ÁNGEL GARCÍA-FERNÁNDEZ

Citizenship: Spanish
Settled status in the UK
Birth date: March 22, 1984
angel.garcia.fernandez@upm.es
Mobile phone: +34677131499
ORCID ID: 0000-0002-6471-8455

March 28th, 2025
Associate Professor (Profesor Titular)
ETSI de Telecomunicación
Universidad Politécnica de Madrid
Spain

EDUCATION

Certificate of Professional Studies in Learning and Teaching in Higher Education — Oct. 2019
Faculty of Humanities and Social Sciences
University of Liverpool, Liverpool, United Kingdom

Doctor of Philosophy (cum laude) — Dec. 2011
Universidad Politécnica de Madrid, Madrid, Spain
Supervisors: Prof. Jesús Grajal,
Dr. Mark R. Morelande (The University of Melbourne, Australia)
Thesis title*: Detection and tracking of multiple targets using wireless sensor networks*
Link: http://oa.upm.es/9823/

MSc degree on Communication Technologies and Systems (2-year degree) — Jul. 2009
Universidad Politécnica de Madrid, Madrid, Spain

Telecommunication Engineer (with distinction) (5-year degree) — Oct. 2007
Universidad Politécnica de Madrid, Madrid, Spain

WORK EXPERIENCE

Associate Professor (Profesor Titular) — Since Jan. 2025
Dept. of Signals, Systems and Radiocommunications
Universidad Politécnica de Madrid, Madrid, Spain

Senior Lecturer — Nov. 2023 /Jan 2025
Dept. of Electrical Engineering and Electronics
University of Liverpool, Liverpool, UK

Lecturer — Oct. 2017 /Nov. 2023
Dept. of Electrical Engineering and Electronics
University of Liverpool, Liverpool, UK

Postdoctoral researcher — Oct. 2016 /Sep. 2017
Dept. of Electrical Engineering and Automation
Aalto University, Espoo, Finland
Supervisor: Prof. Simo Särkkä
Bayesian inference with applications in indoor localisation and fMRI-EEG
Machine learning: classification using Gaussian processes

Research Associate — Oct. 2013 /Sep.2016
Dept. of Electrical and Computing Engineering

Curtin University, Perth, Australia
Supervisor: Prof. Ba-Ngu Vo
Multiple target tracking using random finite sets

Postdoctoral researcher — Mar. 2013 /Sep.2013
Dept. of Signals, Systems and Radiocommunications
Universidad Politécnica de Madrid, Madrid, Spain
Supervisor: Prof. Jesús Grajal
Bayesian filtering and multiple target tracking

Postdoctoral researcher — May 2012 /Feb. 2013
Dept. Signals and Systems
Chalmers University of Technology, Gothenburg, Sweden
Supervisor: Prof. Lennart Svensson
Road geometry estimation and Bayesian filtering

Postdoctoral researcher — Jan. 2012 /Apr. 2012
Dept. of Signals, Systems and Radiocommunications
Universidad Politécnica de Madrid, Madrid, Spain
Supervisor: Prof. Jesús Grajal
Bayesian filtering and multiple target tracking

PhD Student (with FPU Fellowship) — Nov. 2007 /Dec. 2011
Dept. of Signals, Systems and Radiocommunications
Universidad Politécnica de Madrid, Madrid, Spain
Supervisor: Prof. Jesús Grajal
Detection and tracking of multiple targets using wireless sensor networks

Undergraduate Research Assistant — Sept. 2006 /Oct. 2007
Dept. of Signals, Systems and Radiocommunications
Universidad Politécnica de Madrid, Madrid, Spain
Supervisor: Dr. Omar Yeste Ojeda
Assessment of time-frequency techniques for ISAR (Inverse Synthetic Aperture Radar) image generation

Undergraduate Research Assistant — Nov. 2005 /June 2006
Dept. of Signals, Systems and Radiocommunications
Universidad Politécnica de Madrid, Madrid, Spain
Supervisor: Prof. Jesús Grajal
Design of microwave circuits

Undergraduate Research Assistant — Nov. 2004 /June 2005
Dept. of Applied Physics
Universidad Politécnica de Madrid, Madrid, Spain
Supervisor: Dr. José Luis Prieto
Design of a probe to measure magnetic sensors

EXTERNAL APPOINTMENTS

Honorary Recognised Supervisor — Jan. 2025
Dept. of Electrical Engineering and Electronics
University of Liverpool, Liverpool, UK

External Senior Research Associate — Jan. 2019 /Jan. 2025
ARIES (Artificial Intelligence and Emergent Systems) Research Centre
Universidad Antonio de Nebrija, Madrid, Spain

JOURNAL PAPERS

The number of citations and complete list of publications can be found in Google scholar: https://scholar.google.es/citations?user=Fd8DG_AAAAAJ&hl=en&oi=sra

I have published the following number of papers in these journals

- IEEE Transactions on Signal Processing (21).
- IEEE Transactions on Aerospace and Electronic Systems (16).
- IEEE Transactions on Automatic Control (5).
- IEEE Transactions on Vehicular Technology (4).
- IEEE Transactions on Intelligent Transportation Systems (2).
- IEEE Transactions on Circuits and Systems for Video Technology (1).
- IEEE Signal Processing Letters (6).
- Signal Processing (6).
- Information Fusion (2).
- Automatica (1).
- Pattern Recognition (1).

I have been the first author in 33 of these publications. The complete list of journal papers is:

1) R. Yang, A. F. García-Fernández, C.-R. Lee, "Beta-Gaussian iterated posterior linearisation filter for lithium-ion battery state-of charge estimation," in Journal of Energy Storage, Volume 117, May 2025.
2) A. F. García-Fernández, S. Särkkä, "Gaussian multi-target filtering with target dynamics driven by a stochastic differential equation," in IEEE Transactions on Signal Processing, vol. 73, pp. 664-675, 2025.
3) M. Fontana, A. F. García-Fernández, S. Maskell, "Notch power detector for multiple vehicle trajectory estimation with distributed acoustic sensing," in Signal Processing, vol. 232, 2025.
4) J. Guo, J. Ma, F. Sun, Z. Gao, A. F. García-Fernández, H. N. Liang, X. Zhu, W. Ding, "CD-UDepth: Complementary Dual-source Information Fusion for Underwater Monocular Depth Estimation," in Information Fusion, vol. 118, 2025.
5) A. F. García-Fernández, G. Battistelli, "Consensus iterated posterior linearisation filter for distributed state estimation," in IEEE Signal Processing Letters, vol. 32, pp. 561-565, 2025.
6) S. Wei, A. F. García-Fernández, W. Yi, "The trajectory PHD filter for coexisting point and extended target tracking," accepted in IEEE Transactions on Aerospace and Electronic Systems, 2025.

