

# Curriculum Vitae

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## **Fernando Mancilla–David**

Professor

Department of Electrical Engineering  
College of Engineering, Design and Computing  
University of Colorado Denver

### *Campus address*

1200 Larimer Street  
North Classroom Building, Room 2522–B  
Denver, CO 80204

## **Education**

### **2007**      *PhD Electrical Engineering*

- University of Wisconsin–Madison, Madison, Wisconsin
- Thesis title: “AC Link Load Flow Control in Electric Power Systems”
- Advisor: Professor Giri Venkataramanan
- GPA: 3.9/4.0

### **2002**      *MS Electrical Engineering*

- University of Wisconsin–Madison, Madison, Wisconsin
- Thesis title: “Nomograms for Simultaneous Transfer Capability”
- Advisor: Professor Fernando Alvarado
- GPA: 4.0/4.0

### **1999**      *BS Electrical Engineering*

- “Universidad Técnica Federico Santa María” (UTFSM), Valparaíso, Chile
- Thesis title: “Back up Algorithm for Power Transformer Contingency”
- Valedictorian (ranked 1<sup>st</sup>) of the 1999 electrical engineering class

## Professional experience

- 2019–**      *Professor*
- Associate Professor, July 2014–July 2019
  - Assistant Professor, August 2007–June 2014
  - University of Colorado Denver, Denver, Colorado
  - Full time faculty member of the Electrical Engineering Department
  - Teach and conduct research in energy & power systems
- 2018**      *Visiting Professor*
- Summer 2018 visit
  - PUC–Rio University, Rio de Janeiro, Brazil
  - Host: Professor Alexandre Street
  - Worked on robust models for power distribution systems
- 2016–2017**      *Visiting Professor*
- Sabbatical leave August 2016–July 2017
  - PUC–Rio University, Rio de Janeiro, Brazil
  - Fulbright Scholar
  - Host: Professor Alexandre Street
  - Taught a power electronics course
  - Conducted research on optimal operation of converter–based power systems
- 2016**      *Visiting Professor*
- Summer 2016 visit
  - “ITMO University,” Saint Petersburg, Russia
  - Hosts: Professors Anton Pyrkin and Alexey Bobtsov
  - Parameters identification for photovoltaic arrays
- 2009–2014**      *Instructor for the Professional Engineer’s Exam*
- University of Colorado Denver, Denver, Colorado
  - Taught power systems and power electronics sections
- 2014**      *Visiting Professor*
- Summer 2014 visit
  - “Universidade Federal de Pernambuco,” Recife, Brazil
  - Host: Professor Francisco Neves
  - Ride–through control for photovoltaic power plants

- 2013**      *Visiting Professor*
- Summer 2013 visit
  - “Universitat Politècnica de Catalunya,” Barcelona, Spain
  - Host: Professor Oriol Gomis
  - Worked on optimal control for large-scale windfarms
- 2013**      *Visiting Professor*
- Summer 2013 visit
  - “L’Ecole supérieure d’électricité” (Supélec), Paris, France
  - Host: Professor Romeo Ortega
  - Worked on control techniques for renewable energy systems
- 2012**      *Visiting Professor*
- Summer 2012 visit
  - “Università di Roma Tre,” Rome, Italy
  - Host: Professor Alessandro Salvini
  - Worked on optimal control for grid-connected photovoltaic panels
- 2011**      *Visiting Professor*
- Summer 2011 visit
  - “Technische Universität Berlin,” Berlin, Germany
  - Host: Professor Dr.–Ing. Kai Strunz
  - Worked on modeling and control techniques for distributed energy resources
- 2010**      *Visiting Professor*
- Summer 2010 visit
  - “L’Ecole supérieure d’électricité” (Supélec), Paris, France
  - Host: Professor Romeo Ortega
  - Worked on control techniques for renewable energy systems
- 2009**      *Visiting Professor*
- Summer 2009 visit
  - “L’Ecole supérieure d’électricité” (Supélec), Paris, France
  - Host: Professor Romeo Ortega
  - Worked on control techniques for renewable energy systems

- 2008** *Visiting Scientist*
- Summer 2008 visit
  - ABB Corporate Research, Västerås, Sweden
  - Host: Dr. Ambra Sannino
  - Worked on harmonics elimination techniques for HVDC Light technology
- 2001–2007** *Research Assistant at the University of Wisconsin–Madison*
- Wisconsin Electric Machines and Power Electronics Consortium (WEM-PEC), 2002–2007. Worked on topological synthesis of ac/ac converters
  - Electric Power Research Institute (EPRI), 2006. Worked on EPRI-funded project “Advanced power electronics controllers for substations”
  - Power Systems Engineering Research Center (PSERC), 2001–2002. Worked on computing power transfer limits between control areas in power systems
  - Consortium for Electric Reliability Technology Solutions (CERTS), 2001. Worked on CERTS-funded project “Conversion of system limits into market signals”
- 2005** *Visiting Scholar*
- Fall 2005 visit
  - North Carolina State University, Raleigh, North Carolina
  - Supervisor: Professor Subhashish Bhattacharya
  - Worked on modeling and control of FACTS devices
- 1999–2000** *Software Engineer*
- Distribution Company CHILECTRA S. A., Santiago, Chile
  - Designed and implemented an algorithm to simulate load transfer in power distribution systems
- 1998** *Lecturer*
- Merchant Marine Academy of Chile, Valparaíso, Chile
  - Taught electric circuits and electromechanical systems
- 1998** *Summer Intern*
- Generation Company ENDESA S. A., Talca, Chile
  - Tested the protection system for a complex of five hydroelectric power plants
- 1992–1999** *Teaching Assistant*
- UTFSM, Valparaíso, Chile
  - Head teaching assistant for the electromagnetism laboratory class

## Peer reviewed publications

### Journal papers (CU Denver students underlined)

- 2023**      • [J44] R. Ribeiro, A. Street, **F. Mancilla–David** and A. Angulo, “Equivalent Reduced DC Network Models With Nonlinear Load Functions: A Data-Driven Approach,” *IEEE Transactions on Power Systems*, Volume XX, Issue XX, Pages XX–XX, Month 2023 (**2023 journal impact factor: 7.326**)
- 2023**      • [J43] D. Jiménez, A. Angulo, A. Street, and **F. Mancilla–David**, “A Closed-Loop Data-Driven Optimization Framework for the Unit Commitment Problem: A Q-Learning Approach Under Real-Time Operation,” *Applied Energy*, Volume 330, January 2023 (**2023 journal impact factor: 11.446**)
- 2022**      • [J42] J. Sepúlveda, A. Angulo, **F. Mancilla–David**, and A. Street, “Robust Co-optimization of Droop and Affine Policy Parameters in Active Distribution Systems with High Penetration of Photovoltaic Generation,” *IEEE Transactions on Smart Grid*, Volume 13, Issue 6, Pages 4355–4366, November 2022 (**2022 journal impact factor: 8.960**)
- 2022**      • [J41] H. Robles–Campos and **F. Mancilla–David**, “Detailed Assessment of Modulation Strategies for Hexverter-Based Modular Multilevel Converters,” *Energies*, Volume 15, Pages 1–23, March 2022 (**2022 journal impact factor: 3.004**)
- 2021**      • [J40] N. Monshizadeh, **F. Mancilla–David**, R. Ortega, and R. Cisneros, “Nonlinear Stability Analysis of the Classical Nested PI Control of Voltage Sourced Inverters,” *IEEE Control Systems Letters*, Volume 6, Pages 1442–1447, August 2021 (**2021 journal impact factor: 2.332**)
- 2021**      • [J39] O. Zevallos, J. da Silva, **F. Mancilla–David**, F. Neves, R. Neto, and R. Prada, “Control of Photovoltaic Inverters for Transient and Voltage Stability Enhancement,” *IEEE Access*, Volume 9, Pages 44363–44373, March 2021 (**2020 journal impact factor: 3.745**)
- 2021**      • [J38] C. Soriano–Rangel, W. He, **F. Mancilla–David**, and R. Ortega, “Voltage Regulation in Buck-Boost Converters Feeding an Unknown Constant Power Load: an Adaptive Passivity-based Control,” *IEEE Transactions on Control Systems Technology*, Volume 29, Issue 1, Pages 395–402, January 2021 (**2021 journal impact factor: 5.312**)

