

Part A. PERSONAL INFORMATION

CV date	1/09/2021
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First and Family name	Matilde Santos Peñas		
Researcher numbers	Researcher ID	K-7671-2014	
	Orcid code	0000-0003-1993-8368	

A.1. Current position

Name of University/Institution	Universidad Complutense de Madrid		
Department	Arquitectura de Computadores y Automática		
Address and Country	C/ Profesor García Santesmases 9; 28040-Madrid, Spain		
Phone number	913947620	E-mail	msantos@ucm.es
Current position	Professor	From	23/09/2011
Espec. cód. UNESCO	1207.02		
Palabras clave	Intelligent Control, Modelling, Simulation, Optimization, Pattern Recognition, AGV, Engineering & Industrial Applications, Wind Energy		

A.2. Education

PhD	University
PhD Physics	Universidad Complutense de Madrid
MS Degree Physics	Universidad Complutense de Madrid
MS Degree Literature	Universidad Complutense de Madrid

A.3. JCR articles, h Index, thesis supervised...

Research segments (6 years each): **5** (the last one from 2014 to 2019).

Knowledge transfer segment: **1** (2002-2010)

Supervised thesis (last ten years): **11**

Total cites: **2572** (google scholar)

Cites/year (since 2016): **1591** (google scholar)

h-index: **27** (google scholar)

Q1 publications: **39/81** (JCR journals)

Publications: <https://scholar.google.com/citations?user=JHVfbC8AAAAJ&hl=en>

Miembro de la European Academy of Sciences and Arts (desde 2019).

Part B. CV SUMMARY

Matilde Santos Peñas received her B.Sc. and M.Sc. degrees in Physics (Computer Engineering) and her Ph.D in Physics from the University Complutense of Madrid (UCM). She is currently Full Professor in System Engineering and Automatic Control (since 2011). She belongs to the Institute of Knowledge Technology. She is a member of the European Academy of Science and Arts.

She has worked and led several National and European projects, focused on intelligent control (fuzzy, neural networks, evolutionary strategies) mainly applied to engineering and industrial applications. The last decade she has worked on autonomous vehicles (marine and aerial), and lately AGVs. She has also developed other soft computing applications for making decision systems and has applied machine learning techniques for pattern recognition in different fields (fusion signals, medical diagnosis, access detection, handwriting). She is now working on modelling, simulation and control of renewable energy systems, mainly floating wind turbines.

She has published many papers in international scientific journals and several book chapters. She coauthored a book on Artificial Intelligence (RaMa, 2005). She has supervised 12 PhDs and more than 70 Master projects.

She currently serves as member of the editorial board of several indexed journals and she is editor-in-chief assistant of Revista Iberoamericana de Automática e Informática Industrial. She serves as Co-Program chair and PC of numerous international conferences.

She has got different awards at conferences. She has been invited as plenary speaker to some international congresses. She has also given several courses and seminars at different universities, some of them abroad.

She is a member of different national and international committees (TC3.2 IFAC Committee Computational Intelligence in Control, coordinator of the national CEA Intelligent Control group). She was member and chair of the Evaluation Committee the National Agency for Quality Assessment and Accreditation of Spain (ANECA). She acts as an Expert Evaluators for The Spanish National Evaluation Agency (ANEP), H2020 projects (European Community), FONCyT (Fondo para la Investigación Científica y Tecnológica), among others. She collaborates with national and international researchers from different countries.

Her major research interests are: Intelligent Control, Modelling and Simulation, Engineering applications of Soft Computing techniques, Pattern recognition, Autonomous vehicles (UAVs, AGVs), Renewable energies (modelling and control of floating wind turbines).

Part C. RELEVANT MERITS

C.1. Selected Indexed Publications Q1-Q2 (last five years)

