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University of Almería
Department of Informatics
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Education

Technical Engineering in Computer Science, University of Almería (Spain), **1997-2000**.

Computer Science Engineering, University of Almería (Spain), **2000-2002**. *Award to the Best Master Thesis.*

Ph.D. Degree with European Mention by the University of Almería (Spain), **16/06/2006**. Extraordinary doctorate award. Ph.D. supervisors: Prof. M. Berenguel and Prof. S. Dormido.

Employment

Researcher in the project "Sistema Remoto para la obtención de datos meteorológicos de la Plataforma Solar de Almería". AICIA-CIEMAT, **01-04-2001 to 30-11-2001**.

Scholarship from the Spanish Ministry of Education for collaboration tasks at the Department of Informations, University of Almería, **01-01-2002 to 30-06-2002**.

Researcher in the project "Control Predictivo de procesos industriales por lotes. Modelado y aspectos computacionales. MCYT – GRUPO AER (CICYT – DPI-2001-2380-C02-02)", **01-09-2002 to 31-12-2002**.

PhD Scholarship under the grant "Formación de Personal Investigador (FPI)", University of Almería". **01-01-2003 to 31-10-2003**.

PhD Scholarship under the grant "Personal Investigador (FPI), Junta de Andalucía". **01-11-2003 to 31-01-2004**.

PhD Scholarship under the grant "Profesorado Universitario (FPU). Ministerio de Educación y Ciencia". **01-02-2004 to 31-05-2006**.

Researcher from the "Ministerio de Educación y Ciencia - Universidad de Almería". **01-06-2006 to 13-02-2007**.

Assistant Professor under the figure "Profesor Colaborador. Universidad de Almería". **14-02-2007 to 24-02-2009**.

Assistant Professor under the figure "Profesor Contratado Doctor. Universidad de Almería". **25-02-2009 to 22-02-2010**.

Associate Professor. University of Almería. **22-02-2010 to 15-09-2017**.

Full Professor. University of Almería. **16-09-2017**.

Researcher profiles

Scopus: https://www.scopus.com/authid/detail.uri?authorId=34769939300

Google Scholar: https://scholar.google.com/citations?hl=en&user=f8DZmoIAAAAJ&view_op=list_works&sortby=pubdate

ORCID: https://orcid.org/0000-0001-5312-0776

Web of Science: https://www.webofscience.com/wos/author/record/K-9608-2014

Brújula (from UAL): http://brujula.ual.es/authors/449.html

CV Summary

14 PhD thesis supervised.

12 research stays.

13 participations in committees and associations.

7 books.

16 book chapters.

161 journal papers.

13 keynotes.

159 international conferences.

107 national conferences.

47 research projects as IP and/or researcher.

36 R&D contracts with companies as IP and/or researcher.

22 awards.

7 patents.

Supervised PhD Thesis

1. R. Nordio. Modeling and control of microalgae-based wastewater treatment. Apto cum laude por unanimidad. Supervisors: **J.L. Guzmán**, F.G. Acién. University of Almería, Spain, 2024.

2. P. Otálora. New control algorithms and artificial intelligence models to improve microalgae productions systems. Apto cum laude por unanimidad. Supervisors: **J.L. Guzmán**, F.G. Acién. University of Almería, Spain, 2024.

3. I. Pataro. Advances in Optimal and Predictive Control Approaches for Solar Thermal Systems Enhancement. Apto cum laude por unanimidad. Supervisors: **J.L. Guzmán**, J.D Gil. University of Almería, Spain, 2024.

4. A. Hoyo. Contributions to Classic Control Strategies and Application to Industrial Facilities. Apto cum laude por unanimidad. Supervisors: **J.L. Guzmán**, J.C. Moreno. University of Almería, Spain, 2023.

5. R. Liu. New Modeling and Control Strategies for Reducing Disease Impact in Greenhouses. Apto cum laude por unanimidad. Supervisors: **J.L. Guzmán**. University of Almería, Spain, 2022.

6. A. Montoya. Aportaciones al modelado y control climático de invernaderos. Apto cum laude por unanimidad. Supervisors: F. Rodríguez, **J.L. Guzmán**. University of Almería, Spain, 2021.

7. E. Rodríguez-Miranda. Modeling and control of the microalgae biomass production process in raceway reactors. Apto cum laude por unanimidad. Supervisors: **J.L. Guzmán**, A. Visioily. International cotutela University of Almería (Spain) and University of Brescia (Italy), 2021.

8. M. Barceló. Optimization of microalgae production in industrial open reactors. Apto cum laude por unanimidad. Supervisors: F. G. Acién, **J.L. Guzmán**. University of Almería, Spain, 2020.

9. J. Sánchez. Contributions to the modelling and simulation of intensive growing systems. Apto cum laude por unanimidad. Supervisors: F. Rodríguez, **J.L. Guzmán**. University of Almería, Spain, 2015.

10. C. Rodríguez. Advanced control strategies for efficient disturbance compensation. Apto cum laude por unanimidad. Supervisors: **J.L. Guzmán**, M. Berenguel. University of Almería, Spain, 2014.

11. I. Fernández. Modelling and control strategies for the microalgal production in industrial photobioreactors. Apto cum laude por unanimidad. Supervisors: M. Berenguel, **J.L. Guzmán**. University of Almería, Spain, 2014.

12. M. Pasamontes. Estrategias de Control avanzadas aplicadas a un sistema de climatización basado en energía solar. Apto cum laude por unanimidad. Supervisors: **J.L. Guzmán**, J.D. Álvarez. University of Almería, Spain, 2013.

13. Andrzej Pawlowski. Predictive control strategies for disturbance compensation. International Ph. D. Apto cum laude por unanimidad. Supervisors: **J.L. Guzmán**, M. Berenguel. University of Almería, Spain, 2012.

14. R. González. Contributions to Modelling and Control of Mobile Robots in Off-Road Conditions. European Ph. D. Apto cum laude por unanimidad. Supervisors: F. Rodríguez, **J.L. Guzmán**. University of Almería, Spain, 2011.

Research stays

1. Departament of Automatic Control, Lund University, *Lund, Suecia*. Period: **30/03/2025-05/04/2005**.
2. China National Engineering Research Center for Information Technology in Agriculture (NERCITA), *Beijing, China*. Period: **26/07/2024-09/08/2024**.
3. École Polytechnique de l'Université de Nantes, *Nantes, France*. Period: **17/10/2021-23/10/2021**.
4. China National Engineering Research Center for Information Technology in Agriculture (NERCITA), *Beijing, China*. Period: **20/11/2018-31/11/2018**.
5. Departamento de Automataçao de la Universidad Federal de Santa Catarina, *Santa Catarina, Brasil*. Period: **22/07/2013-12/08/2013**.
6. Departamento de Automataçao de la Universidad Federal de Santa Catarina, *Santa Catarina, Brasil*. Period: **18/02/2011-18/03/2011**.
7. Departamento de Automataçao de la Universidad Federal de Santa Catarina, *Santa Catarina, Brasil*. Period: **07/08/2010-28/08/2010**.
8. Departament of Chemical Engineering, Arizona State University, *Tempe, USA*. Period: **13/10/2008-03/11/2008**.
9. Departamento de Informática y Automática, UNED, *Madrid, España*. Period: **14/09/2007-29/09/2007**.
10. Plataforma Solar de Almería, CIEMAT, *Tabernas, Almería, España*. Period: **10/12/2007-21/12/2007**.
11. Departament of Automatic Control, Lund University, *Lund, Suecia*. Period: **01/09/2005-19/12/2005**.
12. Departamento de Informática y Automática, UNED, *Madrid, España*. Period: **01/11/2003-01/02/2004**.

Committees and Associations

1. Member of the Spanish IFAC association in Automatic Control since 2003.
2. Member of the IEEE Control System Society since 2006.
3. Member of the IFAC Technical Committee on Control Education since 2008.
4. IEEE Technical Committee on System Identification and Adaptive Control since 2008.
5. Member of Subcommittee on Event-Based Control and Signal Processing in Factory Automation (IEEE IES TCFA) since 2014.
6. ViceChair of the Spanish Control Engineering Group of the Spanish Committee of Automatic Control, 2014-2018.
7. Chair of the Spanish Control Engineering Group of the Spanish Committee of Automatic Control, 2018-2022.
8. Vice-Chair of IFAC Technical Committee 9.4. on Control Education since 2020.
9. Member of the IFAC Education Activities Committee since 2023.
10. Director of the Biorizon Biotech - UAL Chair on Regenerative Agriculture 4.0 since 2023.
11. Associate Editor of Journal of Advances Robotics Systems, InTech (Robot manipulation, mobile robots and control), since 2014.
12. Associate Editor of Journal of Franklin Institute, Elsevier (Optimal Control, Process Control), since 2015 to 2017.
13. Associate Editor of Revista IberoAmericana de Automática e Informática Industrial, Elsevier, CEA (Process Control), since 2015.

Publications - Books

1. **J.L. Guzmán**, Tore Hägglund. *Feedforward Control*. De Gruyter, 2024. ISBN 9783111429304. *https://doi.org/10.1515/9783111429489*

2. **J.L. Guzmán**, R. Costa-Castelló, M. Berenguel, S. Dormido. *Automatic Control with Interactive Tools*. Springer, 2023. ISBN 978-3-031-09922-9. *http://www2.ual.es/icontrol/*

3. F. Rodríguez, M. Berenguel, **J.L. Guzmán**, A. Ramírez-Arias. *Modeling and Control of Greenhouse Crop Growth*. Springer, 2015. ISBN 978-3-319-11133-9.

4. R. González, F. Rodríguez, **J.L. Guzmán**. *Autonomous Tracked Robots in Planar Off-Road Conditions*. Springer, 2014. ISBN 978-3-319-06038-5.

