



Universidad
de Alcalá

INSTITUTO UNIVERSITARIO
DE INVESTIGACIÓN EN
ESTUDIOS LATINOAMERICANOS
•IELAT•

CURRICULUM VITAE

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(October, 2022)

Current Situation

- Full Professor. Department of Electronics. University of Alcalá (2016-present).
- Secretary. Institute of Latin American Studies (IELAT), University of Alcalá.
- Academic coordinator of the Master's Degree in Electronic Engineering. On-site mode M202 and blended-learning mode M203.
- Four six-year research periods awarded by the National Commission for the Evaluation of Research Activity. Last period 2012-2017.
- One six-year research period granted by the National Commission for the Evaluation of Knowledge Transfer and Innovation Activity period 1999-2008.

Academic Experience

- Telecommunications Technical Engineer. EUIT Telecommunications. CEI Alcalá de Henares (center attached to the Polytechnic University of Madrid). 1984.
- Telecommunications Engineer. Polytechnic University of Madrid. 1992.
- PhD in Telecommunication Engineering. University of Alcalá. 1998.
- Lecturer. Professional Technical Subjects. EUIT Telecommunication. CEI Alcalá de Henares. 1986.
- Lecturer. Electronic Technology Area. Engineering School. UAH. 1988.
- Professor. Electronic Technology Area. Engineering School. UAH. 2000-2016.
- Director of the Research Center: High Technology and Homologation Center. UAH. 1999-2010. ENAC 574/LE1083 and 173/LC423 accreditations.
- Director. Cuadrec Chair of Electronic Control. 2008-2011.
- Advisor to the General Directorate of Universities and Research of the Community of Madrid. 2007-2011.
- Editorial Board Member. Journal of Applied Soft Computing (Q1 JCR). 2014-2022.
- Editorial Board Member. Multidisciplinary Digital Publishing Institute (MDPI). Sensors Special Issue: Mobile Robot Navigation. ISSN:1424-8220. October 2018.
- IEEE Senior Member. 2015.

Awards

- 3M Foundation Award for Innovation 2009. Environment Category: "Electronic system for measuring and monitoring the effects of real traffic on pollutant emissions". Alcalá de Henares, 21-October-2009. Mention in Europa Press Newspaper (21-10-2009).

Relevant Publications (last 10 years)

