

Dr. Miguel Velez-Reyes
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Distinguished Professor in Engineering
The University of Texas at El Paso
Curriculum Vitae

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EDUCATION:

- 1992 Ph.D. in Electrical Engineering, Massachusetts Institute of Technology, Cambridge, MA.
Dissertation under Prof. George C. Verghese on **Decomposed Algorithms for Parameter Estimation**.
- 1988 Engineer Degree in Electrical Engineering, Massachusetts Institute of Technology, Cambridge, MA.
- 1988 Master of Science in Electrical Engineering, Massachusetts Institute of Technology, Cambridge, MA.
Thesis under the supervision of Prof. George C. Verghese on **Decomposed Algorithms for Speed and Parameter Estimation in Induction Motors**.
- 1985 Bachelor of Science in Electrical Engineering University of Puerto Rico Mayagüez Campus, PR.
Graduated magna cum laude and received Georg Simon Ohm award for best Electrical Engineering Student Class of 1985.

PROFESSIONAL APPOINTMENTS:

- 2012-present **Professor and Chair, Electrical and Computer Engineering**, The University of Texas at El Paso, TX.
- 2015-present **Faculty Affiliate, Computational Science Doctoral Program**, The University of Texas at El Paso, TX.
- 2015-present **Faculty Affiliate, Environmental Science and Engineering Doctoral Program**, The University of Texas at El Paso, TX.
- 2014-2015 **Interim Director, Regional Cyber and Energy Security Center**, The University of Texas at El Paso, TX.
- 2007-2012 **Director, Laboratory for Applied Remote Sensing and Image Processing**, University of Puerto Rico Mayagüez Campus, PR.
- 2004-2012 **Faculty of the Doctoral Program in Computing and Information Sciences and Engineering Program**, University of Puerto Rico at Mayagüez, PR.
- 2003-2012 **Associate Director, Center for Subsurface Sensing and Imaging Systems**. A National Science Foundation Engineering Research Center lead by Northeastern University in partnership with the University of Puerto Rico at Mayaguez, RPI, and Boston University.
- 2003-2008 **Director, Tropical Center for Earth and Space Studies**. A NASA University Research Center at the University of Puerto Rico Mayagüez Campus, PR.
- 2000-2012 **Professor of Electrical and Computer Engineering**, University of Puerto Rico at Mayagüez, PR.
- 1998-2009 **Campus Director, Center for Power Electronic Systems**. A National Science Foundation Engineering Research Center led by Virginia Tech in partnership with RPI, University of Wisconsin—Madison, NCA&T and University of Puerto Rico at Mayaguez, PR.

- 1995-2000 **Associate Professor of Electrical and Computer Engineering**, University of Puerto Rico at Mayagüez, PR.
- 1992-1995 **Assitant Professor of Electrical and Computer Engineering**, University of Puerto Rico at Mayagüez, PR.
- Summer 2003 **Summer Faculty Fellowship Program, United States Air Force Research Laboratories**, Hanscom Air Force Base, Boston, MA.
- Summer 1997 **Summer Faculty Fellowship Program, NASA Goddard Space Flight Center**, Greenbelt, MD
- Summer 1996 **Summer Faculty Fellowship Program, United States Air Force Phillips Laboratory**, Hanscom Air Force Base, Lexington, MA.

HONORS AND AWARDS:

- 2014 **George W. Edwards, Jr./El Paso Electric Distinguished Professor in Engineering**, The University of Texas at El Paso, TX.
- 2010 **Elected Fellow of SPIE**, for contributions to the area of Hyperspectral Image Processing.
- 2010 **Distinguished Professor**, Department of Electrical and Computer Engineering, UPR Mayagüez, PR
- 2005 **Elected Fellow of the Academy of Arts and Sciences of Puerto Rico**, for leadership and contributions to Science and Engineering in Puerto Rico.
- 2000 **UPR Distinguished Researcher in Science and Technology**, UPR Office of the President, PR.
- 2000 **Senior Member of IEEE**
- 1999 **Walter Fee Outstanding Young Engineer Award**, IEEE Power Engineering Society.
- 1998 **Distinguished Professor**, Department of Electrical and Computer Engineering, UPR Mayaguez, PR.
- 1998 **Distinguished Professor**, Puerto Rico Professional Engineers and Land Surveyors Association Mayagüez Chapter, PR.
- 1997 **Presidential Early Career Award for Scientists and Engineers (PECASE)** for “Contributions to engineering education and research on power systems applicable to large systems that transfer power among multiple suppliers in the electric power industry.” The presidential honor is the highest bestowed by the U.S. government on outstanding young scientists and engineers who are in the early stages of their independent research careers. Given in November 3, 1997.
- 1992 **Grass Instruments Fellowship**, MIT, January to May 1992.
- 1992 **Elected to Sigma Xi**, Research Honor Society.
- 1985 **Fellow of the AT&T Cooperative Research Fellowship Program**, June 1985 to December 1991.
- 1985 **Georg Simon Ohm Award**. Best student of the 1985 UPRM Electrical Engineering Graduating Class.
- 1984 **Elected to Tau Beta Pi**, Engineering Honor Society.
- 1984 **Elected to Phi Kappa Phi**, Scientific Honor Society.

CONSULTING EXPERIENCE:

- Telecom Solutions, Puerto Rico, Inc., (Dr. Agustin Rullan, lead), Redesign of the Timing Output T1 Assembly: Conversion to Surface Mount Technology, April-December 1997.
- Preparation of the Puerto Rico Professional Engineer Exam in Electrical Engineering for the Examination Board for Engineers, Architects and Land Surveyors of the Puerto Rico State Department, March 1997.
- PRIME Fomento, (Dr. Agustin Rullan lead), Redesign of the MICRO-400 Line Driver: Transition from Through-Hole to SMT, July-December 1995.
- Curriculum and Facilities Assessment of the Informatics, and the Technology and Engineering Schools at Universidad Accion Pro Educación y Cultura (UNAPEC), Santo Domingo, Dominican Republic, October 12-16, 1994.

JOURNAL PUBLICATIONS:

- M. Marin-McGee and M. Velez-Reyes, "A Spectrally Weighted Structure Tensor for Hyperspectral Imagery." **IEEE Journal on Selected Topics in Applied Earth Observations and Remote Sensing**, Vol. 9, No. 9, pp. 4442-4449, 2016.
- M.C. Torres-Madronero and M. Velez-Reyes, "Integrating Spatial Information in Unsupervised Unmixing of Hyperspectral Imagery using Multiscale Representation." **IEEE Journal on Selected Topics in Applied Earth Observations and Remote Sensing**, Vol. 6, No. 7, pp. 1985-1993, 2014.
- M.A. Goenaga, M.C. Torres-Madronero, M. Velez-Reyes, S.J. Van Bloem, and J.D. China, "Multi-temporal unmixing analysis of Hyperion images over the Guanica dry forest." **IEEE Journal on Selected Topics in Applied Earth Observations and Remote Sensing**, Vol. 6, No. 2 Part 1, 2013.
- J. Castro-Suarez, J. R., Pacheco-Londono, L. C., Vélez-Reyes, M., Diem, M., Tague, T. J., & Hernandez-Rivera, S. P., "FT-IR Standoff Detection of Thermally Excited Emissions of Trinitrotoluene (TNT) Deposited on Aluminum Substrates." **Applied Spectroscopy**, 67(2), 181-186, 2013.
- L.P. Dorado, M. Velez-Reyes, A. Mukerjee, and B. Roysam, "Vector SIFT Detector for Interest Point Detection in Hyperspectral Imagery." **IEEE Transactions on Geosciences and Remote Sensing**, Vol. 50, No. 11, pp. 4521-4533, 2012.
- B. Trigueros-Espinosa, M. Vélez-Reyes, N.G. Santiago and S. Rosario-Torres, "Evaluation of the graphics processing unit architecture for the implementation of target detection algorithms for hyperspectral imagery", **Journal of Applied Remote Sensing** 6, 061506 (Jun 21, 2012).
- A. Mukerjee, M. Velez-Reyes, and B. Roysam, "Interest Points for Hyperspectral Image Data". **IEEE Transactions on Geosciences and Remote Sensing**, Vol. 47, No. 3, March 2009, pp. 748 - 760.
- J.M. Duarte-Carvajalino, G. Sapiro, M. Velez-Reyes, and P.E. Castillo, "Multiscale Representation and Segmentation of Hyperspectral Imagery using Geometric Partial Differential Equations and Algebraic Multigrid Methods." In **IEEE Transactions on Geosciences and Remote Sensing**, Vol. 46, No. 8, August 2008, pp. 2418-2434.
- V. Manian and M. Velez-Reyes, "Support vector classification of land cover and benthic habitat from hyperspectral images," In **International Journal of High Speed Electronics and Systems**, Vol. 18, No. 2, June 2008, pp. 337-348.
- J.M. Duarte-Carvajalino, P. Castillo, and M. Velez-Reyes, "Comparative Study of Semi-implicit Schemes for Nonlinear Diffusion in Hyperspectral Imagery." In **IEEE Transactions on Image Processing**, Vol. 16, No.5, May 2007, pages: 1303 – 1314.
- L.O. Jiménez-Rodríguez, E. Arzuaga-Cruz, and M. Velez-Reyes, "Unsupervised Feature Extraction Techniques for Hyperspectral Data and its Effects on Supervised and Unsupervised Classification." In **IEEE Transactions on Geosciences and Remote Sensing**, Vol. 45, no. 2, February 2007, pages:469 – 483.
- A.A. Irizarry-Rivera, M. Rodríguez-Martínez, B. Velez, M. Velez-Reyes, A.R. Ramirez-Orquin, E. O'Neill-Carrillo, J.R. Cedeño, "Intelligent power routers: A distributed coordination approach for electric energy processing networks." In **International Journal of Critical Infrastructures**, Vol. 3, Nos. 1/2, 2007, pages: 20-57.
- N. Dukhan, P.D. Quiñones-Ramos, E. Cruz-Ruiz, M. Velez-Reyes, E.P. Scott, "One-dimensional heat transfer analysis in open-cell 10-ppi metal foam." In **International Journal of Heat and Mass Transfer**, Vol. 48, December 2005, pages: 5112–5120.
- M. Hernández-Mora, J.E. González, M. Velez-Reyes, J.M. Ortiz, Y.P. Pang, and E. Scott, "Dynamic reduced electrothermal model for integrated power electronic modules (IPEM)". **Journal of Electronic Packaging**. Volume 126, Issue 4, December 2004, pages: 477-490.

- E. O'Neill-Carrillo, M. Velez-Reyes, and A. Irizarry, "The power of undergraduate research." In **IEEE Electric Power and Energy Magazine**. Special Issue on Education, Vol. 1, Iss. 4, Jul-Aug 2003 Page(s):29 - 36.
- M. Burth, G.C. Verghese, and M. Velez-Reyes, "Subset Selection for Improved Parameter Estimation in On-Line Identification of a Synchronous Generator." In **IEEE Transactions on Power Systems**, Vol. 14, No. 1, February 1999, pages: 218 - 225.
- B. Argüello-Serrano and M. Velez-Reyes, "Nonlinear Control of a Heating, Ventilating, and Air Conditioning System with Thermal Load Estimation." In **IEEE Transactions on Control Technology**, Vol. 7, No. 1, January 1999, pages: 56 - 63.
- M. Velez-Reyes and G.C. Verghese, "Parameter Estimation using Decomposed Algorithms with Fast Convergence Rates." In **Computers and Industrial Engineering**, Vol. 33, Nos 1-2, 1997, pages: 67-70.

BOOK CHAPTERS:

- M.Velez-Reyes, J. A. Goodman, and B.E. Saleh, "Chapter 6: Spectral Imaging." In B.E. Saleh, ed., **Introduction to Subsurface Imaging**, Cambridge University Press, 2011.
- J. Castro-Suarez, J. R., Pacheco-Londoño, L. C., Vélez-Reyes, M., Diem, M., Tague Jr, T. J., & Hernandez-Rivera, S. P.. "Open-path FTIR detection of explosives on metallic surfaces." In G. Nikolic, ed., **Fourier Transforms - New Analytical Approaches and FTIR Strategies**, InTech Open Press, pp. 431-458, 2011.
- A.A. Irizarry-Rivera, M. Rodríguez-Martínez, B. Velez, M. Velez-Reyes, A.R. Ramirez-Orquin, E. O'Neill-Carrillo, and J.R. Cedeño, "Intelligent Power Routers: Distributed Coordination for Electric Energy Processing Networks." In J. Momoh and L. Mili. eds., **Operation and Control of Electric Energy Processing Systems**, Wiley-IEEE Press, 2010.
- V. Manian and M. Velez-Reyes, "Support vector classification of land cover and benthic habitat from hyperspectral images," In J. Theriault and J. Jensen, editors, **Spectral Sensing Research for Surface and Air Monitoring in Chemical, Biological, and Radiological Defense and Security Applications (Selected Topics in Electronics and Systems – Vol. 49)**, World Scientific Publishing Company, August 11, 2009, pp. 109-120.
- M. Velez-Reyes, W. Rivera-Gallego, and L.O. Jiménez-Rodríguez, "A Solutionware for Hyperspectral Image Processing and Analysis." In A.J. Plaza and C.I. Chang, editors, **High-Performance Computing in Remote Sensing**, Chapman & Hall/CRC Press, October 2007.

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- J. Yi and M. Velez-Reyes, " Low-dimensional enhanced superpixel representation with homogeneity testing for unmixing of hyperspectral imagery." In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XXIV**, Vol. 10644. May 15, 2018; doi: 10.1117/12.2304889
- M. Velez-Reyes and M. Aldeghlawi, "Using a column subset selection method for endmember extraction in hyperspectral unmixing." In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XXIV**, Vol. 10644. May 15, 2018; doi: 10.1117/12.2309867
- M. Aldeghlawi and M. Velez-Reyes, "A comparison of column subset selection methods for unsupervised band subset selection in hyperspectral imagery." In **Proceedings of the 2018 IEEE Southwest Symposium on Image Analysis and Interpretation**, Las Vegas, NV 2018.
- M. Alkhatib and M. Velez-Reyes, "Segmentation-based cNMF for Hyperspectral Unmixing." In **Proceedings IEEE International Geosciences and Remote Sensing Symposium**, Forth Worth, Texas, July 2017. doi: 0.1109/IGARSS.2017.8127033