5. **J.L. Guzmán**, R. Costa-Castelló, M. Berenguel, S. Dormido. *Control automático con herramientas interactivas*. Pearson, 2012. ISBN 978-84-8322-750-3.

6. L. Roca, M. Berenguel, **J.L. Guzmán**, L.J. Yebra. *Aportaciones al modelado y control de una planta de desalación solar*. Editorial CIEMAT, 2010. ISBN: 978-84-7834-649-3.

7. F. Rodríguez, M. Berenguel, **J.L. Guzmán**, M.R. Arahal. *Prácticas de control por computador*. Sistemas de Oficina de Almería, S.A., 2004. ISBN 84-96270-11-4.

Publications - Book Chapters

1. A. Sánchez-Zurano, R. Nordio, E. Iniesta, E. Rodríguez-Miranda, F.J. Hernández-Fernández, **J.L. Guzmán**, F.G Acién. *Bioremediation of Effluents in Pilot-Scale Microalgae Cultivation Systems: A Case Study*. In: Microalgae Horizons. Grand Challenges in Biology and Biotechnology. Springer, 2025. ISBN: 978-3-031-84281-8.

2. **J.L. Guzmán**, J.D. Gil, F.G. Mañas, A. Hoyo. *Technological-based Resources as Support to Agricultural and Biosystems Engineering Studies*. In Agricultural, Biosystems, and Biological Engineering Education: Global Perspectives and Current Practice (chapter 38). CRC Press, 2024. ISBN: 9780429150111.

3. M. J. Rodríguez, E. Rodríguez-Miranda, A. Morillas-España, J. González-Hernández, **J.L. Guzmán**, J. L., B. Llamas, F.G. Acién. *Microalgae Used to Fix CO2 as Valuable Biomass*. In Circular Economy on Energy and Natural Resources Industries: New Processes and Applications to Reduce, Reuse and Recycle Materials and Decrease Greenhouse Gases Emissions (pp. 73-92). Cham: Springer International Publishing, 2024. ISBN: 978303156283-9.

4. R. Nordio, A. Sánchez-Zurano, E. Rodríguez, A. Morillas, J. González, **J.L. Guzmán**, and F.G. Acién,. *Microalgae-related wastewater treatment for more sustainable water reuse and nutrient recycling*. In Sustainable Industrial Processes Based on Microalgae, pp. 83-105. Elsevier, 2024. ISBN: 9780443192135.

5. F.G. Acién, C. Gómez, A. Morillas, A. Zouhayr, A. Sánchez, R. Nordio, E. Rodríguez, **J.L. Guzmán**, and J. M. Fernández-Sevilla. *Wastewater treatment by microalgae-based processes*. In Algal Systems for Resource Recovery from Waste and Wastewater, pp. 77-102. IWA Publishing, 2023. ISBN: 9781789063547.

6. M. Barceló-Villalobos, F.G. Acién, **J.L. Guzmán**, J.M. Fernández-Sevilla, M. Berenguel. *New strategies for the design and control of raceway reactors to optimize microalgae*. In Handbook of Algal Technologies and Phytochemicals, CRC Press/Taylor & Francis, 2019, Chapter 18. K415947/9780367178376.

7. I. Fernández, **J.L. Guzmán**, M. Berenguel, F.G. Acién. *Dynamic Modeling of Microalgal Production in Photobioreactors*. In Prospects and Challenges in Algal Biotechnology, Springer, 2017, pp. 49-87. 978-981-10-1949-4.

8. I. Fernández, **J.L. Guzmán**, M. Berenguel, F.G. Acién. *Dynamic Modeling of Microalgal Production in Photobioreactors*. In Prospects and Challenges in Algal Biotechnology, Springer, 2017, pp. 49-87. 978-981-10-1949-4.

9. A. Pawlowski, **J.L. Guzmán**, M. Berenguel, F.G. Acién, S. Dormido. *Event-Based Control Systems for Microalgae Culture in Industrial Reactors*. In Prospects and Challenges in Algal Biotechnology, Springer, 2017, pp. 1-48. 978-981-10-1949-4.

10. A. Zorzona, J.C. Moreno, **J.L. Guzmán**, F. Rodríguez, J. Sánchez-Hermosilla. *Robots Liability: A Use Case and a Potential Solution*. In Robotics - Legal, Ethical and Socioeconomic Impacts, In Tech, 2017, DOI: 10.5772/66612.

11. A. Pawlowski, **J.L. Guzmán**, M. Berenguel, S. Dormido. *Event-Based Generalized Predictive Control*. In Event-based control and signal processing, CRC Press/Taylor & Francis, 2015, pp. 151-176. K24071/9781482256550.

12. **J.L. Guzmán**, T. Hägglund, A. Visioli. *Feedforward Compensation for PID Control Loops*. In PID Control in the Third Millennium, Springer, 2012, pp. 207-234. ISBN 978-1-4471-2424-5.

13. **J.L. Guzmán**, J.C. Moreno, M. Berenguel, F. Rodríguez, J. Sánchez-Hermosilla. *A frequency domain quantitative technique for robust control system design*. In Robust Control, Theory and Applications, Intech, 2011, pp. 391-492. ISBN 978-953-307-229-6.

14. J. Sánchez-Hermosilla, F. Rodríguez, R. González, **J.L. Guzmán**, M. Berenguel. *A mechatronic description of an autonomous mobile robot for agricultural tasks in greenhouses*. In Mobile Robots Navigation, Intech, 2010, pp. 583-608. ISBN 978-953-307-076-6.

15. A. Pawlowski, **J.L. Guzmán**, F. Rodríguez, M. Berenguel. S. Dormido. *Study of event-based sampling techniques and theirs influence on greenhouse climate control with wireless sensors network*. In Factory Automation, Intech, 2009. ISBN 978-953-7619-42-8.

16. **J.L. Guzmán**, H. Vargas, J. Sánchez, M. Berenguel, S. Dormido, F. Rodríguez. *Education research in engineering studies: Interactivity, virtual and remote labs*. In Distance Education Research Trends. Nova Science Publishers, 2007, pp. 1-44.

Publications - Journal Articles

1. A. Hoyo, J.C. Moreno, **J. L. Guzmán**, J. D. Gil and M. Berenguel. Enhancing Solar Furnace Performance by a Robust QFT-Based Control Approach. *IEEE Transactions on Industrial Informatics*, 2025.

   JCR index: Not available yet

   DOI: https://ieeexplore.ieee.org/document/11045445

2. I. M. L. Pataro, J. D. Gil, J. D. Álvarez, **J. L. Guzmán**, J. M. Lemos and M. Berenguel. Learning-Based Practical Nonlinear Predictive Controller for Solar Thermal Collector Fields. *IEEE Transactions on Control Systems Technology*, 2025.

   JCR index: Not available yet

   DOI: https://doi.org/10.1109/TCST.2025.3571558

3. M. Muñoz, M. Torres, J.D Gil, **J. L. Guzmán**. An Internet of Things platform for heterogeneous data integration: Methodology and application examples. *Journal of Network and Computer Applications*, 240, 104197, 2025.

   JCR index: Not available yet

   DOI: https://doi.org/10.1016/j.jnca.2025.104197

4. R. Nordio, F. Casagli, E. Rodríguez-Miranda, **J. L. Guzmán**, O. Bernard, F. Acién. Benchmarking of ALBA and ABACO-2 models for algae-bacteria wastewater treatment . *Algal Research*, 104049, 2025.

   JCR index: Not available yet

   DOI: https://doi.org/10.1016/j.algal.2025.104049

5. D. Rodríguez-García, E. Gualda-Alonso, J. L. García-Sánchez, **J. L. Guzmán**, J. A. Sánchez Pérez, J. L. Casas López. Data-based optimization approach for the automatic operation of solar photo-Fenton plants . *Chemical Engineering Journal*, 505, 159688, 2025.

   JCR index: Not available yet

   DOI: https://doi.org/10.1016/j.cej.2025.159688

6. M. Caparroz, **J. L. Guzmán**, J.D. Gil, M. Berenguel, F.G. Acién. A hybrid MRAC-PI approach to regulate pH in raceway reactors for microalgae production. *Control Engineering Practice*, 156, 106191, 2025.

   JCR index: Not available yet

   DOI: https://doi.org/10.1016/j.conengprac.2024.106191

7. J. González, M. Ciardi, **J. L. Guzmán**, F.G. Acién, J.C. Moreno. A low-cost methodology based on artificial intelligence for contamination detection in microalgae production systems. *Algal Research*, 85, 103849, 2025.

   JCR index: Not available yet

   DOI: https://doi.org/10.1016/j.algal.2024.103849

8. K. Žáková, D. Urbano, R. Cruz-Correja, **J. L. Guzmán**, J. Matišák. Exploring Student and Teacher Perspectives on ChatGPT's Impact in Higher Education. *Education and Information Technologies*, 30, 649–692, 2025 (Accepted for publication).

   JCR index: Not available yet

   DOI: https://doi.org/10.1007/s10639-024-13184-y

9. F. Rodríguez, M. Berenguel, F. García-Mañas, **J. L. Guzmán**, J. Sánchez-Molina. A multilayer control architecture for greenhouse crop production in agro-industrial districts: Conceptual framework, prospects and challenges. *Smart Agricultural Technology*, 9, 100657, 2024.

   JCR index: Not available yet

   DOI: https://doi.org/10.1016/j.atech.2024.100657

10. M. Caparroz, **J. L. Guzmán**, M. Berenguel, J.D. Gil, F.G. Acién. Control adaptativo por modelo de referencia para la regulación del pH. *Revista Iberoamericana de Automática e Informática industrial*, 22 (2), 126-134, 2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.4995/riai.2024.21919.