- 2013 F. Valdés, R. Iglesias, F. Espinosa and M.A. Rodríguez. “Effect of a risk factor in convoy merging manoeuvres considering uncertainty in travelling times”. *Applied Soft Computing*. Elsevier. ASOC 1684. Vol 13, Issue 1, pag. 247-258. Doi: 10.1016/j.asoc.2012.08.011.
- 2013 A. Wefky, F. Espinosa, L. de Santiago, A. Gardel, P. Revenga and M. Martínez. “Modeling Radiated Electromagnetic Emissions of Electric Motorcycles in terms of Driving Profile using MLP Neural Network”. *Progress in Electromagnetics Research –PIER-* vol. 135, 231-244, Doi: 10.2528/PIER12102510
- 2013 M. Manzano, F. Espinosa, Á.M. Bravo, E. Santiso, I. Bravo, D. García. “Dynamic cognitive self-organized TDMA for medium access control in real-time vehicle to vehicle communications” *Mathematical problems in engineering*. Hindawi. Vol 2013, art 574528 pages.13. Doi: 10.1155/2013/574528
- 2013 A. Wefky, F. Espinosa, F. Leferink, A. Gardel and R. Vogt-Ardatjew. “On-road Magnetic Emissions Prediction of Electrical Cars in Terms of Driving Dynamics Using Neural Network”. *Progress in Electromagnetics Research –PIER-* Vol 139, pag. 671-687. Doi:10.2528/PIER13040405
- 2014 C. Santos, M. Mazo Jr, and F. Espinosa. “Adaptive Self-triggered Control of a Remotely Operated P3-DX Robot: Simulation and Experimentation” *Robotics and Autonomous Systems*. Elsevier. Doi: 10.1016/j.robot.2014.01.010
- 2015 J.C. García, J.A. Jiménez, F. Espinosa, A. Hernández, I. Fernández, M.C. Pérez, J. Ureña, M. Mazo and J.J. García. “Characterization of railway line impedance based only on short-circuit measurements” *International Journal of Circuit Theory and Applications*. John Wiley & Sons, Vol.43, pag. 984-994. Doi: 10.1002/cta.1987
- 2015 M. Manzano, Felipe Espinosa, Ángel M^a Bravo, Alfredo Gardel. “Cognitive self-scheduled mechanism for access control in noisy vehicular ad-hoc networks”. *Mathematical Problems in Engineering*. Hindawi. Special Issue: Recent Advances on the Theory and Applications of Networked Control Systems. Vol 2015, Art ID 354292. Doi: 10.1155/2015/354292
- 2015 C. Santos, F. Espinosa, E. Santiso and M. Mazo Jr. “Aperiodic linear networked control considering variable channel delays: application to robot coordination”. *Sensors-Basel* 2015, 15, 12454-12473. Doi: :10.3390/s150612454
- 2015 Miguel Martínez-Rey, Felipe Espinosa, Alfredo Gardel and Carlos Santos. “On-board event-based state estimation for trajectory approaching and tracking of a vehicle”. *Sensors-Basel* 2015, 15(6), 14569-14590. Doi: 10.3390/s150614569
- 2016 C. Losada, F. Espinosa, C. Santos, M. Gálvez, E. J. Bueno, M. Marrón, and F. J. Rodríguez. “An Experience of CACSD for Networked Control Systems: From Mechatronic Platform. Identification to Control Implementation” *IEEE Transactions on Education*. Issue 99, pages 1-8, Doi: 10.1109/TE.2016.2550586
- 2017 Espinosa, F., Hernández, A., Mazo, M., Ureña, J., Pérez, M.C., Jiménez, J.A., Fernández, I. García, J.C. and García, J.J. “Detector of Electrical Discontinuity of Rails in Double-Track Railway Lines: Electronic System and Measurement Methodology”. *IEEE Transactions on Intelligent Transportation Systems*. Vol 18, Issue 4, pages 743-755, Doi: 10.1109/TITS.2016.2586538
- 2017 Martínez-Rey, M., Espinosa, F., Gardel, A. “Analysis of the optimal sampling rate for state estimation in sensor networks with delays”. *ISA Transactions*. ISATRA2445. Doi: 10.1016/j.isatra.2017.03.007.
- 2017 C. Santos, M. Martínez-Rey, F. Espinosa, A. Gardel and E. Santiso. “Event-based sensing and control for remote robot guidance: an experimental case”. *Sensors-Basel* 2017, 17(9), 2034. Doi: 10.3390/s17092034
- 2017 F. Potortì, S. Park, A.R. Jiménez-Ruiz, P. Barsocchi, M. Girolami, A. Crivello, S.Y. Lee, J.H. Lim, J. Torres-Sospedra, F. Seco, R. Montoliu, G.M. Mendoza-Silva, M.C. Pérez-Rubio, C. Losada-Gutiérrez, F. Espinosa, J. Macias-Guarasa. “Comparing the performance of indoor localization systems through the EvAAL framework”. *Sensors-Basel* 2017, 17, 2327. Doi: 10.3390/s17102327
- 2018 Santos, C., Echevarria, J., Espinosa, F., Marron, M., Losada, C and Pizarro, D. “Digital implementation of a self-triggered control approach for a mechatronic platform: experimental results” *International Journal of Intelligent Machines and Robotics*. IJIMR-172082. Vol 1, n° 1. DOI: 10.1504/IJIMR.2018.090945
2018. F. Espinosa, J. J. García, A. Hernández, M. Mazo, J. Ureña, J. A. Jiménez, I. Fernández, C. Pérez, J.C. García. “Advanced monitoring of rail breakage in double-track railway lines by means of PCA techniques” *Applied Soft Computing*. Vol 63, pag 1-13, Doi: 10.1016/j.asoc.2017.11.009
- 2018 F. Espinosa, J.L. Lázaro, J. Olivares and rest of ALCOR Project’s researchers. “Proyecto ALCOR: Contribuciones a la Optimización del Guiado Remoto de Robots en Espacios Inteligentes”.

