

**Part A. PERSONAL INFORMATION**

<b>CV date</b>	01/2026
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First name	Matilde Pilar		
Family name	Sánchez Fernández		
e-mail	mati@tsc.uc3m.es		
Open Researcher and Contributor ID (ORCID) (*)	0000-0003-1617-6273		

**A.1. Current position**

Position	Full Professor		
Initial date	March of 2022		
Institution	Universidad Carlos III de Madrid (UC3M)		
Department/Center	Signal Theory & Communications Dept.	Polytechnic School	
Country	Spain	Teleph. number	+34916249173
Key words	Signal processing, MIMO techniques, channel modeling in wireless communications, machine learning, compress sensing		

**A.2. Education**

PhD, Licensed, Graduate	University	Year
Telecommunication Engineer	Universidad Politécnica de Madrid	1996
PhD in Telecommunication Engineer	Universidad Politécnica de Madrid	2001

**A.3. Quality indicators of scientific results**

- Positive evaluation of the research activity (CNEAI): 2001–2006, 2007–2012, 2013–2018, 2019–2024.
- Positive evaluation of knowledge transfer and innovation activity (CNEAI): 2010–2015.
- Total citations: 1,763 (Google Scholar).
- Average citations per year over the last 5 years: 130 (Google Scholar).
- h-index: 19 (Google Scholar).

**Part B. CV SUMMARY**

Matilde Sánchez Fernández was an engineer at Telefónica until 2000, when she joined Universidad Carlos III de Madrid (UC3M), where she is Professor since 2022. Her current lines of research are signal/information processing techniques for wireless technologies, including multi-antenna systems, wireless communications channel modeling and characterization, and learning techniques, game theory and compress sensing applied to communications and information processing. A recent line of work is being developed for the application of these techniques to health and image processing. In the research line, massive MIMO systems with textile technology she has received the 3rd prize in the first call of the Bell Labs Prize 2014, an international competition that recognizes game-changing innovations in science, technology, engineering and mathematics. In this same line, she has also published articles in collaboration with researchers from Bell Labs (USA) and with researchers from Nokia (Spain) as academic-corporate collaboration, she has directed a PhD Thesis with European Mention, two R&D&I projects, one of them in collaboration with Nokia, Spain and has filed a patent.

In her international postdoctoral collaborations, she has carried out international postdoctoral mobility with a cumulative total of 2 years including stays at Bell Labs (NJ, USA) in 2003, 2004, 2005, 2006, 2015 all of them with contrastable results, including publication of journal articles and two patents applications, a stay at Princeton University (NJ, USA) as Visiting Fellow in 2011 and a stay in Pontificia Universidad Católica de Valparaíso, Chile in 2022. In 2024 she has been 6 months in sabbatical in Federico II University in Naples, Italy. She has also visited the Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Barcelona for 6 months in 2007.

She is an awardee of the Competition for Attracting Advanced Human Capital from Abroad 2019, International Cooperation Program of CONICYT, Ministry of Education, Chile (MEC 80190055). She has participated in the organization as Financial Chair in the international conferences IEEE Information Theory Workshop 2013 and IEEE Statistical Signal Processing



Workshop 2016 and has been evaluator of international research projects for the EU in the FET-OPEN, FP7-FET and H2020 programs.

In Universidad Carlos III de Madrid she has hold management positions as Vicerector for Internationalization and European University (May 2015- April 2023), Deputy Vicerector for International Relations and Cooperation (September 2014 - April 2015), Deputy Director of the Signal Theory and Communications Department, (September 2009-December 2010), (September 2012-September 2014) and Academic Secretary of the Signal Theory and Communications Department, Universidad Carlos III de Madrid. (February-September 2009).