11. **J.L. Guzmán**, K. Zakova, I.K. Craig, T. Hägglund, D.E. Rivera, J.E. Normey-Rico, P. Moura-Oliveira, L. Wang, A. Serbezov, T. Sato, A. Visioli. An International Overview of Teaching Control Systems During COVID-19 Pandemic. *International Journal of Engineering Education*, 40(5), 1162–1180, 2024.

    JCR index: Not available yet

    https://www.ijee.ie/contents/c400524.html

12. R. Nordio, S. Belachqer-El Attar, A. Sánchez-Zurano, N. Pichel, E. Viviano, F. Adani, **J. L. Guzmán**, F.G. Acién. Exploring microbial growth dynamics in a pilot-scale microalage raceway fed with urban wastewater: insights into the effects of operational variables. *Journal of Environmental Management*, 369, 122385, 2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.1016/j.jenvman.2024.122385

13. J. González, **J. L. Guzmán**, F.G. Acién, J.C. Moreno. A graphical simulation tool to estimate microalgae production capacity around the world. *Algal Research*, 83, 103665, 2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.1016/j.algal.2024.103665

14. E. Delgado, J.C. Moreno, E. Rodríguez-Miranda, A . Baños, A. Barreiro, **J. L. Guzmán**. Soft-sensor based on sliding modes for industrial raceway photobioreactorsl. *Biosystems Engineering*, 246, 1-12,2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.1016/j.biosystemseng.2024.07.015

15. I.M.L. Pataro, J.D. Gil, L Roca, **J. L. Guzmán**, M. Berenguel, I. Cañadas. Enhancing solar furnace thermal stress testing using an adaptive model and nonlinear predictive control. *Renewable Energy*, 230, 120797,2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.1016/j.renene.2024.120797

16. J. Carreño, J.C Moreno, **J. L. Guzmán**. Optimal Active Disturbance Rejection Control for Second Order Systems. *IEEE Access*, 12, 76244-76256, 2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.1109/ACCESS.2024.3401079

17. I.M.L. Pataro, J.D. Gil, **J. L. Guzmán**, J. Lemos, M. Berenguel. Controlador cuadrático lineal con acción de control por adelanto y estabilidad robusta para hornos solares. *Revista Iberoamericana de Automática e Informática industrial*, 21(4), pp. 306–317, 2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.4995/riai.2024.21179

18. A. López-Palenzuela, M. Berenguel, J.D. Gil, L. Roca, **J. L. Guzmán**, J. Rodríguez. Temperature Control in Solar Furnaces using Nonlinear PID-based Control Approaches. *International Journal of Control, Automation and Systems*, 22, 2419–2427, 2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.1007/s12555-024-0024-z

19. M. Caparroz, **J. L. Guzmán**, M. Berenguel, F.G. Acién. A novel data-driven model for prediction and adaptive control of pH in raceway reactor for microalgae cultivation. *New Biotechnology*, 8, 1-13, 2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.1016/j.nbt.2024.04.001

20. F. García-Mañas, T. Hägglund, **J. L. Guzmán**, F. Rodríguez, M. Berenguel. A practical solution for multivariable control of temperature and humidity in greenhouses. *European Journal of Control*, 77, 100967, 2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.1016/j.ejcon.2024.100967

21. J. C. Moreno, J. González, A. Navarro, **J. L. Guzmán**. New Tuning Rules of PI+CI Controllers for First-Order Systems. *Actuators*, 13(67), 2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.3390/ act13020067

22. A. Hoyo, **J. L. Guzmán**, J.C. Moreno, T. Hägglund. Double feedforward compensation for cascade control schemes. *Computers and Chemical Engineering*, 181, 108544, 2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.1016/j.compchemeng.2023.108544

23. S. Villaró-Cos, **J. L. Guzmán**, F.G. Acién, T. Lafarga. Research trends and current requirements and challenges in the industrial production of Spirulina as a food source. *Trends in Food Science & Technology*, 143, 104280, 2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.1016/j.tifs.2023.104280

24. R. Nordio, E. Rodríguez-Miranda, F. Casagli, A. Sánchez-Zurano, **J. L. Guzmán**, and F.G. Acién. ABACO-2: a comprehensive model for microalgae-bacteria consortia validated outdoor at pilot-scale. *Water Research*, 248, 1208372024, 2024.

    JCR index: Not available yet

    DOI: https://doi.org/10.1016/j.watres.2023.120837

25. I.M.L. Pataro, J.D. Gil, **J. L. Guzmán**, J. Lemos. Análisis de rendimiento del rechazo de perturbaciones en controladores cuadráticos lineales: un método práctico de sintonía adaptativo. *Revista Iberoamericana de Automática e Informática industrial*, 21(2), 148-158, 2024.

    JCR index: Not available yet.

    DOI: https://doi.org/10.4995/riai.2023.19703.

26. J. C. Moreno , M. Berenguel, J. G. Donaire, F. Rodríguez, J.A. Sánchez-Molina, **J. L. Guzmán**, C. Giagnocavo. A pending task for the digitalisation of agriculture: A a general framework for technologies classification in agriculture. *Agricultural Systems*, 213, 103794, 2024.

    JCR index: Not available yet.

    DOI: https://doi.org/10.1016/j.agsy.2023.103794

27. I.M.L. Pataro, J.D. Gil, **J. L. Guzmán**, M. Berenguel, I. Cañadas. Predictive control strategies for solar furnace systems on the basis of practical constrained solutions. *Journal of Process Control*, 132, 103114, 2023.

    JCR index: Not available yet.

    DOI: https://doi.org/10.1016/j.jprocont.2023.103114

28. R. Liu, **J. L. Guzmán**, J.D. Gil, X. Yanga, K. Liu, L. Ming. A hierarchical optimization strategy in the intelligent ecological control of the greenhouse downy mildew. *Computers and Electronics in Agriculture*, 214, 108337, 2023.

    JCR index: Not available yet.

    DOI: https://doi.org/10.1016/j.compag.2023.108337

29. R. Nordio, E. Viviano, A. Sánchez-Zurano, J. González-Hernández, E. Rodríguez-Miranda, **J. L. Guzmán**, and F.G. Acién. Influence of pH and dissolved oxygen control strategies on the performance of pilot-scale microalgae raceways using fertilizer or wastewater as the nutrient source. *Journal of Environmental Management*, 345(1), 118899, 2023.

    JCR index: Not available yet

    DOI: https://doi.org/10.1016/j.jenvman.2023.118899

30. I. M. L. Pataro, J. D. Gil, M. Americano, L. Roca, **J. L. Guzmán**, M. Berenguel. A stochastic nonlinear predictive controller for solar collector fields under solar irradiance forecast uncertainties. *IEEE Transactions on Control Systems Technology*, 2023 (Accepted for publication).

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159. **J.L. Guzmán**, M. Berenguel, S. Dormido. Interactive teaching of constrained predictive control. *IEEE Control Systems Magazine*, 25(2), 52-66, 2005.

    JCR index: 1.640, 7/46 Q1 (Automation & Control Systems).

    DOI: https://doi.org/10.1109/MCS.2005.1411384

160. **J.L. Guzmán**, M. Berenguel, S. Dormido. MIMO-GPCIT: Herramienta interactiva de control predictivo generalizado para sistemas multivariables com restricciones. *Revista Iberoamericana de Automática e Informática Industrial*, 1(1), 57-68, 2004.

    JCR index: None.

    DOI: Not available.

161. **J.L. Guzmán**, R. Medina, F. Rodríguez, J. Sánchez-Hermosilla, M. Berenguel. Pressure control of a mobile spraying system. *Spanish Journal of Agricultural Research*, 2(2), 181-190, 2004.

    JCR index: None.

    DOI: Not available.

Publications - Keynotes

1. Invited speaker and workshop organizer at the GreenSys 2025 - International Symposium on Advanced Technologies and Management for Sustainable Greenhouse Systems, Almería (Spain), 22-27. *Automation and AI in Agriculture: Realistic Pathways to Industry?*.

2. Keynote speaker at the 14th IFAC Advances in Control Education, Budapest (Hungary), 17-19 June 2025. *Benchmark problems for control engineering education*.

3. Invited speaker at the 1st International Congress on Algae Biotechnology, Lisbon (Portugal), 2025: *Smart Microalgae Production: Innovations in Automation and Optimization Strategies*.

4. Invited speaker as part of Webinar series organized by the Spanish Committee of Automatics (CEA), 2024: *An educational methodology based on interactive tools as support for control education*.

5. Invited speaker at the industrial workshop organized by CASI company, Almería, 2024: *Digitalizaton, automatizon and AI as tools for sustainability: applications to the agriculture sector in Almería*.

6. Invited speaker at IFAC Internet Based Control Education (IFAC IBCE'24), 2024: *Interactivity for engineering education: Automatic Control with Interactive Tools*.

7. Invited speaker as part of the Workshop of the ALGENAUTS project on microalgae production technologies, 2023 (https://www.youtube.com/watch?v=gQVvbtxAP5M).

8. Keynote speaker at the 7th World Intelligence Congress Intelligent Agriculture Summit Forum & International Conference on Intelligent Agriculture (ICIA2023) held in Tianjin (China) (https://www.youtube.com/watch?v=-7nOoo7UCM4)

9. Invited speaker as part of the Webinar series organized by the IFAC 9.4 Technical Committee in Control Education and IEEE Control System Society, 2023: *Interactivity for engineering education: Automatic Control with Interactive Tools*.

10. Invited speaker at IFAC Wold Congress 2023 (Yokohama, Japan) as part of the workshop on Advanced Topics in PID Control System Design, Automatic Tuning and Applications: *Tuning rules for feedforward compensators combined with PID control*.

