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Summary

I have participated in projects that involve mastering the concepts of Machine Learning, Artificial Intelligence, signal and image processing in a wide variety of fields such as bioengineering, process control, digital communications and business management improvements, among which stand out: detection and classification of cardiac abnormalities using Dictionary Learning, Sparse Signal Representation theory, Deep Neural Networks (DNN) and Support Vector Machines (SVM); detection and diagnosis of failures in the instrumentation of oil processes from the analysis of time series in the Wavelet domain using pattern recognition techniques; estimation of UWB communications channels and noise signal detection using the concept of compressive sensing; and signal and image filtering using robust signal processing techniques. For four years, I worked as a CEO of a startup (MeridaTech) that focused on applied research to the scientific software industry, specifically in the acceleration of scientific software applying optimization coding techniques, use of concepts of parallel and distributed computation, and development of compression algorithms for data transmission on computer clusters. In the last year, I have served as head of the Data Science Department for Go-ToDigital, with the responsibility of coordinating and supervising machine learning projects applied to the improvement of business management.

Education

Postdoctoral Studies, University of Delaware, Newark, DE. USA, 2008-2009.

Ph D. Electrical Engineering, University of Delaware, Newark, DE. USA, 2001.

MSEE Electrical Engineering, University of Delaware, Newark, DE. USA, 1998.

Diploma in Electrical Engineering, University of Los Andes (ULA) Mérida, Venezuela, 1995. Graduated with the highest Distinction: **Summa Cum Laude**.

High School Electronic Technician, Technical Industrial School "Manuel Antonio Pulido Méndez" Mérida, Venezuela, 1987.

Research Interests

⋆ Apply Artificial Intelligence techniques to improve business management.

⋆ Machine Learning for signal/image classification, detection and estimation.

⋆ Signal Processing for Communications and Bio-engineering.

⋆ High Performance Computing.

⋆ Image and Video Processing: compression, filtering, denoising and enhancement.

⋆ Robust and Nonlinear Signal Processing.

Professional Experience

- ⋆ **Head of the data sciences department** for GoToDigital. Jan. 2019 - Present.

- ⋆ **Chief Executive Officer** of Mérida Technology Group. http://meridatech.com/. Mérida, Venezuela. Nov. 01, 2014 - Sep. 2018. Co-founder.

- ⋆ **Visiting Lecturer**. Specialization on Networking and Telecommunications. School of Science and Engineering. University of SINU. Colombia. 2010, 2012, 2014, 2016, 2018.

- ⋆ **Titular Professor**. Department of Electrical Engineering. Universidad de Los Andes. Mérida, Venezuela. Oct. 2011 - Dic. 2018.
- ⋆ **Associate Professor**. Department of Electrical Engineering. University of Los Andes. Mérida, Venezuela. Oct. 2006 - Sep. 2011.

- ⋆ **Visiting Lecturer**. Computer Science Department. University of Buenos Aires. Argentina. Jul. 2004.

- ⋆ **Assistant Professor**. Department of Electrical Engineering. University of Los Andes. Mérida, Venezuela. Sept. 2001 - Sept. 2006.
- ⋆ **Research Assistant**. Electrical and Computer Engineering. University of Delaware. Newark, USA. Sept. 1996 - Jul. 2001.

- ⋆ **Undergraduate Practical Training**. Petroleum company of Venezuela (PDVSA). Jul. 1994 - Jan. 1995.

- ⋆ **Teaching Assistant**
  - Department of Electrical Engineering, ULA, May 1993 - Jun. 1994.
  - Department of Mathematical Sciences, ULA, Jan. 1991 - May 1993.

Teaching Experience

- ⋆ Fundamentals of Measurements. EE undergraduate course, ULA
- ⋆ Electrical Circuit Analysis I. EE undergraduate course, ULA
- ⋆ Digital Communication. EE undergraduate course, ULA
- ⋆ Digital Signal Processing. EE undergraduate course, ULA
- ⋆ Biomedical Signal Processing. Graduate course, Biomedical master program, ULA
- ⋆ Industrial Data Communication. Graduate course, Instrumentation and Control master program.
- ⋆ Transmission of Biomedical Data. Graduate course, Biomedical master program, ULA
- ⋆ Advanced Signal Processing. Graduate course, Biomedical master program, ULA
- ⋆ Statistical Signal Processing. Graduate course, Biomedical master program, ULA
- ⋆ Nonlinear Signal Processing. University of Buenos Aires. Graduate course.
- ⋆ Data Transmission System. University of SINU. Graduate course.

Other Professional Activities

- ⋆ Head of the data sciences department for GoToDigital. Jan. 2019 - Present.

- ⋆ Chief Executive Officer of Mérida Technology Group. http://meridatech.com/. Mérida, Venezuela. Nov. 2014 - Sep. 2018. Co-founder.

