ORTIZ-RIVERA, EDUARDO I.

US Citizen, Born: Aibonito, Puerto Rico, United States of America

Academic rank: Associate Professor

University of Puerto Rico at Mayagüez
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(i) Degrees with fields, institution, and date:

Ph.D.	Electrical Engineering, Ph.D. Advisor: Ph.D. Dissertation:	Michigan State University (MSU), Dr. Fang Z. Peng, IEEE Fellow (Power Electronics) "Modeling and Analysis of Solar Distributed Generation"	05/2006
M.S.	Electrical Engineering, Academic Advisor: Research Advisor:	Michigan State University, Dr. Percy A. Pierre, National Academy of Engineering Fellow Dr. R.L. Tummala, MSU Distinguished Professor	05/2002
B.S.	Electrical Engineering Specialization:	University of Puerto Rico, Mayagüez Campus Power Systems and Control Systems	05/2000

(ii) Faculty service at UPRM:

- Date of original appointment: July 2006
- Total years of service: 9 years and 1 months

(iii) Areas of professional expertise:

Photovoltaic Systems, Aerospace and Unmanned Systems, Renewable Energy, Electric Drives, Power Electronics, Algorithms for Maximum Power Control, Resonators, Nonlinear Control, Engineering Education

Professional Certifications:

1. *Senior Member of the IEEE, since May 2015*
2. *North American Board of Certified Energy Practitioners* (*NABCEP*)
   (No. E121109-18, *NAPCEB Certified 2010)*
3. *Installing Photovoltaic Systems Certification by Florida Solar Energy Center 2009*
   (DBPR CE No. 0000859, ECLB No. 0008242)
4. *Licensed Engineer In Training (EIT) in Puerto Rico, USA, since 2000*

(iv) Appointments—academic or industrial:

07/2011 to present	Associate Professor, University of Puerto Rico-Mayagüez, PR
11/2014 to present	Chairman, Educational Committee for the PR's Aerospace Technology Cluster
10/2014 to present	Associate Director for the UPRM's Center of Aerospace and Unmanned Systems Engineering (CAUSE)
01/2013 to 01/2015	UPRM ECE Associate Department Head for Graduate Studies & Research Affairs
08/2010 to 01/2013	Undergraduate Research LS-AMP Faculty Mentor, UPRM-College of Engineering
07/2011	Faculty Tenure
08/2006 to 06/2011	Assistant Professor, University of Puerto Rico-Mayagüez, PR
July 2013	Faculty Guest Researcher, Universidad del Valle de Guatemala, as part of the NSF-PASI Sponsored by NSF and the Organization of American States (OAS)
August 2011	Faculty Guest Researcher, Naval Research Laboratory, Washington DC (ONR)
Summers 2007-11	Faculty Guest Researcher, Argonne National Laboratory, Argonne, IL (DoE NSF)
2010	DHS Faculty Researcher, University of Southern California, DHS Center of Excellence USC-CREATE, Los Angeles, CA (DHS)
Summer 2006	Visiting Researcher, Volgograd State Technical University, Volgograd, Russia
08/2002 – 05/2006	Research Assistant, Michigan State University, East Lansing, MI
05/2004 - 07/2004	Visiting Researcher, Chinese Academy of Sciences Institute of Automation (CASIA), Beijing, China (NSF)
Summers: 2001, 2002	Research Assistant, Fermi National Accelerator Laboratory, Batavia, IL (GEM)
08/2000 - 05/2002	Teaching Assistant, Electrical and Computer Engineering, MSU, East Lansing
05/2000 - 07/2000	Project Manager Assistant, Transmission Lines Division, Lord Electric Co, RP, PR
08/1999 – 04/2000	Research Assistant, Tren Urbano, ATI, San Juan, PR

(v) Journal publications (undergraduate student as co-author*):

1- Lugo-Cordero, H.M.; Guha, R.K.; **Ortiz-Rivera, Eduardo I**.; "An Adaptive Cognition System for Smart Grids with Context Awareness and Fault Tolerance" IEEE Transactions on Smart Grid, Issue: 99, Pages 1249-1256, May 2014

2- **Ortiz-Rivera, Eduardo I**.; Cosme, Antonio*; Alvarez, Jaime*; "Compact Fluorescent Lamps, an Anticipatory Mind to Mercury" IEEE Potentials-Magazine Jan./February 2011 Vol.30 No.1

3- Balaguer, Irvin; **Ortiz-Rivera, Eduardo I**.; "Survey of Distributed Generation Islanding Detection Methods" IEEE Latin America Transactions, October 2010 vol. 8 No. 5

4- Fang Zheng Peng; Joseph, A.; Jin Wang; Miaosen Shen; Lihua Chen; Zhiguo Pan; **Ortiz-Rivera, E.**; Yi Huang; "Z-source inverter for motor drives" IEEE Transactions on Power Electronics, Volume 20, Issue 4, July 2005 Page(s):857 – 863

5- **Ortiz-Rivera, Eduardo I**. "Analytical Model for a Photovoltaic Module using the Electrical Characteristics provided by the Manufacturer Data Sheet" IEEE Transactions on Power Electronics. (Accepted)

6- **Ortiz-Rivera, Eduardo I**. "A Novel Method to Estimate the Maximum Power for a Photovoltaic Inverter System." IEEE Transactions on Power Electronics (Accepted)

(vi) Conference publications (undergraduate student as co-author*):

7- Salazar-Duque, J.E.; **Ortiz-Rivera, E.I.**; Gonzalez-Llorente, J. "Analysis and non-linear control of a SEPIC dc-dc converter in photovoltaic systems" 2015 IEEE Workshop on Power Electronics and Power Quality Applications (PEPQA), Bogotá, Colombia.

8- Darvali, Rachid; **Ortiz-Rivera, Eduardo I**.; Wang, Jin;"Solar Irradiance Prediction Model based on a Statistical Approach for Microgrid Application" 42nd IEEE Photovoltaic Specialists Conference, New Orleans. June 14-19, 2015.

9- Darvali, Rachid; **Ortiz-Rivera, Eduardo I**.; Rincon Amilcar; "Design and Thermal Testing of a Power Supply Prototype for the Space Plasma Ionic Charge Analyzer (SPICA) CubeSat" 42nd IEEE Photovoltaic Specialists Conference, New Orleans. June 14-19, 2015.