11. Invited speaker as part of the Webinar on Modelling, simulation and advanced control of microalgae related processes as the key factor to achieve robust and reliable industrial processes, 2022: *Modelling and control of photobioreactors*. (https://www.youtube.com/watch?v=2wgY5Lj4Zi8).

12. Invited speaker as part of the Workshop on Learning technologies in engineering, Almería, 2022: *Interactive tools and virtual/remote labs as support to engineering education*.

13. Invited speaker at IFAC Wold Congress 2020 (Berlin, Germany) as part of the workshop on Advanced Topics in PID Control System Design, Automatic Tuning and Applications: *Advances in feedforward control for measurable disturbances*.

Publications - International Conference Papers

1. P. Otálora, S. Skogestad, **J.L. Guzmán**, M. Berenguel. Modeling, Control and Online Optimization of Microalgae-based Biomass Production in Raceway Reactors. *12th IFAC Symposium on Advanced Control of Chemical Processes ADCHEM 2024*, 2024, Toronto, Canada.

2. S. Banerjee, P. Otálora, M. El Mistiri, O. Khan, **J.L. Guzmán**, D. E. Rivera. Control-Relevant Input Signal Design For Integrating Processes: Application to a Microalgae Raceway Reactor. *20th IFAC Symposium on System Identification SYSID 2024*, 2024, Boston, United States.

3. T. Hägglund, **J.L. Guzmán**. Give us PID controllers and we can control the world. *4th IFAC Conference on Advances in Proportional-Integral-Derivative Control (PID 2024)*, 2024, Almería, Spain.

4. P. Otálora, A. Hoyo, M. Caparroz, J. González, **J.L. Guzmán**, M. Berenguel. Classic PID-based control strategies for raceway photobioreactor biomass concentration and water level. *4th IFAC Conference on Advances in Proportional-Integral-Derivative Control (PID 2024)*, 2024, Almería, Spain.

5. M. Berenguel, C. Iborra, F. Rodríguez, F. García-Mañas, **J.L. Guzmán**, J. A. Sánchez-Molina. Nonlinear PID-based temperature control techniques in greenhouses using natural ventilation. *4th IFAC Conference on Advances in Proportional-Integral-Derivative Control (PID 2024)*, 2024, Almería, Spain.

6. **J.L. Guzmán**, D.E. Rivera, M. Berenguel, S. Dormido. i-pIDtune 2.0: An Updated Interactive Tool for Integrated System Identification and PID Control. *4th IFAC Conference on Advances in Proportional-Integral-Derivative Control (PID 2024)*, 2024, Almería, Spain.

7. J. D. Gil, I. M. L. Pataro, **J.L. Guzmán**, M. Berenguel. On the hybrid MRAC-PID control: A comparison study. *4th IFAC Conference on Advances in Proportional-Integral-Derivative Control (PID 2024)*, 2024, Almería, Spain.

8. D. Rodríguez-García, J.L. García Sánchez, **J.L. Guzmán**, J.L. Casas López, J.A. Sánchez Pérez. PI-based cascade control for Fresnel solar collectors in wastewater reclamation. *4th IFAC Conference on Advances in Proportional-Integral-Derivative Control (PID 2024)*, 2024, Almería, Spain.

9. S. Knorn, A. Visioli, C. Stoica, G. Lichtenberg, D. Varagnolo, H. Sánchez, D. Rotondo, **J.L. Guzmán**. Santa has Everything under Control: A Control Themed Advent Calendar. *3rd Control Conference Africa CCA 2024*, 2024, Balaclava, Mauritius.

10. J. D. Gil, J. Gonzalez, F. Cañadas-Aránega, I. M. L. Pataro, A. Hoyo, P. Otálora, F. Rodríguez, **J.L. Guzmán**, M. Berenguel. Gamification in control engineering: An ongoing initiative at the University of Almería. *4th Workshop on Internet Based Control Education (IBCE2024)*, 2024, Ghent, Belgium.

11. S. Knorn, H. Sánchez, D. Rotondo, D. Varagnolo, **J.L. Guzmán**, G. Lichtenberg, C. Stoica, A. Visioli. Analysis of Participants' Feedback on a control-themed Advent calendar. *4th Workshop on Internet Based Control Education (IBCE2024)*, 2024, Ghent, Belgium.

12. R. Nordio, **J.L. Guzmán**., F. G. Acién. Model-guided optimization of microbial communities in microalgae-bacteria systems: a case study. *8th Congress of the International Society of Applied Phycology*, 2024, Porto, Portugal.

13. E. Delgado, E. Rodríguez-Mirando, A. Baños, A. Barreiro, J.C. Moreno, **J.L. Guzmán**. Online Biomass Estimation in a Raceway Photobioreactor. *IEEE 28th International Conference on Emerging Technologies and Factory Automation*, ETFA 2023, Sinaia, Romania.

14. J.I. Mulero, A. Baños, J.C. Moreno, **J.L. Guzmán**. Hybrid control of the pH in a raceway photobiorreactor. *IEEE 28th International Conference on Emerging Technologies and Factory Automation*, ETFA 2023, Sinaia, Romania.

15. R. Nordio, **J.L. Guzmán**, F.G. Acién. Increasing biomass productivity in microalgae pilot scale raceway reactors through optimal pH and dissolved oxygen control strategies, *AlgaEurope*, Prague, Czech Republic, 2023.

16. R. Nordio, **J.L. Guzmán**, F.G. Acién. Enhancing microalgae-based wastewater treatment efficiency through pH, dissolved oxygen and culture height optimization in raceway reactors. *European Congress of Marine Biotechnologies 2023*, Málaga, Spain.

17. A. Hoyo, Tore Hägglund, **J.L. Guzmán**, J. C. Moreno. A new method to deal with the saturation problem in feedforward control for measurable disturbances. *24th Nordic Process Control Workshop*, Trondheim, Norway, 2023.

18. P. Otálora, **J.L. Guzmán**, J.D. Gil, M. Berenguel. Data-driven modelling and predictive control solutions for pH control in microalgae-based processes. *24th Nordic Process Control Workshop*, Trondheim, Norway, 2023.

19. M. Berenguel, J.D. Gil, **J.L. Guzmán**, L. Roca, I. Cañadas. Control issues in solar furnaces. *24th Nordic Process Control Workshop*, Trondheim, Norway, 2023.

20. R. Nordio, **J.L. Guzmán**, F.G. Acién. pH and dissolved oxygen control strategies as a key to improve microalgal biomass production in pilot scale raceway reactors. 14th European Congress of Chemical Engineering & 7th European Congress of Applied Biotechnology, Berlin, Germany, 2023.

21. **J.L. Guzmán**, T. Hägglund. *Selecting Control Schemes and Tuning Rules in Feedforward Control*. 22nd IFAC World Congress. Yokohama, Japan, 2023.

22. J. D. Gil, L. Roca, **J.L. Guzmán**, M. Berenguel, A. López-Palenzuela. *Nonlinear Predictive Control for Temperature Regulation of Solar Furnaces*. 22nd IFAC World Congress. Yokohama, Japan, 2023.

23. P. Otálora, **J.L. Guzmán**, J. D. Gil, M. Berenguel, F.G. Acién. *Data-Driven Model Predictive Control for pH Regulation in Raceway Reactors*. 22nd IFAC World Congress. Yokohama, Japan, 2023.

24. **J.L. Guzmán**, M. Berenguel, S. Dormido, R. Costa-Castello. *Using Interactive Tools to Connect Theory and Practice*. 22nd IFAC World Congress. Yokohama, Japan, 2023.

25. F. García-Mañas, T. Hägglund, **J.L. Guzmán**, F. Rodríguez, M. Berenguel. *Multivariable Control of Nighttime Temperature and Humidity in Greenhouses Combining Heating and Dehumidification*. 22nd IFAC World Congress. Yokohama, Japan, 2023.

26. R. Nordio, **J. L. Guzmán**, F. G. Acién. pH and dissolved oxygen control strategies as a key to improve microalgal biomass production in pilot scale raceway reactors. *14th European Congress of Chemical Engineering and 7th European Congress of Applied Biothecnology*, Berlin, Germany, 2023.

27. G. Ifrim, H. Georgiana, L. Condrachi, M. Titica, **J.L. Guzmán**. Fictitious Reference Iterative Tuning Control of the pH in a Photobioreactor. *26th International Conference on System Theory, Control and Computing (ICSTCC)*, Sinaia, Rumania, 2022.

28. D. Rodríguez, E. Gualda, P. Soriano, J.L. Casas, **J.L. Guzmán**, J.L. García, J.A. Sánchez-Pérez. Interactive tool for computational kinetics of microcontaminant removal by the solar photo-Fenton process. *Young Water Profeesionals - IWA*, Valencia, Spain, 2022.

29. A. Hoyo, F.J. Mañas-Álvarez, E. Rodríguez-Miranda, J.D. Gil, M. Castilla, **J.L. Guzmán**. Bringing Automatics and Robotics closer to pre-university students. *13th IFAC Symposium on Advances in Control Education*, Hamburg Bergedorf, Germany, 2022.

30. **J.L. Guzmán**, K. Zakova, I.K. Craig, T. Hägglund, D.E. Rivera, J.E. Normey-Rico, P. Moura-Oliveira, L. Wang, A. Serbezov, T. Sato, M. Beschi. Teaching Control during the COVID-19 Pandemic. *13th IFAC Symposium on Advances in Control Education*, Hamburg Bergedorf, Germany, 2022.

31. **J.L. Guzmán**, F. García-Mañas, A. Hoyo, J. Ramos-Teodoro, J.G. Donaire. Use of TCLab kits for control engineering curricula at the University of Almería. *13th IFAC Symposium on Advances in Control Education*, Hamburg Bergedorf, Germany, 2022.