- ⋆ Graduate Program Coordinator. Biomedical Engineering (MSc). 2013 - 2015.

- ⋆ Member of the board of Fundacite-Mérida. 2009 - 2012.

- ⋆ Member of the board of CENDITEL. 2009 - 2012.

- ⋆ Visiting Professor. ECE, University of Delaware. Jun. - Aug. 2006.

- ⋆ Visiting Lecturer. Computer Science Department. University of Buenos Aires. Argentina. Jul. 2004.

- ⋆ Head of the Circuit and Measurement Group. 2004 - 2006, 2010 - 2013.

- ⋆ Manager EE Control Lab. 2003 - 2004.

- ⋆ Associate Editor of Science and Engineering Journal. 2004 - 2006.

- ⋆ Member of the Fundacite's Applied Science Commission in charge of granting scholarships, educational fund-aid, and research financial resources. 2003 - 2007.

- ⋆ Member of the Applied Science Commission of the University of Los Andes Council of Scientific, Humanistic and Technological Development (CDCHT-ULA) in change of evaluating and granting research grants. 2003 - 2006.

- ⋆ Member of the Electrical Engineering Department board.

- ⋆ Referee for the following journals: IEEE Communications Letters, IEEE Signal Processing Letters, Journal of Mathematical Imaging and Vision, Journal of Selected Topics in Signal Processing, IEEE Transaction on Signal Processing, IEEE Transaction on Image Processing, IEEE Transaction on Circuit and Systems for Video Technology, Optical Engineering, and Discrete Mathematics.

- ⋆ Referee for CDCHT-ULA (University of Los Andes Council of Scientific, Humanistic and Technological Development),

Publications/Presentations

Patent

- ⋆ U.S. Patent Number **7,395,493**. Systems and methods for adaptively decoding transmitted frames. Granted on Jul. 01, 2008, with J. Gonzalez, Salim A. W. Ahmed.

- ⋆ U.S. Patent Number **7,386,779** Systems and methods for correcting errors in a received frame. Granted on Jun. 10, 2008, with J. Gonzalez, Salim A. W. Ahmed.

- ⋆ U.S. Patent Number **7,224,845**. Bijection mapping for compression/denoising of multi-frame images. Granted on May 29, 2007, with L. Russo y G. Arce.

- ⋆ U.S. Patent Number **7,120,210**. Method and system for processing a signal. Granted on Oct. 10, 2006, with J. G. Gonzalez and Salim A.

- ⋆ U.S. Patent Number **6,961,397**. Symbol synchronizer for impulse noise channels. Granted on Nov. 1, 2005, with J. G. Gonzalez, Salim A. and W. Ahmed.

Book Chapters

- ⋆ Nonlinear Filtering, Book Chapter in The essential Guide to Image Processing. Al Bovic Editor. Chapter 12. Second Edition. pp. 263-292. ELSEVIER. 2009, with Gonzalo R. Arce and Jan Bacca.

- ⋆ Nonlinear Filtering for Image Analysis and Enhancement, *Image and Video Processing Handbook*, Second Edition. pp. 109-133. Editor: Al Bovik, Academic Press, San Diego, CA. 2005, with Gonzalo R. Arce and Jan Bacca.

- ⋆ Recent developments in stack filtering and smoothing, *Advances in Imaging and Electron Physics*. Vol. 117, pp 174-239 Edited by P. W. Hawkes, Academic Press, Burlington, MA. 2001, with Gonzalo R. Arce.

- ⋆ Image Enhancement and Analysis with Weighted Medians, *Nonlinear Image Processing*, pp. 27-67. Editors: S. K. Mitra and G. Sicuranza, Academic Press, San Diego, CA. 2000, with Gonzalo R. Arce.

- ⋆ Nonlinear Filtering for Image Analysis and Enhancement, *Image and Video Processing Handbook*, pp. 81-100. Editor: Al Bovik, Academic Press, San Diego, CA. 2000 with Gonzalo R. Arce and John Mullan.

Selected Papers in refereed Journals

- ⋆ Quality factor estimation based on the peak frequency shift method using a Robust Fourier transform to VSP data. *The Journal of Geophysics and Engineering*. Accepted for publication Jul. 2019, with Sandoval, R. and Vivas, F..

- ⋆ Discriminative dictionary learning for local LV wall motion classification in cardiac MRI. *Expert Systems with Applications*. Nro. 129. Sep. 2019. Pages: 286 - 295, with Juan José Mantilla, Jean-JacquesBellanger, ErwanDonal, Christophe Leclercq and Mireille Garreau.

- ⋆ Interpolation and denoising of seismic signals using orthogonal matching pursuit algorithm: An aplication in VSP and refraction data. *Ciencia, Tecnología y Futuro - CTF*. Sept. 2018, with Sandoval, R. Vivas, F. and Cabrera, F..