## Part C. RELEVANT MERITS

### C.1. Publications (*Last 10 years*)

1. Á. Callejas-Ramos, M. Sánchez-Fernández, A. Tulino and J. Llorca, "Atomic Norm for Parametric Estimation of Sparse Channels," IEEE Transactions on Wireless Communications, in press 2026.
2. V. Silva, H. Molina-Bulla, M. Lázaro, M. Rodríguez and M. Sánchez-Fernández, "LSTM With Bayesian Loss for Ordinal and Imbalanced Channel Quality Prediction," IEEE Open Journal of the Communications Society, vol. 6, pp. 8667-8687, 2025.
3. S. Tomasin, R. Hasler, A. M. Tulino, and Matilde Sánchez-Fernández, Estimation of Interference Correlation in mmWave Cellular Systems, IEEE Transactions on Wireless Communications, vol. 23, no. 3, pp. 1771 – 1782, 2024.
4. M. Sánchez-Fernández, V. Jamali, J. Llorca, A. Tulino, Gridless Multidimensional Angle of Arrival Estimation for Arbitrary 3D Antenna Arrays, IEEE Transactions on Wireless Communications, vol. 20, no. 7, pp. 4748-4764, 2021.
5. A. Vega Delgado, M. Sánchez-Fernández, L. Venturino, A. Tulino, Super-resolution in automotive pulse radars, IEEE Journal of Selected Topics in Signal Processing, vol. 15, no. 4, pp. 913 - 926, 2021.
6. J. J. Murillo-Fuentes, I. Santos, J. C. Aradillas, M. Sánchez-Fernández, A Low-Complexity Double EP-based Detector for Iterative Detection and Decoding in MIMO, IEEE Transactions on Communications, vol. 69, no.3, 1538 – 1547, March 2021.
7. E. Crespo-Bardera, A. Garrido Martín, A. Fernández Durán, M. Sánchez-Fernández, Design and Analysis of Conformal Antenna for Future Public Safety Communications, IEEE Antennas and Propagation Magazine, 2020.
8. E. Crespo-Bardera, M. Rodríguez, M. Sánchez-Fernández, E. Rajo-Iglesias, R. Feick, R. Valenzuela, Empirical Rates Characterization of Wearable Multi-Antenna Terminals for First-Responders, IEEE Access, vol.7, pp. 6990-7000, 2019.
9. E. Crespo-Bardera, A. Vega-Delgado, A. Garrido Martín, A. Fernández-Durán, M. Sánchez-Fernández, Textile multi-antenna Technology and Relaying Architectures for Emergency networks, Wireless Communications and Mobile Computing, pp. 1-7, 2019.
10. A. Vega Delgado, M. Sánchez-Fernández, J. Llorca, A. Tulino, Feasible Transmission Strategies for Downlink MIMO in Sparse Millimeter Wave Channels, IEEE Communications Magazine, vol. 56, no. 7, pp. 49 – 55, 2018.
11. J. Céspedes, P. M. Olmos, M. Sánchez-Fernández, Fernando Perez-Cruz, Probabilistic MIMO Symbol Detection with Expectation Consistency Approximate Inference, IEEE Transactions on Vehicular Technology, vol. 67, no. 4, pp. 3481 - 3494, 2018.
12. M. Sánchez-Fernández, A. Tulino, E. Rajo-Iglesias, J. Llorca, A. García Armada, Blended Antenna Wearables for an Unconstrained Mobile Experience, IEEE Communications Magazine, vol. 55, no. 4, pp. 160 - 168, 2017.
13. G. Robles, J. M. Fresno, M. Sánchez-Fernández, J. M. Martínez-Tarifa, Antenna Array Layout for the Localization of Partial Discharges in Open-Air Substations, Sensors, 2016.
14. S. Zazo, S. Valcarcel Macua, M. Sánchez-Fernández, J. Zazo, Dynamic Potential Games with Constraints: Fundamentals and Applications in Communications, IEEE Transactions on Signal Processing, vol. 64, no. 14, pp. 3806 - 3821, 2016.
15. M. L. Pablo-González, M. Sánchez-Fernández, E. Rajo-Iglesias, Combination of the three types of diversity to design high capacity compact MIMO terminals, IEEE Antennas and Wireless Propagation Letters, vol. 13, pp. 1309-1312, 2014
16. J. Céspedes, P. M. Olmos, M. Sánchez-Fernández, F. Perez-Cruz, Expectation Propagation Detection for High-order High-dimensional MIMO Systems, IEEE Transactions on Communications, vol. 62, no. 8, pp. 2840-2849, 2014