7) K. Granström, L. Svensson, Y. Xia, J. Williams, A. F. García-Fernández, "Poisson multi-Bernoulli mixtures for sets of trajectories," accepted in IEEE Transactions on Aerospace and Electronic Systems, 2024.
8) S. Särkkä, A. F. García-Fernández, "Temporal Parallelisation of the HJB Equation and Continuous-Time Linear Quadratic Control," accepted in IEEE Transactions on Automatic Control, 2024.
9) J. Gu, A. F. García-Fernández, Robert E. Firth, L. Svensson, "Graph GOSPA metric: a metric to measure the discrepancy between graphs of different sizes," IEEE Transactions on Signal Processing, vol. 72, pp. 4037-4049, 2024.
10) J. Wang, T. Dai, X. Zhao, A. F. García-Fernández, E. G. Lim, J. Xiao, "Class Activation Map Calibration for Weakly Supervised Semantic Segmentation" IEEE Transactions on Circuits and Systems for Video Technology, vol. 34, no. 11, pp. 11668-11681, Nov. 2024.
11) Y. Xia, A. F. García-Fernández, L. Svensson, "Markov Chain Monte Carlo Multi-Scan Data Association for Sets of Trajectories," in IEEE Transactions on Aerospace and Electronic Systems, vol. 60, no. 6, pp. 7804-7819, Dec. 2024.
12) G. Jones, A. F. García-Fernández, C. Blackman, "Non-myopic GOSPA-driven Gaussian Bernoulli Sensor Management," in IEEE Transactions on Aerospace and Electronic Systems, vol. 60, no. 6, pp. 7628-7642, Dec. 2024.
13) J. Guo, J. Ma, A. F. García-Fernández, F. Li, X. Zhu, "BD-RDE: Bridging Domains for Robust Depth Estimation in Underwater Environments with a Color-balance Domain" accepted in Human-centric Computing and Information Sciences, 2024.
14) H. Kim, A. F. García-Fernández, Y. Ge, Y. Xia, L. Svensson, H. Wymeersch, "Set-Type Belief Propagation with Applications to Poisson Multi-Bernoulli SLAM," in IEEE Transactions on Signal Processing, vol. 72, pp. 1989-2005, 2024.
15) E. Davies, A. F. García-Fernández, "Information Exchange track-before-detect Multi-Bernoulli filter for superpositional sensors," in IEEE Transactions on Signal Processing, vol. 72, pp. 607-621, 2024.
16) J. Wang, S. Yua, B. Zhang, X. Zhao, A. F. García-Fernández, E. G. Lim, J. Xiao, "Cross-Frame Feature-Saliency Mutual Reinforcing for Weakly Supervised Video Salient Object Detection" in Pattern Recognition, vol. 150, pp. 1-10, June 2024.
17) B. Zhang, W. Yi, A. F. García-Fernández, L. Kong, "The Trajectory Motion Model Based TPHD and TCPHD Filters for Maneuvering Targets", Information Fusion, vol. 104, pp. 1-14, April 2024.
18) M. Hernandez, A. F. García-Fernández, S. Maskell, "Nonmyopic Sensor Control for Target Search and Track Using a Sample-Based GOSPA Implementation", IEEE Transactions on Aerospace and Electronic Systems, vol. 60, no. 1, pp. 387-404, Feb. 2024.
19) A. F. García-Fernández, J. Xiao, "Trajectory Poisson multi-Bernoulli mixture filter for traffic monitoring using a drone," in IEEE Transactions on Vehicular Technology, vol. 73, no. 1, pp. 402-413, Jan. 2024.
20) Y. Xia, A. F. García-Fernández, F. Meyer, J. L. Williams, K. Granström, L. Svensson, "Trajectory PMB Filters for Extended Object Tracking Using Belief Propagation," IEEE Transactions on Aerospace and Electronic Systems. vol. 59, no. 6, pp. 9312-9331, Dec. 2023.
21) Z. Li, X. Zhu, S. Yao, Y. Yu, A. F. García-Fernández, E. G. Lim, A. Levers, "A Large Scale Digital Elevation Model Super-Resolution Transformer" International Journal of Applied Earth Observation and Geoinformation, vol. 124, 2023.
22) A. F. García-Fernández, Y. Xia, L. Svensson, "Poisson multi-Bernoulli mixture filter with general target-generated measurements and arbitrary clutter," IEEE Transactions on Signal Processing, vol. 71, pp. 1895-1906, 2023.
23) M. Fontana, A. F. García-Fernández, S. Maskell, "Data-driven clustering and Bernoulli merging for the Poisson multi-Bernoulli mixture filter" IEEE Transactions on Aerospace and Electronic Systems, vol. 59, no. 5, pp. 5287-5301, Oct. 2023.
24) Zhuoxiao Li, Zitian Peng, Zheng Zhang, Yijie Chu, Chenhang Xu, Shanliang Yao, Ángel F García-Fernández, Xiaohui Zhu, Yong Yue, Andrew Levers, Jie Zhang,

Jieming Ma, "Exploring modern bathymetry: a comprehensive review of data acquisition devices, model accuracy, and interpolation techniques for enhanced underwater mapping," Frontiers in Marine Science, vol. 30, 2023.
25) J. Guo, J. Ma, A. F. García-Fernández, Y. Zhang, H. Liang, "A survey on image enhancement for low-light images," Heliyon, vol. 9, no. 4, Apr. 2023.
26) S. Särkkä, A. F. García-Fernández, "Temporal parallelisation of dynamic programming and linear quadratic control," IEEE Transactions on Automatic Control, vol. 68, no. 2, pp. 851-866, Feb. 2023.
27) Y. Xia, L. Svensson, A. F. García-Fernández, J. L. Williams, D. Svensson, K. Granström, "Multiple object trajectory estimation using backward simulation," IEEE Transactions on Signal Processing, vol. 70, pp. 3249-3263, 2022.
28) A. F. García-Fernández, L. Svensson, "Tracking multiple spawning targets using Poisson multi-Bernoulli mixtures on sets of tree trajectories," IEEE Transactions on Signal Processing, vol. 70, pp. 1987-1999, 2022.
29) Y. Xia, K. Granström, L. Svensson, M. Fatemi, A. F. García-Fernández, J. L. Williams, "Poisson multi-Bernoulli approximations for multiple extended object filtering," IEEE Transactions on Aerospace and Electronic Systems, vol. 58, no. 2, pp. 890-906, April 2022.
30) S. Hassan, S. Särkkä, A. F. García-Fernández, "Temporal parallelization of inference in hidden Markov models," IEEE Transactions on Signal Processing, vol. 69, pp. 4875-4887, 2021.
31) A. F. García-Fernández, W. Yi "Continuous-discrete multiple target tracking with out-of-sequence measurements," IEEE Transactions on Signal Processing, vol. 69, pp. 4699-4709, 2021.
32) A. F. García-Fernández, S. Maskell, P. Horridge, J. Ralph, "Gaussian tracking with Kent-distributed direction-of-arrival measurements," IEEE Transactions on Vehicular Technology, vol. 70, no. 7, pp. 7249-7254, July 2021,
33) A. F. García-Fernández, J. Ralph, P. Horridge, S. Maskell, "A Gaussian filtering method for multi-target tracking with nonlinear/non-Gaussian measurements," IEEE Transactions on Aerospace and Electronic Systems, vol. 57, no. 5, pp. 3539-3548, Oct. 2021.
34) A. F. García-Fernández, J. L. Williams, L. Svensson, Y. Xia, "A Poisson multi-Bernoulli mixture filter for coexisting point and extended targets," IEEE Transactions on Signal Processing, vol. 69, pp. 2600-2610, 2021.
35) S. Särkkä, A. F. García-Fernández, "Temporal parallelization of Bayesian smoothers," IEEE Transactions on Automatic Control, vol. 66, no. 1, pp. 299-306, Jan. 2021. **The proposed parallel Kalman filter/smoother is included in Tensorflow[1].**
36) A. F. García-Fernández, L. Svensson, J. L. Williams, Y. Xia, K. Granström, "Trajectory Poisson multi-Bernoulli filters," IEEE Transactions on Signal Processing, vol.68, pp. 4933-4945, 2020.
37) D. K. Patel, M. López-Benítez, B. Soni, A. F. García-Fernández "Artificial neural network design for improved spectrum sensing in cognitive radio," Wireless Networks, vol. 26, pp. 6155–6174, 2020.
38) A. F. García-Fernández, A. S. Rahmathullah, L. Svensson, "A metric on the space of finite sets of trajectories for evaluation of multi-target tracking algorithms," IEEE Transactions on Signal Processing, vol. 68, pp. 3917-3928, 2020. **The proposed metric is included in the official Matlab release[2].**
39) A. F. García-Fernández, S. Maskell, "Continuous-discrete multiple target filtering: PMBM, PHD and CPHD filter implementations," IEEE Transactions on Signal Processing. vol. 68, pp. 1300-1314, 2020.

[1] https://www.tensorflow.org/probability/api_docs/python/tfp/experimental/parallel_filter/kalman_filter

[2] https://uk.mathworks.com/help/fusion/ug/introduction-to-tracking-metrics.html