- ⋆ Detecting Activation in fMRI Data: An Approach Based on Sparse Representation of BOLD Signal. *Mathematical Problems in Engineering*, vol. 2018, Article ID 1730149, 15 pages, 2018. https://doi.org/10.1155/2018/1730149, with Blanca Guillén and Rubén Medina.

- ⋆ Recursive Weighted Myriad Based Filters and their Optimizations. *IEEE Transactions on Signal Processing*. Vol. 64, No. 15, Aug. 2016. pp. 4027 - 4039, with Juan M. Ramírez.

- ⋆ Classification of electrophoretic registers from meningitis contaminated rats. *International Journal of Engineering and Technology (IJET)*. Vol 7, No 5, Oct-Nov 2015. pp. 1862-1866. ISSN : 0975-4024, with Luis E. Mendoza and Oscar E. Gualdron.

- ⋆ Robust Transforms Based on the Weighted Median Operator. *IEEE Signal Processing Letters*, vol. 22, no.1, pp. 120 - 124, Jan. 2015, with Juan M. Ramírez.

- ⋆ Reconstruction of Sparse Signals From ℓ_1 Dimensionality-Reduced Cauchy Random Projections. *IEEE Transactions on Signal Processing*. Vol. 60, No. 11, Nov. 2012. 5725 - 5737, with Ana B. Ramírez, Gonzalo R. Arce, Daniel Otero and Brian M. Sadler.

- ⋆ Compressive Sensing Signal Reconstruction by Weighted Median Regression Estimates. *IEEE Transactions on Signal Processing*, vol. 59, No. 6, Jun. 2011. 2585-2601, with Gonzalo R. Arce.

- ⋆ A baseline correction algorithm for capillary electrophoresis data using local optimization of LE-GEND algorithm in the wavelet domain. *INTERCIENCIA*. Vol. 34. No. 8. Aug. 2009. pp. 556 - 562, with Enedina Sosa.

⋆ Pattern Recognition in Capillary Electrophoresis Data using Dynamic Programming in the Wavelet Domain. *ELECTROPHORESIS*. Vol. 29. Nro. 13, pp. 2828 - 2840. Jun. 2008, with Gerardo Ceballos, and Luis Hernández.

⋆ Ultrawideband Compressed Sensing: Channel estimation, *IEEE Journal of Selected Topics in Signal Processing*, Vol. 1. No. 3. Oct. 2007, with G. R. Arce and Z. Wang.

⋆ Localización de Móviles en Telefonía Celular Usando Redes Neuronales. *INTERCIENCIA*. Vol. 31. No. 4. Apr. 2006. pp. 300 - 304, with Edgar Belandria, and Francisco Viloria.

⋆ Zero-Order Statistics: A Mathematical Framework for the Processing and Characterization of Very Impulsive Signals. *IEEE Transactions on Signal Processing*. Vol. 54, No. 10, Oct. 2006 pp. 3839 - 3851, with Juan Gonzalez and Gonzalo Arce.

⋆ Improving Immunization of Programmable Logic Controllers using Weighted Median Filters. *ISA Transactions*. Vol. 44, No. 2. Apr. 2005. pp. 225-241. **2006 Best Paper Award**, with Dhionel Díaz

⋆ Multichannel Image Compression By Bijection Mappings Onto Zero-Trees. *IEEE Transactions on Image Processing*. Vol. 11. No 3. Mar. 2002. pp. 223 - 233, with Gonzalo R. Arce and Leonard Russo.

⋆ Image Sharpening For The World Wide Web, *IEEE Transactions on Image Processing*. Vol. 11. No. 3. Jul. 2002. pp 717 - 727, with Marco Fischer and Gonzalo R. Arce.

⋆ Output Distributions of Stack Filters Based on Mirrored Threshold Decomposition. *IEEE Transactions on Signal Processing*. Vol. 49, No 7, Jul. 2001 pp. 1454-1460, with Ilya Shmulevich and Gonzalo R. Arce.

⋆ Optimization of Stack Filters based on Mirrored Threshold Decomposition, *IEEE Transactions on Signal Processing*. Vol. 49, No 6, Jun. 2001, pp. 1179-1188, with Gonzalo R. Arce.

⋆ Recursive Weighted Median Filters Admitting Negative Weights and Their Optimization. *IEEE Transaction on Signal Processing*. Vol 48, No 3, Mar. 2000, pp. 768-779, with Gonzalo R. Arce.

⋆ Stack filters, stack smoothers and Mirrored Threshold Decomposition. *IEEE Transactions on Signal Processing*, Vol. 47, No. 10, pp. 2757-2767, Oct. 1999, with Gonzalo R. Arce.