1. J.E. Sierra-García, M. Santos. Deep Learning and Fuzzy Logic to Implement a Hybrid Wind Turbine Pitch Control. *Neural Computing and Applications*, 2021
2. Barreno, F., Romana, M. G., & Santos, M. (2021). Fuzzy expert system for road type identification and risk assessment of conventional two-lane roads. *Expert Systems*, e12837.
3. Villoslada, D., Santos, M., Tomás-Rodríguez, M., (2021). General methodology for the identification of reduced dynamic models of barge-type floating wind turbines, *Energies*.
4. J.E. Sierra, M. Santos. Intelligent control of an UAV with a cable-suspended load using a neural network estimator, *Expert Systems with Applications*, 2021.
5. Rojas-Thomas, J. C., & Santos, M. New internal clustering validation measure for contiguous arbitrary-shape clusters. *International Journal of Intelligent Systems*, 1-24 (2021).
6. Llamocca, P., López, V., Santos, M., & Čukić, M. (2021). Personalized Characterization of Emotional States in Patients with Bipolar Disorder. *Mathematics*, 9(11), 1174.
7. Galán-Lavado, A., & Santos, M. (2021). Analysis of the Effects of the Location of Passive Control Devices on the Platform of a Floating Wind Turbine. *Energies*, 14(10), 2850.
8. J.E. Sierra, M. Santos. Look-up table and neural network hybrid strategy for wind turbine pitch control. *Sustainability*, 13(6), 3235, 2021.
9. J.E. Sierra, M. Santos. Improving Wind Turbine Pitch Control by Effective Wind Neuro-estimators. *IEEE Access* 9, 10413-10425, 2021.
10. R. Naranjo, M. Santos, L. Garmendía, A convolution-based distance for fuzzy singletons and its application to a pattern recognition problem, *Integrated Computer-Aided Engineering ICAE*, 28, 1, 51-63, 2021.
11. E. Plaza, M. Santos. Knowledge Based Approach to Ground Refueling Optimization of Commercial Airplanes, *Expert Systems*, 38(2), e12631, pp. 1-17, March 2021
12. J.E. Sierra, M. Santos. Exploring Reward Strategies for Wind Turbine Pitch Control by Reinforcement Learning. *Applied Energy, Sciences-Basel*, 10(21), 7462, 2020
13. J.E. Sierra, M. Santos, Performance Analysis of a Wind Turbine Pitch Neurocontroller with Unsupervised Learning, *Complexity*, Volume 2020, Article ID 4681767, 2020
14. C. Guevara, M. Santos. Surveillance Routing of COVID-19 Infection Spread Using an Intelligent Infectious Diseases Algorithm, *IEEE Access*, 8, 201925-201936, 2020
15. C. Guevara, M. Santos. Intelligent models for movement detection and physical evolution of patients with hip surgery. *Logic Journal of the IGPL*, jzaa032, 2020.
16. J.E. Sierra, M. Santos, Switched learning neural control strategy, *Neurocomputing*, 2020
17. R. Naranjo, M. Santos, L. Garmendía, A convolution-based distance for fuzzy singletons and its application to a pattern recognition problem, *Integrated Computer-Aided Engineering ICAE*, 2020
18. M. Tomás-Rodríguez, M. Santos. Modelling and control of floating offshore wind turbines, *Revista Iberoamericana de Automática e Informática Industrial* 16(4), 381-390, 2019
19. J.C. Rojas, M. Mora, M. Santos, Neural networks ensemble for automatic DNA microarray spot classification, *Neural Comput & Applications* 31:2311–2327, 2019
20. R. Naranjo, M. Santos. A fuzzy decision system for money investment in stock markets based on fuzzy candlesticks pattern recognition, *Expert Systems Applications* 2019
21. Sierra, J.E., Santos, M. 2019 Wind and payload disturbance rejection control based on adaptive neural estimators: application on quadrotors. *Complexity* ID6460156, 17 pp
22. Santos, M., Calafat, M.A. (2019). Dynamic simulation of induced voltages in high voltage cable sheaths: Steady state. *Int. J. Electrical Power & Energy Systems* 105, 1-16
23. Aubin, V., Mora, M., & Santos-Peñas, M. (2018). Off-line writer verification based on simple graphemes. *Pattern Recognition*, 79, 414-426

24. V. San Juan, M. Santos, J. M. Andújar. Intelligent UAV map generation and discrete path planning for search and rescue, *Complexity*, Article ID 6879419, 17 pages, 2018
25. R. Naranjo, J. Arroyo, M. Santos, Fuzzy modeling of stock trading with fuzzy candlesticks, *Expert System with Applications*, 93, 15-27, 2018
26. J.E. Sierra, M. Santos, Modeling engineering systems using analytical and neural techniques: hybridization, *Neurocomputing*, 271, 70-83, 2018
27. C. Guevara, M. Santos, V. López. Data Leakage Detection Algorithm based on Task Sequences and Probabilities. *Knowledge-Based Systems*, 120, 236-246, 2017
28. J.C. Rojas, M. Santos, M. Mora. New internal index for clustering validation based on graphs, *Expert Systems with Applications*, 86, 334-349, 2017
29. P. García-Auñón, M. Santos, J.M. de la Cruz. Parameter selection based on fuzzy logic to improve UAV path-following algorithms. *Journal of Applied Logic*, 24, 62-75, 2017

C.2. Research projects and grants

1. Analysis and vibration control of floating wind turbines (FloatWind)/Análisis y control de vibraciones de turbinas eólicas marinas flotantes
Organization: Ministerio de Ciencia, Innovación y Universidades
Dates: 1/01/2019-31/12/2021
IP (Coordinator): Matilde Santos
2. SELFNET: Framework for Self-Organized network management in virtualized and software defined networks (671672).
Organization: European Horizonte 2020 (H2020-ICT-2014-2)
Dates: 01/07/2015 al 30/06/2018
3. RAMSES: Internet Forensic platform for tracking the money flow of financially-motivated malware (700326).
Organization: European Horizonte 2020 (H2020-FCT-2015)
Dates: 01/09/2016 (3 years)
4. Red Temática de Control Inteligente
Organization: DPI2015-71320-REDT, Ministerio de Economía y Competitividad
Coordinator: José Manuel Andújar (UHU) and Matilde Santos (UCM)
Dates: 01/01/2016-31/12/2017
5. Sistema Autónomo para Localización y Actuación ante Contaminantes en el Mar)
Organization: CICYT, DPI 2013-46665-C1
Dates: 01/01/2014-31/12/2016
6. Desarrollo de sistema submarino autónomo (AUV, autonomous underwater vehicle) para detección temprana de vertidos en líneas submarinas
Organization: IPT-2012-0157-310000
Dates: 01/01/2013-31/12/2015
7. Aplicación de la inteligencia artificial en los sensores y biosensores-2
Organization: PCI-AECID B/024393/09
Dates: 1/01/2010-31/12/2010
Coordinator: Matilde Santos Peñas (UCM)