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- J. Yi and M. Velez-Reyes, "Dimensionality reduction using superpixel segmentation for hyperspectral unmixing using the cNMF." In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XXIII**, Vol. 101981. May 5, 2017; doi:10.1117/12.2264345;
 - E. Galvan, P. Mandal, M. Velez-Reyes and S. Kamalasan, "Transactive control mechanism for efficient management of EVs charging in transactive energy environment." In **Proceedings of the 48th North American Power Symposium**, Denver, CO, 18-20 Sept. 2016. doi:10.1109/NAPS.2016.7747937
 - S.M. Sajjadi, P. Mandal, T.L. Tseng and M. Velez-Reyes, "Transactive energy market in distribution systems: A case study of energy trading between transactive nodes." In **Proceedings of the 48th North American Power Symposium**, Denver, CO, 18-20 Sept. 2016.
 - M. Marin-McGee and M. Velez-Reyes, "Coherence Enhancement Diffusion for Hyperspectral Imagery using a Spectrally Weighted Structure Tensor," In **Proceedings of the 8th IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)**, August 21-24, 2016, Los Angeles, CA.
 - M. Alkhatib and M. Velez-Reyes, "Understanding Spatial-Spectral Domain Interactions in Hyperspectral Unmixing using Exploratory Data Analysis." In **Proceedings of the 8th IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)**, August 21-24, 2016, Los Angeles, CA.
 - E. Carpena-Colón, L. O. Jimenez-Rodriguez, E. Arzuaga and M. Velez-Reyes, "Subsurface linear unmixing on a controlled underwater environment," 2 In **Proceedings of the 8th IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)**, August 21-24, 2016, Los Angeles, CA. pp. 1-5, doi: 10.1109/WHISPERS.2016.8071788
 - M.C. Torres-Maldronero and M. Velez-Reyes, "Hyperspectral Endmember Class Extraction using Clustering and Validity Indexes." In **Proceedings of the 2016 IEEE Southwest Symposium on Image Analysis and Interpretation**, March 6-8, 2016 • Santa Fe, New Mexico, USA.
 - E. Galvan, P. Mandal, T.L. Tseng, and M. Velez-Reyes, "Energy Storage Dispatch Using Adaptive Control Scheme Considering Wind-PV in Smart Distribution Network." In **Proceedings of the 47th North American Power Symposium**, Charlotte, NC, October 2015.
 - S.M. Sanchez and M. Velez-Reyes, "Skin detection in hyperspectral images." In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XXI**, Vol. 9472, May 2015.
 - I. Marqués, M. Graña, S.M. Sanchez, M.Q. Alkhatib, M. Velez-Reyes, "Person detection in hyperspectral images via skin segmentation using an active learning approach." In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XXI**, Vol. 9472, May 2015.
 - M.C. Torres-Madronero, M. Velez-Reyes, J.A. Goodman, "Subsurface Unmixing for Benthic Habitat Mapping using Hyperspectral Imagery and Lidar-Derived Bathymetry," In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XX**, Vol. 9088, May 2014.
 - M.A. Goenaga-Jimenez, and M. Velez-Reyes, "Integrating Spatial Information in Unmixing using the Nonnegative Matrix Factorization," In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XX**, Vol. 9088, May 2014.
 - N.M. Rodríguez-Carrión, S.D. Hunt, M.A. Goenaga-Jimenez, and M. Velez-Reyes, "Determining optimum pixel size for classification," In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XX**, Vol. 9088, May 2014.
 - W. Sun; T.L. Tseng; B. Zheng; F. Lure; T. Wu; G. Francia; S. Cabrera; J. Zhang; M. Velez-Reyes; W. Qian, "Using undiagnosed data to enhance computerized breast cancer analysis with a three stage data labeling

method.” **Proceedings of SPIE: Medical Imaging 2014: Computer-Aided Diagnosis**, Vol. . 9035, 90350T. (March 20, 2014) doi: 10.1117/12.2043708

- M.C. Torres-Madronero and M. Velez-Reyes, “Unsupervised unmixing of hyperspectral imagery using a multiscale representation.” In **Proceedings of the 5th IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)**, June 2013.
- M. Marin-McGee, S. Velasco-Forero, and M. Velez-Reyes, “Multivariate diffusion and induced segmentation.” In **Proceedings of the 5th IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)**, June 2013.
- M. Marin-McGee and M. Velez-Reyes, “Enhancement of hyperspectral imagery using spectrally weighted tensor anisotropic nonlinear diffusion for classification.” In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XIX**, Vol. 8743, April 2013.
- M.A. Goenaga-Jimenez and M. Velez-Reyes, “Comparing Quadtree Region Partitioning Metrics for Hyperspectral Unmixing.” In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XIX**, Vol. 8743, April 2013.
- M.C. Torres-Madronero and M. Velez-Reyes, “Unmixing analysis based on multiscale segmentation.” In **Proceedings of the 4th IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)**, June 2012.
- M.C. Torres-Madronero and M. Velez-Reyes, “Unsupervised unmixing analysis based on multiscale representation.” In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVIII**, Vol. 8390, April 2012.
- M.A. Goenaga-Jimenez and M. Velez-Reyes, “Incorporating Local Information in Unsupervised Hyperspectral Unmixing.” In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVIII**, Vol. 8390, April 2012.
- G.J. Pérez-Irizarry, F. De La Cruz-Sanchez, B.A. Landrón-Rivera, N.G. Santiago and M. Velez-Reyes, "Developing a portable GPU library for hyperspectral image processing", In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVIII**, Vol. 8390, April 2012.
- M. Marin-McGee and M. Velez-Reyes, “A Structure Tensor for Hyperspectral Images.” In **Proceedings of the 3rd IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)**, June 2011.
- M.C. Torres-Madronero, M. Velez-Reyes, S.L. Van Bloem, and J.D. China, “Multi-temporal unmixing analysis of Hyperion images over the Guanica Dry Forest.” In **Proceedings of the 3rd IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)**, June 2011.
- J. Castro-Suarez, J. R., Pacheco-Londoño, L. C., Ortiz-Rivera, W., Velez-Reyes, M., Diem, M., & Hernandez-Rivera, S. P.. “Open path FTIR detection of threat chemicals in air and on surfaces.” In **Proceeding of SPIE: Infrared Technology and Applications XXXVII**, Vol 8012, May 2011.
- B.E. Trigueros, M.Velez-Reyes, S. Rosario-Torres, N. Santiago, “Evaluation of the GPU architecture for the implementation of target detection algorithms for hyperspectral imagery.” In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVII**, Vol. 8048, April 2011.
- M. Marin-McGee and M. Velez-Reyes, “Enhancement of flow-like structures in hyperspectral imagery using anisotropic diffusion.” In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVII**, Vol. 8048, April 2011.
- L.P. Dorado-Muñoz and M. Velez-Reyes, “Ship detection in MODIS imagery.” In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVII**, Vol. 8048, April 2011.

- D.W. Messinger, J. van Aardt, D. McKeown, M. Casterline, J. Faulring, N. Raqueño, B. Basener, and M. Velez-Reyes, “High-resolution and LIDAR imaging support to the Haiti earthquake relief effort.” In **Proceedings of SPIE: Imaging Spectrometry XV**, Vol. 7812, August 2010.
- L.P. Dorado, and M. Velez-Reyes, “A Vector SIFT Operator for Interest Point Detection in Hyperspectral Imagery.” In **Proceedings of the Second IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)**, 14-16 June 2010.
- A. Santos-García and M. Velez-Reyes, “Identifiability of Geometric Models for Linear Unmixing at Different Spatial Resolutions in Hyperspectral Unmixing. .” In **Proceedings of the Second IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)**, 14-16 June 2010.
- M. Marin-McGee and M. Velez-Reyes, “Denoising of hyperspectral images by best multilinear rank approximation of a tensor.” In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVI**, Vol. 7695, April 2010.
- C. Peña-Ortega and M. Velez-Reyes, "Evaluation of different structural models for target detection in hyperspectral imagery." In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVI**, Vol. 7695, April 2010.
- N. Rey-Villamizar and M. Velez-Reyes " Using k-MST, k-EC and k-VC neighbor graphs construction methods with spatial coherent distance for manifold learning in hyperspectral image processing." In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVI**, Vol. 7695, April 2010.
- A. Santos-García and M. Velez-Reyes, "Understanding the impact of spatial resolution in unmixing of hyperspectral images." In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVI**, Vol. 7695, April 2010.
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- C. Peña-Ortega and M. Velez-Reyes, “Comparison of basis-vector selection methods for structural modeling of hyperspectral imagery.” In **Proceedings of SPIE: Imaging Spectrometry XIV**, Vol. 7457, August 2009.
- M.C. Torres-Madronero, M. Velez-Reyes, and J.A. Goodman, “Underwater unmixing and water optical properties retrieval using HyCIAT.” In **Proceedings of SPIE: Imaging Spectrometry XIV**, Vol. 7457, August 2009.
- S. Rosario-Torres and M.Velez-Reyes, “Speeding up the MATLAB™ Hyperspectral Image Analysis Toolbox using GPUs and the Jacket Toolbox.” In **Proceedings of First IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)**, 26-28 Aug. 2009 Page(s):1–4.
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- L.P. Dorado-Muñoz, M. Velez-Reyes, B. Roysam, and A. Mukherjee, “Interest Point Detection for Hyperspectral Imagery.” In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XV**, Vol.7334, April 2009, (9 pages).
- E. Veronica Morales and M.Velez-Reyes, “Effects of image restoration in classification and visual analysis of LANDSAT imagery over Puerto Rico.” In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XV**, Vol.7334, April 2009, (10 pages).