- 2020 • [J37] C. Álvarez, M. López–Campos, R. Stegmaier, **F. Mancilla–David**, R. Schurch, and A. Angulo, “A Condition Based Maintenance Model Including Resource Constraints on the Number of Inspections,” *IEEE Transactions on Reliability*, Volume 69, Issue 3, Pages 1165–1176, September 2020 (**2020 journal impact factor: 2.888**)
- 2020 • [J36] M. Barragán–Villarejo, J. Maza–Ortega, **F. Mancilla–David**, and F. de Paula García–López, “Experimental Realisation of an AC–Link Shunt–Series Power Flow Controller ,” *IET Power Electronics*, Volume 13, Issue 12, Pages 2675–2678, September 2020 (**2020 journal impact factor: 2.839**)
- 2020 • [J35] C. Álvarez, **F. Mancilla–David**, P. Escalona, and A. Angulo, “A Bienstock–Zuckerberg–based Algorithm for Solving a Network–Flow Formulation of the Convex Hull Pricing Problem,” *IEEE Transactions on Power Systems*, Volume 35, Issue 3, Pages 2108–2119, May 2020 (**2020 journal impact factor: 6.807**)
- 2020 • [J34] **F. Mancilla–David**, A. Angulo, and A. Street, “Power Management in Active Distribution Systems Penetrated by Photovoltaic Inverters: A Data–Driven Robust Approach,” *IEEE Transactions on Smart Grid*, Volume 11, Issue 3, Pages 2271–2280, March 2020 (**2020 journal impact factor: 10.490**)
- 2020 • [J33] A. Arancibia, C. Soriano–Rangel, **F. Mancilla–David**, R. Ortega, and K. Strunz, “Finite–time Identification of the Thévenin Equivalent Parameters in Power Grids,” *International Journal of Electrical Power & Energy Systems*, Volume 116, Pages 1–10, March 2020 (**2019 journal impact factor: 4.418**)
- 2019 • [J32] H. Robles–Campos, B. Azuaje–Berbecí, C. Scheller, A. Angulo and **F. Mancilla–David**, “Detailed Modeling of Large Scale Photovoltaic Power Plants under Partial Shading Conditions,” *Solar Energy*, Volume 194, Pages 485–498, December 2019 (**2019 journal impact factor: 4.674**)
- 2018 • [J31] W. He, C. Soriano–Rangel, R. Ortega, A. Astolfi, **F. Mancilla–David**, and S. Li, “Energy Shaping Control for Buck–Boost Converters with Unknown Constant Power Load,” *Control Engineering Practice*, Volume 74, Pages 33–43, May 2018 (**2018 journal impact factor: 3.232**)

- 2017 • [J30] A. Pyrkin, **F. Mancilla–David**, R. Ortega, A. Bobtsov, and S. Aronovskiy, “Identification of Photovoltaic Arrays’ Maximum Power Extraction Point via Dynamic Regressor Extension and Mixing,” *International Journal of Adaptive Control and Signal Processing*, Volume 31, Issue 9, Pages 1337–1349, September 2017 (**2017 journal impact factor: 2.082**)
- 2017 • [J29] J. D. Lara–Jiménez, J. M. Ramírez–Arredondo and **F. Mancilla–David**, “Allocation of PMUs for Power System–Wide Inertial Frequency Response Estimation,” *IET Generation, Transmission & Distribution*, Volume 11, Issue 11, Pages 2902–2911, August 2017 (**2017 journal impact factor: 2.618**)
- 2017 • [J28] M. Carrasco, A. Laudani, G. Lozito, **F. Mancilla–David**, F. Riganti Fulginei, and A. Salvini, “Low cost solar irradiance sensing for PV systems,” *Energies*, Volume 10, Issue 7, Article 998, July 2017 (**2017 journal impact factor: 2.676**)
- 2017 • [J27] M. Carrasco, **F. Mancilla–David**, A. Angulo, J. Weston and P. Papantoni–Kazakos, “Proximal Jacobian Distribution Optimal Power Flow in a Distributed Cyber–Physical Environment,” *IEEE Journal on Emerging and Selected Topics in Circuits and Systems*, Volume 7, Issue 2, Pages 319–328, June 2017 (**2017 journal impact factor: 3.218**)
- 2017 • [J26] A. Angulo, M. Carrasco, **F. Mancilla–David**, A. Street, and R. Cárdenas, “Experimental Parameter Extraction in the Single–Diode Photovoltaic Model via a Reduced–Space Search,” *IEEE Transactions on Industrial Electronics*, Volume 64, Issue 2, Pages 1468–1476, February 2017 (**2017 journal impact factor: 7.050**)
- 2017 • [J25] P. García–Vite, C. Soriano–Rangel, J. C. Rosas–Caro, and **F. Mancilla–David**, “A DC–DC Converter with Quadratic Gain and Input Current Ripple Cancellation at a Selectable Duty Cycle,” *Renewable Energy*, Volume 101, Pages 431–436, February 2017 (**2017 journal impact factor: 4.900**)
- 2016 • [J24] A. Angulo, **F. Mancilla–David**, R. Palma–Behnke, and D. Espinoza, “A Polyhedral–Based Approach Applied to Quadratic Cost Curves in the Unit Commitment Problem,” *IEEE Transactions on Power Systems*, Volume 31, Issue 5, Pages 3674–3683, September 2016 (**2016 journal impact factor: 5.680**)

- 2016 • [J23] M. Carrasco and **F. Mancilla–David**, “Maximum Power Point Tracking Algorithms for Single–Stage Photovoltaic Power Plants under Time–Varying Reactive Power Injection,” *Solar Energy*, Volume 132, Pages 321–331, July 2016 (**2016 journal impact factor: 4.018**)
- 2016 • [J22] F. Neves, M. Carrasco, **F. Mancilla–David**, G. Azevedo, and V. Santos, “Unbalanced Grid Fault Ride–Through Control for Single–Stage Photovoltaic Inverters,” *IEEE Transactions on Power Electronics*, Volume 31, Issue 4, Pages 3338–3347, April 2016 (**2016 journal impact factor: 7.151**)
- 2015 • [J21] A. Laudani, G. M. Lozito, **F. Mancilla–David**, F. Riganti–Fulginei, and A. Salvini, “An Improved Method for SRC Parameter Estimation for the CEC PV Module Model,” *Solar Energy*, Volume 120, Pages 525–535, October 2015 (**2015 journal impact factor: 3.685**)
- 2015 • [J20] C. Soriano–Rangel, J. C. Rosas–Caro, and **F. Mancilla–David**, “An Optimized Switching Strategy for a Ripple–Cancelling Boost Converter,” *IEEE Transactions on Industrial Electronics*, Volume 62, Issue 7, Pages 4226–4230, July 2015 (**2015 journal impact factor: 6.383**)
- 2015 • [J19] **F. Mancilla–David**, J. L. Domínguez–García, M. De Prada, O. Gomis–Bellmunt, M. Singh, and E. Muljadi, “Modeling and Control of Type–2 Wind Turbines for Sub–Synchronous Resonance Damping,” *Energy Conversion and Management*, Volume 97, Pages 315–322, June 2015 (**2015 journal impact factor: 4.801**)
- 2015 • [J18] J. C. Rosas–Caro, J. C. Mayo–Maldonado, **F. Mancilla–David**, A. Valderrabano–González, and F. Beltrán Carbajal, “Single–Inductor Resonant Switched Capacitor Voltage Multiplier with Safe Commutation,” *IET Power Electronics*, Volume 8, Issue 4, Pages 507–516, April 2015 (**2016 journal impact factor: 3.547**)
- 2014 • [J17] M. Carrasco, **F. Mancilla–David**, and R. Ortega, “An Estimator of Solar Irradiance in Photovoltaic Arrays with Guaranteed Stability Properties,” *IEEE Transactions on Industrial Electronics*, Volume 61, Issue 7, Pages 3359–3366, July 2014 (**2014 journal impact factor: 6.498**)
- 2014 • [J16] **F. Mancilla–David**, F. Riganti–Fulginei, A. Laudani, and A. Salvini, “A Neural Network–Based Low–Cost Solar Irradiance Sensor,” *IEEE Transactions on Instrumentation and Measurement*, Volume 63, Issue 3, Pages 583–591, March 2014 (**2014 journal impact factor: 1.790**)



