 4 citations [Google Scholar, GS]
- Gallego-García, P.; Estévez-Gómez, N.; De Chiara L. et al. (2024) Dispersal history of SARS-CoV-2 in Galicia, Spain. Journal of Medical Virology 96. DOI: 10.1002/jmv.29773 (JCR: D1). 1 citation [GS]
- Conde-Pérez, K.; Aja-Macaya, P.; Buetas, E. et al. (2024) The multispecies microbial cluster of Fusobacterium, Parvimonas, Bacteroides and Faecalibacterium as a precision biomarker for colorectal cancer diagnosis. Molecular Oncology 18(5): 1093-1122. DOI: 10.1002/1878-0261.13604 (JCR: Q1). 4 citations [GS]
- Conde-Pérez, K.; Aja-Macata, P.; Martín-de Arribas, E., et al. (2024) Parvimonas micra can translocate from the subgingival sulcus of the human oral cavity to colorectal adenocarcinoma. Molecular Oncology 18(5):1143-117. DOI: 10.1002/1878-0261.13506 3 (JCR: Q1). 6 citations [GS]

- Slanináková, T.; Antol, M.; Ol'ha, J.; Dohnal, V.; Ladra, S.; Martínez-Prieto M.A. (2023) Reproducible experiments with Learned Metric Index Framework. *Information Systems* 118 (JCR: Q2). 3 citations [GS]
- Silva-Coira, F.; Paramá, J.R.; Ladra, S. (2023) Map algebra on raster datasets represented by compact data structures. *Software: Practice & Experience*, 53(6): 1362-1390. DOI: 10.1002/spe.3191 (JCR: Q2).
- Trigo-Tasende, N., Vallejo, J.A., Rumbo-Feal, S. et al. (2023) Wastewater early warning system for SARS-CoV-2 outbreaks and variants in a Coruña, Spain. *Environmental Science and Pollution Research* 811, 152334. DOI: 10.1007/s11356-023-27877-3 (JCR: Q2). 9 citation [GS]
- de Bernardo, G.; Gagie, T.; Ladra, S.; Navarro, G.; Seco, D. (2023) Faster Compressed Quadrees. *Journal of Computer and System Sciences*, 131:86-104. DOI: 10.1016/j.jcss.2022.09.001 (JCR: Q3). 3 citations [GS]
- Freire C., Borja; Ladra, S.; Paramá, J. R.; Salmela, L. (2023) ViQUF: de novo Viral Quasispecies reconstruction using Unitig-based Flow networks. *IEEE/ACM Trans. On Computational Biology and Bioinformatics*, 20(1):1550-1562. DOI: 10.1109/TCBB.2022.3190282 (JCR: Q2). 5 citations [GS]
- Vallejo J. A.; et al. (2022) Modeling the number of people infected with SARS-COV-2 from wastewater viral load in Northwest Spain. *Science of the Total Environment* 811, 152334. DOI: 10.1016/j.scitotenv.2021.152334 (JCR: Q1, D1). 52 citations [GS]
- Freire C., Borja; Ladra, S.; Paramá, J. R. (2022) Memory-efficient assembly using Flye. *IEEE/ACM Trans. On Computational Biology and Bioinformatics*, 19(6): 3564-3577. DOI: 10.1109/TCBB.2021.3108843 (JCR: Q2). 37 citations [GS]
- Glaria; Hernandez Rivas, C.; Ladra, S.; Navarro, G.; Salinas, L. (2021) Compact structure for sparse undirected graphs based on a clique graph partition. *Information Sciences*, 544, pp. 485-499. DOI: 10.1016/j.ins.2020.09.010 (JCR: Q1). 14 citations [GS]
- Freire, B.; Salmela, L.; Ladra, S.; Paramá, J.R. (2021) Inference of viral quasispecies with a paired de Bruijn graph. *Bioinformatics*. DOI: 10.1093/bioinformatics/btaa782 (JCR: Q1, D1). 12 citations [GS]
- Silva Coira, F.; Paramá, J. R.; Ladra, S.; López, J. R.; Gutiérrez, G. (2020) Efficient processing of raster and vector data. *Plos ONE*, 15(1), e0226943. DOI: 10.1371/journal.pone.0226943 (Revista JCR: Q1). 25 citations [GS]
- Álvarez García, S.; Freire, B.; Ladra, S.; Pedreira, Ó. (2019). Compact and efficient representation of general graph databases. *Knowledge and Information Systems* 60(3):1479-1510. DOI: 10.1007/s10115-018-1275-x (JCR: Q1). 10 citations [GS]
- Ladra, S.; Paramá, J.R.; Silva-Coira, F. (2017). Scalable and queryable compressed storage structure for raster data. *Information Systems* 72(1):79-204. DOI: 10.1016/j.is.2017.10.007 (JCR: Q2). Citations: 35 [GS]. In the top-20 (position 18th) of most downloaded articles from Information Systems, Apr 2018.
- Brisaboa, N.R.; Ladra, S.; Navarro, G. (2014). Compact Representation of Web Graphs with Extended Functionality. *Information Systems* 39(1):152-174. DOI: 10.1016/j.is.2013.08.003 (JCR, Q2). Citations: 164 [GS]. 11th most cited article published during 2013-2016 in Information Systems
- Brisaboa, N.R.; Ladra, S.; Navarro, G. (2013). DACs: Bringing Direct Access to Variable-Length Codes. *Information Processing and Management*. Vol 49(1), 392-404. DOI: 10.1016/j.ipm.2012.08.003 (JCR, Q3). Citations: 137 [GS]. 4th most cited article published during 2013-2016 in IPM.