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- A. Santos-García, M. Velez-Reyes, S. Rosario-Torres, and J.D. China, “A comparison of unmixing algorithms for hyperspectral imagery.” In **Proceedings of SPIE: Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XV**, Vol.7334, April 2009, (12 Pages).
 - J. Goodman, M. Velez-Reyes, and S. Rosario-Torres, “An Update on SeaBED: A TesBED for Validating Subsurface Aquatic Hyperspectral Remote Sensing Algorithms.” In **Proceedings of SPIE: Remote Sensing of the Ocean, Sea Ice, and Large Water Regions 2008**, Vol. 7105, October 2008.
 - M.E. Torres-Hernández, and M. Velez-Reyes, “Hierarchical Control of Hybrid Power Systems.” In **Proceedings of the 2008 IEEE International Conference on Power Electronics (CIEP ‘08)**, Cuernavaca, Mexico, August 24-27, 2008.
 - C. Gerardino-Neira, J. Goodman, M. Velez-Reyes, W. Rivera-Gallego, “Sensitivity analysis of hyperspectral inversion model for remote sensing of coastal ecosystems.” In **Proceedings IEEE International Geosciences and Remote Sensing Symposium**, Boston, July 2008.
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INVITED TALKS AND PRESENTATIONS:

- M. Velez-Reyes, "Models and Algorithms for Hyperspectral Image Processing." **Interdisciplinary Distinguished Seminar Series**, North Carolina State University Laboratory for Analytical Sciences and the Army Research Office, Raleigh, NC, March 3, 2017. Available from <https://youtu.be/RZu1LHumbiQ>
- M. Velez-Reyes, "Integrating Spatial and Spectral Information in Hyperspectral Image Processing." Plenary talk at the 2016 **XXI Symposium on Signal Processing, Images and Artificial Vision**, Universidad Pontificia Bolivariana Seccional Bucaramanga, Bucaramanga, Colombia, August 31 to September 2, 2016.
- M. Velez-Reyes, "Integrating Spatial and Spectral Information in Hyperspectral Image Processing." **Information Science and Technology Seminar Speaker Series**, Los Alamos National Laboratories, September 9, 2015.
- M. Velez-Reyes, "Matrix Factorizations for Mining Multi/Hyperspectral Remote Sensing Imagery." Presented at the **SHPE Annual Conference 2014 Environmental Sustainability and Earth Systems Engineering Research Symposium**, Detroit, MI, November 7, 2014.
- M. Velez-Reyes, "Fusion of Hyperspectral Imagery and Bathymetry Information for Inversion of Biophysical Models." Presented at the **SHPE Annual Conference 2013 Environmental Sustainability and Earth Systems Engineering Research Symposium**, Indianapolis, IN, November 1-2, 2013
- M. Velez-Reyes, "Department of Electrical and Computer Engineering Capabilities in Power and Energy Systems," Presented at the Regional Capacities in Advanced Energy Engineering Research and Development Panel of **ReEnergize the Americas 2012 Conference**, Las Cruces, October 17-18, 2012
- M. Velez-Reyes, "Benthic Habitat Mapping using Hyperspectral Remote Sensing." **University of Florida Department of Computer and Information Sciences and Engineering Faculty Seminar Series**, February 8, 2011.
- M. Velez-Reyes, "Benthic Habitat Mapping using Hyperspectral Remote Sensing." **Ocean and Resources Engineering Seminar**, University of Hawaii, Manoa, January 12, 2011.
- M. Velez-Reyes, "Hyperspectral Image Exploitation for Ship Detection", At the **Maritime Domain Awareness: Ports and Offshore Colloquium**, Colegio de Ingeniero y Agrimensores de Puerto Rico, San Juan, PR, Jan. 20, 2010.
- M. Velez-Reyes, "Experiences in Working with Process and Product Oriented NSF Engineering Research Centers." **2009 NSF ERC Annual Meeting**, Bethesda, MD, Dec. 2-4, 2009.
- M. Velez-Reyes, "Hyperspectral Image Exploitation for Ship Detection." **2008 Asia-Pacific Homeland Security Summit & Exposition**, Honolulu, HI, Oct. 8-10, 2008.

- M. Velez-Reyes, “Advanced Algorithms for Unmixing of Hyperspectral Imagery.” **2008 International Symposium on Spectral Sensing Research**, Hoboken, New Jersey, June 23, 2008.
- M. Velez-Reyes, “Advances in Hyperspectral Image Processing,” **First European School on Hyperspectral Imaging. Sponsored by the Hyperspectral Imaging Network (HYPER-I-NET) of the European Union**, Caceres, Spain, October 29-31, 2007.
- M. Velez-Reyes, “PECASE at a Non-PhD Granting Institution.” **NSF CAREER Mentoring and Networking Workshop**, National Science Foundation, Arlington, VA, January 21-23, 2004.
- M. Velez-Reyes and A. Stankovic, “Challenges in Modeling and Identification of Power Systems: Dealing with Ill Conditioning, High Dimensionality, and other Challenges.” **NSF Workshop on Applied Mathematics for Deregulated Electric Power Systems: Optimization, Control, and Computational Intelligence**, Alexandria, VA, November 3-4, 2003
- M. Velez-Reyes and D. Borojevic, “Integrated Modeling for Power Electronics Packaging.” Presented at **Modern Trends in Electronic Packaging**, University of Puerto Rico Mayagüez Campus, Jan. 31-Feb. 1, 2001.
- M. Velez-Reyes, “Parameter Estimation for Ill-Conditioned Systems.” Presented at **United Technologies Research Center**, in Hartford, Connecticut, on February 18, 2000.
- M. Velez-Reyes, “Parameter Estimation for Ill-Conditioned Systems.” Presented at **Otis Elevators Drives Research Center**, in Fairmont, Connecticut, on February 17, 2000.
- M. Velez-Reyes, “Center for Power Electronic Systems.” Presented at **Eaton Corporation Innovation Center**, in Milwaukee, Wisconsin, on November, 1999.
- M. Velez-Reyes, “Industry Affiliates Program & Raytheon Partnership.” Panel presentation at A Decade of Partnership: University of Puerto Rico Mayagüez and Raytheon at the **SHPE 20th Annual National Technical and Career Conference**, February 4-7, Orlando FL, 1998.