32. P. Otálora, J.D. Gil, **J.L. Guzmán**, M. Berenguel, F.G. Acién. A model-free control approach for the pH regulation in raceway reactors. *13th IWA Specialist conference on Wastewater Ponds and Algal Technologies*, Melbourne, Australia, 2022.

33. M. J. Rodríguez-Torres, A. Morillas-España, **J. L. Guzmán**, F. G. Acién. Modelling and Control Differences for pH Regulation in Microalgae Production System between Fertilizers and Wastewater Sources. *13th IWA Specialist conference on Wastewater Ponds and Algal Technologies*, Melbourne, Australia, 2022.

34. A. Sánchez-Zurano, E. Rodríguez-Miranda, **J. L. Guzmán**, F. G. Acién, J.M. Fernández-Sevilla, E. Molina. Modelling of microalgae and bacteria populations for biological wastewater treatment. *13th IWA Specialist conference on Wastewater Ponds and Algal Technologies*, Melbourne, Australia, 2022.

35. **J.L. Guzmán**, Tore Hägglund. Why tuning rules for feedforward control are required?. 23rd Nordic Process Control Workshop, Luela, Sweden, 2022.

36. **J.L. Guzmán**, F.G. Acién, M. Berenguel. Microalgae production systems: modelling and control issues. 23rd Nordic Process Control Workshop, Luela, Sweden, 2022.

37. **J.L. Guzmán**, B. Joseph. A Web-Based Unit Operations Lab for Enhancing Design, Control and Optimization in Chemical and Biochemical Engineering Courses. AICHE Annual Meeting. Virtual, 2020.

38. B. Joseph, **J.L. Guzmán**. A Techno-Economic Analysis of Greenhouse Waste and Water Recycling Using Anaerobic Digestion: A Case Study in Food-Energy-Water Nexus. AICHE Annual Meeting. Virtual, 2020.

39. **J.L. Guzmán**, M. Berenguel A. Merchan, J.D. Gil, J.D. Alvarez. A virtual lab for modeling and control of a solar collector field. 21st IFAC World Congress. Berlin, Germany, 2020.

40. P. Otálora, **J.L. Guzmán**, M. Berenguel, F.G. Acién. Dynamic Model for the pH in a Raceway Reactor using Deep Learning techniques. 14th International Conference on Automatic Control and Soft Computing (CONTROLO 2020). Bragança, Portugal, 2020.

41. M. Leal, A. Hoyo, **J.L. Guzmán**, T. Hägglund. Double back-calculation approach to deal with input saturation in cascade control problems. 14th International Conference on Automatic Control and Soft Computing (CONTROLO 2020). Bragança, Portugal, 2020.

42. R. Liu, J. Liu, A.X. Ren, H.Y. Liu, **J.L. Guzmán**, J.F. Bienvenido, X.T. Yang, M. Li. Simulation of night-time condensation on cucumber leaves in single slope solar greenhouse. *International Symposium on Advanced Technologies and Management for Innovative Greenhouses: GreenSys2019*, Angers, France, 2019.

43. M. Muñoz, **J.L. Guzmán**, J.A. Sánchez, F. Rogríguez, M. Torres. Greenhouse Models as a Service (GMaaS) for Simulation and Control. *6th IFAC Conference on Sensing, Control and Automation Technologies for Agriculture AGRICONTROL*, Sydney, Australia, 2019.

44. E. Rodríguez-Miranda, **J.L. Guzmán**, M. Berenguel, F.G. Acién, A. Visioli. Diurnal and Nocturnal pH control in Microalgae Raceway Reactors. *2nd IWA Conference on Algal Technologies for Wastewater Treatment and Resource Recovery*, Valladolid, Spain, 2019.

45. A. Hoyo, **J.L. Guzmán**, F.G. Acién, M. Berenguel, J.C. Moreno. A graphical tool to simulate raceway photoreactors. *2nd IWA Conference on Algal Technologies for Wastewater Treatment and Resource Recovery*, Valladolid, Spain, 2019.

46. M. Barceló-Villalobos, **J.L. Guzmán**, F.G. Acién. A feedback control strategy of dissolved oxygen in raceway reactors. *2nd IWA Conference on Algal Technologies for Wastewater Treatment and Resource Recovery*, Valladolid, Spain, 2019.

47. J.J. Carreño-Zagarra, R. Villamizar, J.C. Moreno, **J.L. Guzmán**. Predictive Active Disturbance Rejection Control for Insulin Infusion in Patients with T1DM. *15th Workshop on Time Delay Systems*, Sinaia, Romania, 2019.

48. E. Rodríguez-Miranda, E. Beschi, **J.L. Guzmán**, M. Berenguel, A. Visioli. Application of Symmetrical-Send-On-Delta event-based controller for a microalgal raceway reactor. *European Control Conference*, Naples, Italy, 2019.

49. A. Pawlowski, **J.L. Guzmán**, M. Berenguel, F.G. Acién. Control system for pH in Raceway photobioreactors based on Wiener models. *12th International Symposium on Dynamics and Control of Process Systems DYCOPS-CAB*, Florianópolis, Brazil, 2019.

50. M. López-Alonso, J.D. Álvarez, **J.L. Guzmán**, M. Berenguel. Nonlinear control of a fan-coil operation. *22nd IEEE International Conference on Intelligent Engineering Systems*, Las Palmas de Gran Canaria, Spain, 2018.

51. A. Pawlowski, L. Merigo, **J.L. Guzmán**, S. Dormido, A. Visioli. Two-degree-of-freedom control scheme for depth of hypnosis in anesthesia. *IFAC Conference on Advances in Proportional-Integral-Derivative Control*, Ghent, Belgium, 2018.

52. J.D. Gil, L. Roca, M. Berenguel, **J.L. Guzmán**. A Multivariable Controller for the Start-up Procedure of a Solar Membrane Distillation Facility. *IFAC Conference on Advances in Proportional-Integral-Derivative Control*, Ghent, Belgium, 2018.

53. A. Hoyo, J.C. Morneo, **J.L. Guzmán**, T. Hägglund. Robust QFT-based PID controller for a feedforward control scheme. *IFAC Conference on Advances in Proportional-Integral-Derivative Control*, Ghent, Belgium, 2018.

54. **J.L. Guzmán**, Y. Piguet, S. Dormido, M. Berenguel, R. Costa-Castelló. New Interactive Books for Control Education. *IFAC Conference on Advances in Proportional-Integral-Derivative Control*, Ghent, Belgium, 2018.

55. **J.L. Guzmán**, J.C. Moreno, M. Berenguel, J. Moscoso. Inverse pole placement method for PI control in the tracking problem. *IFAC Conference on Advances in Proportional-Integral-Derivative Control*, Ghent, Belgium, 2018.

56. T. Hägglund, **J.L. Guzmán**. Development of Basic Process Control Structures. *IFAC Conference on Advances in Proportional-Integral-Derivative Control*, Ghent, Belgium, 2018.

57. J.J. Carreño, R. Villamizar, J.C. Moreno, **J.L. Guzmán**. Active Disturbance Rejection and PID Control of a One-stage Refrigeration Cycle. *IFAC Conference on Advances in Proportional-Integral-Derivative Control*, Ghent, Belgium, 2018.

58. A. Hoyo, **J.L. Guzmán**, M. Berenguel. Use of the benchmark for PID control in engineering studies at the University of Almería. *IFAC Conference on Advances in Proportional-Integral-Derivative Control*, Ghent, Belgium, 2018.

59. C. Rodríguez, M. Guinaldo, E. Aranda-Escolástico, **J.L. Guzmán**, S. Dormido. An Object-Oriented Library for Process Control Simulations in MATLAB. *20th IFAC World Congress*, Toulouse, France, 2017.

60. A. Pawlowski, C. Rodríguez, **J.L. Guzmán**, M. Berenguel, S. Dormido. Predictive feedforward compensator for dead-time processes. *20th IFAC World Congress*, Toulouse, France, 2017.

61. M. Veronesi, **J.L. Guzmán**, A. Visioli, T. Hägglund. Closed-loop tuning rules for feedforward compensator gains. *20th IFAC World Congress*, Toulouse, France, 2017.

62. A. Pawlowski, **J.L. Guzmán**, J.Sánchez-Hermosilla, C. Rodríguez, S. Dormido. A low-cost embedded controller design for selective spraying vehicle. *20th IFAC World Congress*, Toulouse, France, 2017.

63. J.D. Gil, L. Roca, A. Ruiz-Aguirre, G. Zaragoza, **J.L. Guzmán**, M. Berenguel. Using a Nonlinear Model Predictive Control strategy for the efficient operation of a solar-powered membrane distillation system. *25th Mediterranean Conference on Control and Automation (MED)*, Valletta, Malta, 2017.

64. A. Pawlowski, L. Merigo, **J.L. Guzmán**, A. Visioli, S. Dormido. Event-based GPC for depth of hypnosis in anesthesia for efficient use of propofol. *3rd IEEE International Conference on Event-Based Control, Communication, and Signal Processing*, Funchal, Portugal, 2017.

65. A. Pawlowski, J.A. Sánchez, **J.L. Guzmán**, F. Rodríguez, M. Berenguel, S. Dormido. Event-Based Control for Greenhouse Irrigation System. *2nd IEEE International Conference on Event-Based Control, Communication, and Signal Processing*, Krakow, Poland, 2016.

66. A. Pawlowski, **J.L. Guzmán**, M. Berenguel, J.E. Normey-Rico, S. Dormido. Multivariable GPC for Processes with Multiple Time Delays: Implementation Issues. *International Conference on Emerging Technologies and Factory Automation ETFA*, Berlin, Germany, 2016.

67. A. Pawlowski, I. Fernández, **J.L. Guzmán**, M. Berenguel, F.G. Acién, S. Dormido. Event-based selective control strategy for raceway reactor: A simulation study. *11th International Symposium on Dynamics and Control of Process Systems DYCOPS-CAB*, Torndheim, Norway, 2016.