40) A. F. García-Fernández, L. Svensson, M. R. Morelande, "Multiple target tracking based on sets of trajectories," IEEE Transactions on Aerospace and Electronic Systems, vol. 56, no. 3, pp. 1685-1707, June 2020.
41) R. Hostettler, F. Tronarp, A. F. García-Fernández, S. Särkkä, "Importance densities for particle filtering using iterated conditional expectations," IEEE Signal Processing Letters, vol. 27, pp. 211-215, 2020.
42) M. Raitoharju, A. F. García-Fernández, R. Hostettler, R. Piché, S. Särkkä, "Gaussian mixture models for signal mapping and positioning," Signal Processing, vol. 168, article 107330, March 2020.
43) Y. Xia, K. Granström, L. Svensson, A. F. García-Fernández, J. L. Williams, "Multi-scan implementation of the trajectory Poisson multi-Bernoulli mixture filter," ISIF Journal of Advances in Information Fusion, Special Issue on Multiple Hypothesis Tracking, Vol. 14, no. 2, pp 213-235, Dec. 2019.
44) W. Yi, L. Fu, A. F. García-Fernández, L. Xu, L. Kong, "Particle filtering based track-before-detect method for passive array sonar systems," Signal Processing, vol. 165, pp. 303-314, Dec. 2019.
45) A. F. García-Fernández, L. Svensson, "Trajectory PHD and CPHD filters," IEEE Transactions on Signal Processing, vol. 67, no. 22, pp. 5702-5714, Nov. 2019.
46) L. Úbeda-Medina, A. F. García-Fernández, J. Grajal, "Sigma-point multiple particle filtering," Signal Processing, vol. 160, pp. 271-283, July 2019.
47) A. F. García-Fernández, F. Tronarp, S. Särkkä, "Gaussian target tracking with direction-of-arrival von Mises-Fisher measurements," IEEE Transactions on Signal Processing, vol. 67, no. 11, pp. 2960-2972, June 2019.
48) A. F. García-Fernández, F. Tronarp, S. Särkkä, "Gaussian process classification using posterior linearisation," IEEE Signal Processing Letters, vol. 26, no. 5, pp. 735-739, May 2019.
49) A. F. García-Fernández, R. Hostettler, S. Särkkä, "Rao-Blackwellized posterior linearization backward SLAM," IEEE Transactions on Vehicular Technology, vol. 68, no.5, pp. 4734-4747, May 2019.
50) A. F. García-Fernández, J. L. Williams, K. Granström, L. Svensson, "Poisson multi-Bernoulli mixture filter: direct derivation and implementation," IEEE Transactions on Aerospace and Electronic Systems, vol. 54, no. 4, pp. 1883-1901, Aug. 2018.
51) M. Raitoharju, L. Svensson, A. F. García-Fernández, R. Piché, "Damped posterior linearization filter," IEEE Signal Processing Letters, vol. 25, no. 4, pp. 536-540, April 2018.
52) F. Tronarp, A. F. García-Fernández, S. Särkkä, "Iterative filtering and smoothing In non-Linear and non-Gaussian systems using conditional moments," IEEE Signal Processing Letters, vol. 25, no. 3, pp. 408-412, March 2018.
53) A. F. García-Fernández, L. Svensson, S. Särkkä, "Cooperative localization using posterior linearization belief propagation", IEEE Transactions on Vehicular Technology, vol. 67, no. 1, pp. 832-836, Jan. 2018.
54) L. Úbeda-Medina, A. F. García-Fernández, J. Grajal, "Adaptive auxiliary particle filter for track-before-detect with multiple targets," IEEE Transactions on Aerospace and Electronic Systems, vol. 53, no. 5, pp. 2317-2330, Oct. 2017.
55) A. F. García-Fernández, L. Svensson, S. Särkkä, "Iterated Posterior linearization smoother", IEEE Transactions on Automatic Control, vol. 62, pp. 2056–2063, April 2017.
56) M. Raitoharju, A. F. García-Fernández, R. Piché, "Kullback-Leibler divergence approach to partitioned update Kalman filter", Signal Processing, vol. 130, pp. 289-298, Jan. 2017.
57) J. Vilà-Valls, P. Closas, A. F. García-Fernández, "Uncertainty exchange through multiple quadrature Kalman filtering," in IEEE Signal Processing Letters, vol. 23, no. 12, pp. 1825-1829, Dec. 2016 (also presented at IEEE ICASSP conference 2017).
58) A. F. García-Fernández, "A track-before-detect labelled multi-Bernoulli particle filter with label switching", IEEE Transactions on Aerospace and Electronic Systems, vol. 52, no. 5, pp. 2123-2138, Oct. 2016.

59) L. Hammarstrand, M. Fatemi, A. F. García-Fernández, L. Svensson, "Long-range road geometry estimation using moving vehicles and road-side observations", IEEE Transactions on Intelligent Transportation Systems, vol. 17, no.8, pp. 2144-2158, Aug. 2016.
60) A. F. García-Fernández, B.-N. Vo, "Derivation of the PHD and CPHD filters based on direct Kullback–Leibler divergence minimization," IEEE Transactions on Signal Processing, vol.63, no.21, pp. 5812-5820, Nov. 2015.
61) A. F. García-Fernández, L. Svensson, M. R. Morelande, S. Särkkä. "Posterior Linearization Filter: Principles and Implementation Using Sigma Points," IEEE Transactions on Signal Processing, vol. 63, no.20, pp.5561-5573, Oct. 2015.
62) A. F. García-Fernández and L. Svensson, "Gaussian MAP filtering using Kalman optimization," IEEE Transactions on Automatic Control, vol. 60, no. 5, pp. 1336–1349, May 2015.
63) A. F. García-Fernández, M. R. Morelande, J. Grajal, and L. Svensson, "Adaptive unscented Gaussian likelihood approximation filter," Automatica, vol. 54, pp. 166–175, April 2015.
64) A. F. García-Fernández, M. R. Morelande, and J. Grajal, "Bayesian sequential track formation," IEEE Transactions on Signal Processing, vol. 62, no. 24, pp. 6366–6379, Dec. 2014.
65) A. F. García-Fernández, L. Hammarstrand, M. Fatemi, L. Svensson, "Bayesian road estimation using on-board sensors," IEEE Transactions on Intelligent Transportation Systems, vol. 15, no. 4, pp. 1676-1689, Aug. 2014.
66) M. R. Morelande, A. F. García-Fernández, "Analysis of Kalman filter approximations for nonlinear measurements," IEEE Transactions on Signal Processing, vol. 61, no. 22, pp. 5477–5484, Nov. 2013.
67) A. F. García-Fernández, J. Grajal, O. A. Yeste-Ojeda, "Back-scattering of a helicopter with a millimeter-wave LFMCW Radar," IEEE Transactions on Aerospace and Electronic Systems, vol. 49, no. 4, pp. 2781-2792, Oct. 2013.
68) A. F. García-Fernández, J. Grajal, M. R. Morelande, "Two-layer particle filter for multiple target detection and tracking," IEEE Transactions on Aerospace and Electronic Systems, vol. 49, no. 3, pp. 1569-1588, July 2013.
69) A. F. García-Fernández, M. R. Morelande, and J. Grajal, "Truncated unscented Kalman filtering," IEEE Transactions on Signal Processing, vol. 60, no. 7, pp. 3372–3386, July 2012.
70) A. F. García-Fernández, M. R. Morelande, and J. Grajal, "Multitarget simultaneous localization and mapping of a sensor network," IEEE Transactions on Signal Processing, vol. 59, no. 10, pp. 4544–4558, Oct. 2011.
71) A. F. García-Fernández, J. Grajal, "Asynchronous particle filter for tracking using non-synchronous sensor networks," Signal Processing, vol. 91, no. 10, pp. 2304–2313, Oct. 2011.
72) A. F. García-Fernández, O. A. Yeste-Ojeda, J. Grajal, "Facet Model of Moving Targets for ISAR Imaging and Radar Back-Scattering Simulation," IEEE Transactions on Aerospace and Electronic Systems, vol.46, no.3, pp.1455-1467, July 2010.

BOOK CHAPTERS

1) W. Yi, A. F. García-Fernández, B. Zhang "Tracking multiple underwater vessels with a passive sonar using beamforming and a trajectory PHD filter" in Noisy Oceans: Monitoring Seismic and Acoustic Signals in the Marine Environment, American Geophysical Union (AGU), Wiley, 2024.