- 2014 • [J15] M. De Prada Gil, **F. Mancilla–David**, J. L. Domínguez–García, E. Muljadi, M. Singh, O. Gomis–Bellmunt, and A. Sumper, “Contribution of Type–2 Wind Turbines to Sub–Synchronous Resonance Damping,” *International Journal of Electrical Power and Energy*, Volume 55, Pages 714–722, February 2014 (**2015 journal impact factor: 2.587**)
- 2013 • [J14] A. Arancibia, K. Strunz, and **F. Mancilla–David**, “A Unified Single– and Three–Phase Control for Grid Connected Electric Vehicles,” *IEEE Transactions on Smart Grid*, Volume 4, Issue 4, Pages 1780–1790, December 2013 (**2013 journal impact factor: 4.334**)
- 2013 • [J13] R. Cisneros, **F. Mancilla–David**, and R. Ortega, “Passivity–Based Control of a Grid–Connected Small–Scale Windmill with Limited Control Authority,” *IEEE Journal of Emerging and Selected Topics in Power Electronics*, Volume 1, Issue 4, Pages 247–259, December 2013 (**2015 journal impact factor: 3.129**)
- 2013 • [J12] P. García–Vite, **F. Mancilla–David**, and J. M. Ramírez–Arredondo, “Per–Sequence Vector–Switching Matrix Converter Modules for Voltage Regulation,” *IEEE Transactions on Industrial Electronics*, Volume 60, Issue 12, Pages 5411–5421, December 2013 (**2013 journal impact factor: 6.500**)
- 2013 • [J11] A. Laudani, **F. Mancilla–David**, F. Riganti–Fulginei, and A. Salvini, “Reduced–Form of the Photovoltaic Five–parameter Model for Efficient Computation of Parameters,” *Solar Energy*, Volume 97, Pages 122–127, November 2013 (**2013 journal impact factor: 3.541**)
- 2013 • [J10] J. C. Rosas–Caro, **F. Mancilla–David**, J. Mayo–Maldonado, J. Gonzalez–Lopez, H. Torres–Espinosa, J. Valdez–Resendiz , “A Transformer–less High–Gain Boost Converter with Input Current Ripple Cancellation at a Selectable Duty Cycle,” *IEEE Transactions on Industrial Electronics*, Volume 60, Issue 10, Pages 4492–4499, October 2013 (**2013 journal impact factor: 6.500**)
- 2013 • [J9] M. Carrasco, **F. Mancilla–David**, F. Riganti–Fulginei, A. Laudani, and A. Salvini, “A Neural Networks–based Maximum Power Point Tracker with Improved Dynamics for Variable DC–Link Grid–Connected Photovoltaic Power Plants,” *International Journal of Applied Electromagnetics and Mechanics*, Volume 43, Issue 1–2, Pages 127–135, October 2013 (**2013 journal impact factor: 0.737**)

- 2013** • [J8] H. Tian, **F. Mancilla–David**, K. Ellis, E. Muljadi, and P. Jenkins, “Determination of the Optimal Configuration for a Photovoltaic Array Depending on the Shading Condition,” *Solar Energy*, Volume 95, Pages 1–12, September 2013 (**2013 journal impact factor: 3.541**)
- 2013** • [J7] R. Ortega, **F. Mancilla–David**, and F. Jaramillo, “A Globally Convergent Wind Speed Estimator for Wind Turbines Systems,” *International Journal of Adaptive Control and Signal Processing*, Volume 27, Issue 5, Pages 413–425, May 2013 (**2013 journal impact factor: 1.656**)
- 2012** • [J6] J. C. Rosas–Caro, **F. Mancilla–David**, J. M. Ramírez–Arredondo, and A. Bakir, “Two–Switch Three–Phase AC–link Dynamic Voltage Restorer,” *IET Power Electronics* Volume 5, Issue 9, Pages 792–802, November 2012 (**2012 journal impact factor: 1.519**)
- 2012** • [J5] H. Tian, **F. Mancilla–David**, K. Ellis, E. Muljadi, P. Jenkins, “A Cell–to–Module–to–Array Detailed Model for Photovoltaic Panels,” *Solar Energy*, Volume 86, Issue 9, Pages 2695–2706, September 2012 (**2012 journal impact factor: 2.952**)
- 2012** • [J4] M. Barragán–Villarejo, G. Venkataramanan, **F. Mancilla–David**, J. M. Maza–Ortega, and A. Gómez–Expósito, “Dynamic Modelling and Control of a Shunt–Series Power Flow Controller based on AC–Link,” *IET Generation, Transmission & Distribution*, Volume 6, Issue 8, Pages 1754–1763, August 2012 (**2012 journal impact factor: 1.414**)
- 2012** • [J3] **F. Mancilla–David** and G. Venkataramanan, “Realisation of an AC–Link Unified Power Flow Controller,” *IET Generation, Transmission & Distribution*, Volume 6, Issue 4, Pages 294–302, April 2012 (**2012 journal impact factor: 1.414**)
- 2012** • [J2] **F. Mancilla–David** and R. Ortega, “Adaptive Passivity–Based Control for Maximum Power Extraction of Stand–Alone Windmill Systems,” *Control Engineering Practice*, Volume 20, Issue 2, Pages 173–181, February 2012 (**2012 journal impact factor: 1.669**)
- 2008** • [J1] **F. Mancilla–David**, S. Bhattacharya and G. Venkataramanan, “A Comparative Evaluation of Series Power Flow Controllers Using DC and AC Link Converters,” *IEEE Transactions on Power Delivery*, Volume 23, Issue 2, Pages 985–996, April 2008 (**2008 journal impact factor: 1.289**)

## Peer reviewed conference papers (CU Denver students underlined)

- 2023 • [C52] A. Bobtsov, **F. Mancilla–David**, S. Aranovskiy, and R. Ortega, “Photovoltaic Arrays’ Dynamic Model Parameter Estimation,” to appear in *Proceedings of the 22<sup>nd</sup> World Congress of the International Federation of Automatic Control*, Yokohama, Japan, July 2023
- 2021 • [C51] M. Al–Ali and **F. Mancilla–David**, “Model predictive control of grid connected inverters using different discretization strategies,” in *Proceedings of the 53<sup>th</sup> North American Power Symposium (NAPS)*, College Station, Texas, November 2021
- 2021 • [C50] C. González, A. Angulo, and **F. Mancilla–David**, “Enhancing Multistep Finite Control Set Performance of 3L–NPC Converters using Optimal Pulse Patterns,” in *Proceedings of the 47<sup>th</sup> Annual Conference of the IEEE Industrial Electronics Society*, Virtual Conference, October 2021
- 2021 • [C49] G. Ogbogu and **F. Mancilla–David**, “Forecast–Aided State Estimation Smoothing Parameter Optimization using Winter–Holt’s Methodology and RMSE,” in *Proceedings of the 52<sup>th</sup> North American Power Symposium (NAPS)*, Tempe, Arizona, April 2021
- 2019 • [C48] S. Harave and **F. Mancilla–David**, “Suppressing Circulating Current in the Modular Multilevel Converter Using Line–to–Line Voltage Correction Modules,” in *Proceedings of the 51<sup>th</sup> North American Power Symposium (NAPS)*, Wichita, Kansas, October 2019
- 2019 • [C47] H. Robles–Campos and **F. Mancilla–David**, “A Control Scheme in the dq Reference Frame for Hexverter–based Systems,” in *Proceedings of the 51<sup>th</sup> North American Power Symposium (NAPS)*, Wichita, Kansas, October 2019
- 2019 • [C46] H. Robles–Campos and **F. Mancilla–David**, “A comparative evaluation of modulation strategies for Hexverterbased Modular Multilevel Converters,” in *Proceedings of the IEEE International Conference on Industrial Technology (ICIT)*, Melbourne, Australia, February 2019
- 2018 • [C45] C. Soriano–Rangel and **F. Mancilla–David**, “Hexverter–Based Optimal Low Frequency AC Transmission System,” *Proceedings of the 50<sup>th</sup> North American Power Symposium (NAPS)*, Fargo, North Dakota, September 2018