EXTRAMURAL AND INTRAMURAL FUNDING:

- PI, Santiago, Ivonne (Co-PI), and Tweedie, Craig E (Co-PI), **Collaborative Research: The Hispanic AGEP Alliance for the Environmental Science and Engineering Professoriate in Community Colleges and Associate Degree Programs**. NSF, Federal, \$1,158,755.00, July 1, 2017 - June 30, 2022.
- UTEP Campus Coordinator, **Center for Earth System Sciences and REmote Sensing Technologies (NOAA-CREST)**, A consortium between City College of New York (lead institution), University of Puerto Rico at Mayaguez, Hampton University, University of Maryland Baltimore County, Sand Diego State University, and The University of Texas at El Paso. NOAA-Cooperative Science Centers at Minority Serving Institutions, \$638,760, September 1, 2016 to August 31, 2021.
- PI, **Computer Vision Applications: Joint Research Training Program ITM-UTEP**, Partners of the Americas Foundation, \$3,805.00. September 1, 2017 - August 31, 2018.
- Co-PI, Santiago, Ivonne (PI), **Hyperspectral remote sensing for nitrogen management**, UTEP College of Engineering, \$6,000.00. May 15, 2015 - August 31, 2015.
- Interim Project Director, **Regional Energy and Cyber Security Center**, City of El Paso, \$405k, January 2014 to January 2015.
- PI, **Establishment of the Sensing and Signal Analytics Laboratory at UTEP**, UT STARS Award, \$500k, August 2012 to April 2015.
- UTEP lead in **SBIR Phase II: 4-Dimensional Optical Tissue Imaging by Variable Digital Illumination**. I collaboration with Dr. Jose Melendez (lead) from Spectral MD, NSF SBIR, \$64k, Dec. 1, 2012 to Nov. 30, 2013.

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- Collaborator in **Multispectral Analysis of Facial Skin: Detecting Emotional State**, University of Texas at El Paso, IDR Level-2 Program, \$20k, December 1, 2012 to November 31, 2013.
 - PI, **PR NASA EPSCoR: Hyperspectral Imaging for Biodiversity Assessment of Coastal and Terrestrial Ecosystems**, 2009 NASA Experimental Program to Stimulate Competitive Research, \$1.5M, (\$750k-NASA, \$750k UPRM), September 1, 2009-August 31, 2013.
 - Collaborator in **A Biomedical Imaging Acceleration Testbed** (PI David Kaeli, Northeastern University, Co-PI Nayda Santiago UPRM), NSF EEC Innovation Awards. \$90k (UPRM Component), December 15, 2009 to November 20, 2013.
 - PI in **Hyperspectral detection limits of skin signatures over natural vegetation backgrounds**, ARMY Engineering Research and Development Center, \$50k, Oct. 1, 2011 to May 31, 2012.
 - Investigator in **NOAA Cooperative Remote Sensing Science and Technology Center**. Lead institution CCNY. UPRM Component \$1.25M. Sept. 1, 2011 to June 30, 2012.
 - Co-I, **Awareness and Localization of Explosives-Related Threats**, DHS Centers of Excellence Program. A consortium between Northeastern University (lead institution), Boston University, Renselear Politecn Institute, Texas Tech, and the University of Puerto Rico Mayagüez Campus. \$800k (UPRM Component), July 1, 2008 to June 30, 2012.
 - Co-I, **National Center for Maritime, Island, and Extreme Environment Security (CIMES)**, DHS Centers of Excellence Program, \$1M (UPRM Component), July 1, 2008 to June 30, 2012.
 - Collaborator in **Intelligent Diagnostic for Aging Civil Infrastructure**, NSF IGERT, (PI Sara Wadia-Fascetti NEU, and Co-PI Ingrid Padilla, UPRM)\$ 600,000, September 1, 2007 to August 31, 2012.
 - PI in **A Geometrical Approach for the Analysis of Hyperspectral Imagery**, National Geospatial Intelligence Agency, \$140,000. August 1, 2006 to December 31, 2008.
 - PI in **Improving Algorithms for Target Detection in Hyperspectral Infrared Imagery**, 2005 DoD Instrumentation and Research Support Program for Hispanic-Serving Institutions, \$485,057. November 15, 2005 to November 14, 2009.
 - Co-PI in **Failure Probabilities for Risk-Based Maintenance and Parameter Estimation of Synchronous Machines** (Agustin Irizarry, PI), National Science Foundation, Industry University Cooperative Research Centers, \$99,444.
 - Co-PI in **Intelligent Power Routers for Distributed Coordination in Electric Energy Processing Networks** (Agustin Irizarry, PI), NSF/ONR Partnership in Electric Power Networks Efficiency and Security (EPNES) Program, October 1, 2002 to August 31, 2006, \$499,849.
 - Co-PI in **Acquisition of Instrumentation for the Electric Energy Processing Systems Laboratory at UPRM**, (Dr. Efrain O'Neill, PI) National Science Foundation Major Research Instrumentation Program, January 1, 2002 to December 2003, \$180,000.
 - Co-PI in **Integrating Laboratory Practices and Undergraduate Research to the Power Engineering Curriculum** (Dr. Efrain O'Neill, PI) National Science Foundation CCLI Program, \$160,000, May 1, 2001 to April 2003.
 - Co-PI in **Output Selection for Tuning of Field Oriented Controllers** (A. Stankovic, NEU, PI). Subcontract to Northeastern University. Sponsor: General Motors Company Advanced Vehicles Division. August 2001 to May 2002, \$11,581.
 - Co-PI in **A Study of Satellite Monitoring of Gas Emissions for Earthquake Prediction** (M. Silevitch, NEU, PI). Subcontract to Northeastern University. Sponsoring Agency: National Reconnaissance Office, February-December 2001. \$35,000.
 - Co-PI in **Center for Subsurface Sensing and Imaging Systems** (M. Silevitch, NEU, PI). A consortium between Northeastern University (lead institution), Boston University, Renselear Politecn Institute, and the

University of Puerto Rico Mayagüez Campus. NSF Engineering Research Centers Program. August 2000 to February 2012. UPRM Component \$7.5M

- PI in **Iterative Algorithms for Unmixing of Hyperspectral Imagery**, Air Force Research Laboratories, November 1, 2002 – May 31, 2003, \$10,000.
- Co-PI, **Center for Power Electronic Systems** (F.C. Lee, VT, PI). A consortium between Virginia Institute of Technology and State University (Lead Institution), University of Wisconsin, Rensselaer Politecn Institute, North Carolina A&T, and the University of Puerto Rico Mayagüez Campus. NSF Engineering Research Centers Program. August 1998 to January 2009. UPRM Component \$2.0M
- PI in **PECASE: Parameter Estimation for Ill-Conditioned Systems with Application to Electric Drives and Power Systems**. NSF PECASE Program. 1 June 1997 to 31 May de 2004. Amount: from NSF \$500,000, UPR Matching \$177,500.
- Co-PI and Project Director from August 2003-September 2006, **Tropical Center for Earth and Space Studies** and PI for the **Information Processing and Extraction Group**, NASA University Research Centers Program, October 2000 to September 2006. \$6.0M.
- Co-PI in **Unsupervised Classification System for Hyperspectral Data Analysis** (Dr. Luis Jiménez, PI). DEPSCoR Program. \$330,000 October 1997 to September 2000.
- Co-PI in **Clustering and Subset Selection Research for Hyperspectral Data Analysis** (Dr. Luis Jiménez, PI). ARMY Corp of Engineers Topographic Engineering Center. \$314,862 October 1997 to September 2000.
- PI for the **Advanced Automated Image Analysis Project** in the **Tropical Center for Earth and Space Studies**, with Prof. Rafael Fernández-Seín (Project director), NASA University Research Centers Program, \$6.5M, July 1995 to June 2000.
- Investigator in **The Manufacturing Engineering Education Partnership**, (Dr. J.L. Zayas PI), ARPA Technology Reinvestment Program, \$659,000, October 1993 to May 1995.
- Investigator in **Integrated Flash Flood Forecasting Model**, (Prof. Rafael Fernández Seín PI), MRCE National Science Foundation, Washington, DC, \$186,868, October 1993 to September 1995.
- PI in **Intelligent Energy Management Systems for Industrial and Commercial Buildings in Puerto Rico**, (Dr. David Serrano (Co-PI.) and Dr. Arshad Khan (Co-PI)), INDUNIV Research Center, San Juan, PR, \$32,520.00, July 1993 to June 1994.
- PI in **Energy Management Systems for Commercial and Industrial Buildings**, Research Initiation Grant from P.R. EPSCoR Program, \$4,000.00, June-July 1993.