CONFERENCE CONTRIBUTIONS

1) B. Hanlon, A. F. García-Fernández, B. Peng, "A comparison between Kalman-MLE and KalmanNet for state estimation with unknown noise parameters," in IEEE International Conference on Multisensor Fusion and Integration (MFI), 2024.
2) G. Jones, A. F. García-Fernández, "GOSPA-Driven multi-Bernoulli Gaussian Sensor Management," in IEEE International Conference on Multisensor Fusion and Integration (MFI), 2024.
3) Y. Xia, A. F. García-Fernández, L. Svensson "Hybrid PHD-PMB Trajectory Smoothing Using Backward Simulation," in IEEE International Conference on Multisensor Fusion and Integration (MFI), 2024 **(Second best paper award)**.
4) M. Li A. F. García-Fernández, "Iterated posterior linearisation filtering for digital carrier synchronisation," in IEEE International Conference on Multisensor Fusion and Integration (MFI), 2024.
5) M. Fontana, T. Hayder, W. Freilinger, A. F. García-Fernández, S. Maskell, "A Poisson Multi-Bernoulli Mixture approach to tracking trains using Distributed Acoustic Sensing" in 26th International Conference on Information Fusion 2024.
6) M. Raitoharju, A. F. García-Fernández, S. Ali-Loytti, S. Särkkä "Stacked iterated posterior linearization filter" in 26th International Conference on Information Fusion 2024.
7) S. Särkkä, A. F. García-Fernández, "On the temporal parallelisation of the Viterbi algorithm" in 31st European Signal Processing Conference, 2023.
8) G. Jones, A. F. García-Fernández, P. W.H. Wong, "GOSPA-driven Gaussian Bernoulli sensor management" in 26th International Conference on Information Fusion, 2023.
9) Y. Xia, A. F. García-Fernández, L. Svensson, "An efficient implementation of the extended object trajectory PMB filter using blocked Gibbs sampling" in 26th International Conference on Information Fusion, 2023.
10) A. F. García-Fernández, Y. Xia, L. Svensson, "A comparison between PMBM Bayesian track initiation and labelled RFS adaptive birth" in 25th International Conference on Information Fusion, 2022.
11) A. F. García-Fernández, J. Ralph, P. Horridge, S. Maskell, "Gaussian trajectory PMBM filter with nonlinear measurements based on posterior linearisation" in 25th International Conference on Information Fusion, 2022.
12) A. Narykov, M. Wright, A. F. García-Fernández, S. Maskell, J. F. Ralph, "Poisson multi-Bernoulli mixture filtering with an active sonar using BELLHOP simulation" in 25th International Conference on Information Fusion, 2022.
13) E. Davies, A. F. García-Fernández, "A multi-Bernoulli Gaussian filter for track-before-detect with superpositional sensors" in 25th International Conference on Information Fusion, 2022.
14) M. Fontana, A. F. García-Fernández, S. Maskell, "A vehicle detector based on notched power for distributed acoustic sensing" in 25th International Conference on Information Fusion, 2022.
15) J. Guo, J. Ma, Á. F. García-Fernández, J. Ge and Y. Zhang, "An Improved Harris Corner Points Detection for Low-Light Scenes Based on Contrast Limited Adaptive Histogram Equalization," 6th International Conference on Imaging, Signal Processing and Communications, pp. 11-15, 2022.
16) A. F. García-Fernández, M. Hernandez, S. Maskell, "An analysis on metric-driven multi-target sensor management: GOSPA versus OSPA," in 24th International Conference on Information Fusion, 2021. **(Jean-Pierre Le Cadre second best paper award).**
17) A. F. García-Fernández, A. S. Rahmathullah, L. Svensson, "A time-weighted metric for sets of trajectories to assess multi-object tracking algorithms" in 24th International Conference on Information Fusion, 2021.

18) A. Chatzopoulou, A. F. García-Fernández, E. Pyzer-Knapp, S. Maskell, "SMC samplers for Bayesian optimization and discovery of additive kernel structure" in 24th International Conference on Information Fusion, 2021.
19) A. F. García-Fernández, S. Maskell, "Continuous-discrete trajectory PHD and CPHD filters" in 23rd International Conference on Information Fusion, 2020.
20) A. F. García-Fernández, L. Svensson, J. L. Williams, Y. Xia, K. Granström, "Trajectory multi-Bernoulli filters for multi-target tracking based on sets of trajectories" in 23rd International Conference on Information Fusion, 2020.
21) Y. Xia, L. Svensson, K. Granström, A. F. García-Fernández, J. L. Williams, "Backward simulation for sets of trajectories" in 23rd International Conference on Information Fusion, 2020.
22) M. Fontana, A. F. García-Fernández, S. Maskell, "Bernoulli merging for the Poisson multi-Bernoulli mixture filter," in 23rd International Conference on Information Fusion, 2020.
23) K. Granström, L. Svensson, Y. Xia, A. F. García-Fernández, J. L. Williams, "Spatiotemporal Constraints for Sets of Trajectories with Applications to PMBM Densities" in 23rd International Conference on Information Fusion, 2020.
24) A. F. García-Fernández, Y. Xia, K. Granström, L. Svensson, J. L. Williams, "Gaussian implementation of the multi-Bernoulli mixture filter" in 22nd International Conference on Information Fusion, 2019.
25) A. F. García-Fernández, L. Svensson, "Spooky effect in optimal OSPA estimation and how GOSPA solves it" in 22nd International Conference on Information Fusion, 2019 **(Jean-Pierre Le Cadre third best paper award).**
26) Y. Xia, K. Granström, L. Svensson, A. F. García-Fernández, J. L. Williams, "Extended target Poisson multi-Bernoulli mixture trackers based on sets of trajectories" in 22nd International Conference on Information Fusion, 2019.
27) R. Hostettler, A. F. García-Fernández, F. Tronarp, S. Särkkä, "Joint calibration of inertial sensors and magnetometers using von Mises-Fisher filtering and expectation maximization" in 22nd International Conference on Information Fusion, 2019.
28) M. Raitoharju, A. F. García-Fernández, S. Särkkä, "Partitioned update binomial Gaussian mixture filter" in 22nd International Conference on Information Fusion, 2019.
29) A. F. García-Fernández, L. Svensson, "Trajectory probability hypothesis density filter," in 21st International Conference on Information Fusion, 2018.
30) K. Granström, L. Svensson, Y. Xia, J. L. Williams, A. F. García-Fernández, "Poisson multi-Bernoulli mixture trackers: continuity through random finite sets of trajectories," in 21st International Conference on Information Fusion, 2018.
31) Y. Xia, K. Granström, L. Svensson, A. F. García-Fernández, "An Implementation of the Poisson Multi-Bernoulli Mixture Trajectory Filter via Dual Decomposition," in 21st International Conference on Information Fusion, 2018.
32) L. Úbeda-Medina, A. F. García-Fernández, J. Grajal, "Robust sensor parameter selection in fully adaptive radar using a sigma-point Gaussian approximation," in IEEE Radar Conference, pp. 263-268, 2018.
33) J. Vilà-Valls, P. Closas, A. F. García-Fernández, C. Fernández-Prades, "Multiple Sigma-point Kalman Smoothers for High-dimensional State-Space Models," in IEEE 7th International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP), 2017.
34) A. S. Rahmathullah, A. F. García-Fernández, L. Svensson, "Generalized optimal sub-pattern assignment metric," in 20th International Conference on Information Fusion, 2017. **(Jean-Pierre Le Cadre best paper award). The proposed metric is included in the official Matlab release[3].**

[3] https://uk.mathworks.com/help/fusion/ref/trackgospametric-system-object.html

35) Y. Xia, K. Granström, L. Svensson, A. F. García-Fernández, "Performance evaluation of multi-Bernoulli conjugate priors for multi-target filtering," in 20th International Conference on Information Fusion, 2017.
36) J. Dunik, O. Straka, A. F. García-Fernández, "Performance evaluation of nonlinearity and non-Gaussianity measures in state estimation," in 20th International Conference on Information Fusion, 2017.
37) L. Úbeda-Medina, A. F. García-Fernández, J. Grajal, "Target tracking using multiple auxiliary particle filtering," in 20th International Conference on Information Fusion, 2017.
38) T. Karvonen, A. Solin, A. F. García-Fernández, F. Tronarp, S. Särkkä, F. H. Lin, "Where is physiological noise lurking in *k*-space?" in proceedings of International Society for Magnetic Resonance in Medicine annual meeting 2017.
39) A. F. García-Fernández, M. R. Morelande, "Explicit filtering equations for labelled random finite sets", in International Conference on Control, Automation and Information Sciences, pp. 349-354, 2015.
40) A. F. García-Fernández, B.-N. Vo, "Derivation of the PHD filter based on direct Kullback-Leibler divergence minimisation" in International Conference on Control, Automation and Information Sciences, pp. 209-213, 2015.
41) M. Fatemi, L. Hammarstrand, L. Svensson, A. F. García-Fernández, "Road geometry estimation using a precise clothoid road model and observations of moving vehicles," in IEEE 17th International Conference on Intelligent Transportation Systems, pp. 238-244, 2014.
42) L. Úbeda-Medina, A. F. García-Fernández, and J. Grajal, "Generalizations of the auxiliary particle filter for multiple target tracking," in 17th International Conference on Information Fusion, 2014.
43) A. F. García-Fernández, L. Svensson, and M. R. Morelande, "Iterated statistical linear regression for Bayesian updates," in 17th International Conference on Information Fusion, 2014.
44) A. F. García-Fernández, B.-N. Vo, and B.-T. Vo, "MCMC-based posterior independence approximation for RFS multitarget particle filters," in 17th International Conference on Information Fusion, 2014.
45) B. Ristic, J. Sherrah, A. F. García-Fernández, "Performance evaluation of random set based pedestrian tracking algorithms," in IEEE 8th International Conference on Intelligent Sensors, Sensor Networks and Information Processing, pp. 300-305, 2013.
46) A. F. García-Fernández, M. R. Morelande, J. Grajal, "Mixture truncated unscented Kalman filtering" in 15th International Conference on Information Fusion, pp. 479-486, 2012.
47) J. Grajal, B. Mencia-Oliva, O. A. Yeste-Ojeda, A. F. García-Fernández, and G. Rubio-Cidre, "A prototype of high resolution ISAR imaging system at millimetre-wave band," in IEEE CIE International Conference on Radar, vol. 1, pp. 551–554, Oct. 2011.
48) A. F. García-Fernández, M. R. Morelande, and J. Grajal, "Particle filter for extracting target label information when targets move in close proximity," in Proceedings of the 14th International Conference on Information Fusion, pp. 795–802, 2011.
49) A. F. García-Fernández, M. R. Morelande, and J. Grajal, "Nonlinear filtering update phase via the single point truncated unscented Kalman filter," in Proceedings of the 14th International Conference on Information Fusion, pp. 17–24, 2011.
50) A. F. García-Fernández, J. Grajal, "Sequential multiple target detection using particle filters," in IEEE Workshop on Statistical Signal Processing, pp. 749–752, 2011.
51) A. F. García-Fernández, J. Grajal, "Multitarget tracking using the joint multitrack probability density," in Proceeding of the 12th International Conference on Information Fusion, Seattle, Washington, USA, pp. 595-602, July 6-9, 2009.
52) A. F. García-Fernández, J. Grajal, O. A. Yeste-Ojeda, "Analysis of ISAR images of a helicopter by a facet model," in Proceedings of the 2008 International Conference on Radar, Adelaide, Australia, pp. 32-37, September 2-5, 2008.