68. C. Rodríguez, J.E. Normey-Rico, **J.L. Guzmán**, M. Berenguel, S. Dormido. Low-order feedback-feedforward controller for dead-time processes with measurable disturbances. *11th International Symposium on Dynamics and Control of Process Systems DYCOPS-CAB*, Torndheim, Norway, 2016.

69. A. Hoyo, **J.L. Guzmán**, J.C. Moreno, M. Berenguel. Teaching Control Engineering Concepts using Open Source tools on a Raspberry Pi board. *IFAC Workshop on Internet Based Control Education*, Brescia, Italy, 2015.

70. B. Salvador, J.C. Moreno, **J.L. Guzmán**. Modelling of a non-commercila UAV for control and robotics laboratory. *IFAC Workshop on Internet Based Control Education*, Brescia, Italy, 2015.

71. D.E. Rivera, **J.L. Guzmán**, M. Berenguel, S. Dormido. Understanding Closed-Loop Identification with ITCLI. *17th IFAC Symposium on System Identification*, Beijing, China, 2015.

72. F. Rodríguez, M. Berenguel, **J.L. Guzmán**, J. Sánchez, F. Bienvenido. Greenhouse technologies applied to climate and irrigation control in Almería Province, Southeastern Spain. *Join International Conference on Intelligent Agrictulture*, Beijing, China, 2015.

73. P. Fernández, J. Sánchez, M. Berenguel, J.C. López, **J.L. Guzmán**, F. Rodríguez. Analysis of the airflow pattern and temperature distribution in a fan heating system of a parral-type greenhouse using CFG simulations. *International Symposium on New Technologies and Management for Greenhouses*, Évora, Portugal, 2015.

74. J. Sánchez, **J.L. Guzmán**, F. Rodríguez, J. Vicente, F.G. Acién. Hybrid modelling for a biomass-based system for heating and CO2 enrichment. *International Symposium on New Technologies and Management for Greenhouses*, Évora, Portugal, 2015.

75. A. Pawlowski, **J.L. Guzmán**, M. Berenguel, J.E. Normey-Rico, S. Dormido. Event-based GPC for Multivariable Processes. *1st IEEE International Conference on Event-Based Control, Communication, and Signal Processing*, Krakow, Poland, 2015.

76. I. Fernández, F.G. Acién, J.M. Fernández-Sevilla, M. Berenguel, **J.L. Guzmán**. First principles based model of microalgal production in tubular photobioreactors. *5th International Congress of the International Society for Applied Phycology (ISAP)*, Sydney, Australian, 2014.

77. C. Rodríguez, **J.L. Guzmán**, M. Berenguel, J.E. Normey-Rico. Optimal feedforward compensators for integrating plants. *19th IFAC World Congress*, Cape Town, South Africa, 2014.

78. A. Pérez-Castro, J. Sánchez, **J.L. Guzmán**. Model correction mechanism for nonlinear time variant systems as support to predictive control strategies. *19th IFAC World Congress*, Cape Town, South Africa, 2014.

79. **J.L. Guzmán**, T. Haggünd, K. Aström, S. Dormido, M. Berenguel, Y. Piguet. Understanding PID design through interactive tools. *19th IFAC World Congress*, Cape Town, South Africa, 2014.

80. A. Pawlowski, **J.L. Guzmán**, M. Berenguel, S. Dormido, I. Fernández. Event-based predictive control triggered by input and output deadband conditions. *19th IFAC World Congress*, Cape Town, South Africa, 2014.

81. M. Beschi, A. Pawlowski, **J.L. Guzmán**, M. Berenguel, A. Visioli. Symmetric send-on-delta PI control of a greenhouse system. *19th IFAC World Congress*, Cape Town, South Africa, 2014.

82. G.A. Andrade, D.J. Pagano, I. Fernández, **J.L. Guzmán**, M. Berenguel. Boundary Control of an Industrial Tubular Photobioreactor Using Sliding Mode Control. *19th IFAC World Congress*, Cape Town, South Africa, 2014.

83. **J.L. Guzmán**, D.E. Rivera, M. Berenguel, S. Dormido. TCLI: An Interactive Tool for Closed-Loop Identification. *19th IFAC World Congress*, Cape Town, South Africa, 2014.

84. L. Roca, **J.L. Guzmán**, J.E. Normey-Rico, M. Berenguel. Filtered Smith Predictor with nonlinear model applied to a solar field. *European Control Conference*, Strasbourg, France, 2014.

85. J.C. González, **J.L. Guzmán**, M. Berenguel, S. Dormido. Development of interactive books for Control Education. *10th IFAC Symposium on Advances in Control Education*, Sheffield, UK, 2013.

86. R. Cosota-Castelló, **J.L. Guzmán**, M. Berenguel, S. Dormido. An interactive CAD tool to teach and learn Nyquist criterion. *10th IFAC Symposium on Advances in Control Education*, Sheffield, UK, 2013.

87. H.F. Scherer, M. Pasamontes, J.D. Álvarez, **J.L. Guzmán**, E. Camponogara, J.E. Normey-Rico. Distributed Model Predictive Control for Energy Distribution. *European Control Conference*, Zurich, Switzerland, 2013.

88. J. Salazar, J.D. Álvarez, **J.L. Guzmán**, F. Tadeo. Control-oriented modelling of the solar climatization of a public building in Mediterranean climate. *8th International Conference and Exhibition on Ecological Vehicles and Renewable Energies*, Monte Carlos, Monaco, 2013.

89. S. Dormido, **J. L. Guzmán**, R. Costa, M. Berenguel. Interactivity in Automatic Control: Foundations and Experiences. *Automation, Control and Processes Conference (ARAP 2012)*, Prague, Czech Republic, 2012, (Plenary Lecture).

90. J.D. Álvarez, **J.L. Guzmán**, D. Rivera, S. Dormido, M. Berenguel. ITCRI: An interactive software tool for evaluating control-relevant identification. *16th IFAC Symposium on System Identification SYSID'12*, Brussels, Belgium, 2012.

91. J.D. Álvarez, **J.L. Guzmán**, D. Rivera, S. Dormido, M. Berenguel. ITCRI: An interactive software tool for evaluating control-relevant identification. *16th IFAC Symposium on System Identification SYSID'12*, Brussels, Belgium, 2012.

92. A. Montoya, F. Rodríguez, **J.L. Guzmán**, J.A. Sánchez. Hybrid Modeling and control of greenhouse temperature through aerial-pipes and air-fan heater systems. *International Conference of Agricultural Engineering CIGR-AgEng2012*, Valencia, Spain, 2012.

93. J.A. Sánchez, F. Rodríguez, **J.L. Guzmán**, F.G. Acién, J.C. López. Biomass-based system design for heating and CO_2 storage. *International Conference of Agricultural Engineering CIGR-AgEng2012*, Valencia, Spain, 2012.

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23. *Control del crecimiento de cultivos bajo invernadero optimizando criterios de sostenibilidad, económicos y de eficiencia energética (CONTROLCROP)*. Proyecto de Excelencia de la Junta de Andalucía. TEP 06174 (215.000 €). IP. Francisco Rodríguez, 03/2011-03/2015

24. *ARFRISOL: Arquitectura bioclimática y frío solar*. Proyecto Singular Estratégico del Ministerio de Educación. PS-120000-2005-1 (1.100.000 €). IP. Francisco Batlles. 2007-2012.

25. *E-Automatica: Red de educación con nuevas tecnologías en automática*. Acción especial del Plan Nacional. DPI2010-11055-E (12.000 €). IP. Óscar Reinoso, 01/2011-01/2013.

26. *Estrategias de control no lineal con compensación del retardo en plantas de generación de energía solar*. Proyecto de Cooperación Bilateral – convenio Hispano-Brasileño, PHB2009-0008-PC (65.000 €), IP Manuel Berenguel 01/2007-01/2013.

27. *Red temática de Educación en Automática*. Acción especial del Plan Nacional. DPI2008-04235-E (9.000 €). IP. Fernando Torres, 06/2009-06/2011.

28. *Ayudas a grupos de investigación del Plan Propio de Investigación de la Universidad de Almería 2011*, TEP197-UAL-2011 (3.044 €). IP. Manuel Berenguel, 2011.

29. *Estudio de un modelo de lectura neuroconginitivo-computacional adaptado a las necesidades educativas de niños sordos: Diseño e Implementación de una aplicación web adaptativa como herramienta de ayuda en el aprendizaje de la lectura*. Proyecto de Excelencia de la Junta de Andalucía. P07-SEJ-03214 (186.668 €). IP. María Teresa Daza González, 02/2008-02/2011.

30. *Análisis y evaluación de las técnicas de aplicación de productos fitosanitarios en invernaderos. Reducción del impacto ambiental y optimización técnico-económica*. Proyecto de Excelencia de la Junta de Andalucía. P07-AGR-02995 (186.668 €). IP. Julián Sánchez-Hermosilla, 02/2008-02/2011.

31. *Alorización de CO_2 de gases de combustión mediante su fijación por microalgas-1.* Ministerio de Ciencia e Innovación. CTQ2008-06741-C02-01/PPQ. (140.000 €). IP. José María Fernández Sevilla, 01/2008-01/2011.

32. *Meeting the challenges of the farm of tomorrow by integrating farm management information systems to support real-time management decisions and compliance to standards – FUTUREFARM.* Proyecto Europeo FP7-KBBE-2007-1 (3.000.000 €). IP. Elder Van-Henten, IP (UAL) **José Luis Guzmán**, 01/2008-01/2011.