10- Gonzalez-Llorente, J.; Hurtado, Ronald*; Sánchez-Sanjuán Sergio A.*; **Ortiz-Rivera, E.I.**; "Evaluation of Techniques for Power Regulation on Nanosatellites" 10th European Space Power Conference, Noordwijkerhout, The Netherlands, Vol. SP-719

11- Darvali, Rachid; Merced, Daniel; Diaz, Andres; **Ortiz-Rivera, Eduardo I**.; "Single Phase Induction Motor Alternate Start-up and Speed Control Method for Small Wind Turbine Applications" 3rd International Conference on Renewable Energy Research and Applications, Milwaukee, WI.

12- Molina, Carlos*; Belfort, Reynaldo*; Chacon, Oscar*; Rivera, Luis*; Pol, Rafael*; Ramos, Daniel*; **Ortiz-Rivera, Eduardo I**.; "The use of Unmanned Aerial Vehicles for an Interdisciplinary Undergraduate Education: Solving Quadrotors Limitations" 2014 IEEE Frontiers in Education Conf., Madrid, Spain.

13- Melendez, Jean*; Navarro, Daniel*; Berrios, Kidany*; **Ortiz-Rivera, Eduardo I**; "Using Cybersecurity as an Engineering Education Approach on Computer Engineering to Learn about Smart Grid Technologies and the Next Generation of Electric Power Systems" 2014 IEEE Frontiers in Education Conference, Madrid, Spain.

14- Delgado*, Lorena; Ruiz, Liann*; Rodriguez, Vivian*; **Ortiz-Rivera, Eduardo I**.; "Integrated educational research and technical experiences to attract females in the area of energy systems: The UPRM Experience" 2014 IEEE Frontiers in Education Conference, Madrid, Spain.

15- Salazar-Llinas, Andres; **Ortiz-Rivera, Eduardo**; Gonzalez-Llorente, Jesus; "Dynamic Power Control of a PV-Fuel Cell Hybrid Energy System Used in DC Motors Applications" 2014 Sixth Annual IEEE Green Technologies Conference (GREENTECH).

16- Darvali, Rachid; Merced, Daniel; Rivera, Jose; Gonzalez, Cesar; **Ortiz-Rivera, Eduardo I**.; "An Electric Power Supply Design for the Space Plasma Ionic Charge Analyzer (SPICA) CubeSat", 2014 IEEE Photovoltaic Specialists Conference, Denver, CO.

17- Perez-Santiago*, Anthony; Ortiz, Randy*; **Ortiz-Rivera, E.I.**; "HOMER: A Valuable Tool to Facilitate the Financing Process of Photovoltaic Systems in Puerto Rico", 2014 IEEE Photovoltaic Specialists Conference, Denver, CO.

18- Gonzalez-Llorente, J.; **Ortiz-Rivera, Eduardo I**.; "Comparison of Maximum Power Point Techniques in Electrical Power Systems of CubeSats" 27th Annual AIAA/USU Conference on Small Satellites, Logan, Utah, August 10-15, 2013. **http://www.cubesat.org/images/stories/workshop_media/SummerWorkshop2013/Slides/Saturday/13.15_SmallSat2013-Comparison%20of%20Maximum%20Power%20Point%20Tracking%20Techniques%20in-.pdf**

19- Amador, A. ; Canals, M. ; Guerrero, G.* ; Cruz, J. ; **Ortiz, E.** "Development of novel instrumented Lagrangian drifters to probe the internal structure of breaking surface waves" 2012 IEEE Oceans, Hampton Roads, VA, USA

20- Perez-Santiago*, Anthony; Reyes, Miguel*; **Ortiz-Rivera, E.I.**; "Work in Progress-HOMER: An Educational Tool to Learn About the Design of Renewable Energy Systems at the Undergraduate Level" 2012 IEEE Frontiers in Education Conference, Seattle, WA.

21- **Ortiz-Rivera, E.I.**; Estela, Angelina*; Romero, Carlos*; Valentín, Jesús A.*; "The Use of UAVS in USA'S Security by an Engineering Education Approach" 2012 IEEE Conference on Technologies for Homeland Security, Greater Boston, MA.

22- Méndez-Gómez, Nelson M.; Bousoño, Orlando; Castañeyra, Ricardo; **Ortiz-Rivera, Eduardo I.**; "Development of a Low-Cost Induction Motor Drive System Using a PVM, Boost Converter and Three-Phase Inverter" 2012 IEEE Photovoltaic Specialists Conference, Austin, TX.

23- Feliciano-Cruz, L.I. ; **Ortiz-Rivera, E.I.** "Biharmonic spline interpolation for solar radiation mapping using Puerto Rico as a case of study" 2012 IEEE Photovoltaic Specialists Conf., Austin, TX, Page(s): 2,913 – 2,915

24- **Ortiz-Rivera, E. I**.; Cruz, Joel*; Martinez-Mitjans, Luis R.*; "Design of a Low-Cost Irradiance Meter Using a Photovoltaic Panel" 2012 IEEE Photovoltaic Specialists Conf., Austin, TX.

25- **Ortiz-Rivera, Eduardo I**., "Approximation of a Photovoltaic Module Model Using Fractional and Integral Polynomials" 2012 IEEE Photovoltaic Specialists Conf., Austin, TX.