SUPERVISION OF PHD STUDENTS

Current PhD students:

- Main supervisor of Roberto Pérez Pérez (Universidad Politécnica de Madrid). Start date: October 2025.

- Main supervisor of Sion Lynch (University of Liverpool, UK). Start date: October 2024. Cosupervisor: Dr. Lee Devlin (UoL) and Dr. David Cormarck (Leonardo). Project co-funded by Leonardo https://uk.leonardocompany.com.

- Main supervisor of Sarah Askevold (University of Liverpool, UK) from September 2024. Start date: October 2022. Cosupervisors: Brianna Heazlewood (Department of Physics), Simon Maskell, Leszek Gasieniec (Department of Computer Science), Veronica Bowman (DSTL). Project co-funded by DSTL https://www.gov.uk/government/organisations/defence-science-and-technology-laboratory .

- Main supervisor of Rui Yang (University of Liverpool, UK, and National Tsing Hua University (NTHU), Taiwan). Start date: December 2023. Cosupervisor: Dr. Che-Rung Lee (NTHU). Dual PhD project for University of Liverpool and NTHU. https://nthu-en.site.nthu.edu.tw.

- Main supervisor of Bettina Hanlon (University of Liverpool, UK. Start date in October 2022. Cosupervisors: Dr. Bei Peng (University of Liverpool, UK) and Tom L. (Government Communication Headquarters, GCHQ, UK). PhD project funded by the Center of Doctoral Training in Distributed Algorithms. Project co-funded by GCHQ https://www.gchq.gov.uk.

- Main supervisor of Jinhao Gu (University of Liverpool, UK). Start date in November 2021. Cosupervisors: Dr. Robert Firth (Hartree centre, Science and Technology Facilities Council (STFC), UK), Prof. Rasmita Raval (Department of Chemistry, University of Liverpool), Dr. Joanne O'Keeffe (Unilever). PhD project funded by the Center of Doctoral Training in Distributed Algorithms. Project co-funded by Unilever https://www.unilever.co.uk.

- Main supervisor of George Jones (University of Liverpool, UK). Start date in October 2021. Cosupervisors: Prof. Prudence Wong (University of Liverpool, UK), Dr Scott Page (Roke). PhD project funded by the Center of Doctoral Training in Distributed Algorithms. Project co-funded by Roke https://www.roke.co.uk.

- Main supervisor of Elinor Davies (University of Liverpool, UK). Start date in October 2020. Cosupervisors: Dr. Vassil Alexandrov (Hartree centre, Science and Technology Facilities Council (STFC), UK), Dr. David Greig (Leonardo). PhD project funded by the Center of Doctoral Training in Distributed Algorithms. Project co-funded by Leonardo https://uk.leonardocompany.com.

- Cosupervisor of Jiawei Guo (Xi'an Jiaotong-Liverpool University, China and University of Liverpool, UK). Start date in February 2021. Main supervisor Jieming Ma (XJTLU). Other cosupervisors: Hai-Ning Liang (XJTLU), Ji Ge (JITRI, China).

- Cosupervisor of Zhuoxiao Li (Xi'an Jiaotong-Liverpool University, China and University of Liverpool, UK). Start date in Sep. 2021. Main supervisor: Xiaohui Zhu (XJTLU). Other cosupervisors: Yong Yue (XJTLU), Andrew Levers (University of Liverpool).

- Cosupervisor of Jian Wang (Xi'an Jiaotong-Liverpool University, China and University of Liverpool, UK). Start date in Sep. 2021. Main supervisor: Eng Gee Lim (XJTLU). Other cosupervisors: Jimin Xiao (XJTLU).

- Cosupervisor of Fengchen Gu (Xi'an Jiaotong-Liverpool University, China and University of Liverpool, UK). Start date in Dec. 2021. Main Supervisor: Huakang Li (XJTLU). Other cosupervisor: Jionglong Su (XJTLU).

- Cosupervisor of Xiaoyu Huang (Xi'an Jiaotong-Liverpool University, China and University of Liverpool, UK). Start date in June 2022. Main supervisor: Yong Yue (XJTLU). Other cosupervisors: Xiaohui Zhu (XJTLU) and Eng Gee Lim (XJTLU).

- Cosupervisor of Huijia Wang (Xi'an Jiaotong-Liverpool University, China and University of Liverpool, UK). Start date in September 2023. Main supervisor: Angelos Stefanidis (XJTLU). Other cosupervisors: Zhengyong Jiang (XJTLU), Jionglong Su (XJTLU).

- Cosupervisor of Zhepeng Li, (Xi'an Jiaotong-Liverpool University, China and University of Liverpool, UK). Start date in June 2023. Main supervisor: Jionglong Su. Other cosupervisors: Angelos Stefanidis(XJTLU), Zhengyong Jiang (XJTLU), Siqi Huang (XJTLU).

Completed graduation:

- Cosupervisor of Qilei Sun (Xi'an Jiaotong-Liverpool University, China and University of Liverpool, UK). PhD thesis title: "Enhanced Precision and Natural Interaction for Virtual Acupuncture Training". Main supervisor: Paul Craig (XJTLU). Other cosupervisors: Jimin Xiao (XJTLU), Cheng Zhang (XJTLU). Viva: November 2024.

- Main supervisor of Marco Fontana (University of Liverpool, UK). PhD thesis title "Multi-target detection and tracking using distributed acoustic sensing"t. Cosupervisor: Prof. Simon Maskell. Project fully funded by Sintela https://sintela.com. Viva September 2024

- Cosupervisor of Aikaterini Chatzopoulou (University of Liverpool, UK). PhD thesis title: "Sequential Monte Carlo samplers for Structure Discovery". Main supervisor: Prof. Simon Maskell. Other cosupervisor: Dr. Edward O. Pyzer-Knapp (IBM Research, UK). PhD project funded by EPSRC via an Industrial Cooperative Awards in Science & Technology (ICASE) award with IBM https://www.ibm.com/uk-en. Viva: January 2024.

- Cosupervisor of Mohammed Alammar (University of Liverpool, UK). PhD thesis title: "Enhanced Signal Area Estimation for Spectrum-Aware Systems based on Image Processing Techniques". Main Supervisor: Miguel López-Benítez. Viva: May 2023.

- Main supervisor of Siu Lun Yeong (University of Liverpool, UK). PhD. thesis title: "Efficient estimators and smoothers". Cosupervisors: Jeyarajan Thiyagalingam (Rutherford Appleton Laboratory, Science and Technology Facilities Council (STFC), UK), Dr. Jerry Chou, Prof. Danushka Bollegala. Viva: February 2020. Thesis link: https://livrepository.liverpool.ac.uk/3133376.

- Cosupervisor of Jaehoon Cha (Xi'an Jiaotong-Liverpool University, China and University of Liverpool, UK). PhD thesis title "Artificial Neural Network Design

Approaches to Multi-Channel Information Analysis," Main Supervisor: Sanghyuk Lee. Other cosupervisors: Eng Lim, Kyeong Kim and Jeyan Thiyagalingam. Graduation: October 2020. Thesis link: https://livrepository.liverpool.ac.uk/3105330

- Cosupervisor of Luis Úbeda-Medina (Technical University of Madrid, Spain). PhD. thesis title "Robust techniques for multiple target tracking and fully adaptive radar". Main supervisor: Prof. Jesús Grajal. Graduation in November 2018. Thesis link: https://oa.upm.es/53209.