⋆ **10+ papers published in national journals.**

Selected Conference Papers

⋆ A Sparse Representation Technique for Interpolation and Denoising: Application on VSP data. *15th International Congress of the Brazilian Geophysical Society and EXPOGEF*, Rio de Janeiro, Brazil, Jul. 31 - Aug. 03 2017: pp. 1380-1383. Disponible en https://doi.org/10.1190/sbgf2017-269, with Rómulo Sandoval Flórez and Flor Alba Vivas Mejía.

⋆ Classification of LV wall motion in cardiac MRI using kernel Dictionary Learning with a parametric approach. *In proceedings of: 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)* 978-1-4244-9270-1/15, pp. 7292-7295, with Juan Mantilla, Jean-J. Bellanger1, Erwan Donal, Christophe Leclercq, Rubén Medina y Mireille Garreau.

⋆ Detection of fibrosis in LGE-cardiac MRI using Kernel DL-based clustering. *2015 Computing in Cardiology Conference (CinC)*. pp. 357-360 with Juan Mantilla, Jean-Jacques Bellanger, Julian Betancur, Frédéric Schnell, Christophe Leclercq and Mireille Garreau.

⋆ SVM-based classification of LV wall motion in cardiac MRI with the assessment of STE. *Proc. SPIE 9287, X International Seminar on Medical Information Processing and Analysis* 2015, pp. 92 870N-92 870N-6 with Juan Mantilla, Mireille Garreau and Jean-Jacques Bellanger.

⋆ Robust sparse signal recovery based on weighted median operator. *2014 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 1050-1054, 4-9 May 2014 with Juan M. Ramírez.

⋆ Robust sparse channel estimation for OFDM system using an iterative algorithm based on complex median. *2014 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 6429-6433, 4-9 May 2014 with Jesús La Cruz and Juan M. Ramírez.

⋆ Machine learning techniques for LV wall motion classification based on spatio-temporal profiles from cardiac cine MRI. *Conference Proceeding of 12th International Conference on Machine Learning and Applications (ICMLA 13)*. Miami, Florida, USA, Dec. 7, 2013, with Juan Mantilla, Mireille Garreau and Jean-Jacques Bellanger

⋆ Automated classification of LV regional wall motion based on spatio-temporal profiles from cardiac cine Magnetic Resonance Imaging. *Conference Proceeding of 9th International Seminar on Medical Information Processing and Analysis (SIPAIM 2013)*. Mexico city. México. Nov. 11 - Nov. 14. 2013 with Juan Mantilla, Mireille Garreau and Jean-Jacques Bellanger.

⋆ Detección de Activaciones en fMRI: Un Enfoque Basado en la Representación Poco Densa de la Señal BOLD. *VII Seminario Internacional de Procesamiento y An álisis de Im ágenes Médicas SIPAIM 2011*. Bucaramanga. Colombia. 5 - 7 Dic. de 2011, with Blanca Guillén and Rubén Medina.

⋆ A Sparse Based Approach for Detecting Activations in fMRI. 33rd Annual International IEEE EMBS Conference.Boston, MA, USA Agos. 30 - Sep. 3, 2011. pp. 7816 - 7819, with Blanca Guillén, and Rubén Medina.

⋆ Measurements of terrestrial digital TV signals at two cities in South America. *2010 Proceedings of the Fourth European Conference on Antennas and Propagation (EuCAP'2010)*. Barcelona, Spain. Jul. 08, 2010 with P. V. Castellanos Gonzalez, N. A. Perez, Uzcategui, J. R. Pena, J. B. Duque, L. da Silva Mello, L. A. R. and Souza, R. S. L.

⋆ Compressive Sensing Signal Reconstruction by Weighted Median Regression Estimates. *2010 IEEE International Conference on Acoustics, Speech, and Signal Processing. ICASSP'2010*, Mar. 14 - 19, 2010 - Dallas, Texas, USA, with Gonzalo R. Arce.

⋆ Reconstruction of Sparse Signals From L_1 Dimensionality-Reduced Cauchy Random projections. *2010 IEEE International Conference on Acoustics, Speech, and Signal Processing. ICASSP'2010*. Mar. 14 - 19, 2010 - Dallas, Texas, USA, with Gonzalo R. Arce, Daniel Otero, and Ana B. Ramírez.

⋆ Data Processing and Pattern Recognition in High-Throughput Capillary Electrophoresis. *2009 European Signal Processing Conference (EUSIPCO-2009)*. Glasgow, Scotland, August 24-28, 2009, 1592-1596, with Ceballos, Gerardo, and Luis Hernández.

⋆ Variable Density Compressed Image Sampling. *2009 European Signal Processing Conference (EUSIPCO-2009)*. Glasgow, Scotland, August 24-28, 2009, 2022 - 2026, with Zhongmin Wang and Gonzalo R. Arce.

⋆ Compressive Matched Subspace Detection. *2009 European Signal Processing Conference (EUSIPCO-2009)*. Glasgow, Scotland, August 24-28, 2009, 120 - 124, with Zhongmin Wang, Gonzalo R. Arce and Brian M. Sadler.