- 2018 • [C44] W. He, C. Soriano–Rangel, R. Ortega, A. Astolfi, **F. Mancilla–David** and S. Li, “DC–DC Buck–Boost Converters With Unknown CPL: An Adaptive PBC,” in *Proceedings of the 2018 American Control Conference (ACC)*, Milwaukee, Wisconsin, June 2018
- 2017 • [C43] A. Bunaiyan and **F. Mancilla–David**, “Two–Stage Approach for the Optimal Power Flow of Photovoltaic–Penetrated Distribution Systems,” in *Proceedings of the 49<sup>th</sup> North American Power Symposium (NAPS)*, Morgantown, West Virginia, September 2017
- 2017 • [C42] C. Soriano–Rangel, M. Carrasco, and **F. Mancilla–David**, “A Comparative Evaluation of HVDC Ties Using Line Commutated and Modular Multilevel Converters,” in *Proceedings of the 49<sup>th</sup> North American Power Symposium (NAPS)*, Morgantown, West Virginia, September 2017
- 2017 • [C41] A. Bunaiyan and **F. Mancilla–David**, “Comparison of the Distribution Optimal Power Flow Relaxations for Unbalanced Loads and Generations,” in *Proceedings of the 49<sup>th</sup> North American Power Symposium (NAPS)*, Morgantown, West Virginia, September 2017
- 2016 • [C40] A. M. S. Al–bayati, **F. Mancilla–David**, and J. L. Domínguez–García, “Aggregated Models of Wind Farms: Current Methods and Future Trends,” in *Proceedings of the 48<sup>th</sup> North American Power Symposium (NAPS)*, Denver, Colorado, September 2016
- 2016 • [C39] D. Wiebe, **F. Mancilla–David**, M. Carrasco, and A. Bunaiyan, “Photovoltaic Inverter Dispatch for Voltage Regulation in Power Distribution Systems: A Comparative Evaluation,” in *Proceedings of the 48<sup>th</sup> North American Power Symposium (NAPS)*, Denver, Colorado, September 2016
- 2016 • [C38] A. Bunaiyan, M. Carrasco and **F. Mancilla–David**, “Numerical Assessment of Second Order Cone Relaxation for Distribution Optimal Power Flow Problems,” in *Proceedings of the 48<sup>th</sup> North American Power Symposium (NAPS)*, Denver, Colorado, September 2016
- 2016 • [C37] H. Robles–Campos and **F. Mancilla–David**, “Selective Harmonic Elimination for the Modular Multilevel Converter,” in *Proceedings of the 48<sup>th</sup> North American Power Symposium (NAPS)*, Denver, Colorado, September 2016

- 2016 • [C36] A. Laudani, F. Riganti–Fulginei, A. Salvini, G. Lozito, M. Carrasco and **F. Mancilla–David**, “A Fast and Effective Procedure for Sensing Solar Irradiance in Photovoltaic Arrays,” in *Proceedings of the 16<sup>th</sup> IEEE International Conference on Environment and Electrical Engineering*, Florence, Italy, June 2016
- 2016 • [C35] A. Pyrkin, **F. Mancilla–David**, R. Ortega, A. Bobtsov, and S. Aranovskiy, “Identification of the Current–Voltage Characteristic of Photovoltaic Arrays,” in *Proceedings of the 12<sup>th</sup> IFAC International Workshop on Adaptation and Learning in Control and Signal Processing*, Eindhoven, The Netherlands, June 2016
- 2015 • [C34] X. Wang, M. Carrasco, **F. Mancilla–David**, and D. Connors, “Accelerating Detailed Simulations of an HVDC System Based on Modular Multilevel Converters in a Multi–Core Environment,” in *Proceedings of the 47<sup>th</sup> North American Power Symposium (NAPS)*, Charlotte, North Carolina, September 2015
- 2015 • [C33] N. M. Salgado–Herrera, **F. Mancilla–David**, A. Medina–Ríos, and R. Tapia–Sánchez, “THD Mitigation in Type–4 Wind Turbine Through AFE Back to Back Converter,” in *Proceedings of the 47<sup>th</sup> North American Power Symposium (NAPS)*, Charlotte, North Carolina, September 2015
- 2014 • [C32] H. J. Álvarez, J. A. Ramírez, P. Zúñiga and **F. Mancilla–David**, “Static Synchronous Series Compensator for Active Power Flow Control During Unconventional Operating Conditions,” in *Proceedings of the 2014 IEEE International Autumn Meeting on Power, Electronics and Computing (ROPEC)*, Ixtapa, Mexico, November 2014
- 2014 • [C31] M. Alsadah and **F. Mancilla–David**, “Modeling and Control of Grid–Connected Photovoltaic Power Plants Utilizing a Simplified Model of the Modular Multilevel Converter,” in *Proceedings of the 46<sup>th</sup> North American Power Symposium (NAPS)*, Pullman, Washington, September 2014
- 2014 • [C30] E. Canak, M. Carrasco, and **F. Mancilla–David**, “Modeling and Control of a Grid–Connected Small–Scale Windmill System Using a Pulse Width Modulated Modular Multilevel Converter,” in *Proceedings of the 46<sup>th</sup> North American Power Symposium (NAPS)*, Pullman, Washington, September 2014

- 2014 • [C29] J. C. Rosas–Caro, J. C. Mayo–Maldonado, **F. Mancilla–David**, A. Valderrabano–Gonzalez, F. Beltran Carbajal, and V. Sanchez, “Single–Inductor Resonant Switched Capacitor Voltage Multiplier with Safe Commutation,” in *Proceedings of the 2014 IEEE Energy Conversion Congress & Exposition (ECCE)*, Pittsburgh, Pennsylvania, September 2014
- 2014 • [C28] A. Laudani, F. Riganti Fulginei, A. Salvini, G. M. Lozito, and **F. Mancilla–David**, “Implementation of a neural MPPT algorithm on a low–cost 8–bit microcontroller,” in *Proceedings of the 2014 International Symposium on Power Electronics, Electrical Drives, Automation and Motion (SPEEDAM)*, Ischia, Italy, June 2014
- 2014 • [C27] M. Carrasco, **F. Mancilla–David**, G. Venkataramanan, and J. Reed, “Low Frequency HVac Transmission to Increase Power Transfer Capacity,” in *Proceedings of the 2014 IEEE PES Transmission & Distribution Conference & Exposition*, Chicago, Illinois, April 2014
- 2013 • [C26] P. M. García–Vite, **F. Mancilla–David**, J. M. Ramírez, C. García Guendulain, and J. de Jesus Chavez, “A pulse width modulated AC link dynamic voltage restorer,” in *Proceedings of the 2013 IEEE International Autumn Meeting on Power, Electronics and Computing (ROPEC)*, Mexico City, Mexico, November 2013
- 2013 • [C25] J. C. Rosas–Caro, **F. Mancilla–David**, H. L. Torres–Espinosa, and A. Valderrabano–Gonzalez, “A Hybrid Interleaved/Switched–Capacitor Boost Converter,” in *Proceedings of the IEEE Energy Conversion Congress and Exposition*, Denver, Colorado, September 2013
- 2013 • [C24] H. Tian, **F. Mancilla–David**, E. Muljadi, T. Stoffel, and A. Andreas, “Model Validation of Photovoltaic Systems,” in *Proceedings of the 5<sup>th</sup> IEEE Green Technologies Conference (GreenTech)*, Denver, Colorado, April 2013
- 2013 • [C23] M. A. Hammoudeh, **F. Mancilla–David**, J. D. Selman, and P. Papantoni–Kazakos, “Communication Architectures for Distribution Networks within the Smart Grid Initiative,” in *Proceedings of the 5<sup>th</sup> IEEE Green Technologies Conference*, (GreenTech) Denver, Colorado, April 2013
- 2013 • [C22] M. de Prada, J. L. Domínguez–García, **F. Mancilla–David**, E. Muljadi, M. Singh, O. Gomis–Bellmunt, and A. Sumper, “Type–2 Wind Turbine with Additional Sub–Synchronous Resonance Damping,” in *Proceedings of the 5<sup>th</sup> IEEE Green Technologies Conference (GreenTech)*, Denver, Colorado, April 2013