POSTDOCTORAL FELLOWS SUPERVISED AT UPRM:

- Dr. James A. Goodman, **Coastal Remote Sensing using Hyperspectral Imaging**, 2004-2006.
- Dr. Vidya Manian, **Classification and Target Detection for Hyperspectral Imagery using Support Vector Machines**, 2005-2006

CURRENT PHD STUDENTS AT UTEP

- Jiarui Yi. Topic: **Superpixel Segmentation for Hyperspectral Unmixing**.
- Maher Aldeghlawi. Topic: **Hyperspectral Image Dimensionality Reduction**.

PHD DISSERTATIONS SUPPERVISED AT UTEP:

- Mohammed Alkhatib, **Superpixel-Based Hyperspectral Unmixing with Regional Segmentation**, Ph.D. Dissertation in Electrical and Computer Engineering. May 2018.

PHD DISSERTATIONS SUPPERVISED AT UPRM:

- Miguel Goenaga, **Spatially Adaptive Constrained Non-Negative Matrix Factorization for Hyperspectral Unmixing**, Ph.D. Dissertation in Computing and Information Sciences and Engineering. June 2014.
- Maria C. Torres-Madronero, **Unsupervised Unmixing Analysis based on Multiscale Segmentation**. Ph.D. Dissertation in Computing and Information Sciences and Engineering. May 2013.
- Maider Marin-McGee, **Structure Enhancement In Hyperspectral Imagery Using Hybrid Nonlinear Diffusion**, Ph.D. Dissertation in Computing and Information Sciences and Engineering. June 2012.
- Julio M. Duarte, **Object-Based Segmentation in Hyperspectral Imagery**, Ph.D. Dissertation in Computing and Information Sciences and Engineering. December 2007.
- Yahya Masalmah, **Unsupervised Unmixing of Hyperspectral Imagery**, Ph.D. Dissertation in Computing and Information Sciences and Engineering. July 2007.

CURRENT MASTER STUDENTS AT UTEP

- Matthew Hilding. Topic: **Remote Sensing of Urban Heating in El Paso**.

MASTER THESES AND PROJECTS SUPERVISED AT UTEP:

- Emmanuel Ochoa, **Jornada Tramcar System**, (Co-Chair) Master of Science Project, December 2016.
- Virginia Jimenez, **Upgrades to the Hyperspectral Image Analysis Toolbox**, Master of Science Project in Electrical Engineering, December 2015.
- Stephanie M. Sanchez, **Skin Detection using Hyperspectral Imaging**, Master of Science Thesis in Electrical Engineering. May 2015.

MASTER THESES AND PROJECTS SUPERVISED AT UPRM:

- Rejan Karmacharya, **Design of a Web-based Data Management Systems for SeaBED**, Master of Engineering Project in Computer Engineering. November 2011.
- Blas Trigueros, **Implementation of Target Detection Algorithms in Hyperspectral Images using GPUs**, Master of Science Thesis in Computer Engineering. July 2011.
- Nicolas Rey-Villamizar, **Using k-MST, k-EC and k-VC Neighbor Graph Construction Methods with Spatial Coherent Distance for Manifold Learning in Hyperspectral Image Processing**, Master of Science Thesis in Electrical Engineering. December 2010.
- Cristina Cruz, **Study of Equation-Free Multiscale Simulation for Power Electronic Systems**, Master of Engineering Project in Electrical Engineering. December 2010.
- Andrea Santos-García, **Understanding the Effect of Spatial Resolution on Unmixing Algorithms for Hyperspectral Imagery**, Master of Science Thesis in Electrical Engineering, August 2010.
- Carolina Peña-Ortega, **Evaluation of Different Structured Models for Target Detection in Hyperspectral Imagery**, Master of Science Thesis in Electrical Engineering, June 2010.
- Leidy P. Dorado Muñoz, **A Vector Sift Operator for Interest Point Detection in Vector Imagery and its Application to Multispectral and Hyperspectral Imagery**, Master of Science Thesis in Electrical Engineering, December 2009.
- Julia P. Certuche Alzate, **A Reconfiguration Algorithm for a DC Zonal Electric Distribution System Based on Graph-Theory Methods**, Master of Science Thesis in Electrical Engineering, May 2009.
- Maria C. Torres, **Hyperspectral Coastal Image Analysis Toolbox**, Master of Engineering Project in Electrical Engineering, December 2008.
- Wilma E. Pabón, **Soft-Classification of Hyperspectral Imagery**, Master of Science Thesis in Electrical Engineering, September 2008.

- Maria E. Torres, **Hierarchical Control of Hybrid Power Systems**, Master of Science Thesis in Electrical Engineering, December 2007.
- E. Veronica Morales, **Multispectral Image Restoration**, Master of Engineering Project in Electrical Engineering , December 2007.
- Janeth Gomez, **A Multi-Agent System Approach for a Self-Reconfigurable Electric Power Distribution System**, Master of Science Thesis in Computer Engineering, December 2006.
- Christian Nieves, **SeaWEB a Portal for the CenSSIS SeaBED Testbed**, Master of Engineering Project in Computer Engineering , July 2006.
- Carlos Niño, **Recursive Identification of a Synchronous Generator**, Master of Science Thesis in Electrical Engineering, June 2006.
- Angel Aquino, **Gray Box Modeling of Electric Drives using Radial Basis Functions: An Experimental Case**, Master of Science Thesis in Electrical Engineering, May 2006.
- Jorge L. Huaman-Qquellon, **A Variable Dimension Gauss-Newton Method for Ill-Conditioned Parameter Estimation with Application to a Synchronous Generator**, Master of Science Thesis in Electrical Engineering, December 2005.
- Alexey Castrodad, **Retrieval of Bottom Properties in Shallow Waters from Hyperspectral Imagery**, Master of Science Thesis in Electrical Engineering, December 2005.
- Alma Estremera, **Designing a Protection System for a DC Zonal Distribution System Using a Supervisory Event Driven Controller**, Master of Science Thesis in Electrical Engineering, December 2005.
- Vanessa Ortiz, **Hyperspectral Change Detection using Temporal Principal Components Analysis**, Master of Science Thesis in Electrical Engineering, In May 2005.
- Shirley Morrillo, **Effects of Resolution Enhancement in Classification of Hyperspectral Imagery**, Master of Science Thesis in Computer Engineering, In December 2004.
- José J. Rodríguez, **Electrothermal Simulation of Integrated Power Electronic Modules**, Master of Science Thesis in Electrical Engineering, December 2004.
- Michelle Barreto, **Estimation of water inherent optical properties using hyperspectral imagery**, Masters of Engineering Project , July 2004.
- Jose M. Ortiz, **Electrothermal Modeling of Power Electronic Modules**, Master of Science Thesis in Electrical Engineering, May 2004.
- Samuel Rosario, **Iterative Algorithms for Unmixing of Hyperspectral Imagery**, Master of Science Thesis in Computer Engineering, May 2004.
- Yamilka Baez, **Gray Box Modeling of Electric Drives**, Master of Science Thesis in Electrical Engineering, December 2003.
- Julio M. Duarte, **Sensitivity analysis of the effect of the water column on remote sensing reflectance in shallow waters case**, Master of Science Thesis in Electrical Engineering, June 2003.
- Alejandra Umaña, **Determining the dimensionality of hyperspectral images** , Master of Science Thesis in Computer Engineering, June 2003.
- Yahya Masalmah, **Statistical Modeling of Clutter in Hyperspectral Data using Gauss-Markov Random Fields**, Master of Science Thesis in Computer Engineering, June 2002.
- Roberto Rivera Sampayo, **Gray-box Modeling of Electrical Machinery**, Master of Science Thesis in Electrical Engineering, December 2001.
- Wee Liam Fung Ng, **Implementation of a Sensorless Induction Motor Drive**. Master of Science Thesis in Electrical Engineering, December 2001.

