JEREMY J. MICHALEK
CURRICULUM VITAE

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ACADEMIC APPOINTMENTS

Professor, Carnegie Mellon University
Mechanical Engineering (July 2014 – *present*)
Engineering and Public Policy (July 2014 – *present*)

Associate Professor, Carnegie Mellon University
Mechanical Engineering (July 2010 – June 2014)
Engineering and Public Policy (July 2011 – June 2014)
Engineering and Public Policy, affiliated (July 2010 – June 2011)

Assistant Professor, Carnegie Mellon University
Mechanical Engineering (July 2005 - June 2010)
Engineering and Public Policy, affiliated (June 2007 – June 2010)

Director, Carnegie Mellon Design Decisions Laboratory (July 2005 - *present*)
http://www.cmu.edu/me/ddl

Director, Carnegie Mellon Vehicle Electrification Group (2012 – *present*)
Co-Director, Carnegie Mellon Vehicle Electrification Group (Jan 2009 – 2012)
http://www.cmu.edu/cit/veg

Postdoctoral Research Fellow (Jan 2005 - June 2005)
Department of Mechanical Engineering
University of Michigan, Ann Arbor, MI

EDUCATION

Ph.D. Mechanical Engineering, University of Michigan, 2005
M.S. Mechanical Engineering, University of Michigan, 2001
B.S. Mechanical Engineering, Minor in Engineering Design, Carnegie Mellon University, 1999

RESEARCH INTERESTS

Systems Assessment: Analyze the economic, environmental, social, technical, and policy aspects of design choices
Energy and Green Design: Understand environmental implications of engineering decisions, and study how economics and energy & environmental policy drive these decisions
Vehicle Electrification: Study vehicle systems, assess technical, cost, life cycle environmental and security implications of electrified vehicles, assess relevant policy

Design for Market Systems: Measure and predict consumer choice and firm behavior in the marketplace to assess and optimize engineering systems for profitability
Systems Optimization: Develop fundamental knowledge and new methods for multidisciplinary design and complex systems optimization

TEACHING INTERESTS

Engineering, economic, and environmental modeling, analysis, and decision-making
Mathematical modeling, numerical methods, and optimization
Innovation and critical thinking in design, defining and working with open-ended problems

PUBLICATIONS

Citations: 2144 • h-index[1]: 24 • i10-index[2]: 38 • Source: Google scholar

Peer-Reviewed Journal Publications

[1] Haaf, C.G., W.R. Morrow, I. Azevedo, E. Feit and **J.J. Michalek** (2016) "Forecasting light-duty vehicle demand using alternative-specific constants for endogeneity correction vs. calibration," *Transportation Research Part B: Methodology*, v84 p182-210.

[2] Jenn, A., I.L. Azevedo and **J.J. Michalek** (2016) "Alternative fuel vehicle adoption increases fleet gasoline consumption and greenhouse gas emissions under United States corporate average fuel economy policy and greenhouse gas emissions standards," *Environmental Science & Technology*, in press.

[3] Weis, A., P. Jaramillo and **J.J. Michalek** (2016) "Consequential life cycle air emissions externalities for plug-in electric vehicles in the PJM interconnection," *Environmental Research Letters*, v11 n2 024009.

[4] Helveston, J.P., Y. Liu, E. Feit, E. Fuchs, E. Klampfl, and **J.J. Michalek** (2015) "Will subsidies drive electric vehicle adoption? Measuring consumer preferences in the U.S. and China," *Transportation Research Part A: Policy and Practice*, v73 p96-112.

[5] Sakti, A., **J.J. Michalek**, E.R.H. Fuchs, and J.F. Whitacre (2015) "A techno-economic analysis and optimization of Li-ion batteries for light-duty passenger vehicle electrification," *Journal of Power Sources* v273 p966-980.

[6] Sylcott, B., **J.J. Michalek**, and J. Cagan (2015) "Exploring the role of interaction effects in visual conjoint analysis," *ASME Journal of Mechanical Design*, v137 n9 p094503 1-5.

[7] Tamayao, M., **J.J. Michalek**, C. Hendrickson and I. Azevedo (2015) "Regional variability and uncertainty of electric vehicle life cycle CO2 emissions across the United States," *Environmental Science & Technology*, v49 n14 p8844-8855.

[8] Weis, A., **J.J Michalek**, P. Jaramillo and R. Lueken (2015) "Emissions and cost implications of controlled electric vehicle charging in the US PJM interconnection," *Environmental Science & Technology*, v49 n9 p5813-5819.

[1] Maximum number *h* such that *h* publications have each been cited at least *h* times
[2] Number of publications that have been cited at least 10 times

[9] Yuksel, T. and **J.J. Michalek** (2015) "Effects of regional temperature on electric vehicle efficiency, range, and emissions in the United States," *Environmental Science and Technology*, v49 n6 p3974-3980.