⋆ Compressive confocal microscopy. *2007 IEEE International Conference on Acoustics, Speech, and Signal Processing. ICASSP'2009*, Taipei, Taiwan April 19-24, 2009, with P. Ye, G. R. Arce, Y. Wu, C. Chen and D. W. Prather.

⋆ Compressive Confocal Microscopy: 3D Reconstruction Algorithms. *SPIE Conference*, San José, California, USA. Jan. 24 -29 2009, with P. Ye, Y. Wu, C. Chen, G. R. Arce and D. W. Prather.

- ⋆ Compressed UWB signal detection with narrowband interference mitigation. *Proceedings of the IEEE International Conference on Ultra-Wideband, ICUWB 2008.* Hannover, Germany, on September 10-12, Vol. 2 pp 157 - 160 with Zhongmin Wang, Gonzalo R. Arce and Brian M. Sadler.

- ⋆ Un enfoque para la detección y diagnóstico de fallas en la instrumentación de un proceso usando reconocimiento de patrones en el dominio wavelet. *VIII Congreso Iberoamericano de Ingeniería Mecánica.* Cusco, Peru Oct. 23 - 25, 2007 with Guillén Marcos and Oscar Camacho.

- ⋆ A novel approach for Pattern Recognition in Capillary Electrophoresis Data. *IV Latin-American Congress on Biomedical Engineering (CLAIB 2007)*, Sept. 26 - 28, 2007, with Gerardo Ceballos, and Luis Hernández.

- ⋆ A Fast Normalization Method of cDNA Microarray Data based on LAD. *IV Latin-American Congress on Biomedical Engineering (CLAIB 2007)*, Sept. 26 - 28, 2007 with Juan M. Ramírez.

- ⋆ Compressed Detection for Pilot Assisted Ultra-Wideband Impulse Radio. *The 2007 IEEE International Conference on Ultra-Wideband, ICUWB 2007*, Singapore. Sept. 24 - 26 2007. Vol. I. pp. 1-6, with Zhongmin Wang, Gonzalo R. Arce, Brian M. Sadler, and Xu Ma.

- ⋆ Compressed Detection for Ultra-Wideband Impulse Radio. *8th IEEE Workshop on Signal Processing Advances for Wireless Communications*, Helsinki, Finland, June 17-20, 2007, with Zhongmin Wang, Gonzalo R. Arce and Brian M. Sadler.

- ⋆ Compressed Sensing for Ultrawideband Impulse Radio. *2007 IEEE International Conference on Acoustics, Speech, and Signal Processing. ICASSP'2007*, Honolulu, Hawaií, U.S.A. Apr. 16-20, 2007. Vol. III. pp. III-523 - III-526, with Gonzalo R. Arce and Zhongmin Wang.

- ⋆ Colored Random Projections for Compressed Sensing. *2007 IEEE International Conference on Acoustics, Speech, and Signal Processing. ICASSP'2007*, Honolulu, Hawaií, U.S.A. Apr. 16-20, 2007. Vol. III. pp. III-873 - III-876 with Zhongmin Wang, and Gonzalo R. Arce.

- ⋆ Nonlinear Filters Based on Support Vector Machines. 2007 IEEE International Conference on Acoustics, Speech, and Signal Processing. ICASSP'2007, Honolulu, Hawaií, U.S.A. Apr. 16-20, 2007. Vol. II. pp. II-581 - II-584, and David A. Márquez and Winston García-Gabín.

- ⋆ Normalization of CDNA Microarray Data Based on Least Absolute. *Proceedings of the 2006 IEEE International Conference on Acoustics, Speech, and Signal Processing. ICASSP'2006.* Toulouse, France, May. 14-19, 2006. Vol. 2, pp: II-1016 - II-1019, with Juan M. Ramírez and Gonzalo Arce.

- ⋆ Adding Robustness to PLC Using a Software Approach Based on Weighted Median Filters. *Proceedings of the Fifth IEEE International Caribbean Conference on Devices, Circuits and Systems (ICCDCS 2004).* Punta Cana. Dominican Republic. Nov. 3-5, 2004. pp: 324 - 329, with Dhionel Díaz.

- ⋆ FPGA Implementation of a new family of Stack Filters. *Proceedings of the Fifth IEEE International Caribbean Conference on Devices, Circuits and Systems (ICCDCS 2004).* Punta Cana. Dominican Republic. Nov. 3-5, 2004. pp: 152 - 157, with Dhionel Díaz.

- ⋆ Detección y Diagnóstico de Fallas utilizando la Transformada Wavelet. *IV Congreso de Automatización y Control.* Mérida. Venezuela, Nov. 2003. **Best student paper award**, with Marco Guillén and Oscar Camacho.