33. *Control jerárquico de procesos con conmutación en el modo de operación: aplicaciones a plantas solares e invernaderos.* Proyecto del Plan Nacional. Ministerio de Ciencia e Innovación. DPI2007-66718-C04-04 (185.860 €). IP. Manuel Berenguel, 10/2007-10/2010.

34. *Red temática de Ingeniería de Control.* Acción especial del Plan Nacional. DPI2006-26332-E (20.000 €). IP. Francisco R. Rubio, 01/2007-01/2009.

35. *XXVII Jornadas de Automática.* Acción especial del Plan Nacional. DPI2005-25227-E (12.000 €). IP. Manuel Berenguel, 07/2006-07/2008.

36. *Red E-Automática. Acción especial del Plan Nacional.* DPI2006-27217-E (18.000 €). IP. Fernando Torres, 01/2006-01/2009.

37. *Red temática de Ingeniería de Control.* Acción especial del Plan Nacional. DPI2004-21642-E (18.000 €). IP. Francisco R. Rubio, 01/2005-01/2007.

38. *Control predictivo jerárquico de procesos en operación semicontinua.* Proyecto del Plan Nacional. Ministerio de Ciencia e Innovación. DPI2004-07444-C04-04 (96.220 €). IP. Manuel Berenguel, 12/2004-12/2007.

39. *Convenio de colaboración entre el CIEMAT y la UAL para la creación de un centro de investigaciones en energía solar (CIESOL).* Programa operativo integrado FEDER-FSE de I+D+I UALM03-25-003 (130.000 €) IP Amadeo Rodríguez, 11/2005.

40. *Análisis basado en datos del comportamiento de controladores para plantas solares sometidas a perturbaciones.* Proyecto bilateral MAE-AECI Hispano-Polaco, Universidad de Almería – Wroclaw University of Technology (15.000 €), IP. Manuel Berenguel, 11/2004-11/2005.

41. *Red temática de Ingeniería de Control.* Acción especial del Plan Nacional. DPI2002-10940-E (9.000 €). IP. Francisco R. Rubio, 09/2003-09/2005.

42. *Red temática de docencia en Automática (DOCENWEB.* Acción especial del Plan Nacional. DPI2002-11505-E (9.000 €). IP. Fernando Torres, 07/2003-07/2005.

43. *Automática y Robótica Industrial. Acciones coordinadas desarrolladas por varios grupos de investigación (Universidad de Sevilla y Universidad de Almería)*, ACC-770-TEP-2003 (33.485 €). IP. Eduardo F. Camacho (US), Manuel Berenguel (UAL), 01/2003-01/2004.

44. *Control óptimo jerárquico de crecimiento de cultivos bajo invernadero basado en variables climáticas y de fertirrigación.* Proyecto convocatoria Universidad de Almería-Cajamar, CR-UAL-0206 (17.956 €). IP. Francisco Rodríguez, 12/2002-12/2004.

45. *Convenio de Investigación para el Desarrollo de sistemas y herramientas de control para plantas solares.* Proyecto de colaboración en la Universidad de Almería y CIEMAT-PSA, 400373 (81.000 €). IP. Manuel Berenguel, 2002-2006.

46. *Control predictivo de procesos industriales con funcionamiento discontinuo: modelado y aspectos computacionales*. Proyecto del Plan Nacional. Ministerio de Ciencia e Innovación. DPI2001-2380-C02-02 (65.660 €). IP. Manuel Berenguel, 12/2001-12/2004.

47. *Acuerdo Específico de Colaboración entre el CIEMAT y AICIA - Tarea 1. Desarrollo e Implantación de un sistema telepático para acceder on-line y de manera remota a los datos generados durante los ensayos llevados a cabo en la PSA*. IP. Eduardo F. Camacho, 2001-2002.

Contracts with Companies

1. *Optimización del crecimiento de cultivos en contenedores Agrikubic en base a criterios económicos y de eficiencia en el uso de recursos* (OptiKubic), SERCOM AUTOMATION S.L., TRFE-I-2022/016 (22.500 €). IP Francisco Rodríguez Díaz, 03/2022-03/2023.

2. *Dimensionamiento y viabilidad económica de una instalación de ciclo combinado para la agroindustrial utilizando como combustible el deshecho de nuez pecana* (CHPTransfer), SERCOM AUTOMATION S.L., TRFE-I-2022/017 (33.500 €). IP Jorge Antonio Sánchez Molina, 03/2022-03/2023.

3. *Desarrollo de estrategias de control avanzadas para procesos producción de microalgas* (ECOALGA), MICROALGAS CARBONERAS, S.L., TRFE-I-2021/014 (23.500 €). IP **José Luis Guzmán**, 09/2021-12/2022.

4. *Asesoramiento al desarrollo de modelos para el diseño de invernaderos fotovoltaicos a partir de las condiciones externas en el marco del Proyecto Europeo SUN4GREEN GA nr. 756006*, RUFEPA TECNOAGRO, S.L. (79.925,00 €). IP Jorge Antonio Sánchez Molina, 11/2018-03/2019.

5. *Asesoramiento al desarrollo de una metodología de modelado de la humedad de suelo en cultivos exteriores*, AYSCOM celular de servicios, S.L. (18.150,00 €). IP Jorge Antonio Sánchez Molina, 09/2016-02/2017.

6. *Desarrollo tecnológico de un prototipo de modelo de previsión de producción en cultivo de tomate bajo invernadero (MODELCROP)*, Grupo Hispatec Informática Empresarial S.A. (227.182,3 €). IP Francisco Rodríguez Díaz, 04/2015-10/2016.

7. *Monitorización espacial de zonas costeras mediante plataformas aéreas controladas de manera remota*, Construcciones Sánchez Domínguez S.A. - SANDO (79.650 €). IP José Carlos Moreno, 07/2015-01/2016.

8. *BIOGREEN: modelo avanzado de producción en invernaderos*, PRIMA-RAM, S.A. (48.308,04 €). IP Manuel Berenguel Soria, 01/2014-03/2015.

9. *Asesoramiento al desarrollo de una metodología de modelado de las variables climáticas en el interior de invernaderos*, Fundación para las Tecnologías Auxiliares de la Agricultura (TECNOVA) (25.255,73 €). IP Francisco Rodríguez Díaz, 03/2015-07/2015.

10. *Análisis del comportamiento de un cultivo de tomate bajo diferentes condiciones climáticas*, Fundación CAJAMAR (3.000 €). IP Jorge Antonio Sánchez Molina, 09/2014-12/2014.

11. *Asesoramiento al desarrollo de una metodología de modelado de la producción de cultivos bajo invernadero*, Verde Smart Co., SL. (2.359,50 €). IP Francisco Rodríguez Díaz, 09/2014-12/2014.

12. *Asesoramiento en el desarrollo de un sistema de ayuda a la toma de decisiones para el control climático en invernaderos basado en predicciones metereológicas externas*, Fundación para la Investigación del Clima. (2.359,50 €). IP Jorge Antonio Sánchez Molina, 09/2014-12/2014.

13. *Asesoramiento, diseño y desarrollo de un sistema integrado de información con asesoramiento en línea para PYMES*, CADIA ingeniería S.L. (79.650 €). IP **José Luis Guzmán**, 11/2010-09/2011.

14. *Asesoramiento al diseño y desarrollo del sistema de control del prototipo de una máquina clasificadora portátil de productos hortofrutícolas.* CADIA Ingeniería S.L. (21.240 €). IP Francisco Rodríguez, 10/2010-09/2011.

15. *Asesoramiento al diseño y desarrollo mecánico del prototipo de una máquina clasificadora portátil de productos hortofrutícolas.* CADIA Ingeniería S.L. (21.240 €). IP Julián Sánchez-Hermosilla. 10/2010-09/2011.

16. *Desarrollo de un sistema de control para el riego por goteo subterráneo*. F09/09 (35.264 €). IP Juan Martínez López, 03/2009-03/2010.

17. *Asesoramiento al desarrollo de un sistema de aprovechamiento de biomasa de invernadero con recuperación de calor y CO_2*. BESEL S.A. (400785, 29.000 €). IP Francisco Rodríguez y Gabriel Acién, 06/2008-06/2010.

18. *Modelado, automatización y robotización de un sistema de fabricación de dientes diamantados*. IBERINA, (400742, 36.725 €). IP Manuel Berenguel, 03/2008-03/2009.

19. *Almacenamiento de sales en torre central*. Gemasolar (400740, 350.000 €). IP Manuel Berenguel, 05/2008-05/2010.

20. *Multiplicación de esfuerzos para el desarrollo, innovación, optimización y diseño de invernaderos avanzados (CENIT-Mediodía)*. Subcontrato Universidad de Almería (400668, 69600 €). IP Francisco Rodríguez, 05/2007-05/2010.

21. *Mejora en la eficiencia en la producción de invernadero semiárido – (Proyecto de la Corporación Tecnológica de Andalucía – INVERSOS)*. Subcontrato Universidad de Almería (400674, 232.086 €). IP Francisco Rodríguez, 09/2007-09/2011.

22. *Diseño de modelos y estrategias de simulación, control, ensayo y monitorización del lazo Senertrough*. Cobra Sistemas y Servicios (400679, 337.982 €). IP Manuel Berenguel, 05/2007-05/2009.

23. *Estudio y diseño de sistemas para animación, comportamiento y robotizado de juegos inmersivos 3D*. Imagital S.L. (400655, 80.476 €). IP Francisco Rodríguez, Manuel Cantón, Luis Iribarne, 03/2007-12/2007.

24. *Asesoramiento y formación en el diseño y desarrollo de herramientas de adquisición y control basadas en Labview*. ULMA (400638, 12.806 €), IP **José Luis Guzmán**, 01/2007-01/2008.

25. *Asesoramiento y formación en el diseño y desarrollo de sistemas SCADA avanzados y reconfigurables*. ULMA (400571, 10.071 €). IP **José Luis Guzmán**, 02/2006-02/2007.

