



Dr. Gustavo Sanchez

September, 2021

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Research and teaching statement

As a professional with 24 years of experience in Automation and Data Science my purpose is to help companies to fully leverage the opportunities of technology to improve their processes. I received my BS degree in 1994 from University of Metz, France, and PhD degree in 2011 from Simon Bolivar University, Venezuela, graduating both with honors. I have published 27 peer-reviewed articles, receiving in 2010 the IEEE Computational Intelligence Best Paper Award. I have been associated with universities in Venezuela, Mexico, USA, China and India. Recently I also received the Best Paper Award during the IEEE "International Conference on Recent Developments in Control, Automation and Power Engineering", New Delhi, 2019.

In my work, I try to strike a balance between the generation of new theoretical results and application to solve practical problems. In 2015, with Dr. Michael Pecht, University of Maryland, in USA, I worked on Machine Learning applications to Prognostics and Predictive Maintenance.

I have taught courses in both undergraduate and graduate levels, including: Automation, Control Systems Theory (classic and advanced), Modeling and Simulation, Robust, Optimal and Predictive Control. I am enthusiastic about using innovative teaching strategies like e-Learning and Project Based Learning.

Since August 2018, I am Professor at JK LakshmiPat University, India, currently working on Machine Learning applications to IoT and remote sensing data analysis.

EDUCATION

- 2011** **PhD in Science**
Simon Bolivar University, Venezuela
- 1996** **BS in Industrial Systems Engineering**
University of Metz, France

ACADEMIC APPOINTMENTS

- 2018** **Professor**
Institute of Engineering & Technology. JK Lakshmipat University. India.
- 2017** **Visiting Professor**
Wenzhou University, China.
- 2015** **Visiting Professor**
Center for Advanced Life Cycle Engineering. University of Maryland. USA.
- 2013 – 2018** **Professor**
Simon Bolivar University. Venezuela
- 2008 – 2013** **Associate Professor**
Simon Bolivar University. Venezuela
- 2007** **Visiting Professor**
Cinvestav – Instituto Politécnico Nacional, Mexico.
- 1999 – 2008** **Teaching Assistant**
Simon Bolivar University, Venezuela

Courses: Linear Systems Theory, Industrial Automation, Optimal and Robust Control, Optimization, Operational Research, Machine Learning.

PUBLICATIONS

SCI-Indexed Journals

1. Lara, A; Sanchez, G; Coello-Coello, C; Schuetze, O. (2010) *HCS: A New Local Search Strategy for Memetic Multiobjective Evolutionary Algorithms*. IEEE Trans. on Evol. Comput. Vol. 14, no 1. pp: 112 - 132.
2. Requez, J. Sanchez, G. Strefezza, M and Granado, E (2016) *PID-Control Optimization Using Solis-Wets Algorithm and Laguerre System Identification*. IEEE Latin America Transactions, vol. 14, no. 2, pp. 624-630.
3. Saxena, S., Sanchez, G., Pecht, M (2017) *Batteries in Portable Electronic Devices: A User's Perspective*. IEEE Industrial Electronics Magazine, vol. 11, no. 2, pp. 35-44. DOI: 10.1109/MIE.2017.2688483
4. D. Kataria, G. Sanchez, and S. Govindasamy (2020) *Fundamentals of Automation Engineering: A hybrid project-based learning approach*. The International Journal of Electrical Engineering & Education, p. 002072092092846, DOI: 10.1177/0020720920928460.
5. D. Kataria, G. Sanchez, J.P Naidu and M.A. Srinivasan (2021). *Design of Flexible Tactile Array Sensor*. IETE Journal of Research. pp 1-8. DOI: 10.1080/03772063.2021.1911692

Journals (other indexes)