- ⋆ Stack Filters based on Mirrored Threshold Decomposition. *Conference Proceedings of IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing, NSIP'01.* Baltimore. USA, Jun. 2001, with Gonzalo R. Arce.

- ⋆ Optimization of Stack Filters based on Mirrored Threshold Decomposition. *Conference Proceedings of IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing, NSIP'01.* Baltimore, USA. Jun. 2001, with Gonzalo R. Arce.

- ⋆ A General Colored Ordering Structure of Samples for Signal Filtering.*Conference Proceedings of 2001 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing, NSIP'01*. Baltimore, USA. Jun. 2001, with Yao Nie and Kenneth E. Barner.

- ⋆ Polarimetric SAR Denoising Using Bijection Mapping" *Proceedings of the Fifth annual FEDLAB symposium*. Maryland-USA. pp. 285-289. Mar. 2001, with Leonard Russo and Gonzalo R. Arce.

- ⋆ An Optimization Algorithm for Recursive Weighted Median Filters With Real-Valued Weights. *Conference Proceeding of the 2000 IEEE International Conference on Image Processing (ICIP'00)*, Vol. I, pp. 892-895. Vancouver. Canada. Sept. 2000, with Gonzalo R. Arce.

- ⋆ Multichannel Image Compression By Bijection Mappings Onto Zero-Trees. Conference Proceeding of the 2000 *IEEE International Conference on Image Processing (ICIP'00)*, Vol. III, pp. 648-651. Vancouver. Canada. Sept. 2000, with Gonzalo R. Arce and Leonard Russo.

- ⋆ Multispectral Image Compression By Bijection Mappings Onto Zero-Trees. *Conference Proceedings of the ARL Federated Laboratory Fourth Annual Symposium*. pp 369-373, Maryland, Mar. 2000, with Gonzalo R. Arce and Leonard Russo.

- ⋆ Output Distributions of Stack Filters Based on Mirrored Threshold Decomposition. *Conference Proceedings of ICASSP'2000*. Vol. 6, pp. 3826 - 3829 Jun. 2000. Istanbul, Turkey, Ilya Shmulevich and Gonzalo R. Arce.

- ⋆ Image Sharpening using Permutation Weighted Median Filters. *Conference Proceedings of EUROSIP'2000*. Vol. 1, pp. 299-303, Tampere, Finland. Sept. 2000, Marco Fischer and Gonzalo R. Arce.

- ⋆ A Novel Method for Hyperspectral/ Multispectral Image Compression. *Conference Proceedings of the workshop on Hyperspectral/Multispectral Sensors Measurements Modeling and Simulations*. Alabama, USA. Sept. 1999, with Gonzalo R. Arce and Leonard E. Russo.

- ⋆ A general Recursive Weighted Median Filter structure admitting real-values weights and their optimization. *Proceedings of the 1999 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing*, Vol I, pp. 65-69. Antalya, Turkey, Jun. 1999, with Gonzalo R. Arce.

- ⋆ Multicomponent (Vector) Image Compression Using Vector Wavelets. *Proceedings of the 1998 Workshop on Data Compression Processing Techniques for Missile Guidance Data Links*. Alabama, USA. Vol. 1. Dec. 1998, with Gonzalo R. Arce and Xiang-Gen.

- ⋆ Multicomponent (Vector) Image Compression Using Vector Wavelets. *Proceedings of the Third annual FEDLAB symposium*. Maryland, USA. pp. 311-315. Feb. 1999, with Gonzalo R. Arce and Xiang-Gen.

- ⋆ Denoising of Multipolarimetric SAR imagery for compression. *Proceedings of the Second annual FEDLAB symposium*. Maryland, USA. pp. 216-220. Febrero 1998. **Outstanding Paper Award**, with Gonzalo R. Arce.

- ⋆ A zero-tree like code using nonlinear signal decompositions". *Proceedings of the 1997 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing*, Michigan, USA. Sept. 1997, with Gonzalo R. Arce and Neal C. Gallagher.

- ⋆ Nonlinear signal decomposition for scalable image Compression". *Proceedings of the First annual FEDLAB symposium*. Maryland, USA. pp. 311-315. Feb. 1997, with Gonzalo R. Arce, Neal C. Gallagher and Dan Lau.

- ⋆ **35+ papers presented in local, regional and national conferences.**

Students Supervised

- **Dissertations**

  - ⋆ Sparse Signal processing techniques for VSP data processing. By Romulo Sandoval. Expected graduation: Oct. 2019.

  - ⋆ Robust techniques for Signal Processing. By Ing. MSc Juan M. Ramírez. Universidad de Los Andes. Dic. 2016. Position: Associate Professor at University of Los Andes. Postdoctoral studies at Universidad Industrial de Santander (UIS), Colombia.