- 2012
- [C21] **F. Mancilla–David**, A. Arancibia, F. Riganti–Fulginei, E. Muljadi, and M. Cerroni, “A Maximum Power Point Tracker Variable DC–Link Three–Phase Inverter Control Scheme for Grid–Connected PV Panels,” in *Proceedings of the 3<sup>rd</sup> IEEE PES Innovative Smart Grid Technologies (ISGT) Europe Conference*, Berlin, Germany, October 2012
- 2012
- [C20] **F. Mancilla–David**, F. Riganti–Fulginei, M. Cerroni, A. Laudani, and A. Salvini, “A Neural Networks–Based Maximum Power Point Tracker for Improved Dynamics of Variable DC–Link Grid–Connected Photovoltaic Power Plants,” in *Proceedings of the 12<sup>th</sup> International Workshop on Optimization and Inverse Problems in Electromagnetism*, Ghent, Belgium, September 2012
- 2012
- [C19] O. Al Gali and **F. Mancilla–David**, “An AC–Link Pulse Width Modulated Shunt Converter for STATCOM Applications,” in *Proceedings of the 44<sup>th</sup> North American Power Symposium (NAPS)*, Champaign, Illinois, September 2012
- 2012
- [C18] B. Dhakal, **F. Mancilla–David**, and E. Muljadi, “Centralized and Modular DC/DC Converters for Photovoltaic Panels with Improved Efficiency,” in *Proceedings of the 44<sup>th</sup> North American Power Symposium (NAPS)*, Champaign, Illinois, September 2012
- 2012
- [C17] J. M. Ramirez, P. Garcia–Vite, J. M. Lozano, and **F. Mancilla–David**, “Dynamic voltage restorers based on AC–AC topologies,” in *Proceedings of the 2012 IEEE Power and Energy Society General Meeting (PES–GM)*, San Diego, California, 2012
- 2011
- [C16] R. Ortega, **F. Mancilla–David**, and F. Jaramillo, “A Globally Convergent Wind Speed Estimator for Windmill Systems,” in *Proceedings of the 50<sup>th</sup> IEEE Conference on Decision and Control (CDC)*, Orlando, Florida, December 2011
- 2011
- [C15] P. García–Vite, **F. Mancilla–David**, and J. M. Ramírez–Arredondo, “Dynamic Modeling and Control of an AC–Link Dynamic Voltage Restorer,” in *Proceedings of the 20<sup>th</sup> IEEE International Symposium on Industrial Electronics (ISIE)*, Gdansk, Poland, June 2011
- 2011
- [C14] R. Ortega and **F. Mancilla–David**, “A Wind Speed Estimator for Windmill Systems,” in *Proceedings of the 2011 International Conference on Renewable Energies and Power Quality (ICREPQ)*, Las Palmas de Gran Canaria, Spain, April 2011

- 2010 • [C13] J. C. Rosas–Caro, **F. Mancilla–David**, J. M. Ramírez–Arredondo, J. M. González–López, and R. Salas–Cabrera, “A Two–Switch AC–Link Voltage Regulator,” in *Proceedings of the 2010 IEEE Energy Conversion Congress and Exposition (ECCE)*, Atlanta, Georgia, September 2010
- 2010 • [C12] J. C. Rosas–Caro, **F. Mancilla–David**, J. M. Ramírez–Arredondo, and A. González–Rodríguez, “AC Choppers with Multiple Steps Switching,” in *Proceedings of the 2010 IEEE Energy Conversion Congress and Exposition (ECCE)*, Atlanta, Georgia, September 2010
- 2010 • [C11] J. C. Rosas–Caro, **F. Mancilla–David**, J. M. González–López, J. M. Ramírez–Arredondo, A. González–Rodríguez, N. Salas–Cabrera, M. Gómez–García, and H. Cisneros–Villegas, “A review of AC choppers,” in *Proceedings of the 20<sup>th</sup> IEEE International Conference on Electronics, Communications and Computer (CONIELECOMP)*, Puebla, Mexico, February 2010
- 2010 • [C10] S. Suryanarayanan, **F. Mancilla–David**, J. Mitra, and Y. Li, “Achieving the Smart Grid through Customer–Driven Microgrids Supported by Energy Storage,” in *Proceedings of the IEEE International Conference on Industrial Technology (ICIT)*, Viña del Mar, Chile, March 2010
- 2010 • [C9] P. García–Vite, **F. Mancilla–David** and J. M. Ramírez–Arredondo, “A Dynamic Voltage Restorer based on Vector–Switching Matrix Converters,” in *Proceedings of the IEEE International Conference on Industrial Technology (ICIT)*, Viña del Mar, Chile, March 2010
- 2009 • [C8] **F. Mancilla–David**, “AC Link Vector Switching Converters for Power Flow Control and Power Quality: A Review,” in *Proceedings of the 41<sup>st</sup> Annual North American Power Symposium (NAPS)*, Starkville, Mississippi, October 2009
- 2008 • [C7] **F. Mancilla–David** and G. Venkataramanan, “Analytical Modeling of Semiconductor Losses in Three Level Inverter for FACTS Applications,” in *Proceedings of the 34<sup>th</sup> Annual Conference of the IEEE Industrial Electronics Society (IECON)*, Orlando, Florida, November 2008
- 2007 • [C6] **F. Mancilla–David** and G. Venkataramanan, “Modeling and Control of the Static Synchronous Series Compensator under Different Operating Modes,” in *Proceedings of the 38<sup>th</sup> IEEE Power Electronics Specialists Conference, (PESC)* Orlando, Florida, June 2007



- 2005 • [C5] **F. Mancilla–David** and G. Venkataramanan, “Generalized Averaged Dynamic Modeling of Vector Switching AC Power Flow Controllers,” in *Proceedings of the 36<sup>th</sup> IEEE Power Electronics Specialists Conference (PESC)*, Orlando, Recife, Brazil, June 2005
- 2005 • [C4] **F. Mancilla–David** and G. Venkataramanan, “A Pulse Width Modulated AC Link Unified Power Flow Controller,” in *Proceedings of the 2005 IEEE Power Engineering Society General Meeting (PES–GM)*, San Francisco, California, June 2005
- 2004 • [C3] **F. Mancilla–David** and G. Venkataramanan, “A Synchronous Back-to-Back Intertie Using the Vector Switching Converter,” in *Proceedings of the 36<sup>th</sup> Annual North American Power Symposium (NAPS)*, Moscow, Idaho 2004
- 2002 • [C2] **F. Mancilla–David** and F. Alvarado, “Nomograms for Simultaneous Transfer Capability,” in *Proceedings of the 34<sup>th</sup> Annual North American Power Symposium (NAPS)*, Tempe, Arizona 2002
- 1999 • [C1] **F. Mancilla**, E. Tomasello, J. Bustos and N. Leiva, “Back up Algorithm for Single Power Transformer Contingency,” in *Proceedings of the IASTED International Conference Power and Energy Systems*, Marbella, Spain, 1999

## Peer reviewed book chapters

- 2015 • [B1] G. Venkataramanan and **F. Mancilla–David**, “Chapter 16: Converters in Power Grid; book chapter in *Power Electronic Converters and Systems: Frontiers and Applications*,” Institute of Engineering and Technology (IET), 2015, ISBN: 978–1–84919–826–4

## Other indicators of scholarly and creative activity

### Research reports (CU Denver students underlined)

- 2012 • [R7] H. Tian, **F. Mancilla–David**, K. Ellis, E. Muljadi, and P. Jenkins, “Detailed Performance Model for Photovoltaic Systems,” *National Renewable Energy Laboratory (NREL) Report No. JA–5500–54601*, 2012