26- Lugo-Cordero, H.M.; Fuentes-Rivera, A.; Guha, R.K.; **Ortiz-Rivera, E.I.**; "Particle Swarm Optimization for load balancing in green smart homes" 2011 IEEE Congress on Evolutionary Computation (CEC), Publication Year: 2011 , Page(s): 715 - 720

27- Lugo-Cordero, Hector M.; Fuentes-Rivera, Abigail; Guha, Ratan K.; **Ortiz-Rivera, Eduardo I**.;"A cognitive approach to load balancing for Green Houses" 2011 IEEE Power and Energy Society General Meeting, Publication Year: 2011

28- Otero, Ruben;* Santiago, Juan*; Cruz, Joel*; Lopez, Victor*; **Ortiz-Rivera, Eduardo I**.; "Three Phase Induction Motor Drive Using Flyback Converter and PWM Inverter Fed from a Single Photovoltaic Panel" 2011 Power and Energy Society General Meeting, Detroit, MI

29- Santiago, Juan*; Gonzalez, Pedro*; Garcia, Sergio*; **Ortiz-Rivera, Eduardo I**.; "Design of an Observer and Speed Controller for a DC Motor Fed by Fuel Cells and DC to DC Converters" 2011 Power and Energy Society General Meeting, Detroit, MI

30- Ortiz, Eliud; Maldonado, Ricardo; O'neill, Harry, **Ortiz-Rivera, Eduardo I**.; "Proposed System Model and Simulation for Three Phase Induction Motor Operation with Single PV Panel" 2011 Power and Energy Society General Meeting, Detroit, MI

31- Garcia, Sergio*; Pabon, Jose*; Diaz, Yancy*; **Ortiz-Rivera, Eduardo I**.; "An Integrated Undergraduate Research Experience in Control, Power Electronics, and Design using a Micromouse" 2010 Frontiers in Education Conference, Washington, DC (**Nomination for 2010 IEEE FIE Young Faculty Award**)

32- Mendez, Edgardo; Serrano Guillermo; **Ortiz-Rivera, Eduardo I**.; "A Monolithic Integrated Solar Energy Harvesting System", 2010 IEEE Photovoltaic Specialists Conf., Hawaii, June 2010 (**IEEE Student Award: Best Photovoltaic Terrestrial Application!)**

33- Díaz-Mercado, Yancy*; García-Vergara, Sergio*; Pabón-De León, José*; **Ortíz-Rivera, Eduardo I.**; "Maximum Power Control Based on Matching D.C. Motor Dynamics and Fuel Cell Dynamic Behavior" Proc. 2010 CPES Annual Conf., D2.9, Blacksburg, VA, April 11-13, 2010

34- Cabrera, Rafmag; Merced, Emmanuelle J.; Suarez, Ramon; Santiago, Jorge; **Ortiz-Rivera, Eduardo I.** "Self-sustainable Voltage Regulator for Photovoltaic Systems using Optimal Control Algorithm" Proceedings 2010 CPES Annual Conf., D2.10, Blacksburg, VA, April 11-13, 2010

35- Soltero, Daniel E. *; Francisco, Luis S.; **Ortiz-Rivera, Eduardo I.**; "Optimal Control for Buck Converter with PV Module" Proceedings 2010 CPES Annual Conference, D2.10, Blacksburg, VA, April 11-13, 2010

36- Jimenez-Brea, Emil A.; **Ortiz-Rivera, Eduardo I**.; Salazar, Andres; "Simple Photovoltaic Solar Cell Dynamic Sliding Mode Controlled Maximum Power Point Tracker for Battery Charging Applications" 23rd IEEE Applied Power Electronics Conference and Exposition, Palms Springs, CA, February 21-25, 2010 (**IEEE Award: Best Presentation on Renewable Energy!)**

37- **Ortiz-Rivera, Eduardo I**. Salazar, Andres; Gonzalez, Jesús; "A Mathematical Model for Online Electrical Characterization of Thermoelectric Generators Using the P-I Curves at Different Temperatures" 23rd IEEE Applied Power Electronics Conference and Exposition, Palms Springs, CA, February 21-25, 2010

38- Jimenez-Brea, Emil A.; Salazar, Andres; **Ortiz-Rivera, Eduardo I.**; Gonzalez, Jesús; "A Maximum Power Point Tracker Implementation for Photovoltaic Cells Using Dynamic Optimal Voltage Tracking" 23rd IEEE Applied Power Electronics Conference and Exp., Palms Springs, CA, February 21-25, 2010

39- Gonzalez, Jesús; **Ortiz-Rivera, Eduardo I**.; Salazar, Andres; Jimenez-Brea, Emil A.; "Analyzing the Optimal Matching of DC Motors to Photovoltaic Modules via DC-DC Converters" 23rd IEEE Applied Power Electronics Conference and Exp., Palms Springs, CA, February 21-25, 2010

40- **Ortiz-Rivera, Eduardo I.**; Salazar, Andres C.; Velez, José*; "An Enriched Undergraduate Research Experience based on the Simulation, Experiments, and Theory of Fuel Cells" 2009 Frontiers in Education Conference, San Antonio, TX , October 18-21, 2009 (**Nomination for 2009 IEEE FIE Young Faculty Award**)

41- **Ortiz-Rivera, Eduardo I.**; Castro, Marcel; "Integration of Hands on Laboratory Experience of Power Electronics and Renewable Energy Applications: Work in Progress" 2009 Frontiers in Education Conference, San Antonio, TX, October 18-21, 2009

42- **Ortiz-Rivera, Eduardo I.**; Gonzalez, Jesús; Salazar, Andres C.; "Bringing Renewable Energy to the Electrical Engineering Undergraduate Education & Research at UPRM" 2009 Frontiers in Education Conference, San Antonio, TX, October 18-21, 2009

43- **Ortiz-Rivera, Eduardo I.**; Feliciano, Luisa; "Performance Evaluation and Simulation of a Solar Thermal Power Plant" 2009 IEEE Energy Conversion Congress and Exposition (Former IEEE PESC Conf.) San Jose, CA, USA, Sept. 20-24, 2009 **(IEEE IAS Myron Sucker Award!)**

44- Diaz, Andrés J.; Saltares, Roger; Rodríguez, Christian; Nuñez, Roberto; **Ortiz-Rivera, Eduardo I.**; Gonzalez, Jesús; "Induction Motor Equivalent Circuit for Dynamic Simulation" IEEE International Machines and Drives Conference, Miami, FL, May 3-6, 2009

45- E. E. Jimenez-Toribio, A. A. Labour-Castro, F. Muniz-Rodriguez, H. R. Perez-Hernandez, and **E. I. Ortiz-Rivera**; "Sensorless Control of SEPIC and Cuk Converters for DC Motors using Solar Panels" IEEE International Machines and Drives Conference, May 3-6, 2009

46- Gonzalez-Llorente, Jesús; **Ortiz-Rivera, Eduardo I**.; Diaz, Andrés J.; "A Maximum Power Point Tracker using Positive Feedforward Control based on the DC Motor Dynamics and PVM Mathematical Model" IEEE International Machines and Drives Conference, May 3-6, 2009