- Revista Iberoamericana de Automática e Informática Industrial. RIAI Vol 15, n 4, 416-426. Doi: 10.4995/riai.2018.9199
- 2018 M.C. Pérez-Rubio, C. Losada-Gutiérrez, F. Espinosa, J. Macías-Guarasa, J. Tiemannb, F. Eckermannb, C. Wietfeldb, M. Katkovc, S. Hubac, J. Ureña, J. M. Villadangos, D. Gualda, E. Díaz, R. Nieto, E. Santiso, P. del Portillo, M. Martínez. “A Realistic Evaluation of Indoor Robot Position Tracking Systems: The IPIN 2016 Competition Experience”. *Measurement* (ISSN: 0263-2241). Doi: <https://doi.org/10.1016/j.measurement.2018.11.018>
- 2019 A. de la Llana, J.L. Lázaro-Galilea, A. Gardel-Vicente, D. Rodríguez-Navarro, I. Bravo-Muñoz, F. Espinosa-Zapata. “Characterization of multipath effects in indoor positioning systems by AoA and PoA based on optical signals”. *Sensors-Basel* 2019, 4.917. Doi:10.3390/s19040917
- 2019 M. Martínez-Rey, C. Santos, R. Nieto, C. Losada, F. Espinosa. “On-line evaluation of the process noise covariance matrix for event-based state estimators” *International Journal for Numerical Methods in Engineering*. Art ID:NME6131. Doi: 10.1002/nme.6131
- 2019 C. Santos, F. Espinosa, M. Martínez-Rey, D. Gualda, C. Losada. “Self-triggered formation control of nonholonomic robots” *Sensors-Basel* 2019, 19, Doi: 10.3390/s19122689
- 2019 Carlos Santos, José A. Jiménez, Felipe Espinosa. “Effect of event-based sensing on IoT node power efficiency. Case study: air quality monitoring in smart cities”. *IEEE Access*. ISSN: 2169-3536. Vol 7. Issue 1. Pp 132577-132586. Doi: 10.1109/ACCESS.2019.2941371
- 2019 Investigadores de la Red de Posicionamiento y Navegación en Interiores REPNIN. Grupo GEINTRA. "Libro Blanco sobre Espacios Inteligentes y Tecnologías de Posicionamiento y Navegación en Entornos de Interior". Libro ISBN: 978-84-17729-47-9. Pag. 1-177. Editorial: Servicio de Publicaciones. Universidad de Alcalá.
- 2020 Carlos Santos, Felipe Espinosa, Enrique Santiso and David Gualda “Lyapunov Self-triggered Controller for Nonlinear Trajectory Tracking of Unicycle-type Robot”. *International Journal of Control, Automation and Systems*. ISSN: 2005-4092. Doi: 10.1007/s12555-018-0576-x
- 2020 C. Losada-Gutiérrez, F. Espinosa, C. Santos-Pérez, M. Marrón-Romera and J.M. Rodríguez-Ascariz. “Remote control of a robotic unit: a case study for control engineering formation” *IEEE Transactions on Education*. ISSN: 0018-9359. Doi: 10.1109/TE.2020.2975937
- 2021 Felipe Espinosa, Carlos Santos, Jesús E. Sierra. “Transporte multi-AGV de una carga: estado del arte y propuesta centralizada”. *Revista Iberoamericana de Automática e Informática Industrial*. Vol.18, nº1, 2021. Doi: <https://doi.org/10.4995/riai.2020.12846>
- 2022 F. Espinosa, A.B. Bartolomé, P. Villoria and M.C. Rodríguez-Sánchez. “Contribution of singular spectral analysis to forecasting and anomalies detection of indoors air quality”. *Sensors-Basel* 2022, 22, 3045. Doi: <https://doi.org/10.3390/s22083054>

International Conferences (last 10 years)