C.2. Research projects

As Principal Investigator:

Title: DATAMICROCCR: New algorithms and data science for the analysis of the microbiome in colorectal cancer and its response to treatments. Financial institution: Next Generation EU; MICIIN (PRTR); Xunta de Galicia (GAIN), Program Complementary Plan in Biotechnology Applied to Health Care. Duration: 2023 to 2025. Budget: 75,000.00 €. Main researcher: Susana Ladra

Title: EarthDL: Modeling, Discovering, Exploring and Analyzing Environmental Data Lakes. Financial institution: Ministry of Science and Innovation, Program Proyectos de Generación de Conocimiento, 2022. Duration: 2023 to 2026. Budget: 103,875.00 €. Main researchers: Miguel R. Luaces, Susana Ladra

Title: FlatCity-POC: Friendly barrierLess AdapTable City: Proof of Concept. Financial institution: Ministry of Science and Innovation, Program Prueba de Concepto, call 2021. Duration: 2021 to 2023. Budget: 48,300.00 €. Main researchers: Miguel R. Luaces, Susana Ladra

Title: CO3: Active cosmetics against the coronavirus, long-term solutions. Financial institution: GAIN (Galician Innovation Agency), Program Conecta Covid. Duration: 2021 to 2023. Budget: 77,357.00 €. Main researchers: Susana Ladra

Title: MaGIST: Streaming and analytic visualization and exploration of spatial big data. Financial institution: Ministry of Science and Innovation, Progr. Retos de la Sociedad, call 2019. Duration: 2020 to 2023. Budget: 45,617.00 €. Main researchers: Miguel R. Luaces, Susana Ladra

Title: Bioinformatics and Information Retrieval Data Structures and Design (BIRDS). Financial institution: European Commission. Reference: 690941. Duration: 2016 to 2019. Budget: 648,000 € Main researchers: Susana Ladra

Title: STEPS: Technological Solutions for the Evolution in the Provision of Field Services. Financial institution: Ministry of Science, Innovation and Universities, Program Retos-Colaboración, call 2017. Reference: RTC-2017-5908-7 Duration: 2018 to 2020 Budget: 193,996 € Main researchers: Susana Ladra

Title: Velocity: Procesado eficiente de Big Data espacio-temporal para FlatCity. Financial institution: Ministry of Economy and Competitiveness, Retos de la Sociedade, 2016. Reference: TIN2016-77158-C4-3-R. Duration: 2016 to 2019. Budget: 30,613 €. Main researchers: Miguel R. Luaces, Susana Ladra

As team member (recent/most relevant):

Title: ATEMPO: Asistencia Transfronteriza de EMergencias en el marco del POCTEP 2021-2027. Financial institution: Crue Universidades, Banco Santander. Call Interreg VA Spain-Portugal (POCTEP). Duration: 2023 to 2025. Budget: 250,659.73 €. Main researcher: Manuel G. Penedo, Miguel R. Luaces (University of A Coruña)

Title: GRESINT: A smart digital transformation of the waste collection and sorting process. Financial institution: Crue Universidades, Banco Santander. Call Interreg VA Spain-Portugal (POCTEP). Duration: 2023 to 2026. Budget: 155,203.96 €. Main researcher: Manuel G. Penedo, Miguel R. Luaces (University of A Coruña)

Title: EPICOVIGAL: Epidemiología genómica y monitorización en tiempo real del SARS-CoV-2 en Galicia. Financial institution: Crue Universidades, Banco Santander. Call FONDO SUPERA COVID19. Duration: 2020 to 2021. Budget: 170,000 €. Main researcher: David Posada (University of Vigo)

C.3. Contracts, technological or transfer merits

Title: “Contract for the development of the Intelidata project”. Financing institution: Asociación Inserta Innovación. PI: Susana Ladra, Miguel R. Luaces (UDC). Duration 2023-2024, Amount: 59,574.66 €

Title: “Intelligent data processing and exploitation for decision support and process optimization”. Financing institution: DIVERSA S.L. PI: Susana Ladra. Duration: 2022-2023, Amount: 10,100 €

Title: “Development of analytical techniques for the evaluation of the interaction behavior of small molecules with proteins in the field of computational chemistry”. Financing institution: Hijos de Rivera S.A. PI: Susana Ladra. Duration: 2021-2022, Amount: 1,800 €

Title: “COVIDBENS: Monitoring of SARS-CoV-2 virus in the facilities managed by EDAR BENS S.A”. Financing institution: EDAR Bens SA PI: Margarita Poza (UDC). Duration: 2020-2022, Amount: 82,630 €

Other transfer merits:

- Positive evaluation of 1 “Sexenio de transferencia” (2009-2018).
- Participant in 30 agreements with companies for more than 3 M€. The funding companies include, among others, PRISA Digital S.L., Indra Software Labs SL, Bahía Software SLU, Biogas Fuel Cell SA.
- Published research results under open licenses (GNU General Public License), being publicly available (for instance: <http://lbd.udc.es/research/>). One patent [eBay Inc., 10747741] based on my software.
- Principal researcher of a national project (STEPS) in collaboration with two companies (including the multinational DEKRA and an SME), which exploit three of the results generated in the project.
- Active participation in outreach events, including collaborations in a science outreach radio program.