  - ⋆ Caractérisation de pathologies cardiaques en Imagerie par Résonance Magnétique par approches parcimonieuses. By Ing. MSc. Juan Mantilla. Co-tutor Dra. Mireille Garreau. Laboratoire Traitement du Signal et de lImage LTSI Université de Rennes I - France. Nov. 2015. Position: Postdoc in COGNACG Cognition and Action Group Lab. Universidad Paris Descartes.

  - ⋆ Estudios de imagénes fMRI basado en representación poco densa. By Lic. Blanca Guillén. (Co-tutor Dr. Rubén Medina). Universidad Simón Bolívar. Julio 2013. Position: Associate Professor at Táchira Experimental University. Venezuela.

  - ⋆ Compressive Sensing for Ultra-wideband signal detection. By Zhognmin Wang. Department of Electrical and Computer Engineering. University of Delaware, (Co-tutor Prof. Gonzalo R. Arce). 2010. Actual position: Design Engieener at Qualcomm.

- **Master Thesis**

  - ⋆ Design of a Registration Device and Executor of Controlled Movements for the Rehabilitation of hand wrist joint. Ing. MSc. Edgar Armando Ceballos Morales. MSc. in Biomedical Engineering. Apr. 2016.

  - ⋆ Proposal for a new interpolation approach to estimate missing data from continuous glucose records based on little dense representation of signals. Ing. Jimer C. Ramírez Guillén. MSc in Automation and Instrumentation. Universidad de Los Andes. Dic. 2015.

  - ⋆ Robust Estimate of Wide Ultra-Band Communications Channels. Ing. Nicey Alberto Yánez MSc in Telecommunications. Universidad de Los Andes. May. 2015.

  - ⋆ Compressed Detection Applied to the Detection of Failures in a Process. Lic. Jesús Rodríguez MSc in Control Engineering. Universidad de Los Andes. Mar. 2012.

  - ⋆ Analysis of Electrophoretic Signals Contaminated with the Meningitis Bacteria Using Vector Support Machines. Ing. Luis Enrique Mendoza. MSc. in Biomedical Engineering. Universidad de Los Andes. May. 2007.

  - ⋆ Denoising and Enhancement of cDNA Microarray Image using nonlinear filters. By Ing. Yvonne Avendaño. Master degree in Biomedical Engineering. University of Los Andes. May. 2007.

  - ⋆ Normalization of cDNA Microarray Data Based on Least Absolute Regression. By Ing. Juan Marcos Ramírez. May. 2006. **With honors**. Master degree in Biomedical Engineering. University of Los Andes. MSc. Juan M. Ramírez is faculty member of the EE Department. ULA.

  - ⋆ A Kernel based approach for classification of electromagnetic interference signals. By Ing. Ender Luzardo. Co-adviser: Prof. Jaime Ramírez. Jul. 2005. **With honors**. Mater degree in Automatization and Instrumentation. MSc. Ender Luzardo is working for the Venezuelan Petroleum company (PDVSA).

  - ⋆ Pattern Recognition in Capillary Electrophoresis Data using Dynamic Programming in the Wavelet Domain. By Ing. Gerardo Ceballos. Jul. 2005. **With honors**. Master degree in Biomedical Engineering. MSc Gerardo Ceballos is faculty member of the EE Department. ULA.

⋆ Fault Detection in valves and transmitters in the wavelet domain. By Ing. Marcos L. Guillén P, Co-advisor: Prof. Oscar Camacho Jan. 2004. Master degree in Automatization and Instrumentation. Msc. Marcos L. Guillén is faculty member of the Mechanical Department. ULA.

⋆ A Mobile Location approach based on Neural Network. By Lic. Edgar Belandria. Jul. 2003. Master degree in Automatization and Instrumentation. MSc. E. Belandria is a Ph D. candidate in the School of Sciences. ULA.

- **Undergraduate Research Projects**
  More than 35 undergraduate research projects in the areas of digital communications, machine learning, biomedical signal processing, and nonlinear signal/image processing.

Awarded research grants

⋆ **Satellite image processing using computational techniques and of Artificial Intelligence.**

Reference:	Grant G-2013
Funding Support:	Ministerio de Ciencia y Tecnología (Fonacit). Venezuela
Center:	LABIDAI - GIBULA
Head of the Research project:	Prof. José L. Paredes
Time Period:	Feb. 20013 - Dic. 2017
Amount granted:	10.000 U.S. $

⋆ **Development of an automatic tool for pattern recognition on capillary electrophoresis data.**

Reference:	Grant G-2005000342
Funding Support:	Ministerio de Ciencia y Tecnología (Fonacit). Venezuela
Center:	LABIDAI - GIBULA
Head of the Research project:	Prof. José L. Paredes
Time Period:	Feb. 2006 - Dic. 2007
Amount granted:	60.000 U.S. $

⋆ **Frequency Selective Filtering using Weighted Order Statistic Admitting Real-valued Weights**.