47- Balaguer, Irvin J.; Kim, Heung-Geun; Peng, Fang Z.; **Ortiz, Eduardo I.**; "Survey of Photovoltaic Power Systems Islanding Detection Methods" 34th Annual Conference of the IEEE Industrial Electronics Society, November 10-13, 2008

48- **Ortiz-Rivera, Eduardo I.**; Diaz, Andrés J.; "An Approximation of a PVM Model using Integer Polynomials" 34th Annual Conf. of the IEEE Industrial Electronics Soc, November 10-13, 2008

49- Jimenez-Brea, Emil A.; **Ortiz-Rivera, Eduardo I.**; Gil-Arias, Omar; "A Dynamic Maximum Power Point Tracker using Sliding Mode Control" 11th IEEE Control and Modeling for Power Electronics (COMPEL), Zurich, Switzerland, Aug 18-20, 2008

50- Gil-Arias, Omar; **Ortiz-Rivera, Eduardo I**.; "A General Purpose Tool for Simulating the Behavior of PV Solar Cells, Modules and Arrays" 11th IEEE Control and Modeling for Power Electronics (COMPEL), Zurich, Switzerland, August 18-20, 2008

51- **Ortiz-Rivera, Eduardo I.**; Pan, Zach; Wang, Jin; "A Mathematical Model to Describe the Electrical Characteristics for a Fuel Cell" IEEE 39th Power Electronics Specialists Conference, Rhodes, Greece, June 15-19 2008

52- Jimenez-Brea, Emil A.; **Ortiz-Rivera, Eduardo I.**; "Sliding Mode Control for PV Power Systems" Proceedings CPES General Meeting 2008, Blacksburg, Virginia, April 6-9, 2008

53- **Ortiz-Rivera, Eduardo I**.; "Maximum Power Point Tracking using the Optimal Duty Ratio for DC-DC Converters and Load Matching in Photovoltaic Applications" 22nd IEEE Applied Power Electronics Conference and Exposition, Austin, Texas, February 24-28, 2008

54- **Ortiz-Rivera, Eduardo I.**; Rodriguez, Luis*; "The Z-Source Converter as an Introduction to Power Electronics and Undergraduate Research" Proceedings 2007 Frontiers in Education Conference, Milwaukee, WI, October, 10-13, 2007

55- **Ortiz-Rivera, Eduardo I.**; Reyes-Hernandez, Angel L.*; Febo, Rey A.*; "Understanding the History of Fuel Cells" Proceedings 2007 IEEE Conference on the History of Electric Power, New Brunswick, New Jersey, August 3-5, 2007

56- **Ortiz-Rivera, Eduardo I.**; "A MPPT Method Based on the Approximation of a PVM Model using Fractional Polynomials" 38th IEEE Power Electronics Spec. Conf., Orlando FL, June 18-22, 2007.

57- Arias, Omar G.; **Ortiz-Rivera, Eduardo I.**; "Emulation of the Behavior of a Photovoltaic Module in SABER" Proc. CPES General Meeting 2007, Blacksburg, Virginia, April 15, 2007

58- Rodriguez, Luis*; Lugo, Salvador*; **Ortiz-Rivera, Eduardo I.**; "Undergraduate Research: Introduction to Power Electronics Using The T-Filter and Z-Source Converter" Proceedings CPES General Meeting 2007, Blacksburg, Virginia, April 15, 2007

59- **Ortiz-Rivera, Eduardo I.;** Peng, Fang Z.; "Algorithms to Estimate the Temperature and Effective Irradiance Level over a Photovoltaic Module using the Fixed Point Theorem.", 37th IEEE Power Electronics Specialists Conf., Jeju, Korea, June 18-22, 2006.

60- **Ortiz Rivera, E.I.**; Peng, F.Z.; "Linear Reoriented Coordinates Method", 2006 IEEE International Conf. on Electro/information Technology, 7-10 May 2006 Page(s):459 – 464

61- **Ortiz-Rivera, Eduardo I**., "A Novel Method of Area Optimization for a System Modeled with Transcendental Functions." AIAA 3rd International Energy Conversion Engineering Conference, San Francisco, California, August 15-18, 2005

62- **Ortiz-Rivera, Eduardo I**.; Peng, Fang Z.; "A Dynamic Photovoltaic System Using the Z-Source Converter.", AIAA 3rd International Energy Conversion Engineering Conference, San Francisco, California, August 15-18, 2005

63- **Ortiz-Rivera, E.I.**; Peng, F.Z.; "Analytical Model for a Photovoltaic Module using the Electrical Characteristics provided by the Manufacturer Data Sheet" PESC '05. IEEE 36th Power Electronics Specialists Conference, 2005. 16-16 June 2005 Page(s):2087 – 2091

64- **Ortiz-Rivera, Eduardo I.** and Fang Z. Peng "A Novel Method to Estimate the Maximum Power for a Photovoltaic Inverter System." The 35th IEEE Power Electronics Specialists Conference (PESC), Aachen, Germany, June 20-25, 2004

65- **Ortiz-Rivera, E.I.**; "Study of power quality: problems in commercial buildings in Puerto Rico" Proceedings of the 2004 IEEE International Conference on Electric Utility Deregulation, Restructuring and Power Technologies, 2004. (DRPT 2004). Volume 1, 5-8 April 2004 Page(s):301 - 305 Vol.1

(vii) Additional publications

1- **Ortiz-Rivera, Eduardo I.;** Gomez, Oscar; The UPRM's ECE Graduate Handbook, Electrical and Computer Engineering Department, University of Puerto Rico-Mayaguez, June, 2013 (Revised Every Semester).