### C.3. Research projects (*Most relevant in the last 10 years*)

1. Calibrated Discrete Representations and Time-Series Modeling with Robust Self-Supervised Networks (CARTESIAN), *funded by* Programa Estatal para la Investigación y el Desarrollo Experimental del Plan Estatal de Investigación Científica, Técnica y de Innovación 2024-2027 Proyectos de Generación de Conocimiento PID2024-157856NB-I00, *Participants*: UC3M, September 2025 – December 2028. *IP*: Pablo Martínez Olmos, David Ramírez García.
2. COMONSENS research network for the advance of Signal Processing, Information Theory, and Machine Learning, *Funded by* : Programa Estatal de Transferencia y Colaboración del Plan Estatal de Investigación Científica, Técnica y de Innovación 2024-2027. RED2024-153725-T. *Participants*: UC3M (coordinator) y 15 Spanish universities, February 2025 – January 2027, *IP*: **M. Sánchez Fernández**.
3. Red DISeCom - Gemelos digitales integrando la detección y las comunicaciones inalámbricas en Iberoamérica, *Funded by* : Programa Iberoamericano de Ciencia y Tecnología para el desarrollo CYTED 525RT0175. *Participants*: Pontificia Universidad Católica de Chile (coordinadora), UC3M, Tecnológico de Monterrey, Universidad Nacional de Colombia, Universidad Privada Boliviana, Pontificia Universidade Catolica do Rio de Janeiro, December 2024 – octubre 2028, *Responsible*: **M. Sánchez Fernández** (UC3M).
4. ISAC-NEWTON: Intelligent Sensing and Communication as Training Network for Perceptive Mobile Networks in 6G, *Funded by* : European Commission Research Executive Agency, GA number: 101169496 HORIZON-MSCA-2023-DN-01, February 2025 – January 2029, *IP*: Víctor Gil Jiménez.
5. 6G-LEADER: Learning-Driven and Evolved Radio for 6G Communication Systems, *Funded by* : European Commission Research Executive Agency, GA number: 101192080 HE-JU-SNS-2024, January 2025 – December 2027, *IP*: Ana García Armada.
6. SOFIA-AIR - Comunicaciones inalámbricas y Sensado pOr medio de diseños Flexibles usando Inteligencia y Algoritmos (SOFIA), *Funded by* : Plan Estatal de Investigación Científica y Técnica y de Innovación 2021-2023 Proyectos de Generación de Conocimiento PID2023-147305OB-C31, *Participants*: CTTC, UC3M y Univ. Islas Baleares, September 2024 – December 2027. *IP*: Víctor Gil Jiménez (UC3M).
7. PASSIONATE - Physics-based wireless AI providing scalability and efficiency, *Funded by* : Plan Estatal de Investigación Científica y Técnica y de Innovación 2021-2023 Proyectos de colaboración internacional PCI2023-145990-2, December 2023 – December 2026, *IP*: Ana García Armada.
8. Young Universities for the Future of Europe (YUFE) Alliance 2030, *Funded by* : Erasmus +KA2: European Universities, EACEA, *Participants*: Universidad de Maastricht (coordinador), Universidad de Bremen, Universidad de Essex, Universidad de Amberes, Universidad de Finlandia del Este, Universidad de Chipre, Universidad Nicolas Copernicus, Universidad de Croacia, Universidad Carlos III de Madrid, December 2022 – November 2026, *Institutional representative*: **M. Sánchez Fernández** (upto April 2023, UC3M).
9. Funciones de red nativas de la nube para 6G Subproyecto 1: CLOUD-nATIVE NETWORK FUNCTIONS FOR 6G - Network Functions Design (6G-CLARION-NFD), *Funded by* : Plan de Recuperación Transformación y Resiliencia, Programa de Universalización de Infraestructuras Digitales para la Cohesión 5G I+D (Convocatoria UNICO-5G I+D) TSI-063000-2021-65, *Participants*: Universidad Carlos III de Madrid, November 2021 – June 2025, *IP*: Albert Banachs.
10. Funciones de red nativas de la nube para 6G Subproyecto 2: CLOUD-nATIVE NETWORK FUNCTIONS FOR 6G - Orchestration (6G-CLARION-OE), *Funded by* : Plan de Recuperación Transformación y Resiliencia, Programa de Universalización de Infraestructuras Digitales para la Cohesión 5G I+D (Convocatoria UNICO-5G I+D) TSI-063000-2021-66, *Participants*: Universidad Carlos III de Madrid, November 2021 – June 2025, *IP*: Albert Banachs.
11. Funciones de red nativas de la nube para 6G Subproyecto 3: CLOUD-nATIVE NETWORK FUNCTIONS FOR 6G - System Implementation (6G-CLARION-SI), *Funded by* : Plan de Recuperación Transformación y Resiliencia, Programa de Universalización de Infraestructuras Digitales para la Cohesión 5G I+D (Convocatoria UNICO-5G I+D) TSI-