C.3. Contracts

- Sistema de control de actitud de nano/micro-satélites. INTA (Instituto Nacional de Técnica Aeroespacial)
- Predicción de periodo quiescente en buques. Ministerio de Defensa. European Defence Agency
- Visión Estereoscópica para Auto-Rover: Investigación aplicada de autonomía basada en imágenes para ROVER de exploración planetaria. TCP Sistemas e Ingeniería S.L.
- Metodología para los Entornos de Modelado y Simulación Distribuidos. INDRA SISTEMAS S.A.
- Evaluación de técnicas de inteligencia artificial para toma de decisiones y optimización de estrategia. EADS-CASA
- Generación gráfica de la red con alta topología de detalle. REPSOL PETRÓLEO S.A.
- Optimización en el almacenamiento y la distribución farmacéutica. COFARES

C.4: Evaluation

- UNA Europa Seed. Expert (evaluation of proposals)
- Canary Agency for Quality Assessment and Accreditation (ACCUE), for Academic Staff Recruitment Assessment Programme, 2021-.
- President, Secretary and member of the committee of the National Agency for Quality Assessment and Accreditation of Spain (ANECA), for Academic Staff Recruitment Assessment Programme (PEP), 2009-2019.
- Evaluator for the National Evaluation and Foresight Agency (ANEP), State Department of Research of the Ministry of Science and Innovation. Scientific/technical evaluation of the units, teams and research proposals of projects of the National Plan, since 2009
- Evaluator for the National Evaluation and Foresight Agency (ANEP). National Programme for Recruitment and Incorporation of Human Resources
- External Examiner at Dublin City University (Electronic Engineering), 2013/14 al 2016/17

C.5 Editorial board of indexed journals

- Editorial board of RIAI (SCI-indexed Journal, Q4), since 2007. Editorial co-chief (2018)
- Editorial board of EAAI (SCI-indexed Journal, Q1), since 2009
- Editorial board of Complexity (SCI-indexed Journal, Q2), since 2018
- Editorial board of Energies (SCI-indexed Journal, Q3), since 2020

C.6 Awards

- Best Intelligent Control poster paper (XLII Jornadas de Automática 2021)
- Federation of European Simulation Societies Certification of contribution, EUROSIM2019
- UCM Award Innovative Idea. IV Contest of Innovative Ideas and New Technology-Based Companies. OTRI, Rectorado de Investigación y Política científica, UCM, 20/12/2010
- Best Intelligent Control Doctoral Thesis:
 - 2014, Gonzalo Farias Castro, Comité Español de Automática (CEA), Mathworks
 - 2013, Fernando Alonso Zotes, Comité Español de Automática (CEA), Mathworks
 - 2012, Joshué Pérez Rastelli. Comité Español de Automática (CEA), Mathworks
- Best student paper: I Jornadas de Investigación en Ciberseguridad JNIC 2015
- Best Intelligent Control poster paper (XXXV Jornadas de Automática 2014)
- Best Poster Paper ISKE 2013
- Excellent FLINS 2010 Conference Poster Paper
- The Second Best IEEE ISKE 2009 Conference Poster Paper
- The Third Best IEEE ISKE 2009 Conference Poster Paper
- The Best IEEE ISKE 2008 Conference Poster Paper
- Best Intelligent Control poster paper (XXVIII Jornadas de Automática 2007)
- Best Intelligent Control poster paper (XXVI Jornadas de Automática 2005)

C.7 Others

- Reviewer of a selection of SCI-indexed scientific journals
- Board of Directors CEA (Spanish Committee of Automatic Control)
- Coordinator of the national Group of Intelligent Control, 2014-2018, Spanish Committee of Automatic Control
- Member of the TC3.2 Committee of the IFAC (<http://tc.ifac-control.org/3/2>), Computational Intelligence in Control, from 2009 to date
- Chair (Head) Doctoral Programme:
 - System Engineering and Automatic Control, UNED-UCM, 2002/03-2009/10
 - Computer Architecture and Automatic Control, UCM, 1997/98 to 2003/04
 - Student Access to University Programme, Electrical Engineering, 1998/99 to 2011/12
- International Conferences Program Committee
- Conferences Local Organizing Committee