- Cosupervisor of Abu Sajana Rahmathullah (Chalmers University of Technology, Gothenburg, Sweden). PhD. thesis title: "Data association algorithms and metric design for trajectory estimation". Main supervisor: Prof. Lennart Svensson. Other cosupervisor: Dr. Daniel Svensson (Volvo Car Corporation). Graduation in May 2016. Thesis link: https://research.chalmers.se/en/publication/242484.

VISITING PHD STUDENTS

- Supervisor of the visit of Fengchen Gu (Xi'an Jiaotong-Liverpool University, China) at the University of Liverpool, UK, March-August 2024 (6 months).

- Supervisor of the visit of Lukas Herrmann (Norwegian University of Science and Technology, Norway) at the University of Liverpool, UK, Feb-Jun 2024 (5 months).

- Supervisor of the visit of Fatemeh Yaghoobi (Aalto University, Finland) at the University of Liverpool, UK, Apr-July 2023 (3 months).

- Supervisor of the visit of Abu Sajana Rahmathullah (Chalmers University of Technology, Sweden) at Curtin University, Australia, Sept-Oct 2015 (2 months).

AWARDS AND PRIZES

- I am included in the "World's Top 2% Scientists List" by Stanford University (years 2023-2024).
https://elsevier.digitalcommonsdata.com/datasets/btchxktzyw/6

- Second best paper award at the 2024 IEEE International Conference on Multisensor Fusion and integration (MFI) for the paper "Hybrid PHD-PMB Trajectory Smoothing Using Backward Simulation" (September 2024).

- Jean Pierre Le Cadre **second best paper award** at the 24th International Conference on Information Fusion, Sun City, South Africa, for the paper "An analysis on metric-driven multi-target sensor management: GOSPA versus OSPA" (November 2021).

- Jean Pierre Le Cadre **third best paper award** at the 22nd International Conference on Information Fusion, Ottawa, Canada, for the paper "Spooky effect in optimal OSPA estimation and how GOSPA solves it" (July 2019).

- Jean Pierre Le Cadre **best paper award** at the 20th International Conference on Information Fusion, Xi'an, China, for the paper "Generalized optimal sub-pattern assignment metric" (July 2017).

- Special Mention Award for **excellent academic performance** by the School of Telecommunication Engineering, Technical University of Madrid, Spain (June 2008).

SCIENTIFIC TASKS

- Associate Editor of IEEE Access (since Oct. 2021).
- Associate Editor of the IEEE International Conference on Intelligent Transportation Systems (2018-2023).
- Associate Editor of the IEEE Intelligent Vehicles Symposium (2024-2025).

- Member of the Engineering and Physical Sciences Research Council (EPSRC) Peer Review College (since Jan 2022). Members of this college review grants submitted to EPRSC.
- Member of the EPSRC Associate Peer Review College (Nov. 2021- Jan 2022).

- Reviewer of the following journals: IEEE Transactions on Signal Processing, IEEE Transactions on Aerospace and Electronic Systems, IEEE Signal Processing Letters, IEEE Transactions on Intelligent Transportation Systems, IEEE Transactions on Vehicular Technology, IEEE Transactions on Automatic Control, IEEE Transactions on Wireless Communications, IEEE Transactions on Circuits and Systems I, IEEE Systems Journal, IEEE Sensors Journal, IEEE Transactions on Instrumentation and Measurement, IEEE Transactions on Robotics, Automatica, Signal Processing, Digital Signal Processing, ISIF Journal of Advances in Information Fusion, IET Radar, Sonar & Navigation, Systems and Control Letters, Neurocomputing, IEEE Access, Journal of Guidance, Control and Dynamics.

- Reviewer of a book proposal for Wiley.

- Member of the Awards Committee (student paper awards) in the 22nd International Conference on Information Fusion (2019).
- Chair of the session "Random Finite Sets and Finite Point Processes 2" in the 24th International Conference on Information Fusion (2021).
- Chair of the session "Point Process Methods 2" in the 21st International Conference on Information Fusion (2018).
- Member of the Technical Program Committee of the International Conference of Information Fusion (2010-2015, 2017, 2024), and Program Committee (2022, 2023).
- Member of the Technical Program Committee (Meta Reviewer) of the IEEE International Conference on Multisensor Fusion and Integration (MFI 2024).
- Member of the Technical Program Committee ICASSP 2017-2019, 2021-2022.
- Member of the Technical Program Committee SSPD conference 2022.
- Member of the Technical Program Committee of the IEEE International Conference on Intelligent Transportation Systems (2015).
- Member of the Program Committee the IEEE International Workshop on Machine Learning for Signal Processing (2018).
-Member of the Technical Program Committee of the IEEE International Conference on Intelligent Sensors, Sensor Networks and Information Processing (2013).
- Member of the Technical Program Committee of the IEEE Workshop on Statistical Signal Processing (2014).
- Member of the Technical Program Committee of the International Conference on Signal Processing and Integrated Networks (2015-2018).
- Member of the Technical Program Committee of the International Conference on Future Networks Systems and Security (2015).

- Member of the Technical Program Committee of the International Conference on Computer, Communications and Control Technology (2015).
- Member of the Technical Program Committee of the IEEE Sensor Array and Multichannel Signal Processing Workshop (2018).
- Reviewer of IEEE Intelligent Vehicles Symposium (2019).

FUNDING

- Project "Multi-static Radar Tracking and Data Fusion," (143,574€). PI: Ángel García-Fernández . Funder: Indra. Duration: 15 months. February 2025 – May 2026.

- Project "Multi-static Radar Simulator Support," (131,496€). PI: Rodrigo Blázque, CI: Ángel García-Fernández . Funder: Indra. Duration: 15 months. February 2025 – May 2026.

- PhD studentship "Marine track-before-detect: Machine learning to track multiple objects using raw radar data in the maritime environment," (£120,495). Supervisor: Ángel García-Fernández. Project co-funded by the University of Liverpool (50%) and Leonardo (50%) https://uk.leonardocompany.com. Duration 4 years (Oct. 2024- Sep. 2028).

- Project "Stone Soup - Software infrastructure for tracking and state estimation in orbital scenarios," £120,912). PI: Ángel García-Fernández (34%). CI: Simon Maskell (33%), Lee Devlin (33%). Funder: DSTL, U.K. Duration: 8 months. October 2023 – June 2024.

- Project "Development of Prototype Toolset for Space Object Manoeuvre Detection, Estimation and Behavioural Profiling," (£91,621). PI: Ángel García-Fernández (50%). CI: Simon Maskell (25%), Lee Devlin (25%). Funder: DSTL, U.K. Duration: 11 months. September 2023 – July 2024.

- Project "Consensus algorithms for distributed, large-scale object detection, tracking, and sensor management," (£9,310). PI: Ángel García-Fernández. Co-Applicant: Prof. Giorgio Battistelli (University of Florence, Italy). Funder: Royal Society, https://royalsociety.org, U.K. Duration: 2 years (September 2023 – August 2025).

- PhD studentship "Scalable battery state-of-charge estimation via parallel Bayesian machine learning," Dual PhD Program of the National Tsing Hua University (NTHU), Taiwan, and the University of Liverpool, UK. Full tuition fees for 4 years and stipend (around £111,200+ £6,720 + $264,000 TWD). Start date: Dec 2023. Supervisors: Ángel García-Fernández, Che-Rung Lee (NTHU). https://nthu-en.site.nthu.edu.tw.

- Project "ROBUSSTOD - Robust Orbit Determination for Space Debris". Funder: European Space Agency. Joint project with GMV Aerospace and Defence (Spain), Universidad Carlos III de Madrid (Spain) and University of Liverpool. PI from UoL: Simon Maskell (34%), CIs: Ángel García-Fernández (33%), Lee Devlin (33%). (UoL funding £87,454). UoL contribution duration, 1 year and 6 months (Sep. 2022 – Feb. 2024). Total project duration, 2 years and 2 months https://www.gmv.com/en, https://www.esa.int.

- Project "Goal decomposition and information theory" (£299,776). PI: Simon Maskell (50%), CIs: Ángel García-Fernández (25%), Rahul Savani (25%). Funder Defence, Science and Technology Laboratory, U.K. Duration: 14 months (April 2022 – June 2023).

- Project "Traffic monitoring using a UAV with optical and thermal camera fusion and deep learning" (£7,800). PI: Ángel García-Fernández. Funder: Royal Society https://royalsociety.org, U.K. Duration: 1 year (March 2022 – March 2023).