- 063000-2021-67, *Participants*: Universidad Carlos III de Madrid, November 2021 – June 2025, IP: Pablo Serrano.
12. IRENE-EARTH – Energy and cost efficient communications with global coverage, funded by Ministry of Science and Innovation, September 2021 – August 2024, principal investigator: **M. Sánchez Fernández**
  13. Towards European University powering new generation of entrepreneurs & innovators - Inno4YUFE, *Financiación*: EIT HEI initiative, Comisión Europea, *Participantes*: Universidad de Maastricht (coordinador), Universidad de Bremen, Universidad de Essex, Universidad Tor Vergata, Universidad de Amberes, Universidad de Finlandia del Este, Universidad de Chipre, Universidad Nicolas Copernicus, Universidad de Croacia, UC3M, July 2021 – July 2023, *Institutional representative*: **M. Sánchez Fernández** (upto April 2023, UC3M).
  14. Young Universities for the Future of Europe-YUFE, *Financiación*: Erasmus +KA2: European Universities, EACEA, *Participantes*: Universidad de Maastricht (coordinador), Universidad de Bremen, Universidad de Essex, Universidad Tor Vergata, Universidad de Amberes, Universidad de Finlandia del Este, Universidad de Chipre, Universidad Nicolas Copernicus, Universidad de Croacia, UC3M, December 2019 – November 2022. *Institutional representative*: **M. Sánchez Fernández** (UC3M).
  15. MadridFlightOnChip, funded by: Comunidad de Madrid, Dirección General de Investigación, November 2019-January 2022
  16. Radio interface for hybrid future 5G terrestrial-satellite (TERESA), funded by: Ministry of Economy, Industry and Competitivity, January 2018 - December 2020.
  17. System for virtual TELEportation of RESCUER for inspecting coal mine areas affected by catastrophic events (TELERESCUER), European Commission, RFCR-CT-2014-00002, April 2015-June 2017.
  18. Massive wireless communication for machines (MACHINE), funded by: Ministry of Industry, Energy and Tourism, TSI-100102-2015-017, October 2015- December 2017.
  19. Wireless communications for security and emergency scenarios (CIES), funded by: Ministry of Economy and Competitivity, RTC-2015-4213-7, September 2015 – December 2017, principal investigator: **M. Sánchez Fernández**
  20. High capacity textile device based on massive MIMO technology, funded by: Ministry of Economy and Competitivity, TEC2014-61776-EXP, June 2015 – May 2017, principal investigator: **M. Sánchez Fernández**
  21. Enabling technologies for shared licenced access, funded by: Ministry of Economy and Competitiveness, TEC2014-59255-C3-1-R, January 2015 – September 2018
  22. LTE and LTE-advanced multiuser and multimedia service optimization (LTEXTREME), funded by: Ministry of Economy and Competitiveness, IPT-2012-0525-430000, July 2012 – December 2015
  23. General radio concepts for energy efficient mobile communications (GRE3N), funded by: Ministry of Economy and Competitiveness, TEC2011-29006-C03-03, January 2011 – September 2015

#### **C.4. Contracts, technological or transfer merits** (*Most relevant in the last 10 years*)

1. Research and Implementation of a Digital Model for Radar Warning Receiver (RIDWaRe), Indra Sistemas, S.A. *Participants*: Signal Theory & communications Department, UC3M, April 2025 (12 months), IP: Borja Peleato.
2. Conducción remota basada en codificación de vídeo ultra-rápida y comunicaciones 5G, *Empresa*: CT Ingenieros A.A.I. S.L., October 2024 (14 months), *IP*: Ana García Armada.
3. High-performance antennas for private utility frequencies (GENIE), Nokia Spain, June 2022 (24 months), *PI*: **M. Sánchez Fernández**
4. Optimization of massive MIMO in millimeter waves for 5G radio access systems (AMATISTA), Nokia, July 2020 (20 months).
5. 5G Antennas for fixed internet access with capacity upgrade, Nokia, July 2020 (22 months)
6. Technologies for Affordable Broadband Access, TREFOIL, Nokia April 2020 (20 months).
7. Design of a demodulator for wireless internet access through visible light, DLED Soluciones S.L., June 2015 (8 months), principal investigator: **M. Sánchez Fernández**
8. Smart Li-fi: Wireless internet access through visible light, UVAX CONCEPTS S.L., February 2014 (12 months), principal investigator: **M. Sánchez Fernández**