(vii)Theses and Graduate Students Supervised (Master in Science Electrical Engineering) (http://grad.uprm.edu/oeg/TesisDisertacionesDigitales/IngenieriaElectricaComputadoras/)

1- Bousoño-Zavala, Orlando. Multivariable Model Predictive Control for Optimal Operation of a Fluid Catalytic Cracking Debutanizer Distillation Column, ECE Masters Thesis. Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez, December, 2011.
2- Salazar-Llinas, Andres C. Analysis and FPGA Implementation of Dynamical Maximum Power Point Tracking Methods for Photovoltaic-Fuel Cell Hybrid System, ECE Masters Thesis. Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez, April, 2011.
3- Feliciano-Cruz, Luisa I. Performance Evaluation and Simulation of a Compound Parabolic Concentrator (CPC) Trough Solar Thermal Power Plant in Puerto Rico Under Solar Transient Conditions, ECE Masters Thesis. Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez, February, 2010.
4- Jimenez-Brea, Emil A. Control of Alternative Energy Hybrid System for Residential and Low Power Applications, ECE Masters Thesis. Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez, November, 2009.
5- González-Llorente, Jesús D. Analysis of Optimal Matching Between a DC Motor and Photovoltaic Modules Via Dc-Dc Power Converters, ECE Masters Thesis. Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez, September, 2009.
6- Gil-Arias, Omar. Modeling and Simulation of Photovoltaic Devices, ECE Masters Thesis. Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez, November, 2008.

(viii) Graduate Student Committee Member
(Thesis can be found at http://grad.uprm.edu/oeg/TesisDisertacionesDigitales/)

1- Trespalacios-Julio, Jessica P.; Soluciones esplícitas para ecuaciones de reacción diffusion no autónomas usando sistemas de Ermakov y Riccati. Masters Thesis. Department of Mathematics, University of Puerto Rico, Mayaguez,December 2014, Advisor: Dr. Erwin Suazo
2- Labour-Castro, Abel A; Implementación de nuevo método de rastreo del punto de máxima potencia en paneles fotovoltaicos para el funcionamiento de radares meteorológicos sin conexión a la red eléctrica. Masters Thesis. Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez, May, 2012. Advisor: Dr. Lionel Orama
3- Cruz-García, Cristina; A Study of Equation-Free Methods for Simulation of Power Electronics Systems, Masters Project. Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez, December, 2010. Advisor: Dr. Miguel Velez-Reyes
4- Vargas-Colón, Ariel O.; Automation of a Fluid Bed Dryer utilizing Multi-Variate Near Infrared Spectra and Model Predictive Control, Masters Thesis. Chemical Engineering Department, University of Puerto Rico, Mayaguez, March, 2010. Advisor: Dr. Carlos Velázquez
5- Dávila-Velázquez, Jorge A.; Development of a simulation model for the design of renewable energy systems applied to aqueducts in communities at Puerto Rico, Masters Thesis. Civil Engineering Department, University of Puerto Rico, Mayaguez, November, 2008. Advisor: Dr. Francisco Maldonado
6- Rodriguez-Otero, Miguel; Power Quality Issues and Feasibility Study in a DC Residential Renewable Energy System, Masters Thesis. Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez, October, 2008. Advisor: Dr. Efraín O'neill
7- Torres-Hernández, María E. Hierarchical Control of Hybrid Power Systems, Masters Thesis. Electrical and Computer Engineering Department, University of Puerto Rico, Mayaguez, October, 2007. Advisor: Dr. Miguel Velez-Reyes

(ix) Current Graduate Students – Major and Theses Advisor

1- *Guerrero, Gerardo. Thesis Topic: Control and Stability for Quadcopters Degree Program: MSEE;
2- *Merced, Daniel. Thesis Topic: Voltage regulation and Control of AC/DC Loads using Fuel Cells, Degree Program: MSEE;
3- Salazar, John Edward. Thesis Topic: Passivity Based Control on DC-DC COnvertes, Degree Program: MSEE;
4- *Gonzalez, Pedro J. Thesis Topic: Optimal High Gain Observer Design for Micro-Photovoltaic Inverters, Degree Program: MSEE;
5- *Darvali, Rachid. Thesis Topic: A GaN Electronics Power Supply for CubeSat, Degree Program: MSEE;
6- Rivera, José. Thesis Topic: A Resonant Transformerless Inverter, Degree Program: MSEE;

**Previous undergraduate member of my research team M_{inds}^2CREATE.*

(x)Current Graduate Students – Committee Member

Name	Degree Program	Start Date	Major Advisor
Christian Maldonado	M.S.E.E.	January 2008	Dr. Andrés Díaz
Harry O'neill	M.S.E.E.	January 2010	Dr. Andrés Díaz
Ricardo Maldonado	M.S.E.E.	September 2010	Dr. Marcel Castro

(xi) Grants or externally funded projects active during the last years:

1. Transformational Initiative for Graduate Education and Research (TIGER), Sponsored by by US-Department of Education, 2014 ($2,500,000)
2. Cybersecurity for Electric Power Plants, Sponsored by UPRM Industrial Affiliates Program, 2013, ($2,500)
3. Design and Construction of Quadcopters, Sponsored by UPRM Industrial Affiliates Program, 2012, ($2,500)
4. Distributed Power Generation Technologies for a High Resilience Electric Power Grid on Puerto Rico, Sponsored by US-Department of Homeland Security, 2011 ($60,000)
5. A Nationwide Consortium of Universities to Revitalize Electric Power Engineering Education by State-of-the-Art Laboratories, 2010 ($5,000,000) US Department of Energy (Joint participation with 50 US Universities, Proposal's PI: Dr. Ned Mohan, U Minnesota) UPRM Coordinator ($75,000)
6. Nuclear Engineering Curriculum Development, Sponsored by the US Nuclear Regulatory Commission, 2009. ($125,500 Proposal's Co-PI)
7. A Transformerless Inverter, Sponsored by UPRM Industrial Affiliates Program, 2010, ($5,000)
8. Distributed Power Generation Technologies for a More Resilient LA/LG Port, Sponsored by US Department of Homeland Security, 2010 ($25,500 Proposal's PI)
9. Faculty and Students Team: Study of Power Markets at Argonne National Laboratory, Sponsored by the NSF-LSAMP & DoE FaST Program, 2007-2010 ($97,500 Proposal's PI)
10. Maximum Power Point Algorithms for PV Applications Sponsored by UPRM Industrial Affiliates Program, 2010, ($5,000 Proposal's PI)
11. A High Efficient Multilevel using the Z-Source Topology, Sponsored by UPRM Industrial Affiliates Program, 2009, ($2,500 Proposal's PI)
12. UPRM Micromouse Design Team, Sponsored by Lockheed Martin, 2009 ($10,000 Proposal's PI)
13. DSP-FPGA Xilinx Development Boards, Donation by Xilinx, 2009 ($25,000 Proposal's PI)
14. Development of algorithms for load matching of PVM with integrated converters, Sponsored by NSF Center of Power Electronics Systems, 2008, ($20,000 Proposal's PI)
15. Control and Monitoring of Residential Power Loads using Wireless Modules for High Efficient Energy Applications, Sponsored by UPRM Industrial Affiliates Program, 2008, ($2,500)
16. A Robust Graphic User Interface and DSP Hardware for Real-Time Estimation of the Temperature and Effective Irradiance Level over a Photovoltaic Module, Sponsored by UPRM Industrial Affiliates Program, 2007, ($2,500)
17. A Robust GUI for Photovoltaic Systems, Sponsored by UPRM "Seed Money", 2006, ($10,000)
18. An Online Information System for Mass Transportation, Sponsored by the ATI/UPR/PUPR/ Professional Development Program, Puerto Rico Highways and Transportation Authority
19. Mathematical modeling of the Z-Source converter (2004), Chinese Academy of Science Institute of Automation, Sponsor US National Science Foundation, Beijing, China (EAPSI Program).