- 2012 • [R6] M. de Prada, E. Muljadi, M. Singh, **F. Mancilla–David**, O. Gomis–Bellmunt, A. Sumper, and J. L. Domínguez–García, “Contribution of Type–2 Wind Turbines to Sub–Synchronous Resonance Damping,” *National Renewable Energy Laboratory* (NREL) Report No. CP–5500–56083, 2012
- 2012 • [R5] **F. Mancilla–David**, A. Arancibia, F. Riganti–Fulginei, E. Muljadi, and M. Cerroni, “Maximum Power Point Tracker Variable–DC–Link Three–Phase Inverter for Grid–Connected PV Panels,” *National Renewable Energy Laboratory* (NREL) Report No. CP–5500–56080, 2012
- 2012 • [R4] B. Dhakal, **F. Mancilla–David**, and E. Muljadi, “Centralized and Modular Architectures for Photovoltaic Panels with Improved Efficiency,” *National Renewable Energy Laboratory* (NREL) Report No. CP–5500–55894, 2012
- 2008 • [R3] G. Venkataramanan, **F. Mancilla–David**, T. Jimichi, T. Nwachukwu, S. Gupta, and P. Mendoza Araya, “Advanced Power Electronics Controllers for Substations: Challenges and Solutions,” *Electric Power Research Institute* (EPRI), Palo Alto, CA and the *University of Wisconsin–Madison*, Madison, WI, 2008. 1015948
- 2006 • [R2] G. Venkataramanan and **F. Mancilla–David**, “Advanced Power Electronics Controllers for Substations,” *Electric Power Research Institute* (EPRI), Palo Alto, CA and the *University of Wisconsin–Madison*, Madison, WI, 2006. 1012367
- 2002 • [R1] F. Alvarado, **F. Mancilla–David** and J. Zuluaga, “Nomograms Project: Conversion of System Limits into Market Signals,” prepared for the *Consortium for Electric Reliability Technology Solutions* (CERTS), 2002

## Patents

- 2013 • [P1] **F. Mancilla–David**, F. Riganti–Fulginei, A. Laudani, and A. Salvini, “A Neural Network Solar Irradiance Sensor,” US Patent Application No. 61/792,210, 2013

**Research advising****2007–***PhD Students*

- [PhD6] Mohammed Al–Ali, “Model Predictive Control of Grid–Connected Inverters,” *in progress*
- [PhD5] Gadi Ogbogu, “Robust Modeling of Converter–Penetrated Power Systems,” *in progress*
- [PhD4] Héctor Robles–Campos, “Modeling, Control and Modulation of Hexverter–based Modular Multilevel Converters,” *graduated*, May 2022
- [PhD3] Carlos Soriano–Rangel, “Contributions to Modeling and Control of Power Converters for Renewable Energy Applications,” *graduated*, November 2018
- [PhD2] Miguel Carrasco, “Modeling, Control, and Dispatch of Photovoltaic–Based Power Distribution Systems,” *graduated*, May 2016
- [PhD1] Pedro García–Vite, “A Pulse Width Modulated AC Link Dynamic Voltage Restorer,” co–advised with J. M. Ramírez from CINVESTAV, Guadalajara, México, *graduated*, April 2012

**2007–***MS Students (Thesis option)*

- [MS21] Arun Sundara Raj, “Modeling of Dynamic Photovoltaic Arrays,” *graduated*, December 2021
- [MS20] Kaleb Waite, “Photovoltaic Module–Level Power Converters,” *graduated*, December 2021
- [MS19] Mohammed Al–Ali, “Model Predictive Control of Grid–Connected Two–Level Inverters,” *graduated*, July 2021
- [MS18] Matthew Triche, “Cascaded dc–dc Converters with Input Current Ripple Cancelation,” *graduated*, June 2020
- [MS17] Trey Greenwell, “Modeling of PV arrays,” *graduated*, May 2020
- [MS16] Chris Scheller, “Hexverter–Based Type–4 Windmill Systems,” *graduated*, January 2020
- [MS15] Sudarshan Harave, “Suppressing Circulating Currents in Modular Multilevel Converters,” *graduated*, July 2019
- [MS14] Daniel Wiebe, “Optimal Power Flow of Photovoltaic–Penetrated Distribution Systems,” *graduated*, May 2018

- [MS13] Bernardo Azuaje Berbeci, “Aggregated Simulations of Large Scale PV Power Plants in a PSCAD environment,” *graduated*, April 2017
- [MS12] Amin Bunaiyan, “Optimal Power Flow of Photovoltaic–Penetrated Distribution Systems,” *graduated*, April 2017
- [MS11] Xiaodan Wang, “Accelerated Simulations of Modular Multilevel Converters,” *graduated*, April 2015
- [MS10] Ersin Canak, “Modeling and control of a grid–connected small–scale windmills,” *graduated*, Fall 2014
- [MS9] Kayla Voller, “A Comparative Evaluation of Gas–Encapsulated and Outdoor Power Substations,” *graduated*, November 2013
- [MS8] Josh Timbre, “Ancillary Services from PV Arrays Cluster,” *graduated*, November 2013
- [MS7] Bishal Dhakal, “Centralized and Modular DC/DC Converters for Photovoltaic Panels with Improved Efficiency,” *graduated*, May 2012
- [MS6] Monther Hammoudeh, “Comparative Analysis of Communication Architectures and Technologies for Smart Grid Distribution Network,” *graduated*, May 2012
- [MS5] Mirsadraddin Rokhsari, “Optimal Energy Management in Microgrids,” *graduated*, May 2012
- [MS4] Ahmed Bakir, “Multiple–Step Switching for Vector–Switching Matrix Converters,” *graduated*, May 2012
- [MS3] Osama Al Gali, “Realization of an AC Link Pulse Width Modulated Shunt Converter for STATCOM and D–STATCOM Applications,” *graduated*, December 2011
- [MS2] Upendra Padala, “Analysis and Control of the Static Synchronous Series Compensator under Unbalanced Operating Conditions,” *graduated*, September 2011
- [MS1] Daniel Mejía, “Optimal Supervisory Control of Hybrid Energy Systems,” *graduated*, May 2011

2007–

## Visiting Scholars

- [VS26] Prof. Alex Vedyakov , “Optimal Pulse Pattern for Multilevel Converters,” *visitor from ITMO University, Saint Petersburg, Russia*, September 2019
- [VS25] Prof. Alejandro Angulo, “Optimal Pulse Pattern for Multilevel Converters,” *visitor from Universidad Técnica Federico Santa María, Valparaíso, Chile*, August 2019
- [VS24] Prof. Julio Rosas–Caro, “Cascaded dc–dc Converter Topologies with Input Current Ripple Cancellation,” *visitor from Universidad Panamericana, Guadalajara, Mexico*, July 2017
- [VS23] Prof. Pedro García–Vite, “Voltage Balancing Algorithms for Capacitors in Hexverter Topologies,” *visitor from Instituto Tecnológico de Ciudad Madero, Ciudad Madero, Mexico*, July 2017
- [VS22] Prof. Antonio Valderrábano González , “Quadratic dc–dc Converters with Input Current Ripple Cancellation,” *visitor from Universidad Panamericana, Guadalajara, Mexico*, July 2016
- [VS21] Prof. Julio Rosas–Caro, “Quadratic dc–dc Converters with Input Current Ripple Cancellation,” *visitor from Universidad Panamericana, Guadalajara, Mexico*, July 2016
- [VS20] Prof. Pedro García–Vite, “Multipulse Modulation for Hexverter,” *visitor Universidad Politécnica de Altamira, Altamira, Mexico*, November 2014–October 2015
- [VS19] José David Lara, “Inertial Response Estimation in a Power System with Significant Wind Penetration,” *visitor from CINVESTAV, Guadalajara, Mexico*, January–May 2015
- [VS18] Nadia Salgado–Herrera, “Parallel Operation of Three Phase Inverters to Minimize Ripple,” *visitor from Universidad Michoacana de San Nicolás de Hidalgo, Morelia, Mexico*, January–May 2015
- [VS17] Angela Cassese, “Modeling of Organic Solar Cells,” *visitor from The University of Rome III, Italy*, August 2014–February 2015
- [VS16] Prof. Dionisio Ramírez , “Communication Protocols for Modular Multilevel Converters,” *visitor from Universidad Politécnica de Madrid, Madrid, Spain*, July 2014
- [VS15] Prof. Julio Rosas–Caro, “Hybrid Switched–Capacitor/Interleaved dc–dc converters,” *visitor from Universidad Panamericana, Guadalajara, Mexico*, July 2014
- [VS14] Andre Griebisch, “Clusterization of Power Distribution Systems,” *visitor from Fachhochschule Köln, Cologne, Germany*, November 2012–March 2013