- Project "Bayesian Localisation in the Underwater Environment (BLUE)" (£1,429,518.88). PI: Jason Ralph (50%), CIs: Simon Maskell (25%), Ángel García-Fernández (25%). Funder: Defence estates, Ministry of Defence, U.K. Duration: 3 years (Nov. 2019 – Oct. 2022).

- Project "Fusion and Information Theory - Understanding and Exploiting Information" (£929,242.33). PI: Simon Maskell (60%). CIs: Ángel García-Fernández (20%), Andrew Levers (20%). Funder: Defence, Science and Technology Laboratory, U.K. Duration: 2 years (Dec. 2019 – Nov. 2021).

- PhD studentship "Learning Transparent Models from Data-driven Algorithms to Enhance Streaming Data Analysis". EPSRC center of doctoral training on distributed algorithms (£123,960). Co-funded by GCHQ. https://www.gchq.gov.uk. Duration 4 years (Oct. 2022- Sep. 2026).

- PhD studentship "Artificial Intelligence for Fast Discovery of Novel Materials for Healthcare". EPSRC center of doctoral training on distributed algorithms (£123,960). Co-funded by Unilever https://www.unilever.co.uk. Duration 4 years (Nov. 2021- Oct. 2025).

- PhD studentship "Non-Myopic Approaches to Sensing and Surveying". EPSRC center of doctoral training on distributed algorithms (£123,960). Co-funded by Roke www.roke.co.uk. Duration 4 years (Oct. 2021- Sep. 2025).

- PhD studentship "Better Bayesian Track Before Detect using Statistical Machine Learning". EPSRC center of doctoral training on distributed algorithms (£123,960). Co-funded by Leonardo https://uk.leonardocompany.com. Duration 4 years (Oct. 2020- Sep. 2024).

- Travel grant (3 weeks Micro Sabbatical) awarded by the Norwegian University of Science and Technology (Trondheim, Norway) Jan 2020 (£1,863).

- PhD studentship "High Performance Processing of Distributed Acoustic Sensing Data: Turning Optical Fibres into Massively Parallel Microphone Arrays" for the University of Liverpool, U.K. Fully funded by Sintela https://sintela.com (£107,492). Main supervisor: Ángel García-Fernández. Co-supervisor: Simon Maskell. Duration: 4 years (Sept. 2019- Aug. 2023).

- Research-oriented consultancy contract for Sintela. Simon Maskell (50%) and Ángel García-Fernández (50%). February 2019 – May 2019 (£6,450).

- Travel grant as guest researcher (2 weeks) awarded by Chalmers University of Technology, May 2018 (£1,477)

- Travel grant as guest researcher (2 weeks) awarded by Chalmers University of Technology, May 2016. (SEK 12214 + 2 week hotel)

- FPU Fellowship from the Spanish Ministry of Education to obtain the PhD (2008-2012). This fellowship is quite competitive and awarded to the best students/projects at a national level (approx. 65,000 €)

- Funding, within the FPU program, to perform a 4-month research visit to University of Melbourne, Australia, in 2009 (7,200 €)

- Funding, with the FPU program, to perform a 3-month research visit to the University of Melbourne, Australia, in 2010 (5,700 €).

- Five excellent academic performance scholarships from the Madrid Regional Government awarded to the best undergraduate students in the Madrid region (2002-2007). This scholarship provided funding for research at an undergraduate level (4,500 € per year).

RESEARCH PROJECTS

I have been a researcher in the following projects:

- Title: "Crowdsourced mapping of the environment – multimodal real-time SLAM via combined inertial, optical, and magnetic sensoring (CrowdSLAM)"
  Main investigators: Simo Särkkä and Juho Kannala.
  Funded by: Academy of Finland.
  Budget: 500.000 €.
  Duration: 2016-2017.

- Title "Ultra-fast fMRI and fMRI-EEG methods for mapping hemodynamic and neuronal brain responses to naturalistic stimuli"
  Main investigators: Fa-Hsuan Lin and Simo Särkkä.
  Funded by: Academy of Finland
  Budget: 574.143 €.
  Duration: 2016-2020.

- Title: "A stochastic geometric framework for Bayesian sensor array processing"
  Main investigators: B.-N. Vo and R. Hoseinnezhad.
  Funded by: Australian Research Council Discovery Project (DP130104404).
  Budget: $295.000.
  Duration: 2013-2015.

- Title: ASIS - Algorithms and Software for improved safety
  Main investigators: Mats Viberg/ Tomas McKelvey.
  Funded by: Volvo car corporation/ Vinnova.
  Budget: 3.200.000 SEK.
  Duration: 2007-2012.

- Title: Red de sensores terrestres no atendidos (Unattended terrestrial sensor networks)
  Main investigator: Jesús Grajal de la Fuente.
  Funded by: Gestión avanzada de tecnologías electrónicas (GATE. S.A.).
  Budget: 30.000 €.
  Duration: 2008-2009.

- Title: COMONSENS (CSD2008-00010) Foundations and Methodologies for future communications and sensor networks.
  Main investigator: Javier Rodríguez Fonollosa/ Santiago Zazo Bello (UPM).
  Funded by: Ministerio de Educación y Ciencia.
  Budget: 3.500.000 €.
  Duration: 2009-2013.

- Title: Sensores heterodinos activos en la banda de Terahercios para detección remota. (Heterodine active Terahertz sensors for remote detection)
  Main investigator: Jesús Grajal de la Fuente.

Funded by: Ministerio de Ciencia e Innovación.
Budget: 342.793 €.
Duration: 2012-2014.

- Title: Radares de alta resolución en bandas milimétricas (High resolution millimeter wave radars)
Main investigator: Alberto Asensio López.
Funded by: Comisión Interministerial de Ciencia y Tecnología.
Duration: 2002-2005.

- Title: Evaluación de factores de error y algoritmos para TDOA aplicados a radiocomunicaciones (Evaluation of error factors and algorithms for TDOA applied to radiocommunications)
Main investigator: Jesús Grajal de la Fuente
Funded by: Indra.
Duration: 2007-2008.

- Title: A novel technology for ultra-sensitive reliable integrated magnetic sensors: a new era in magnetic detection SENPIMAG (E040915069)
Main investigator: Claudio Aroca Hernández Ros.
Funded by: European Union.
Duration: 2003-2010.

EXAMINATION OF PHD THESES

- Audun Gullikstad Hem, "Maritime Target Tracking With Exteroceptive Sensors and Target-Provided Information," Department of Engineering Cybernetics, Norwegian University of Science and Technology, Norway (Jun. 2024). Supervisors: Edmund Brekke and Thor Inge Fossen.

- Raya Alhajri, "Investigation Into the Impact of Human Body Shadowing and Device Stressing on ZigBee based Radio Frequency Fingerprinting Identification," Department of Electrical Engineering and Electronics, University of Liverpool, UK (Jan. 2024). Supervisors: Prof. Alan Marshall and Prof. Xinping Yi.

- Lyudmil Vladimirov, "Mathematical Models and Monte-Carlo Algorithms for Improved Detection of Targets in the Commercial Maritime Domain," Department of Electrical Engineering and Electronics, University of Liverpool, UK (Dec. 2019) Supervisors: Prof. S. Maskell, Prof. J. Ralph, Dr. S. Lee.

- Yifan Zhou, "Analysing large-scale surveillance video," Department of Computer Science, University of Liverpool, UK (Jun. 2018), Supervisors: Prof. S. Maskell and Prof. R. Savani.

RESEARCH STAYS IN OTHER INSTITUTIONS

I have performed the following research stays, with at least one week of duration:

Dipartimento di Ingegneria dell'Informazione — 2 weeks in Jan 2024
University of Florence, Florence, Italy
Collaborator: Giorgio Battistelli

Department of Engineering Cybernetics — 3 weeks in Jan. 2020
Norwegian University of Science and Technology, Trondheim, Norway

Collaborator: Edmund Brekke

Advanced Mining Technology Center — 1 week in Sept. 2018
Department of Electrical Engineering
Universidad de Chile, Santiago, Chile
Collaborator: Martin Adams

Department of Electrical Engineering — 11 days in May 2018
Chalmers University of Technology, Gothenburg, Sweden
Collaborators: Lennart Svensson, Karl Granström

Department of Signals and Systems — 2 weeks in Jun. 2016
Chalmers University of Technology, Gothenburg, Sweden
Collaborators: Lennart Svensson, Karl Granström

Defence Science and Technology Group (Australian Department of Defence) and the University of Adelaide, Australia — 1 week in Apr. 2016
Collaborator: Jason Williams

Dept. of Electrical and Electronic Engineering — Aug. 2009 /Dec. 2009
The University of Melbourne, Melbourne, Australia
Supervisor: Mark R. Morelande

Dept. of Electrical and Electronic Engineering — Sep. 2010 /Dec. 2010
The University of Melbourne, Melbourne, Australia
Supervisor: Mark R. Morelande

TEACHING EXPERIENCE

I obtained the "Certificate in Professional Studies in Learning and Teaching in Higher Education" at the University of Liverpool, U.K., in October 2019 (60 credits). I achieved the status of Fellow of the Higher Education Academy, U.K., in June 2019. I also have the following teaching experience in four different countries.