(xii) Invited Presentations

1. "A Proposal: The First Latin-American Cubesat" Universidad del Valle de Guatemala, July 25, 2013 (Invited by the National Science Foundation, and the Organization of America States) for the Pan-American Advance Scientific Institute in Computation-Based Discovery in Guatemala, July 15-26 2013
2. "Puerto Rico as a Link for Research Opportunities in Latin-America and United States" Universidad Tecnológica de Panamá, June 9, 2013 (Invited by Dr. Maytee Zambrano)
3. "The Power of Education using Technology" National University College-Arecibo, October 26, 2012 (Invited by Prof. José Ibarrondo)
4. "Power Electronics for Renewable Energy Application in the Caribbean" University of Arkansas-Fayetteville, July 1, 2011 (Invited by Dr. Alan Mantooth and Dr. Juan Balda)
5. "Nonlinear Modeling of Photovoltaic Energy Systems" Iowa State University, June 16, 2011 (Invited by Dr. Steve W. Martin)
6. "Increasing the Resiliency of the LA/LB Port using Distributed Power Generation Technologies" University of Southern California, Los Angeles, CA, July 30, 2010 (Invited by Dr. Steve Hora)
7. "Research Opportunities on Renewable Energy and Aerospace at Puerto Rico" University of Nevada-Las Vegas, Las Vegas, NV, July 23, 2010 (Invited by Dr. Yahia Baghzouz)
8. "Undergraduate Research Applied to Renewable Energy" Hope College, Holland, MI, July 15, 2010 (Invited by Dr. Alfredo Gonzales and Dr. Moses Lee)
9. "Power Electronics: Basic Design of DC/DC Converters for Renewable Energy Applications" University of Minnesota, Minneapolis, MN, June 10, 2010 (Invited by Dr. Ned Mohan and Dr. Bill Robbins)
10. "Nonlinear Control and Modeling of Fuel Cells", University of Texas- San Antonio, San Antonio, TX, October 20, 2009 (Invited by Dr. Yufang Jin and Dr. Hariharan Krishnaswami)
11. "Design of PV Power Residential Systems for Non-Electrical Engineers", 2nd Puerto Rico's Renewable Energy Conference, San Juan, Puerto Rico, September, 23, 2009 (Invited by Dr. Ramon Vazquez)
12. "Design and Modeling of PV Systems", Illinois Institute of Technology, Chicago, IL, July 30, 2008 (Invited by Dr. Alireza Khaligh)
13. "Design of High Frequency Transformers", Northern Arizona University, Flagstaff, AZ, July 6-12, 2008
14. "Basic Design of PV Power Systems" 1st Conv. of Renewable Energy, San Juan, PR, May 1-3, 2008
15. "More Electric Aircraft Technologies and Thermal Energy Management Workshop the Academic Contribution, Florida A&M, Tallahassee, FL, March 5, 2008
16. "Photovoltaic Distributed Generation" Howard University, Washington DC, November 20, 2007
17. "Portal ATI: An Integrated Information System" Government of Puerto Rico, Alternativa de Transporte Integrado Central Office, San Juan, PR, October, 26, 2007
18. "Understanding Solar Energy" University of Puerto Rico-Mayagüez, PR, August, 14, 2006

(xiii) List of Collaborators

Dr. Guenter Conzelmann, Argonne National Laboratory, Decision and Information Sciences Division, Director of the Center for Energy, Environment & Economic Analysis (CEEESA)

Dr. Stephen Hora, University of Southern California, Director of the National Center for Excellence for Risk and Economic Analysis of Terrorism Events (CREATE)

Dr. Stan Supinski, U.S. Naval Postgraduate School, CHDS Director of Partnership Programs

Dr. Ned Mohan, IEEE Fellow and Distinguished Professor of the University of Minnesota

Dr. Marcos Lafoz, Researcher, Centro Estudios y Experimentación de Obras Públicas (CEDEX), and Polythecnic University of Madrid

Dr. Alireza Khaligh, Assistant Professor, Illinois Institute of Technology, Director of the Energy Harvesting and Renewable Energies Laboratory (EHREL)

Dr. Jin Wang, The Ohio State University, Assistant Professor and Supervisor of the High Voltage and Power Electronics Laboratory
Dr. Claudio Rivetta, Physicist, Stanford Linear Accelerator

(xiv) Institutional and professional service:

1-IEEE Awards & Recognition Committee Chair, Western Puerto Rico Section 2014-present

2-IEEE GOLD Coordinator, Puerto Rico Western Section Region 9, 2009-2014

3-Faculty Advisor, Univ. of Puerto Rico, IEEE International Future Energy Challenge, 2010-present

4-Faculty Advisor, Univ. of Puerto Rico, IEEE Micromouse Design Team & Competition, 2009-present.

5-Reviewer for the IEEE Transactions in Power Electronics, Industrial Electronics, Industry Applications, Power Systems Society.

6-Reviewer for the IASTED Transactions in Power Quality.