1. Sanchez, G; Villasana, M. Strefezza, M (2007) *Multi-Objective Pole Placement with Evolutionary Algorithms*. Lectures Notes on Computer Science. Vol. 4403. Springer-Verlag.
2. González C, Suarez K and Sanchez, G. (2013). Application of biofluid complex analysis in respiratory system. Revista de la Facultad de Ingeniería Universidad Central de Venezuela, 28(4), 7-13.
3. Requez, J; Strefezza, M; Sanchez, G; Granado, E (2015). *Sensitivity analysis of an algorithm to estimate switched linear systems L_2 norm*. Revista de la Facultad de Ingeniería-UCV. Venezuela.
4. Toro A, Sanchez G, Strefezza M, Granado G (2017) *IIoT and control systems: benefits, challenges and architectures*. Journal of Science and Engineering. Vol. 38, No. 3, pp. 209-214. ISSN 1316-7081. ISSN Elect. 2244-8780. Universidad de Los Andes (ULA)

Conference Proceedings

1. Sanchez, G. Castillo, E. Strefezza, M. Villegas, T. Reyes, O. *A multivariable fuzzy controller for a CSTR*. IASTED International Conference on Intelligent System Control. Tampa, Florida, USA. 2001
2. Sanchez, G. Strefezza, M. Reyes, O. Castillo, E. *Using fuzzy logic to tune optimization parameters in neural model based predictive control technique*. Artificial Neural Networks Intelligent Engineering (ANNIE) 2002. Saint Louis, Missouri. USA. 2002

3. Ginart, A. Sanchez, G. *Fast defuzzification method based on centroid estimation*. IASTED International Conference on Applied Modelling and Simulation. Cambridge, Mass. USA. 2002
4. Sanchez, G.; Ferrer, J. *A new approach for approximating the free transfer function in Q-parametrization*. IEEE Conference on Control Applications/International Symposium on Intelligent Control/International Symposium on Computer Aided Control Systems Design (CCA / ISIC / CACSDo4). Taipei. Taiwan. 2004
5. Sanchez, G.; Villasana, M. Strefezza, M. *Solving Multi-Objective Linear Control Design Problems Using Genetic Algorithms*. 17th IFAC World Conference. Seoul, Korea. 2008.
6. Schuetze, O; Sanchez, G.; Coello Coello, C (2008). *A New Memetic Strategy for the Numerical Treatment of Multi-Objective Optimization Problems*. Genetic and Evolutionary Computation Conference. Atlanta, Georgia, USA.
7. Reyes, O; Sanchez, G; Strefezza, M (2008). *Using Genetic Algorithms to Design a Fuzzy Logic Controller for a pH Reactor: an object Approach*. 10th IASTED International Conference on Control and Applications. Quebec, Canada
8. Reyes, O; Rebolledo, A; Sanchez, G. (2008). *An algorithm to describe the ideal spur gear profile*. Proceedings of ICME 2008 WCE, World Congress on Engineering 2-4 July, 2008, London, U.K.
9. Reyes, O; Sanchez, G.; Strefezza, M (2009). *Multi-objective GA-Fuzzy controller*. Proceedings of the 6th International Conference on Informatics in Control, Automation and Robotics. Volume 1. Intelligent Control Systems and Optimization
10. Sanchez, G.; Reyes, O; Strefezza, M (2009). *A Muti-objective Approach to Approximate the Stabilizing Region for Linear Control Systems*. Proceedings of the 6th International Conference on Informatics in Control, Automation and Robotics. Volume 1. Intelligent Control Systems and Optimization
11. Sanchez, G.; González O. (2010). *A low-cost control system for hydraulic applications*. IEEE ANDESCON. September 14-17. Bogota D.C., Colombia
12. Sanchez, G.; Strefezza, M and Villasana, M. (2011) *Genetic solutions to mixed H_2/H_{inf} problems: Limits of Performance*. International Conference on Evolutionary Computation Theory and Applications (ECTA 2011). Paris, France. October, 24-26, 2011.
13. Sanchez, G. (2012) *The Hill-Climber with Side-Step for Constrained Problems*. Evolve 2012 Conference. Mexico City, Mexico, August 07-09 2012. ISBN 978-2-87971-112-6
14. González O., C; Sánchez, G. *A study of the complexity of respiratory signals during wake and sleep*. IV ECCOMAS. Funchal, Portugal. October, 2013. CD. pp. 1 - 4.
15. Valero, C; Sanchez, G. *A new glucose regulation model*. IASTED International Conference. Modelling, Identification and Control. MIC 2014. February 1 - 1, 201 Innsbruck, Austria
16. F. Castillo and G. Sanchez. *2DOF Helicopter models: A simulation evaluation for MPC applications*. IEEE 3rd Colombian Conference on Automatic Control (CCAC), Cartagena, 2017, pp. 1-6.