United Kingdom

- Since 2017/2018: Coordinator of Advanced Signal Processing (ELEC474, 15 credits), University of Liverpool, UK.
- Since 2022/2023: Coordinator of Project, Problem Solving and Industrial Awareness (ELEC222, 7.5 credits).
- Since 2022/2023: Coordinator of Applied Design and Industrial Awareness (ELEC273, 15 credits).
- From 2022/2023 to 2023-2024 (2 academic years): Coordinator of Problem Solving and Industrial Awareness (ELEC224, 7.5 credits)
- In 2020/2021 and 2021/2022 (2 academic years=: Coordinator of Neural Networks (ELEC320, 7.5 credits), University of Liverpool, UK.
- From 2017/2018 to 2021/2022 (5 academic years): Lecturer of Project, Problem Solving and Industrial Awareness (ELEC222, 7.5 credits).
- From 2017/2018 to 2021/2022 (5 academic years): Lecturer of Problem Solving and Industrial Awareness (ELEC224, 7.5 credits)

- From 2017/2018 to 2021/2022 (5 academic years): Lecturer of Applied Design and Industrial Awareness (ELEC273, 15 credits).
- In 2020/2021: Lecturer of 50% of Computational Intelligence (COMP575, 15 credits), University of Liverpool, UK.
- Supervisor and assessor of final year BEng/MEng and MSc projects.

Finland

- Seminar course on recent advances in nonlinear filtering and smoothing (3 credits), Aalto University, Finland. Coordinator and main lecturer, (2017).
- Nonlinear filtering and parameter estimation (5 credits), Aalto University, Finland. I delivered one third of the lectures and the tutorials. I also assessed student projects (2017).

Australia

- Signals and systems (25 credits), Curtin University of Technology, Australia. I delivered 50% of the lectures and the tutorials in the academic year 2015 and in 2016.

Spain

- Communication theory (6 credits), Technical University of Madrid, Spain: Laboratory assistant (2012).
- Laboratory of digital electronic systems (3 credits), Technical University of Madrid, Spain: Laboratory assistant (2005).
- Laboratory of electronic circuits (4.5 credits), Technical University of Madrid, Spain: Laboratory assistant (2004).

TUTORIALS, WORKSHOPS AND GUEST LECTURES

I have designed and delivered the tutorial "Poisson multi-Bernoulli mixtures for multiple target tracking," Authors: Á. F. García-Fernández, Y. Xia. Collaborators: K. Granström, L. Svensson.

- 28th International Conference on Information Fusion, Ro de Janeiro, Brazil, July 2025. Presenters: Y. Xia, Y. Ge (3 hours).
- 2024 IEEE International Conference on multi-sensor Fusion and Integration (MFI). Presenter: Y. Xia (3 hours).
- 27th International Conference on Information Fusion, Venice, Italy, July 2024. Presenters: Á. F. García-Fernández, Y. Xia (3 hours)
- 25th International Conference on Information Fusion, Linkoping, Sweden, July 2022. Presenters: Á. F. García-Fernández, Y. Xia. Collaborators: K. Granström, L. Svensson (3 hours).
- 24th International Conference on Information Fusion, Sun city, South Africa, November 2021. Presenters: Á. F. García-Fernández, Y. Xia (3 hours)
- 23rd International Conference on Information Fusion, South Africa, July 2020. Presenters: Á. F. García-Fernández, Y. Xia.
-

I have given the following workshop:

- "On the value of information via metrics" Defence Science and Technology Laboratory, UK. Presenter: Á. F. García-Fernández. Collaborators: M. Hernandez, S. Maskell. 29th January 2021 (3 hours).
-

I have given the following guest lectures on my research that are part of an official course at a different university:

- Guest lecture (2 hours) entitled "Introduction to random finite sets and the Poisson multi-Bernoulli mixture filter for multiple target tracking" in the course "Non-linear state estimation", Norwegian University of Science and Technology, Trondheim, Norway, January 2020.

- Guest lecture (2 hours) entitled "Beyond the EKF and the UKF: the iterated posterior linearisation filter" in the course "Non-linear state estimation", Norwegian University of Science and Technology, Trondheim, Norway, January 2020.

- Guest lecture (1 hour) on "Posterior linearization and iterated filters and smoothers" in the course "Model-based estimation", Tampere University of Technology, Finland, 10th April 2017.

ADMINISTRATIVE ROLES

- Coordinator of the Electrical Engineering and Electronics Year 2 laboratories

  - This role involves managing and coordinating the laboratory experiments for ELEC222, ELEC224, ELEC273 and also the experiments for ELEC270 (Signals and Systems), ELEC271 (Electronic Circuits and Systems), ELEC211 (Digital Electronics and Microprocessor Systems), and ELEC207 (Instrumentation and Control).
  - This role involves leading a team of 5 academics, 5 laboratory technicians and 14 student teaching assistants. It also requires engaging with the coordinators of ELEC270, ELEC271, ELEC211 and ELEC207 to carry out the experiments. The marking of all the assignments of these experiments is also coordinated by the Year 2 lab coordinator.
  - Most experiments are full day experiments and take place on Thursdays and Fridays in both semesters.
  - This role involves coordinating the Year 2 group projects, including the bench inspection and report grading. This involves the coordination of all EEE academics, all students enrolled in ELEC222 and ELEC273, all Year 2 labs teaching assistants and the lab technicians.
  - This role involves engaging with the School Health and Safety officer for the risk assessment training and safety inductions for Year 2 students.
  - This role involves being a member of the Staff-Student Liaison Committee (SSLC).
  - This role involves checking and signing the time sheets of Year 2 lab demonstrators for payment.

- Year 2 Coordinator of the Department of Electrical Engineering and Electronics since July 2022. This role includes:
  - Solving matters related to Year 2 students and Year 2 timetabling.
  - Approving the coursework calendar for Year 2 students.
  - Chairing the Departmental progress meeting for Year 2 undergraduate students (together with the Program Director).
  - Approving the briefing sheets of all Year 2 assignments.
  - Delivering a welcome lecture for Year 2 students in the welcome week.
  - Engaging with the English Language Center to find and deliver adequate English support for foreign Year 2 students.

- Member of the Board of Studies of the Department of Electrical Engineering and Electronics.
- Member of the Board of Studies of the English Language Center.

- Member of the Electrical Engineering and Electronics Year 2 laboratories management team (deputy Year 2 master), University of Liverpool from Oct. 2017 to Jul. 2022.

- Liaison officer of the Department of Electrical Engineering and Electronics for Mathematics and Engineering, University of Liverpool from Aug. 2018 to Jul. 2022. This includes being:
- Member of the Board of Studies in Mathematics Sciences.
- Member of the Board of Studies of Mechanical, Material and Manufacturing Engineering.
- Member of the Board of Studies of Aerospace Engineering.

- Member of the Equality, Diversity and Inclusion committee and the Athena SWAN self-assessment team, School of Electrical Engineering, Electronics and Computer Science, University of Liverpool, from Feb. 2019 to Oct. 2022). The team achieved the bronze award of the Athena SWAN charter in 2019.

RESEARCH SOFTWARE

I have made the code of some of the above publications publicly available at https://github.com/Agarciafernandez.

LANGUAGE SKILLS

- Spanish: Native Speaker.
- English: Certificate of Proficiency in English, University of Cambridge (UK), May 2011.

REFERENCES

- Prof. Lennart Svensson
  Department of Signals and Systems
  Chalmers University of Technology, Gothenburg, Sweden
  Email: lennart.svensson@chalmers.se

- Prof. Simo Särkkä
  Department of Electrical Engineering and Automation
  Aalto University, Espoo, Finland.
  Email: simo.sarkka@aalto.fi

- Dr. Mark R. Morelande
  National Australia Bank, Melbourne, Australia
  Email: m.morelande@gmail.com

- Prof. Jesús Grajal
  Dept. of Signals, Systems and Radiocommunications
  Universidad Politécnica de Madrid, Madrid, Spain
  Email: jesus.grajal@upm.es