- 2013 Prieto, R. Misa, F. Espinosa, A.M. Wefky. “PCA en la selección de característica de vehículos automotores para identificación”. XI Simposion Internacional de Automatización. Informática 2013. Proceedings of the Congress. La Habana, Cuba. Fecha: 18-23, Marzo, 2013.
- 2013 C Santos, M Mazo, E Santiso, F Espinosa, M Martínez. “Adaptive Self-triggered Control for Remote Operation of Wifi Linked Robots. ROBOT2013: First Iberian Robotics Conference. Proceedings of the Congress. Madrid, 28-29 Noviembre, 2013.
- 2013 M Martínez, F Espinosa, A Gardel, C Santos, J García. “Pose Estimation of a Mobile Robot Based on Network Sensors Adaptive Sampling” ROBOT2013: First Iberian Robotics Conference. Proceedings of the Congress. Madrid, 28-29 Noviembre, 2013.
- 2015 M Martínez-Rey, F Espinosa, A Gardel, C Santos, A Salcedo. “Computation reduction of smart sensors for EBSE using Mahalanobis Sampling” EBCCSP-2015 First IEEE International Conference on Event-Based Control, Communication and Signal Processing. IEEE Conference Publications. Doi: 10.1109/EBCCSP.2015.7300687. Krakow, 16-19 June, 2015.
- 2015 A. Gardel, J. García, I. Bravo, F. Espinosa, T. Chateau. “Camera calibration parameters for oriented person re-identification” 9th International Conference on Distributed Smart Camera – ICDS-2015- Editorial ACM New York, NY, USA ©2015, ISBN: - 978145033681. Vol 1 pag 1-6. Doi: 10.1145/2789116.2789138. Sevilla. Spain. 08-11 Sept 2015
- 2015 Carlos Santos, Felipe Espinosa, Enrique Santiso, Miguel Martínez-Rey, Manuel Mazo Jr. “Aperiodic consensus control for tracking nonlinear trajectories of a platoon of vehicles” ITSC-2015 18th IEEE International Conference on Intelligent Transportation Systems. IEEE Conference Publications. Doi: 10.1109/ITSC.2015.321. Las Palmas de Gran Canaria, 15-18 September, 2015.

- 2016 M Martínez-Rey, F Espinosa, A Gardel, C Santos and E Santiso. “Mobile robot guidance using adaptive event-based pose estimation and camera sensor” EBCCSP-2016 Second International Conference on Event-Based Control, Communication and Signal Processing. IEEE Conference Publications. DOI: 10.1109/EBCCSP.2016.7605089. Krakow, 13-15 June, 2016.
2016. A. Gardel, F Espinosa, R Nieto, J.L. Lázaro and I. Bravo. “Wireless camera nodes on a cyber-physical system”. IDSC-2016. 10th Int. Conf. on Distributed Smart Camera. ACM New York, NY, USA ©2016. ISBN: 978-1-4503-4786-0. Vol 1, pp 1-6. Doi: 10.1145/2967413.2967423. Paris, France. 12-15 September, 2016
- 2016 M Martínez-Rey, E Santiso, F Espinosa, R Nieto and A Gardel. “Smart laser scanner for event-based state estimation applied to indoor positioning” IPIN-2016 Seventh Int. Conf. on Indoor Positioning and Indoor Navigation. IEEE Conference Publications. DOI: 10.1109/IPIN.2016.7743613. Alcalá de Henares, 4-7 October, 2016.
- 2017 C. Santos, F. Espinosa, E Santiso, M. Martinez-Rey. “A simplified event-triggering condition non-dependent on measurement error” EBCCSP-2017 Third International Conference on Event-Based Control, Communication and Signal Processing. IEEE Conference Publications. Doi: 10.1109/EBCCSP.2017.8022823. Madeira, 24-26 May, 2017.
- 2018 Rodríguez, D. Lázaro, J.L. Espinosa, F. de la Llana, A. Santos, C. “Simplified calibration process for a PSD-based optical (IPS)” IPIN 2018 International Conference on Indoor Positioning and Navigation (IPIN). IEEE Conference Publications. Doi: 10.1109/IPIN.2018.8533732. Nantes, 22-27 September 2018.
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Others

- Supervisor of 7 PhD (doctoral theses), International Doctorate Mention 4 of them.
- Student Branch Counselor of The Institute of Electrical and Electronics Engineers, Inc. in the University of Alcalá. 2003
- Recognition of 7 five-year periods of university teaching dedication 1985-2020.
- Stays in foreign centers: Universidad de Oriente, Santiago de Cuba, Cuba (1997, 1999, 2000). Université Blaise Pascal, Clermont Ferrand, France (2000). Intelligent System Research Centre, University of Ulster, Derry, Northern Ireland (2011). University College Cork, Cork, Ireland (2014). PUCMM, Santo Domingo, Dominican Republic (2020).
- Research leader of 18 research projects funded by public entities.
- Participation in more than 40 privately funded research contracts (Art. 83 LOU), 24 of them as research leader or co-leader.
- Co-author of 8 national patents and 1 international patent.