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Education

Ph.D. Applied Economics and Management, Cornell University, USA, 2012

Energy Systems and Economics, Environmental Economics

Master of Arts, Economics, New York University, USA, 2004

Exchange Program, Universiteit Maastricht, The Netherlands, 2000

Scholarship from Nuffic.

Bachelor of Science, Electrical Engineering, Universidad de los Andes, Colombia, 1999

Employment

Assistant Professor

Lehigh University, Bethlehem, PA.

Department of Economics, College of Business and Economics

Joint appointment

Industrial and Systems Engineering, P.C. Rossin College of Engineering and Applied Science

August 2012 – Present

September 2016 – Present

Research Assistant

Cornell University, Ithaca, NY.

July 2007 – July 2012

Vice President Portfolio Management

Citibank International PLC. London, UK.

March 2005 – June 2007

Relationship Manager

Citibank Western Europe. Brussels, Belgium; London, UK.

June 2004 – August 2004

Senior Portfolio Analyst

Junior, April 2001 – April 2002. Citibank Colombia. Santafe de Bogotá, Colombia.

April 2001 – August 2003

Consultant Engineer

AENE Consultoria, Santafe de Bogotá, Colombia.

June 1999 – August 2000

Publications

Journals

“Allocation of Resources using a Microgrid Formation Approach for Resilient Electric Grids,” with Sedzro, K. and Zuluaga, L.F. Revise and Resubmit, second round, *IEEE Transactions on Power Systems*, 2017.

“Generalized Minimax: A Self-enforcing Pricing Scheme for Load Aggregators,” with Sedzro, K. and Chuah, M.C. *IEEE Transactions on Smart Grid*, 1949-3053, August 2016.

“The Economic Value of Transmission Lines and the Implications for Planning Models,” with Maneevitjit, S. and Mount, T.D. *Energy Economics*, 57, 1-15, June 2016.

“A Robust Model for the Ramp-Constrained Economic Dispatch Problem with Uncertain Renewable Energy,” with Moarefdoost, M.M. and Zuluaga, L.F. *Energy Economics*, 56, 310-325, May 2016.

“Optimal use of energy storage systems with renewable energy sources.” *Journal of Electrical Power & Energy Systems*, 71 (0), 101-111, 2015.

“Stochastically Optimized, Carbon-Reducing Dispatch of Storage, Generation, and Loads,” with Shawhan, D.L., Murillo-Sanchez, C.E., Zimmerman, R.D., Zhu, Y., Tylavsky, D.J., Kindle, A.G. and Dar, Z. *IEEE Transactions on Power Systems*, 30 (2), 1064-1075, 2015.

“Using Deferrable Demand in a Smart Grid to Reduce the Cost of Electricity for Customers,” with Jeon, W.Y., Mo, J.Y. and Mount, T. *Journal of Regulatory Economics*, Volume 47, Issue 3, pp. 239-272, June 2015.

“The Controllability of Real Things: Planning for Wind Integration,” with Jeon, W.Y., Mo, J.Y. and Mount, T. *The Electricity Journal*, 28 (1), 19-28, 2015.

“Is Deferrable Demand an Effective Alternative to Upgrading Transmission Capacity?,” with Mount, T., Jeon, W. and Lu, H. *Journal of Energy Engineering*, 141 (1), B4014005 1-16, March 12, 2015.

“Shale Gas Vs. Coal: Policy Implications From Environmental Impact Comparisons Of Shale Gas, Conventional Gas, And Coal On Air, Water, And Land In The United States,” with Jenner, S. *Energy Policy*, 53 (0), 442-453, 2013.

“Ancillary Services in Systems with Penetration of Renewable Energy Sources, The Case of Ramping,” with Mount, T. *Energy Economics*, 34 (6), 1959-1971, 2012.

“The Hidden System Costs of Wind Generation in a Deregulated Electricity Market,” with Mount, T., Maneevitjit, S., Thomas, R. and Zimmerman, R. *The Energy Journal*, 33 (1), 161-186, 2012.

“Geographical Averaging and Ancillary Services for Stochastic Power Generation,” with Mount, T. and Thomas, R. *International Journal of Innovations in Energy Systems and Power*, 6 (1), 13-21, 2011.

“Wine in Your Knapsack?,” with Conrad, J. and Gomez, M. . *The Journal of Wine Economics*, 6 (1), 83-110, 2011.