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- Lida Jauregui, **Overcomming Ill-Conditioning in Parameter Estimation with Application to Synchronous Generator**. Master of Science Thesis in Electrical Engineering, July 2001.
 - José Ramos, **Sensitivity Analysis of Speed and Parameter Estimation for Induction Motors**, Master of Science Thesis in Electrical Engineering, May 2001.
 - Milagros Linares, **Subset Selection for the Reduction of Hyperspectral Imagery**. Master of Science Thesis in Computer Engineering, May 2001.
 - Miguel Lacouture, **Implementation of Algorithms for Subset Selection in Hyperspectral Imagery**. Master of Engineering Project in Computer Engineering , December 2000.
 - Edgardo Desardén, **Control of a Centrifuge Machine**, Master of Engineering Project in Electrical Engineering , July 1998.
 - Fabian González, **Algorithms for Atmospheric Retrievals using Regularization Methods**, Master of Science Thesis in Electrical Engineering, May 1998.
 - Jose M. Ortiz, **Detection of Oceanic Features in Thermal Imagery**, Master of Science Thesis in Electrical Engineering, May 1998.
 - José L. Rodríguez-Granell, **Detection of Data Breaks using Nonlinear Smoothing Algorithms**, Master of Engineering Project in Electrical Engineering , May 1998.
 - Rogelio Castro, **Adaptive Speed Control of an Induction Motor without a Speed Sensor**, Master of Science Thesis in Electrical Engineering, May 1997.
 - Carlos Rentel, **Nonlinear Decoupling of Temperature and Relative Humidity for a Heating Ventilating and Air Conditioning System**, Master of Science Thesis in Electrical Engineering, December 1996.
 - Elvyn Rodríguez, **Decoupled Control of a Separately Excited DC Motor**, Master of Science Thesis in Electrical Engineering, May 1996.
 - Julio Tafur, **Adaptive Output Feedback Linearizing Speed Control of a Shunt DC Motor**, Master of Science Thesis in Electrical Engineering, December 1995.
 - Betzaida Argüello, **Nonlinear Control of a HVAC System with Thermal Load Estimation**, Master of Science Thesis in Electrical Engineering, December 1994.
 - Samuel X. Seguí, **Adaptive Speed Control of a DC Motor without Rotational Transducers**, Master of Science Thesis in Electrical Engineering, May 1994.

COURSES TAUGHT AT UTEP

- **EE 2351 Electric Circuits II:** Analysis of transient behavior in first-order and second order circuits. Circuit analysis using the Laplace transforms. Network functions and frequency response representation of circuits. Steady-state analysis of circuits fed by non-sinusoidal periodic signals using Fourier series. Two-port networks. Computer-aided analysis of circuits.
- **EE 3195 Junior Professional Orientation:** This course provides an introduction to the profession of electrical engineering with emphasis on career placement, public service, graduate study, engineering ethics and professional registration.
- **EE 5300 Probability and Random Processes:** Random process fundamentals, including spectral analysis, special classes of random processes, linear systems response to random processes, and applications.
- **EE 5324 Staistical Estimation and Detection:** Application of statistical decision theory and estimation theory to problems of communication systems, including radar and sonar. Narrowband signals, gaussian derived processes, hypothesis testing, detection of signals, and estimation of signal parameters.
- **EE 5373 Introduction to Remote Sensing Systems:** Introduction to imaging principles and system performance parameters for optical systems used in multi/hyperspectral remote sensing. Study and evaluation of existing and proposed ground-based, airborne, and satellite remote sensing platforms. Introduction to the

end-to-end information processing chain including algorithms, methodologies and tools for information extraction and management in multi/hyperspectral remote sensing. Discussion of research trends in the area.

COURSES TAUGHT AT UPRM

- **INEL 3105 Electrical Systems Analysis I:** Analysis of direct current and alternating current linear electric circuits; laws and concepts that characterize their behavior.
- **INEL 4102 Electrical Systems Analysis II:** Network functions; circuit analysis by Laplace transforms and Fourier Series; two-port networks; Butterworth and Chebyshev filters; computer-aided analysis of these systems.
- **INEL 4095 Signals and Systems:** Introduction to the mathematical representation of analog and discrete signals and systems. Study of Fourier series, the Fourier transform, and the Z transform applied to analog and discrete signals. Sampling of analog signals. Analysis of signals and frequency response of linear systems. Characterization of linear time-invariant systems of analog and discrete signals. (I was one of the creators of this course as part of our work in curricular revision)
- **INEL 4505 Introduction to Control Systems:** Analysis of control systems and their mathematical models; analysis and design of control systems for single-input single-output plants; computer solution of problems will be emphasized.
- **INEL 5009 Digital Signal Processing:** Signal classification, Z-Transform and discrete Fourier transform; matrix representation of digital filters and digital systems; digital filter design; discrete Fourier transform algorithms.
- **INEL 5355 Introduction to Subsurface Sensing and Imaging:** Introduction to a unified look at the emerging field of subsurface sensing and imaging (SSI). Discussion and analysis of the interrelatedness of the three technological levels of sensing, modeling and signal processing, and computational technology, the similarity of SSI across diverse problem domains and size scales, and the variety of information extraction strategies. Discussion, analysis and comparison of the use of multiple views in space, wavelength, and other accessible dimensions of the sensing modalities. Experimental and subsequent visualization and processing of the measured data using a particular SSI modality. (I was one of the creators of this course as part of our work under the Center for Subsurface Sensing and Imaging Systems).
- **INEL 5408 Electrical Motors Control:** Characteristics and selection criteria of alternating current (A.C.) and direct current (D.C.) motors; design and control of solid state drive systems; braking methods; heating and duty cycle calculations. Performance calculations and design of closed loop controllers.
- **INEL 5505 Introduction to Linear Systems:** Linear spaces and matrices; state variables representations for linear continuous and discrete systems; the Z-transform and its application; controllability and observability; state estimators; stability.
- **INEL 5516 Automation and Robotics:** Analysis and design of automated pneumatic systems using programmable controllers. Programming of industrial robots.
- **INEL 6000 Introduction to Nonlinear Control:** Analysis and synthesis of nonlinear control systems; phase plane and describing function techniques; Lyapunov's second method and its application in the design and stability determination of nonlinear systems.
- **INEL 6001 Feedback Control Systems I:** The Z-transform and its application to sampled-data control systems; analysis of automatic control systems, using state variable concepts; stability criteria; introduction to parameter optimization techniques.