26. *Asesoramiento, reparación y mejora del software de adquisición y control del proyecto Watergy*. Fundación Cajamar (400705, 3.250 €). IP **José Luis Guzmán**, 09/2007-12/2007.

27. *Desarrollo de un prototipo de equipo autopropulsado para trabajos de pulverización y transporte en cultivos hortícolas*. Carretillas Amate S.L. (400567, 64.380 €). IP Julián Sánchez-Hermosilla, 01/2006-01/2008.

28. *Desarrollo de sistemas y herramientas de control para plantas termosolares*. CIEMAT-Plataforma Solar de Almería (400373, 81.000 €). IP Manuel Berenguel, 10/2005-10/2007.

29. *Monitorización de las variables climáticas para la evaluación en campo de la efectividad de filmes*. Iberocons (400564, 4340 €). IP Francisco Rodríguez, 10/2005-06/2006.

30. *Asesoramiento y colaboración en el diseño de sistemas de monitorización y control*. AYNAT S.L. (400574, 6960 €). IP Manuel Berenguel, 03/2006-12/2006.

31. *Diseño e implementación de un sistema dinámico basado en web para la adquisición y gestión de datos de la Estación Experimental Las Palmerillas a través de Internet*. CAJAMAR (400513, 7335 €). IP Manuel Berenguel, 05/2005-08/2005.

32. *Asesoramiento y formación en el diseño y desarrollo de un sistema supervisor SCADA de control y monitorización de las variables climáticas en el interior de un invernadero*. ULMA (400490, 10.645 €). IP Francisco Rordríguez, 01/2005-12/2005.

33. *Formación y asesoramiento al diseño, implementación y validación de algoritmos de control climático de invernaderos*. ULMA (400440, 3.883 €). IP Francisco Rodríguez, 03/2004-12/2004.

34. *Sistema distribuido y configurable de monitorización de variables climáticas en el interior de invernaderos*. Industria de Telecomunicación y Control (400408, 1.500 €). IP Francisco Rodríguez, 09/2003-11/2003.

35. *Asesoramiento al diseño y desarrollo de algoritmos de control y modelado de variables climáticas en el interior de invernaderos industriales*. ULMA (400394, 6.325 €). IP Francisco Rodríguez, 07/2003-12/2003.

36. *Diseño y desarrollo de un sistema de control climático bajo invernaderos abierto y configurable*. INSTITUT DE RECERCA I TECNOLOGÍA AGROALIMENTARIES (IRTA) (400343, 5228 €). IP Francisco Rodríguez, 05/2002-08/2002.

Awards

1. *Premio INNOVACIÓN-DOCENTE-UAL al mejor Proyecto de Innovación Docente*, Universidad de Almería, 2025 (award to the best project on education innovation at the University of Almería, 2025).

2. *Premio al mejor trabajo en Ingeniería de Control en las XXLII Jornadas de Automática*, Comité Español de Automática, 2022 (award to the best contribution in Control Engineering at the XXLII Spanish National Automatic Control annual Meeting, 2022).

3. *Premio al mejor trabajo en Ingeniería de Control en las XXLII Jornadas de Automática*, Comité Español de Automática, 2021 (award to the best contribution in Control Engineering at the XXLII Spanish National Automatic Control annual Meeting, 2021).

4. *Premio de la Fundación Mediterránea de la Universidad de Almería al grupo de investigación con mayor colaboración con empresas*, 2018 (award of the Mediterranean Foundation of the University of Almería to the R&D group with more collaboration with industry, 2018).

5. *Medalla Agustín de Betancourt y Molina a la trayectoria investigadora* por parte de la Real Academia de Ingeniería, 2016 (Medal of Agustín de Betancourt y Molina by the Spanish Royal Academy of Engineering to his research trajectory, 2016).

6. *Premio al mejor trabajo en Ingeniería de Control en las XXXVI Jornadas de Automática*, Comité Español de Automática, 2015 (award to the best contribution in Control Engineering at the XXXVI Spanish National Automatic Control annual Meeting, 2015).

7. *Premio al mejor profesor de la titulación Ingeniería Industrial en Electrónica*, Escuela Politénica Superior, Universidad de Almería, 2015 (award to the best professor in the Industrial Engineering on Electronics, University of Almería, 2015).

8. *Premio al mejor trabajo en Ingeniería de Control en las XXXIV Jornadas de Automática*, Comité Español de Automática, 2013 (award to the best contribution in Control Engineering at the XXXIV Spanish National Automatic Control annual Meeting, 2013).

9. *Premio al mejor trabajo en Ingeniería de Control en las XXXII Jornadas de Automática*, Comité Español de Automática, 2011 (award to the best contribution in Control Engineering at the XXXII Spanish National Automatic Control annual Meeting, 2011).

10. *Primer premio en Ingeniería de Control en el concurso benchmark*, Comité Español de Automática, 2009-2010 (first prize in Control Engineering in the benchmark of the Spanish Association of Automatic Control, 2009-2010).

11. *Primer Premio ABB-Comité Español de Automática*. XXXI Jornadas de Automática, 2010 (first prize ABB-Spanish Automatic Control Committee during the XXXI Spanish National Automatic Control annual Meeting, 2010).

12. *Primer premio al mejor grupo de Innovación Docente de Andalucía*. Agencia Andaluza de Evaluación y Acreditación (AGAE), 2008-2009 (first prize to the best group in teaching & learning innovation of Andalusia. Andalusian Agency of Evaluation and Accreditation (AGAE), 2008-2009).

13. *Premio de la Fundación Mediterránea de la Universidad de Almería al grupo de investigación con mayor colaboración con empresas*, 2008 (award of the Mediterranean Foundation of the University of Almería to the R&D group with more collaboration with industry, 2008).

14. *Primer premio al mejor grupo de Innovación Docente* de la Universidad de Almería 2008-2009 (first prize to the best group in teaching & learning innovation of the University of Almería, 2008-2009).

15. *Premio Extraordinario de Doctorado de la Universidad de Almería*, 2006 (Extraordinary Doctorate Award of the University of Almería, 2006).

16. *Primer premio: The UNACOMA Vision Event. Agricultural Engineering World Congress.* European Society of Agricultural Engineers, 2006 (first prize: the UNACOMA Vision Event. Agricultural Engineering World Congress. European Society of Agricultural Engineers, 2006).

17. *Segundo Premio ABB-Comité Español de Automática*. XXVII Jornadas de Automática, 2006 (second prize ABB-Spanish Automatic Control Committee during the XXVII Spanish National Automatic Control annual Meeting, 2006).

18. *Premio NATIONAL INSTRUMENTS al desarrollo de aplicaciones educativas en control utilizando LabVIEW.* XXVII Jornadas de Automática, 2006 (National Instruments award to the development of educational applications in control using LabVIEW. XXVII Spanish National Automatic Control annual Meeting, 2006).

19. *Premio OMRON de Iniciación a la Investigación e Innovación en Automática*, 2005 (OMROM award: Introduction to Research and Innovation in Automation, 2005).

20. *Premio PRODEL convocatoria 2004 al mejor trabajo sobre "Prácticas de laboratorio para la enseñanza de la automática".* XXV Jornadas de Automática, Comité Español de Automática, 2004 (PRODEL award: Laboratory practices to Automatic Control teaching, 2004).

21. *Premio al mejor trabajo en Ingeniería de Control en las XXIV Jornadas de Automática*, Comité Español de Automática, 2003. (Award to the best contribution in Control Engineering at the XXIV Spanish National Automatic Control annual Meeting, 2003).

22. *Premio al Mejor Proyecto Fin de Carrera de Ingeniería Informática de la Universidad de Almería*, 2002 (Award to the best Master Thesis in Computer Science of the University of Almería, 2002).

Patents

1. J. González, **J.L. Guzmán**, F.G. Acién. *Método para la detección de contaminantes en cultivos de microalgas y cianobacterias*. Number: P202530128, 18/02/2025.

2. J.L. Casas, D. Rodríguez, J.L. García, **J.L. Guzmán**, J. Sánchez, Zouhayr Arbib, Fernando del Amo Perez, Frank Rogalla. *System and method of urban wastewater regeneration based on fresnel solar concentration technology*. Number: EP24383017, 23/09/2024.

3. J. González, **J.L. Guzmán**, F.G. Acién. *Dispositivo y procedimiento de medida en línea de concentración de biomasa en cultivo de microalgas*. Number: P202330246, 24/03/2023.

4. F. Rodríguez, J. García-Donaire, Ramón González, A. Pawolowski, J. Sánchez-Hermosilla, **J.L. Guzmán**, M. Berenguel, J.C. López, E. Baeza, J.C. Gázquez, V. Plaza. *Sistema de guiado para movimiento autónomo de vehículos en entornos estructurados (Guidance system for autonomous vehicles in strcutured environments)*. Number: ES 2 401 509 B1, 05/03/2014.

5. J. Sánchez-Hermosilla, F. Rodríguez, **J.L. Guzmán**, M. Berenguel, A. Sánchez,. *Mecanismo portador articulado para equipos de clasificación.*. Number: ES P201300031, 21/12/2012.

6. F. Rodríguez, J. Sánchez-Hermosilla, A. Sánchez, **J.L. Guzmán**, R. González, M. Berenguel. *Vehículo autónomo polivalente para trabajos en invernaderos (Multipurpose autonomous vehicle to work in greenhouses)*. Number: ES 2 329 107 B1, 19/05/2008.

7. J. Sánchez-Hermosilla, F. Rodríguez, **J.L. Guzmán**, Luis Amate, J.F. Muñoz. *Máquina clasificadora de frutas y hortalizas portátil*. Number: ES 2318987, 03/08/2006.