17. G. Sanchez. *Multi-Criteria Pareto-Based Control Loop Performance Assessment*. IEEE "International Conference on Recent Developments in Control, Automation and Power Engineering", RDCAPE 2019, New Delhi, 2019 (**Best paper award**).
18. D. Kataria, G. Sanchez. *Design on Project-Based Learning for Analog Circuits*. "IEEE Frontiers in Education Conference". FIE 2020.
19. M. Themalil. S. Singh, R. Kaur, D. Jain, G. Sanchez and M. Sharma. *Investigation on Miniaturization Feasibility of the Pixel Antenna for Small Satellite Footprints*. "IEEE8th International Conference on Smart Computing and Communications", ICSCC 2021. DOI: 10.1109/ICSCC51209.2021.9528091

TEACHING AND RESEARCH SKILLS

- delivering lectures, seminars and tutorials, both in classic or virtual environments; developing and implementing new methods of teaching: Project Based Learning, E-Learning.
- ability to communicate effectively in English, French and Spanish;
- undertaking personal research projects and contributing to the institution's research profile; writing up research and preparing it for publication;
- coaching and supervising PhD students;
- representing the institution at professional conferences and seminars, and contributing to these as necessary;
- establishing collaborative links outside the university with industrial, commercial and public organizations

RESEARCH PROJECTS

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|-------------|---|
| 2018 | GPS-aided GEO augmented navigation for estimation of small water reservoirs in India Chambal Basin
Funded by ISRO, India: 20.000\$ |
| 2016 | Route and scheduling optimization for solid waste collection.
Funded by Simon Bolivar University, Venezuela. Amount of funding: 1.000\$ |
| 2015 | Batteries in Portable Electronic Devices.
Funded by University of Maryland, USA. Amount of funding: 10.000\$ |
| 2015 | Optimization of Risk Abatement Actions Selection for Project Management
Funded by Simon Bolivar University, Venezuela. Amount of funding: 1.000\$ |
| 2012 | A low-cost control system for hydraulic applications
Funded by FONACIT, Venezuela. Amount of funding: 5.000\$ |
| 2005 | Solving Controller Design Problems using Evolutionary Algorithms
Funded by Simon Bolivar University, Venezuela Amount of funding: 10.000\$ |

CONSULTING PROJECTS

2019	Predictive maintenance JK Tyre / JK Cement - India
2018	Industrial Automation POLAR -Venezuela
2015	Automation of a Service Station Facility General Electric -Venezuela
2013	SCADA system design for brewery plants POLAR-Venezuela

ADMINISTRATIVE SERVICE

2013-2014	Head of Department Simon Bolivar University
2003-2005	Career Coordinator Simon Bolivar University

AWARDS

2019	IEEE RDCAPE 2019 Best Paper Award
2010	IEEE Computational Intelligence Society Best Paper Award. Amount of award: 2000\$
2007	Student grant - 4th International Conference – Evolutionary Multi-Criterion Optimization – Matsuhima, Japan. Amount of award: 1000\$
1990	Scholarship to study in France. Amount of award: 50.000\$

REFERENCES

Dr. Michael Pecht

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University of Maryland
College Park, MD 20742

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Professor and Dean (Research & Development)
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