- [VS13] Prof. Romeo Ortega, “Modeling and Control of Grid–Connected PV Systems,” *visitor from Supélec, France*, March 2013
- [VS12] Prof. Francesco Riganti–Fulginei, “A Neural Network Irradiance Sensor—System Training,” *visitor from The University of Rome III, Italy*, January 2013
- [VS11] Prof. Antonino Laudani, “A Neural Network Irradiance Sensor—Microcontroller Implementation,” *visitor from The University of Rome III, Italy*, January 2013
- [VS10] María Icardo Colvée, “PSCAD Simulation of Back–to–Back Inter-ties,” *visitor from Universidad de Cantabria, Santander, Spain*, September 2012–December 2012
- [VS9] Prof. Julio Rosas–Caro, “High–Gain DC–DC Converters,” *visitor from Instituto Tecnológico de Ciudad Madero, Mexico*, June 2012–August 2012
- [VS8] Mikel De Prada, “Subsynchronous resonance damping,” *visitor from the Polytechnic University of Catalonia, Barcelona, Spain*, April 2012–July 2012
- [VS7] Prof. Hongmei Tian, “Modeling and Control of Solar Parks,” *visitor from Shenzhen Polytechnic, China*, January 2011–January 2012
- [VS6] Dr. Arnaldo Arancibia, “Grid–Integration of Electric Vehicles,” *visitor from The Technical University of Berlin, Germany*, January 2012
- [VS5] Valerio Scheleter, “A Power System Stabilizer for Type II Wind-mills,” *visitor from The University of Rome III, Italy*, August 2011–March 2012
- [VS4] Matteo Cerroni, “Ancillary Services from Distributed Energy Resources,” *visitor from The University of Rome III, Italy*, August 2011–March 2012
- [VS3] Dr. Antonio Sánchez, “Control of Dynamic Energy Routers,” *visitor from Supélec, France*, April 2011
- [VS2] M. Barragán–Villarejo, “Dynamic Modelling and Control of an AC–Link Unified Power Flow Controller,” *visitor from the University of Sevilla, Spain*, September 2010
- [VS1] Prof. Pável Zuñiga, “Control of the Static Synchronous Series Compensator under Unbalanced Operation,” *visitor from the University of Guadalajara, Mexico*, March–April 2010

## Peer reviewed presentations at meetings/conference

- 2013**
- [CP7] F. Mancilla–David, “Model Validation of Photovoltaic Systems,” presented at the 5<sup>th</sup> *IEEE Green Technologies Conference (GreenTech)*, Denver, Colorado, April 2013

- 2011 • [CP6] **F. Mancilla–David**, “Dynamic Modeling and Control of an AC–Link Dynamic Voltage Restorer,” presented at the 20<sup>th</sup> *IEEE International Symposium on Industrial Electronics* (ISIE), Gdansk, Poland, June 2011
- 2009 • [CP5] **F. Mancilla–David**, “AC Link Vector Switching Converters for Power Flow Control and Power Quality: A Review,” presented at the 41<sup>st</sup> *Annual North American Power Symposium* (NAPS), Starkville, Mississippi, 2009
- 2007 • [CP4] **F. Mancilla–David**, “Modeling and Control of the Static Synchronous Series Compensator under Different Operating Modes,” presented at the 38<sup>th</sup> *IEEE Power Electronics Specialists Conference* (PESC), Orlando, Florida, 2007
- 2005 • [CP3] **F. Mancilla–David**, “A Pulse Width Modulated AC Link Unified Power Flow Controller,” presented at the 2005 *IEEE Power Engineering Society General Meeting* (PES–GM), San Francisco, California, 2005
- 2004 • [CP2] **F. Mancilla–David**, “A Synchronous Back–to–Back Intertie Using the Vector Switching Converter,” presented at the 36<sup>th</sup> *Annual North American Power Symposium* (NAPS), Moscow, Idaho, 2004
- 2002 • [CP1] **F. Mancilla–David**, “Nomograms for Simultaneous Transfer Capability,” presented at the 34<sup>th</sup> *Annual North American Power Symposium* (NAPS), Tempe, Arizona, 2002

## Seminars/workshops presented

- 2022 • [RS21] **F. Mancilla–David**, “Role of control systems in power electronics,” presented at *ITAM*, Mexico City, Mexico, March 2022
- 2020 • [RS21] **F. Mancilla–David**, “Characterization of Photovoltaic Systems for Large Scale Solar Power Generation,” cyber–presented at *Universidad Técnica Federico Santa María*, Valparaíso, Chile, May 2020
- 2019 • [RS20] **F. Mancilla–David**, “Characterization of Photovoltaic Systems for Large Scale Solar Power Generation,” presented at *University of Sevilla*, Sevilla, Spain, October 2019

- 2017 • [RS19] **F. Mancilla–David**, “The Role of Power Electronics in Modern Energy Systems: A summary of research activities at CU Denver,” presented at *PUC–Rio University*, Rio de Janeiro, Brazil, July 2017
- 2017 • [RS18] **F. Mancilla–David**, “Guidelines for Planning the Chilean Electric Transmission Systems Under the New Electricity Bill,” **Keynote Speaker**, presented at *Chile’s Department of Energy*, Santiago, Chile, April 2017
- 2016 • [RS17] **F. Mancilla–David**, “Characterization of Photovoltaic Systems for Large Scale Solar Power Generation,” presented at *ITMO University*, Saint Petersburg, Russia, June 2016
- 2015 • [RS16] **F. Mancilla–David**, “Characterization of Photovoltaic Systems for Large Scale Solar Power Generation,” presented at *CentraleSupélec*, Paris, France, December 2015
- 2015 • [RS15] **F. Mancilla–David**, “Research on Energy & Power Systems at the University of Colorado Denver,” presented at the *Power Systems Summer School 2015*, CINVESTAV, Chapala, Mexico, October 2015
- 2015 • [RS14] **F. Mancilla–David**, “Research on Photovoltaic & Wind Energy System Performed at the University of Colorado Denver,” presented to the *U.S. State Department delegation of twelve international visitors through IIE/Education USA*, Denver, Colorado, July 2015
- 2013 • [RS13] **F. Mancilla–David**, “Characterization of Photovoltaic Systems for Large Scale Solar Power Generation,” presented at the *College of Engineering and Applied Science Seminar Series*, *University of Colorado Denver*, Denver, Colorado, October 2013
- 2011 • [RS12] **F. Mancilla–David**, “AC–Link Vector Switching Matrix Converters for Power Flow Control and Power Quality Enhancement,” presented as a Special Seminar at the *Technische Universität Berlin*, Berlin, Germany, June 2011
- 2011 • [RS11] **F. Mancilla–David**, “Small–Scale Permanent Magnets Windmills: Construction, Modeling, Control, and Design,” presented at the *Renewable Energy Club Seminar*, *University of Colorado Denver*, Denver, Colorado, January 2011