Refereed Conferences and Newsletters

“The Case for a Simple Two-Sided Electricity Market,” with Mount, T., Jeon, W., and Lu, H. Proceedings of the 50th Annual Hawaii International Conference on System Sciences (HICSS), IEEE Computer Society, Washington, DC, January 2017.

“On the Death and Possible Rebirth of Energy-Only Markets,” with Mount, T., and Jeon, W. Proceedings of the 49th Annual Hawaii International Conference on System Sciences (HICSS), IEEE Computer Society, Washington, DC, January 2016.
<http://ieeexplore.ieee.org/document/7427477/>

“Economic Cost-Benefit Analysis for Power System Operations with Environmental Considerations,” with Shawhan, D.L., Murillo-Sanchez, C.E., Zimmerman, R.D., Zhu, Y., Tylavsky, D.J., Kindle, A.G. and Dar, Z. Proceedings of the 2015 IEEE Powertech, Eindhoven, The Netherlands, June 2015.
<http://ieeexplore.ieee.org/document/7232802/>

“Can Energy Bids from Aggregators Manage Deferrable Demand Efficiently?,” with Lu, H., Mount, T., and Jeon, W. Proceedings of the 48th Annual Hawaii International Conference on System Sciences (HICSS), IEEE Computer Society, Washington, DC, January 2015.
<http://ieeexplore.ieee.org/document/7070119/>

“Barriers to Increasing the Role of Demand Resources in Electricity Markets,” with Mount, T., Jeon, W. and Hao, L.

Proceedings of the 47th Annual Hawaii International Conference on System Sciences (HICSS), IEEE Computer Society, Washington, DC, January 2014.

<http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6758890>

“On the Usage of Storage Systems in the Presence of Ramping Costs and High Penetration of Renewables,” with Mount, T. and Zimmerman, R.

IEEE Conference on Technologies for Sustainability (Sustech). Portland, OR, August 2013.

<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6617291>

“The Effect of Stochastic Wind Generation on Ramping Costs and the System Benefits of Storage,” with Mount, T. and Jeon, W.

Proceedings of the 46th Annual Hawaii International Conference on System Sciences (HICSS), IEEE Computer Society, Washington, DC, January 2013.

<http://ieeexplore.ieee.org/document/6617291/>

“Controllable Demand For Electricity Systems With High Wind Penetrations,” with Mount, T., Zimmerman, R. and Munoz-Alvarez, D. *USAEE Dialogue*, 21, January 2013.

http://dialogue.usaee.org/index.php?option=com_content&view=article&id=222&Itemid=845

“Evaluating the Net Benefits of Investing in New Wind and Transmission Capacity on a Network,” with Mount, T., Maneevitjit, S., Thomas, R. and Zimmerman, R.

Proceedings of the 42nd Annual Hawaii International Conference on System Sciences (HICSS), IEEE Computer Society, Washington, DC, January 2009.

<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=04755519>

Working Papers

“Socio-Economic Analysis of Shale Gas Development in Pennsylvania,” with Casagrande, D.

“The Environmental Value of of Co-optimizing Deferrable Demand from Thermal services and Electric Vehicles,” with Mount, T.

“Structural Change, Rents Transferring and Market Power in the International Coffee Market: A Time Series Analysis,” with Gomez, M. I.

“Pricing Attacks and the Cyber-Physical Management of the Electricity System,” with Blum, R., Snyder, L. and Kishore, S.

Grants, Awards and Honors

Estimating Consumer Preferences for Diverse Electric Services 2016
EPRI, \$59,750

Optimization Methods for Decisions in Industrial gas Network Products 2016
PA Dept. of Community & Economic Development, PITA, Air Products, \$85,500

Cybersecurity of Energy Delivery Systems 2015
Department of Energy (DoE), Affiliated Faculty. DoE Center for *Secure, Evolvable Energy Delivery Systems* (SEEDS). Founding Members: Lehigh University, University of Arkansas (Fayetteville and Little Rock), Carnegie Mellon University, Florida International University, \$12,000,000

CRISP: Probabilistic Resilience Assessment of Interdependent Systems - PRAISys 2015
National Science Foundation, \$1,9003,209.