#### **C.4.a. Patents**

1. Inventors: E. Rajo Iglesias, M. Sánchez Fernández, A. Fernández, Title: Dense multi-band antenna for fixed wireless, Application ID: 21383242, Owner: Nokia Solutions & Networks, December 2021.
2. Inventors: E. Rajo Iglesias, M. Sánchez Fernández, A. Fernández, T. Sanjuan, Title: Small Form Factor Mutiband Antenna, Application ID: 22382543, Owner: Nokia Solutions & Networks, June 2022.
3. Inventors: A. Tulino, M. Sánchez Fernández, J. Llorca, H. Huang, Title: Super-resolution delay-doppler-azimuth-elevation estimation via atomic norm Minimization, Application ID: P201431806, Owner: Nokia.
4. Inventors: A. García Armada, M. Luz Pablo González, M. Sánchez Fernández, R. Corvaja, Ignacio Berberana Fernández Murias, Title: Method to Optimize the power allocation of User Flows Transmitted from Base Stations in Coordinated Base Station Transmission Systems, Application ID: P201131183, Owner: Telefónica, Status: pending
5. Inventors: M. Sánchez Fernández, E. Rajo Iglesias, A. García Armada, Title: Method and system to increase uplink capacity between a user terminal and a base station, Application ID: P201431806, Owner: Universidad Carlos III de Madrid, Status: pending
6. Inventors: A. García Armada, M. Sánchez Fernández, R. Corvaja, Title: Joint Transmission Method, Application ID: P201031785, Owner: Universidad Carlos III de Madrid, Status: approved

#### **C.5. Research stays**

1. Università degli Studi di Napoli Federico II, February 2024 (6 months). Funded by: National Spanish Program for the Promotion of Talent and Employability, within the framework of the 2021-2023 State Plan for Scientific, Technical, and Innovation Research (PEICTI). Subprogram for Senior Professors and Researchers' Stays in Foreign Centers, including the 2022 'Salvador de Madariaga' Program.
2. Pontificia Universidad Católica de Valparaíso, January 2022 (1 month).
3. Wireless Communications Research Department, Bell-Labs, New Jersey, USA, May 2015 (3 months). Funded by: Mobility stays for senior professors and researchers in foreign higher education and research centers, including the 2014 Salvador de Madariaga Program.
4. Princeton University, Nueva Jersey, USA, February 2011 (6 months). Funded by: 2010 National Program for the Mobility of Research Human Resources.
5. Centre Tecnològic de Telecomunicacions de Catalunya, Barcelona, Spain, April 2007, (12 semanas). Funded by: Centre Tecnològic de Telecomunicacions de Catalunya.
6. Wireless Communications Research Department, Bell-Labs, New Jersey, USA, March 2006 (10 weeks), March 2005 (12 weeks). April 2004 (8 weeks), June 2003 (10 weeks)
7. Kansas University, Kansas, USA, August 1998 (1 año). Funded by: Electrical Engineering and Computer Science Department, University of Kansas.

#### **C.6. Tesis Doctorales Dirigidas**

1. Mohamed Lamine Touhami Moulay Brahim: Performance Evaluation And Anomaly detection in Mobile BroadBand Across Europe, Multimedia & Communications PhD Program, Universidad Carlos III de Madrid, Spain, 2022.
2. Adrián Vega Delgado: Atomic norm decomposition for sparse model reconstruction applied to positioning and wireless communications, Multimedia & Communications PhD Program, Universidad Carlos III de Madrid, Spain, 2022.
3. Estefanía Crespo Bardera: Large-scale MIMO textile technology for enhanced terminals, Multimedia & Communications PhD Program, Universidad Carlos III de Madrid, Spain, 2019.
4. Javier Céspedes Martín: Approximate Inference in Massive MIMO Scenarios with Moment Matching Techniques, Multimedia & Communications PhD Program, Universidad Carlos III de Madrid, Spain, 2017 (co-advisor Pablo Martínez Olmos).



5. M Luz de Pablo González: Contributions to next-generation wireless systems based on MIMO: study of compact terminals and interference management in coordinated schemes, Multimedia & Communications PhD Program Universidad Carlos III de Madrid, Spain, 2015 (co-advisor Ana García Armada).

### **C.7. Academic leadership and management roles**

1. ViceRector for Internationalization and European University. Universidad Carlos III de Madrid. Spain (April 2019 - April 2023)
2. ViceRector for International Relations and Cooperation. Universidad Carlos III de Madrid. Spain (May 2015 - April 2019)
3. Deputy ViceRector for International Relations. Universidad Carlos III de Madrid. Spain (September 2014 - April 2015)
4. Deputy Chair of the Signal Theory & Communications Department, Universidad Carlos III de Madrid. Spain (September 2009-December 2010), (September 2012-September 2014)
5. Academic Secretary of the Signal Theory & Communications Department, Universidad Carlos III de Madrid. (February - September 2009)