Reference:	Grant I - 768 - 04 - 02 - B
Funding Support:	CDCHT - ULA. Venezuela
Center:	Electrical Engineering Department
Head of the Research project:	Prof. José L. Paredes
Time Period:	Apr. 2004 - Apr. 2008
Amount granted:	5.000 U.S. $

Eight (8) small research grants to support undergraduate and graduate students under my supervision granted by the University of Los Andes Council of Scientific, Humanistic and Technological Development (CDCHT-ULA).

Honors, Awards & Scholarship

⋆ **IEEE Senior member** since 2011.

⋆ **Award PPI.** (Programa de Promoción a la Investigación). Granted by the Ministry of Science and Technology. Venezuela. A national ranking program for researchers. Level III (highest level) From

Jan. 2007 - Dic.2015. Level II from: Jan. 2005. Level I: from 2003.

⋆ **Outstanding Advisor Award** granted by IEEE-INELECTRA as advisor of the project winner of the third place award for the best national research undergraduate project. Oct. 2008.

⋆ **Award PEI** (Programa Estimulo al Investigador). Granted by the CDCHT-ULA. PEI-2007, PEI-2005. PEI-2003.

⋆ Award ADG-2008, ADG-2010, ADG-2012, as a member of the Biomedical research group; Award ADG-2006, ADG-2004, ADG-2002 as a member of the research group: Research and Development on Automatization and Instrumentation granted by the CDCHT-ULA. Nov. 2006.

⋆ **2006 ISA Transaction Best Paper Award** for the best paper published in ISA Transaction in 2005.

⋆ **Outstanding Advisor Award** granted by IEEE-INELECTRA as advisor of the project winner of the award for the best national research undergraduate project. Oct. 2005.

⋆ **Tulio Febres medal of honor in its first class.** Granted by the Government of Merida state. Nov. 2004.

⋆ **Invited Professor** to ECI 2004. School of Informatic Sciences. University of Buenos Aires, Argentina Jul. 2004.

⋆ Co-author of the paper "Detección y Diagnóstico de Fallas utilizando la Transformada Wavelet" winner of the best student paper award of IV Congress on Automatization and Control. Mérida. Venezuela, Nov. 2003.

⋆ **Young research award** granted by "Fundación Nacional de Ciencias y Tecnología". Fundacite-Mérida in the field of science and technologic. Feb. 2003.

⋆ **Best Paper of the FEDLAB'97 Annual Conference**
Second annual FEDLAB symposium. Maryland, Feb. 1998.

⋆ **Award for Outstanding Student**
Granted by the Mérida State governor to the student graduating with the highest overall GPA in the Electrical Engineering Department, University of Los Andes, Jun. 1995.

⋆ **Honor Degree Distinction in Electrical Engineering (SUMMA CUM LAUDE)**
Granted by the University President, University of Los Andes, Feb. 1995. for being the first student to graduate **Summa cum Laude** from his department.

⋆ **Four plates**
Granted by the School of Engineering, ULA, the Electrical Engineering Department, ULA, Engineering Student Association and Piñango cultural center, Feb. 1995, for being the first Electrical Engineering student to graduate from the University of Los Andes with the highest distinction.

⋆ **Tulio Febres Cordero Prize**
Granted by the Mérida State Major in 1994.

⋆ **Four "Luis María Ribas Dávila" Prizes**
Granted to the student with the highest GPA in the Electrical Engineering Department during the academic years 1991, 1992, 1993 and 1994 issued by the Dean of the Engineering School.

⋆ **Golden medal**
Granted by the school board administrator of the "Manuel A. Pulido Méndez" Technical School for being the best student in high school during 1982-1987 academic years.

Scholarships

- ⋆ **Research Assistant**
  Department of Electrical and Computer Engineering, University of Delaware. USA Sep. 1996 - Jul. 2001.

- ⋆ **Honor Scholarship**
  Granted by the Venezuelan Petroleum Company (PDVSA) 1992-1995.

- ⋆ **Scholarship for outstanding student**
  Granted by FUNDACITE-Mérida, Venezuela, 1995.

- ⋆ **Honor Scholarship**
  Issued by the school board administrator of the "Manuel A. Pulido Méndez" Technical School, Mérida, Venezuela, 1987.

Professional Affiliations

- ⋆ Member of IEEE: Signal Processing Society and Communications Society. Senior Member.

- ⋆ Member of the Faculty staff of the University of Los Andes Mérida, Venezuela

- ⋆ Member of the Engineering Association of Mérida State, Venezuela

Foreign Languages

- ⋆ Spanish (Native)

- ⋆ English

Computer Skills

- ⋆ **Languages**: Python, C/C++

- ⋆ **Software**: MATLAB, LateX, Microsoft Office

- ⋆ **Operating System**: Linux, MS-DOS/Window.