Finalist, Paper Competition Next Generation Network, CIGRE, US National Committee.	2015
Finalist, Best Paper Award HICSS 48th, Electricity Energy Systems, track <i>Economics, Markets and Policy</i> .	2015
Toward a Systematic Collection and Processing of Data for Implementing Smartgrids PA Dept. of Community & Economic Development, PITA, OSIsoft, \$24,200.	2014
CyberSEES: Ocean Wave Energy and the Power Grid: Optimization and Integration National Science Foundation, \$900,000.	2014
Consortium for Electric Reliability Technology Solutions (CERTS) Department of Energy, \$35,000.	2014
Accelerator Grant Lehigh University, \$100,000.	2013
Faculty Innovation Grant (FIG) Lehigh University, \$25,000.	2013
Consortium for Electric Reliability Technology Solutions (CERTS) Department of Energy, \$30,000.	2013
Graduate School Travel Grant Cornell University.	2012
IAEE Conference scholarship International Association for Energy Economics.	Spring 2011, Fall 2011
Graduate School Travel Grant Cornell University.	2011
Tinker Grant Cornell University, joint with Graduate School Grant for Supply Chain study in Colombia.	Fall 2010
Graduate School Travel Grant Cornell University.	2010
Provost Fellowship New Jersey Institute of Technology.	Fall 2006, Spring 2007
Outstanding Performance Recipient of Certificate for Conversion Excellence, Citibank Colombia.	2002
Scholarship from NUFFIC Scholarship from NUFFIC for Exchange Program to Maastricht University, second semester 2000. Selected for Exchange Program with Maastricht University, only student from Colombia.	June 1999
Fourth position, Investment Portfolio Contest Bogotá Stock Exchange, 610 participants national level.	June 2000
Diploma Microelectronic Contest Best Undergraduate Project Design, Universidad de los Andes.	August 1996
Best Graduates at National Level Mention from the Ministry of Education, High School Colombia.	November 1994

Professional Activities

Proceedings

“The Value of Aggregation Under Minimax Pricing Scheme in the Electricity Retail Market.”
IEEE PES Annual Meeting. Boston, MA, July 2016.

“Challenges in Optimal Cost Internalization: The Welfare Impacts of Large Penetration of Stochastic Resources in Multi-Period Look-Ahead Markets.”
IEEE PES Annual Meeting. Denver, CO, July 2015.

“Economic Cost-Benefit Analysis for Power System Operations with Environmental Considerations.”
PowerTech, 2015. Eindhoven, The Netherlands, June 2015.

“Minimax: an incentive-driven pricing scheme in the electricity retail market,” with Sedzro, K.S. and Chuah, M.C.
IEEE Workshop on Modeling and Simulation of Cyber-Physical Energy Systems. Seattle, WA, May 2015.
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7115400>

“Adaptive particle swarm optimization learning in a time delayed recurrent neural network for multi-step prediction,” with Hatalis, K., Alnajjab, B. and Kishore, S.
Foundations of Computational Intelligence (FOCI), Orlando, FL, November 2014.

“Multi-step forecasting of wave power using a nonlinear recurrent neural network,” with Hatalis, K., Pradhan, P., Kishore, S. and Blum, R.
IEEE PES Annual Meeting. Washington, DC, July 2014.

“Prospects of wave power grid integration,” with Pradhan, P., Hatalis, K., Kishore, S. and Blum, R.
IEEE PES Annual Meeting. Washington, DC, July 2014.

“How to Remunerate Ramping Services?,” with Mount, T.
IEEE PES Annual Meeting. Vancouver, BC, July 2013.

“On the Capacity value of Renewable Energy Sources in the presence of Energy Storage and Ramping Constraints,” with Mount, T. and Zimmerman, R.
IEEE Workshop on Modeling and Simulation of Cyber-Physical Energy Systems. Berkeley, CA, May 2013.
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6623322>

“Alternate Mechanisms for Integrating Renewable Sources of Energy into Electricity Markets,” with Mount, T., Zimmerman, R., Murillo-Sanchez, C. and Anderson, L.
IEEE PES Annual Meeting. San Diego, CA, July 2012.
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6345107>

“Integration of Stochastic Power Generation, Geo-Averaging and Load Response, Multi-period,” with Mount, T. and Thomas, R.
Proceedings of the 46th Universities’ Power Engineering Conference. Soest, Germany, September 2011.
<http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=6125476>

“Integration of Stochastic Power Generation, Geo-Averaging and Load Response, Dynamic Update,” with Mount, T. and Thomas, R.
Proceedings of the 17th Power Systems Computation Conference. Stockholm, Sweden, September 2011.
http://www.psc-central.org/uploads/tx_ethpublications/fp368_01.pdf

“The economic value of transmission lines with increased penetrations of stochastic generation,” with Mount, T. and Maneevijit, S.
IEEE PES Annual Meeting. Detroit, MI, July 2011.
<http://ieeexplore.ieee.org/search/srchabstract.jsp?tp=&arnumber=6039349>

“Dynamic Optimization for the Management of Stochastic Generation and Storage,” with Mount, T.

and Shoemaker, C.