7-Reviewer for several IEEE Conferences including PESC, APEC, IEC, FIE, PMAPS, etc.

8-Reviewer for NASA ad-hoc panels

9-Organize seminars in the area of photovoltaic systems and engineering education at UPRM including the visits of Dr. José Herrero Rueda (CIEMAT), Dr. Marcel Castro (Howard University) and Igrid Gregory (ORISE/ORAU)

10- Dr. Ortiz-Rivera invited guest speaker Dr. Thomas Veselka for 10th International Conference on Probabilistic Methods Applied to Power Systems (PMAPS), Rincon, PR (May 2008)

11- Guest speaker for the 1ra Conv. de Energía Renovable, Centro de Conv. de PR, May 1, 2008

12- Faculty Mentor for Undergraduate Research, UPRM, College of Engineering, Louis-Starks Alliance for Minority Program, 2010 -present

13- Member, UPRM ECE Graduate Committee, 2009-present

14- Member, UPRM ECE Control Systems Committee, 2006-present

15- Member, UPRM ECE Power Systems Committee, 2006-present

16- Member, UPRM Project BEAMS Committee, 2007

17- Served in several National Science Foundation Proposal Review Panels

18- Professional development activities in the last years:

19- Seminars related to solar energy and other types of alternative energies

20- Seminars and workshops in power electronics and energy management

21- Seminars related to continuous education and ethics offered by UPRM

22- NSF Fellowship to attend the QEM Seminar: NSF Career Proposal, May 29, 2008

23- DoE Fellowship to attend to the MSI Seminar, September 21-24, 2009

24- Dr. Ortiz had organized yearly seminars for the tools LATEX, SABER, and Mathematica at UPRM

(xv) Offered Courses at UPRM since August 2006

In my academic career, I have taught six graduate courses:

1. INEL 6000 Nonlinear Systems Control,
2. INEL 6001 Advance Feedback and Optimal Control,
3. INEL 6046 Master Thesis,
4. INEL 6085 Advance Power Electronics,
5. INEL 6995 Analysis and Control of Photovoltaic Systems
6. INTD 6995 Institutional Coop Plan: Graduate Experience with the Industry;

three graduate and advanced electrical engineering undergraduate courses

7. INEL 5195 Design Project in Electrical Engineering,
8. INEL 5505 Linear Systems Control,
9. INEL 5995 Special Topics on Electrical Engineering: Sustainable Energy Systems;

four electrical engineering undergraduate courses;

10. INEL 4076 Fundamentals of Electronics (2nd and 3rd year),
11. INEL 4102 Circuits Analysis II (2nd and 3rd year),
12. INEL 4505 Introduction to Control Systems (2nd and 3rd year),
13. INEL 4998 Undergraduate Research on Electrical Engineering;
14. INEL 4995 Engineering Practice for COOP Students

three computer and mechanical engineering undergraduate courses;

15. ICOM 4998 Undergraduate Research on Computer Engineering,
16. ICOM 5995 Special Topics on Computer Engineering: Cybersecurity for Power Systs.
17. INME 5995 Special Topics on Human Power Vehicles

the development of three undergraduate courses related energy systems at UPRM;

18. INEL4417 Alternative Power Generation (Dr. EIOR developed the course on January 2009)
19. INEL4418 Power Electronics Laboratory (Dr. EIOR developed the course on January 2013)
20. INEL5417 Power Electronics Applied to Renewable Energy (" " on August 2011)

and I taught one undergraduate engineering laboratory course at Michigan State University

21. ECE 345 Electronic Instrumentation and Systems Laboratory (2nd and 3rd year)

(xvi) Undergraduate Research ([+]Students with at least one IEEE publication under my supervision**)** During the last years, I supervised more than 100 undergraduate students in projects related to undergraduate research.

Example of the undergraduate students are or were members of my research team *Mi$_{nds}^2$CREATE*.

Advisor of Students Participating in Undergraduate Research

Name	Start Date	End Date	After UPRM Graduation	Highest Degree
Salvador Lugo[+]	August 2006	May 2007	PR Electric Power Auth.	BSEE
Samuel Ortiz	August 2006	May 2007	Cutler Hammer	BSEE
Ismael Román	August 2006	May 2007	Infomedia	MSCE
Rey Febo[+]	August 2006	May 2007	Air Force Research Lab	Ph.D. (U Dayton)
Luis A. Rodriguez[+]	August 2006	May 2008	Ph.D. Lehigh University	MSEE (Lehigh U)
Angel Reyes[+]	August 2006	May 2008	Southern Power Company	BSEE (UPRM)
Jensen Lugo	January 2007	May 2007	Raytheon	BSEE (UPRM)
Jose Acevedo	January 2007	May 2007	Southern Power Company	BSEE (UPRM)
Eric Sanchez	January 2007	Dec 2007	Hewllett Packard	BSEE (UPRM)
Diana Ramos	January 2007	May 2008	Ph.D. Michigan State Univ.	BSEE (UPRM)
Jorge Cintron	January 2007	May 2008	Ph.D. Michigan State Univ.	BSEE (UPRM)
Zulinnette Rodriguez	January 2007	Dec 2008	PR Electric Power Auth	BSEE (UPRM)
Nelson Vazquez	January 2007	Dec 2008	Texas Instruments	BSEE (UPRM)
Bethzaly Feliciano	August 2007	Dec 2008	Southern Power Company	BSEE (UPRM)
Miguel Rios[+]	August 2006	Dec 2008	Twitter	MSCE U Maryland
Antonio Cosme[+]	January 2007	Dec 2009	Continue BSEE UPRM	
Emmanuel Merced[+]	January 2007	Dec 2007	Ph.D. Michigan State Univ	MSEE (UPRM)
Carlos A. Colón	January 2007	Dec 2009	DFC Technologies	BSCE (UPRM)
Ramon Suarez[+]	January 2007	Dec 2007	Lockheed Martin Corp	MSEE (UPRM)
Daniel Soltero[+]	August 2007	May 2010	Ph.D. MIT	BSEE (UPRM)
Eduardo Montalvo	January 2008	May 2010	Ph.D. Michigan State Univ.	BSEE (UPRM)
José Vélez[+]	January 2008	May 2010	Southern Power Company	BSEE (UPRM)
Jaime Alvarez[+]	January 2008	Dec 2010	Synerlution, Inc	BSEE (UPRM)
Rafael Colón[+]	January 2008	Dec 2009	Infotec	BSEE (UPRM)
Hector Baez	January 2009	Dec 2010	MSEE (UPRM)	BSEE (UPRM)
Giselle Santana	January 2009	May 2010	PR Electric Power Auth	BSEE (UPRM)
Sergio Garcia[+]	August 2009	Dec 2010	Ph.D. Georgia Tech	BSEE (UPRM)
Jose Pabón[+]	August 2009		MSEE UPRM	BSEE (UPRM)
Yancy Diaz[+]	August 2009		Ph.D. Georgia Tech	BSEE (UPRM)
Juan Santiago+	August 2009		Ph.D. MIT	BSEE (UPRM)
Luis Martinez+	January 2010		MSEE UPRM	BSEE (UPRM)
Joel Cruz+	January 2010		MSEE UPRM	BSEE (UPRM)
Ruben Otero+	August 2010		Ph.D. UMinnesota	BSEE (UPRM)
Pedro J. Gonzalez+	January 2010		MSEE UPRM	BSEE (UPRM)
Victor Lopez+	January 2010		MSEE UPRM	BSEE (UPRM)
Keishly Rosario				
Carlos Gonzalez				
Bettina Benito				
Sharimar Colón				
Zaylis Zayas				
Fernando Lopez				
Alexander Collazo				
Angeliz Gonzalez				
Miguel Reyes+				
Anthony Lopez+				