- **INEL 6007 Introduction to Remote Sensing:** History, principles and applications of remote sensing: electromagnetic radiation, aerial photography, land observation satellite system. airborne and spaceborne sensors, data and image analysis/interpretation, pattern recognition, applications on subsurface sensing.
- **INEL 6047 Advanced Control Systems Theory:** Advanced problems in linear and nonlinear control systems. The use of linear algebra for the analysis and design of nonlinear control systems is emphasized. Also, the implementation of linear systems using using analog and digital simulation diagrams is studied.
- **INEL 6066 Control of Electric Drive Systems:** Theory and operation of phase and chopper controlled direct current (d.c.) drives, closed loop d.c. drives and their analysis, phase locked loop d.c. drives; design of controllers for optimal performance. Speed control and control schemes for induction and synchronous motors; inverters and cycloconverters; closed loop alternating current (a.c.) drives; stability and performance analysis
- **INEL 6076 Adaptive and Optimal Signal Processing:** Signal and system modeling, spectrum estimation, linear optimum filtering, linear and nonlinear adaptive filtering.
- **INEL 6078 Estimation, Detection and Stochastic Processes:** Fundamentals of detection, estimation, and random process theory for signal processing, communications, and control. Random processes and sequences. Linear systems driven by random processes. Bayesian and nonrandom parameter estimation. Signal detection and estimation from waveform observations. Wiener and Kalman filters. (I was the creator of this course as part of our work in graduate curricular revision for ths signal processing area)

SHORT COURSES TAUGHT:

- **Introduction to Hyper/Multispectral Remote Sensing.** Offered at the Universidad Pontificia Bolivariana Seccional Bucaramanga, Bucaramanga, Colombia, August 30, 2016.

ACADEMIC SERVICE:

- Member, UTEP Partnerships for Research and Education in Materials Internal Advisory Board, 2014-2015
- Member, Search Committee UTEP Physics Department Chair, 2013-2014.
- Member, Advisory Board, Regional Energy and Cyber Security Center, 2013.
- Coordinator, Proposal to Establish a PhD program in Electrical Engineering at UPRM. (2002-2012). Leading efforts to establish a PhD in EE. The program started in Spring 2016.
- Coordinator, Graduate Program, UPRM Electrical and Computer Engineering Department. (Aug 1998-June 2012).
- Coordinator, UPRM Electrical Engineering Academic Affairs Committee, (September 2010-June 2012). Leading efforts for a curricular revision of the BSEE program at UPRM.
- Advisor, UPRM Student Chapter of SPIE, (2009-June 2012).
- Coordinator, UPRM Communications and Signal Processing Committee, (2008-2010).
- Member, Graduate Committee of the UPRM PhD Program in Computing and Information Sciences and Engineering, (2009-2010)
- Member, UPRM Graduate Council, (2000-2005). As part of my participation, I worked on the committees that developed the drafts of the current policies on graduate studies and assistantships at UPRM.
- Member, Board of Directors, University of Puerto Rico at Mayaguez Research and Development Center, (2002-2007).
- Member, UPRM ECE Personnel Committee (August 2000 – July 2006).
- Advisor, UPRM ECE Graduate Students Association (1998-2005).
- Member, UPRM ECE Department Chair Search Committee, 2001.

- Member, UPRM Engineering Dean Search Committee, 2000.
- Coordinator, UPRM ECE Industrial Affiliates Program. (August 1993- July 2000). Coordination of program activities including company recruiting, promotion, proposal evaluation, and coordination of meetings. During my tenure as director, we increased the number of participating companies from 8 to 11 and the level of funding from \$24,000 to \$55,000 per year. Student participation increased from 20 to 50 students per year.
- Coordinator, UPRM Energy Conversion Laboratory (August 1992-May 2001). Coordination of electric power and energy conversion laboratory. Development and maintenance efforts of laboratory facilities. Increased number of workstations from 18 to 20 wrote laboratory manual with partial support from the NSF. Obtained over \$400k for laboratory enhancement including a NSF CCLI in October 2000.
- Coordinator, UPRM ECE Robotics and Automation Laboratory (August 1994-May1997). Coordinate use of laboratory facilities as part of teaching the Robotics and Automation course. Also work jointly with the Manufacturing Engineering Education Partnership lead by Penn State in getting equipment donations for over \$400,000.

PROFESSIONAL SERVICE:

- Chair, SPIE Conference on Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery, 2013 to current.
- Member, Heat Island Effect Mitigation / Infrastructure Working Group, El Paso, Texas. December 2016 - Present.
- Guest editor, ECE Source: Special issue on diversity, November 2017.
- Member, Editorial Committee, ECE Shource, 2017 to present.
- Member, ECEDHA Diversity Group. May 2016 - Present.
- Technical Committee Member, IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS), 2012-present.
- Technical Program Committee Member, 2014 IEEE Southwest Symposium on Image Analysis and Interpretation, 2013-present.
- Panelist, NRC Research Associateships Program, 2013-current.
- Member IEEE Geoscience and Remote Sensing Society Image Analysis and Data Fusion Technical Committee, 2012-present.
- Member Advisory Board, UTEP Doctoral Program in Environmental Science and Engineering, April 2016 to present.
- Member Internal Advisory Board, UTEP NSF Partnerships for Research and Education in Materials Program, January 2015 to August 2016.
- Member Research Advisory Committee, Power Across Texas, September 2014-2015
- Program Evaluator and Team Leader, Greater Caribbean Engineering Accreditation System, January 18-21, 2015.
- Member, Advisory Board for the UTEP Regional Cyber and Energy Security Center, April 2013-2014.
- Program Committee Member, SPIE Conference on Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery, 2004-2013.
- Program Committee Member, SPIE Conference in High Performance Computing in Remote Sensing, 2010-2011.
- Co-Chair, SPIE Conference on Remote Sensing of the Ocean, Sea Ice, and Large Water Regions, 2006-2011.
- Organizing Committee Member, SPIE European Remote Sensing Symposium, 2006-2011.

- Program Evaluator for Electrical Engineering, Accreditation Board for Engineering and Technology (ABET), elected by IEEE, 2002-2008.
- Chairman, 2002 IEEE Workshop on Computers in Power Electronics.
- AdCom Member, IEEE Power Electronics Society Administrative Committee, Region 9 Representative (2000-2003).
- President, IEEE Puerto Rico Western Chapter April (1998-2000)
- Vice-President, IEEE Puerto Rico Western Chapter from (1995 – 1998)
- Reviewer for IEEE Transactions on Geoscience and Remote Sensing, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, IEEE Geoscience and Remote Sensing Letters, IEEE Transactions on Image Processing, Canadian Journal of Remote Sensing, Hindawi Remote Sensing.
- Served in National Science Foundation, and NASA Proposal Review Panels

CURRENT PROFESSIONAL MEMBERSHIPS AND AFFILIATIONS:

- ECE Department Heads Association (ECEDHA)
- NSPE – National Society of Professional Engineers
- TSPE – Texas Society of Professional Engineers
- SPIE – Fellow, The International Society for Optical Engineering
- IEEE – Senior Member , Institute for Electrical and Electronics Engineers
- ASEE – American Society for Engineering Education
- SACNAS – Life Member, Society for the Advancement of Chicanos and Native Americans in Science
- SHPE – Life Member, Society of Hispanic Professional Engineers
- AGU – American Geophysical Union
- SIAM – Society of Industrial and Applied Mathematics

LICENSURES AND CERTIFICATIONS

- Professional Engineer State of Texas, Texas Board of Professional Engineers. (February 1, 2017 - Present).
- Professional Engineer Puerto Rico, Puerto Rico State Board of Engineers, Architects and Land Surveyors. (July 1994 - September 2016).

PERSONAL INFORMATION:

U.S. Citizen and Bilingual in English and Spanish.