Proceedings of the T&D Latin America Conference. Sao Paulo, Brazil, November 2010.

http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=5762985

“Geographical Averaging and Ancillary Services for Stochastic Power Generation,” with Mount, T. and Thomas, R.

Proceedings of the 45th Universities’ Power Engineering Conference. Cardiff, UK, September 2010.

<http://ieeexplore.ieee.org/search/srchabstract.jsp?navigation=no&arnumber=5649447>

“Are Existing Ancillary Service Markets Adequate with High Penetrations of Variable Generation?,” with Mount, T.

Panelist, Identifying and Prioritizing Enhancements with the Advent of Smart Grid. IEEE PES Annual Meeting, Minneapolis, MN, July 2010.

http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5588073

“A symbiotic role for plug-in hybrid electric vehicles in an electric delivery system,” with Mount, T., Maneevitjit, S. and Zimmerman, R.

Proceedings of the 22nd Rutgers Western Conference. Monterey, CA, June 2009.

“The Economic Implications of Adding Wind Capacity to a Bulk Power Transmission Network,” with Mount, T., Maneevitjit, S., Thomas, R. and Zimmerman, R.

21st Annual Western Center for Research in Regulated Industries Conference, Monterrey, CA, June 2008.

“A “SuperOPF” Framework,” with Maneevitjit, S., Mount, T., Murillo-Sanchez, C., Thomas, R.J. and Zimmerman, R.D. *Consortium for Electric Reliability Technology Solutions (CERTS) Technical Report*, 2008.

<http://certs.lbl.gov/pdf/superopf-framework.pdf>.

Presentations and Panels

2017

IAEE 40th International Conference; CRRRI Rutgers Eastern Conference on Regulated Industries; ISCTE-IUL, Lisbon; Universidad Carlos III de Madrid; EPRI, Charlotte; Argonne National Laboratory.

Chair IAEE Session “Sustainability, Volatility, and the Evolution of Energy Markets,” Allied Social Science Associations Meetings.

2016

INFORMS Annual Meeting. USAEE/IAEE North American Conference; Department of Energy and Mineral Engineering, Pennsylvania State University; Energy Policy Research Conference; Center for Public Utilities, New Mexico State University; Modeling and Optimization: Theory and Applications (MOPTA); IEEE 2016 Power and Energy Society (PES) General Meeting; IAEE 39th International Conference; Rutgers Eastern Conference on Regulated Industries; Arizona State University; Allied Social Science Associations Meetings.

Chair Panel “Flexible Demand, Scheduling and its Economic Impacts on the Markets and System Operation,” PES General Meeting, Co-Chair Miguel Ortega-Vazquez, University of Washington.

2015

Pennsylvania State University; INFORMS Annual Meeting; USAEE/IAEE North American Conference; IEEE 2015 Power and Energy Society (PES) General Meeting; 22nd International Symposium on Mathematical Programming (ISMP); Rutgers Eastern Conference on Regulated Industries; Carnegie Mellon Electricity Conference.

Chair Panel “Impacts of Variability, Uncertainty and Forecasting Errors in Power Systems Operational Planning,” PES General Meeting, Co-Chair Miguel Ortega-Vazquez, University of Washington.

2014

INFORMS Annual Meeting; FERC Workshop/Trans-Atlantic Infraday;
CIGRE Canada Conference; Energy Policy Research Conference; 14th Modeling and Optimization: Theory and Applications (MOPTA); IAEE International Conference; Workshop on Sustainable Production and Management of Shale Gas; University of Maryland, School of Public Policy.

Co-Chair 14th Annual AIMMS-MOPTA Competition; Co-Chair Panel “Multi-stage Optimization and Its Impact on Electricity Market,” Power and Energy Society General Meeting.

2013

PSERC Industry-University Meeting; INFORMS Annual Meeting; 13th GEE/IAEE European Conference; Lehigh University; Allied Social Science Associations Meetings.