(xvii) Scientific and professional societies of which a member:

- Member of the Association for Unmanned Vehicle Systems International (AUVSI)
- Member of the Institute of Electrical and Electronics Engineers (IEEE)
- IEEE Senior Member (since June 2015)
- Member of the following IEEE Societies
    - Power Electronics Society
    - Control Systems Society
    - Power & Energy Society
    - Engineering Education Society
    - Electron Devises Society
- Member of the Electrochemical Society (ECS)
- Member, Tau Beta Pi National Engineering Honor Society
- Member, Golden Key International Honor Society
- American Institute of Aeronautics and Astronautics
- International Association of Science and Technology for Development
- Asociación de Consultores y Contratistas en Energía Renovable

(xviii) Honors and awards:

- 2009-2010 Distinguished Professor, UPRM ECE Department.
- *Who's Who Among America's Teachers*, 2009 & 2010.
- Graduate Assistance In Areas Of National Need Fellow (GAANN) Fellow, 2005-2006
- National Consortium for Graduate Degrees for Minorities in Engineering and Science, GEM Fellow, (Master) 2000-2002, (Ph.D.) 2002-2006
- National Science Foundation EAPSI Award, 2004
- Alfred P. Sloan Ph.D. Fellow, 2001
- Puerto Rico Industrial Development Company (PRIDCO) Fellow, 2000-2002
- Michigan State University Competitive Doctoral Fellow, 2000-2006
- Hispanic Scholarship Fund Fellow, 1998-2006
- UPR President's Fellowship: UPRM ECE Future Faculty Fellow, 2000-2006
- Puerto Rico Manufacturers Association Fellowship, 1995-2006
- National Pershing's Rifle National Society
- Scabbard & Blade National Society
- Magna Cum Laude, BSEE, UPRM, 2000

(xix) UPRM Student Awards (related to his mentoring)

- Orlando Bousño received the GEM Fellowship for 2012
- Sergio Garcia received the National Science Foundation Graduate Fellowship for 2012
- Juan Santiago received the National Science Foundation Graduate Fellowship for 2011
- Emmanuel Merced received the National Science Foundation Graduate Fellowship for 2011
- Edgardo Mendez received the IEEE PVSC 2010 Best Work on PV Terrestrial Applications
- Andres Salazar received the IEEE APEC 2010 Best Technical Presentation: Renewable Energy
- Luisa Feliciano received the IEEE ECCE 2009 Myron Suker IAS Award
- Jesus Gonzalez received the IEEE PMSA 2009 Student Travel Grant Award
- Daniel Soltero received the UPRM EPSCOR/DoE Fellowship for 2008-2009
- Daniel Soltero received the National Science Foundation Graduate Fellowship for 2010
- Miguel Rios received the Google Fellowship for 2008-2009
- Miguel Rios received the AT&T Fellowship for 2008-2009
- Diana Ramos received the Michigan State University Competitive Doctoral Fellowship for 2008-09
- Miguel Rios, Daniel Soltero, Jensen Lugo received the 2006-08 Alliance Minority Program Awards
- Miguel Rios, Emmanuel Merced, Jaime Alvarez, Carlos Colón received Hisp. Schol. Fund Awards

(xx) Community service activities:

- Volunteer and Founder Member for Alianza Ciudadana para la Educación de la Energía Renovable (ACEER) providing seminars & education to the community about the use of renewable energy.
- Guest Speaker for the DOE Science Undergraduate Laboratory Internships Program (SULI) at Argonne National Laboratory (Summers 2007-2010)
- Involvement in UPRM ECE Department activities including graduate & undergraduate recruitment & orientation activities and activities of the American Cancer Society (La Descarga Electrica).
- Guest speaker for the UPRM IEEE Student Chapter "The Solar Week" November 14, 2007.
- Guest speaker for the UPRM SIEPR Student Chapter "Solar Cells" September 15, 2007.

(xxi) Languages Fluent in Spanish and English

Researcher in NSF ERC for Center of Power Electronics Systems (CPES)

Director of UPRM Power Electronics Laboratory (since 2008)

President, ECE Graduate Committee, (member since 2006, president 2012)

UPRM BEAMS Committee, 2007-2008

Created INEL 6995 Analysis and Control of Photovoltaic Systems, and INEL 5417 (Power Electronics Applied to Renewable Energy), INEL4417 (Alternative Power Generation) and INEL4418 (Power Electronics Laboratory) courses

Graduated 6 M.S. students, advising 5 M.S. students, member of graduate committee of 8 M.S. and advised more than 100 undergraduate students on more than 50 different undergraduate research projects.

Faculty advisor to student branch of UPRM IEEE Control Society