- 2011 • [RS10] **F. Mancilla–David**, “Small–Scale Permanent Magnets Windmills: Construction, Modeling, Control, and Design,” presented at the *College of Engineering and Applied Science Seminar Series, University of Colorado Denver*, Denver, Colorado, January 2011
- 2010 • [RS9] **F. Mancilla–David**, “Small–Scale Permanent Magnets Windmills: Construction, Modeling, Control, and Design,” **Keynote Speaker**, presented at the *International Conference and Fair on Education, Research & Employment in the Renewable Energy Sector, University of Chile*, Santiago, Chile, November 2010
- 2010 • [RS8] **F. Mancilla–David**, “FACTS and Custom Power Technology: Smart Devices for Smart Grids,” presented at the *Supélec Seminar Series*, Supélec, Paris, France, June 2010
- 2010 • [RS7] **F. Mancilla–David**, “FACTS and Custom Power Technology: Smart Devices for Smart Grids,” presented at the *International Workshop on Smartgrids and Distributed Generation, University of Chile*, Santiago, Chile, January 2010
- 2008 • [RS6] **F. Mancilla–David**, “Research in Power Engineer at the University of Colorado Denver,” presented at the *Electrical Engineering Department Seminar Series, University of Colorado Denver*, Denver, Colorado, October 2008
- 2008 • [RS5] **F. Mancilla–David**, “AC Link Load Flow Control in Electric Power Systems,” presented as a Special Seminar at the *University of Ruhuna Hapugala*, Galle, Sri Lanka, August 2008
- 2008 • [RS4] **F. Mancilla–David**, “AC Link Load Flow Control in Electric Power Systems,” presented as a Special Seminar at *ABB High Voltage Products*, Ludvika, Sweden, June 2008
- 2008 • [RS3] **F. Mancilla–David**, “AC Link Load Flow Control in Electric Power Systems,” presented as a Special Seminar at the *Royal Institute of Technology (KTH)*, Stockholm, Sweden, June 2008
- 2008 • [RS2] **F. Mancilla–David**, “AC Link Load Flow Control in Electric Power Systems,” presented as a Special Seminar at *ABB Corporate Research*, Vasteras, Sweden, May 2008

- 2006**
- [RS1] **F. Mancilla–David**, “A Comparative Evaluation of Series Power Flow Controllers Using DC– and AC–Link Converters,” presented at the *WEMPEC Annual Review Meeting*, University of Wisconsin–Madison, Madison, Wisconsin, May 2006

## Courses taught

### Courses taught at CU Denver

- 2007–** *Regular courses*
- [CO12] ELEC/MECH 3030–3 Electric Circuits and Systems
  - [CO11] ELEC 4174/5174–3 Power Electronic Systems
  - [CO10] ELEC 4184/5184–3 Power Systems Analysis
  - [CO9] ELEC 4444–1 Power Systems Laboratory
  - [CO8] ELEC 4755/5755–3 Renewable Energy Systems
  - [CO7] ELEC 5194–3 Power Systems Operation and Control
  - [CO6] ELEC 5294–3 Advanced Power Electronic Systems
- 2007–** *Advising courses*
- [CO5] ELEC 3939 Cooperative Education Credits
  - [CO4] ELEC 4840 Undergraduate Independent Study
  - [CO3] ELEC 5840 Graduate Independent Study
  - [CO2] ELEC 6950 MS Thesis Credits
  - [CO1] ELEC 8990 PhD Thesis Credits
- 2007–** *Voluntary advising*
- [VA2] Has served as an advisor to many Senior Design team projects, 2007–present
  - [VA1] Has participated in CU Denver’s Renewable Energy Club, 2011–2015

### Courses taught abroad

- 2016** *Course taught at PUC–Rio, Brazil*
- [CA3] ELE2551 “Power Electronic Systems,” Fall 2016
- 2013** *Short course taught at Supélec, France*
- [CA2] “Power Converters with Focus on Renewable Energy Resources,” A two–day course presented at Supélec, Paris, France, June 10–11, 2013

- 2011**      *Short course taught at the Polytechnic University of Madrid, Spain*
- [CA1] “The Role of Power Electronics within the Smart Grid Initiative,” A two–day course presented at the Polytechnic University of Madrid, Segovia, Spain, July 11–12, 2011

## Professional organizations

- 2020–**      *Advising*
- [A1] Faculty Advisor to CU Denver’s Chapter of the Society of Hispanic Professional Engineers (SHPE)
- 2007–**      *Memberships*
- [M3] Institute of Electrical and Electronics Engineers (IEEE)
  - [M2] IEEE Power & Energy Engineering Society (IEEE PES)
  - [M1] IEEE Power Electronics Society (IEEE PELS)
- 2012–2017**      *Editorial*
- [E1] Editorial board member for *Energy Technology, Wiley*, (**2017 journal impact factor: 3.175**) 2012–2017

## Service to technical community

- 2008–**      *PhD thesis external reviewer*
- [TC36] F. de Paula García López, (University of Sevilla, Spain, 2019)
  - [TC35] L. Trilla (“Universitat Politècnica de Catalunya,” Spain, 2013)
  - [TC34] J. M. Lozano (CINVESTAV, México, 2011)
  - [TC33] J. C. Rosas–Caro (CINVESTAV, México, 2008)

- 2007–** *Reviewer for a large number of high impact journals*
- [TC32] IEEE Transactions on Power Electronics
  - [TC31] IEEE Transactions on Industrial Electronics
  - [TC30] IEEE Transactions on Industry Applications
  - [TC29] IEEE Journal of Emerging and Selected Topics in Power Electronics
  - [TC28] IET Power Electronics
  - [TC27] IEEE Transactions on Smart Grid
  - [TC26] IEEE Transactions on Power Delivery
  - [TC25] IEEE Transactions on Energy Conversion
  - [TC24] IEEE Transactions on Sustainable Energy
  - [TC23] IEEE Journal of Photovoltaics
  
  - [TC22] Solar Energy, Elsevier
  - [TC21] Applied Energy, Elsevier
  - [TC20] Energy Conversion and Management, Elsevier
  - [TC19] IEEE Transactions on Control Systems Technology
  - [TC18] IEEE Transactions on Circuits and Systems I
  - [TC17] IEEE Journal on Emerging and Selected Topics in Circuits & Systems
  - [TC16] IET Circuits, Devices & Systems
  - [TC15] IEEE Transactions on Instrumentation & Measurement
- 2007–** *Reviewer for a large number of conferences*
- [TC14] IEEE Energy Conversion Congress & Exposition (ECCE)
  - [TC13] American Control Conference (ACC)
  - [TC12] IEEE Green Technologies Conference (GreenTech)
  - [TC11] IEEE Conference on Innovative Smart Grid Technologies (ISGT)
  - [TC10] IEEE International Symposium on Industrial Electronics (ISIE)
  - [TC9] IEEE Power & Energy Society General Meeting (PES–GM)
  - [TC8] IEEE Power Electronics Specialists Annual Conference (PESC)
  - [TC7] North American Power Symposium (NAPS)
- 2013**
- [TC6] Session chair: “Power Systems–Session A,” 5<sup>th</sup> *IEEE Green Technologies Conference* (GreenTech), Denver, Colorado, April 2013
- 2012**
- [TC5] Session chair: “Distribution systems II,” 44<sup>th</sup> *Annual North American Power Symposium* (NAPS), Urbana, Illinois, 2012

- 2009 • [TC2] Session chair: “Topics of Special Interest in Power Systems,” 41<sup>st</sup> Annual North American Power Symposium (NAPS), Starkville, Mississippi, 2009
- 2007 • [TC1] Session chair: “Control of Power Systems,” 39<sup>th</sup> Annual North American Power Symposium (NAPS), Las Cruces, New Mexico, 2007

## Awards/honors

- 2020 • [AH6] IEEE Industrial Electronics Society Student Best Paper Award (with student H. Robles–Campos), Paper “A comparative evaluation of modulation strategies for Hexverter–based Modular Multilevel Converters,” Proceedings of the 20th IEEE International Conference on Industrial Technology (ICIT–2019), Melbourne, Australia, 2019.
- 2016 • [AH5] Fulbright Scholar, Fall 2016
- 2016–2017 • [AH4] Brazilian Government CNPq Visiting Scholar; partial funding to join PUC–Rio University as a visiting professor during the 2016–2017 academic year
- 2000–2001 • [AH3] “Eduardo Neale–Silva” Memorial Scholarship; full funding to study at the University of Wisconsin–Madison during the 2000–2001 academic year
- 1999 • [AH2] “Federico Santa María” Award; given to the top electrical engineer in the class of 1999
- 1999 • [AH1] “Colegio de Ingenieros de Chile” (Chile’s Institute of Engineers) Award; given to the top electrical engineer in the class of 1999

*End of Curriculum Vitae*