Chair, Smart Grid Session, 13th Annual, Modeling and Optimization: Theory and Applications.

2012

USAEE/IAEE North American Conference; INFORMS Annual Meeting; Future Energy Summit, IDGA; 12th Annual, Modeling and Optimization: Theory and Applications; International PhD Workshop in Sustainable Development; Eighth Carnegie Mellon Conference on the Electricity Industry.

2011

INFORMS Annual Meeting; USAEE/IAEE North American Conference; 17th Power Systems Computation Conference; 5th Annual Conference American Association of Wine Economists; International PhD Workshop in Sustainable Development; Seventh Carnegie Mellon Conference on the Electricity Industry.

2010

Sixth Carnegie Mellon Conference on the Electricity Industry.

2009

Fifth Carnegie Mellon Conference on the Electricity Industry.

Professional Memberships

Institute of Electrical and Electronic Engineers (IEEE) Senior Member, Secure Electric Energy Delivery Systems (SEEDS) Center, Power Systems Engineering Research Center (PSERC), Institute for Operations Research and the Management Sciences (INFORMS), American Economic Association (AEA), Power and Energy Society (PES), International Association for Energy Economics (IAEE), United States Association for Energy Economics (USAEE), Agricultural and Applied Economics Association (AAEA), American Association of Wine Economists, (AAWE).

Teaching Experience

Government & Society, 1-MBA *Spring 2017*
Lehigh University. Bethlehem, PA, U.S.A.

Community Consulting Practicum *Spring 2016, 2017*
Lehigh University. Bethlehem, PA, U.S.A.

Mathematical Economics *Fall 2014-2016*
Lehigh University. Bethlehem, PA, U.S.A.

Advanced Undergraduate/Graduate Electricity Economics *Spring 2013, 2014; Fall, 2015, 2016*
Lehigh University. Bethlehem, PA, U.S.A.

Undergraduate Intermediate Microeconomics *Fall 2012-Spring 2017*
Lehigh University. Bethlehem, PA, U.S.A.

Lecturer, Electrical Engineering Seminar *June 2011*
KTH School of Electrical Engineering, Stockholm, Sweden.

Instructor, Economic Principles I course

Fall 2004

New York University. New York, NY, U.S.A. Professor Marc Lieberman.

Instructor, Economic Principles II course

Fall 2003 and Spring 2004

New York University. New York, NY, U.S.A. Professors Dermot Gately (Spring 2004) and Stefano Eusepi (Fall 2003).

T.A., Optimization Course for Engineers

Fall 1998, Spring 1999

Universidad de los Andes. Santafe de Bogotá, Colombia. Professor Hernando Duran.

Service

Reviewer for

IAEE's *The Energy Journal*; Elsevier's *Energy Economics*; Elsevier's *Energy Policy*; Springer's *Journal of Regulatory Economics*; Springer's *Networks and Spatial Economics*; American Economic Association Annual Meeting; IEEE *Transactions on Power Systems*; IEEE *Transactions on Smart Grid*; IEEE *Transactions on Sustainable Energy*; IEEE *Transactions on Energy Conversion*; Hawaii International Conference on System Sciences (HICSS); Elsevier's *Energy Conversion and Management*; Elsevier's *Transportation Research Part D: Transport and Environment*; IET *Generation, Transmission & Distribution*; Power Systems Computation Conference (PSCC); Elsevier's *Journal of Electrical Power and Energy Systems*; Elsevier's *Applied Energy*.

Council Member At Large, U.S. Association for Energy Economics (USAEE); Founding faculty advisor, USAEE, Lehigh University Student Chapter. Chair, Optimization Models for Electricity Systems session, MOPTA, 2013; Technical Program Committee Member, IEEE SmartGridComm Symposium 2012. President, Cornell University Colombian Student Association, 2010-2011.

References

Timothy D. Mount
Professor Emeritus
Charles H. Dyson School of Applied Economics
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Cornell University
Warren Hall
Ithaca, NY 14853
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Professor Emeritus
School of Civil and Environmental Engineering
Cornell University
422 Hollister Hall
Ithaca, NY 14853
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Department of Biological and Environmental
Engineering
Cornell University
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Ray D. Zimmerman
Senior Research Associate
Charles H. Dyson School of Applied Economics
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Cornell University
B30 Warren Hall
Ithaca, NY 14853
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Robert J. Thomas
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School of Electrical and Computer Engineering

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Industrial and Systems Engineering
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