[10] Griffin, W.M., **J.J. Michalek**, H.S. Matthews and M.N.A. Hassan (2014) "Availability of biomass residues for co-firing in peninsular Malaysia: implications for cost and GHG emissions in the electricity sector," v7 n2 p804-823.

[11] Haaf, C.G., **J.J. Michalek**, W.R. Morrow, and Y. Liu (2014) "Sensitivity of vehicle market share predictions to discrete choice model specification," *ASME Journal of Mechanical Design* v136 121402 p1-9.

[12] Khajavirad, A., **J.J. Michalek** and N.V. Sahinidis (2014) "Relaxations of factorable functions with convex-transformable intermediates," *Mathematical Programming*, DOI 10.1007/s10107-012-0618-8, p1-34.

[13] Min, J., I. Azevedo, **J.J. Michalek** and W. Bruine de Bruin (2014) "Labeling energy cost on light bulbs lowers implicit discount rates," *Ecological Economics* v97 p42-50.

[14] Weis, A., P. Jaramillo and **J.J. Michalek** (2014) "Estimating the potential of controlled electric vehicle charging to reduce operational and capacity expansion costs for electric power systems with high wind penetration," *Applied Energy* v115 p190-204.

[15] Traut, E., T.W. Cherng, C. Hendrickson, and **J.J. Michalek** (2013) "US residential charging potential for electric vehicles," *Transportation Research Part D: Transport and Environment* v25 p139-145.

[16] Karabasoglu, O. and **J.J. Michalek** (2013) "Influence of driving patterns on life cycle cost and emissions of hybrid and plug-in electric vehicle powertrains," *Energy Policy*, v60 p445-461.

[17] Peterson, S. and **J.J. Michalek** (2013) "Cost effectiveness of plug-in hybrid electric vehicle battery capacity and charging infrastructure investment for reducing US gasoline consumption," *Energy Policy*, v52 p429-438.

[18] Sakti, A., **J.J. Michalek**, S-E Chun and J.F. Whitacre (2013) "A validation study of lithium-ion cell constant C-rate discharge simulation with Battery Design Studio©," *International Journal of Energy Research* v37 n12 p1562-1568.

[19] Resende, C.B., C.G. Heckmann and **J.J. Michalek** (2012) "Robust design for profit maximization with aversion to downside risk from parametric uncertainty in consumer choice models," *ASME Journal of Mechanical Design*, v134 100901 p1-12.

[20] Traut, E., C. Hendrickson, E. Klampfl, Y. Liu and **J.J. Michalek** (2012) "Optimal design and allocation of electrified vehicles and dedicated charging infrastructure for minimum life cycle greenhouse gas emissions and cost," *Energy Policy*, v51 p524-534.

[21] **Michalek, J.J.**, M. Chester, P. Jaramillo, C. Samaras, C.S. Shiau, and L. Lave (2011) "Valuation of plug-in vehicle life cycle air emissions and oil displacement benefits" *Proceedings of the National Academy of Sciences*, v108 n40 p16554-16558.

[22] **Michalek, J.J.**, F.M. Feinberg, P. Ebbes, F. Adigüzel and P.Y. Papalambros (2011) "Enhancing marketing with engineering: optimal product line design for heterogeneous markets," *International Journal of Research in Marketing*, v28 p1-12. **[Best Article Award]**

[23] Shiau, C.-S. and **J.J. Michalek** (2011) "Global optimization of plug-in hybrid vehicle design and allocation to minimize life cycle greenhouse gas emissions," *ASME Journal of Mechanical Design*, v133 n8 p084502 1-6.

[24] Shiau, C-S, N. Kaushal, C.T. Hendrickson, S. Peterson, J. Whitacre, and **J.J. Michalek** (2010) "Optimal plug-in hybrid electric vehicle design and allocation for minimum life cycle cost, petroleum consumption, and greenhouse gas emissions," *ASME Journal of Mechanical Design*, *Special Issue on Sustainability*, v132 n9 p091013 1-11.

[25] Khajavirad, A and **J.J. Michalek** (2009) "A determinstic Lagrangian-based global optimization approach for quasiseparable nonconvex mixed-integer nonlinear programs," *ASME Journal of Mechanical Design*, v131 p051009 1-8

[26] Khajavirad, A., **J.J. Michalek** and T.W. Simpson (2009) "An efficient decomposed multi-objective genetic algorithm for solving the joint product family selection and design problem with generalized commonality," *Structural and Multidisciplinary Optimization*, v39 p187-201.

[27] Shiau, C.-S. and **J.J. Michalek** (2009) "Optimal product design under price competition," *ASME Journal of Mechanical Design*, v131 071003 p1-10.

[28] Shiau, C.-S., **J.J. Michalek**, and C.T. Hendrickson (2009) "A structural analysis of vehicle design responses to corporate average fuel economy policy," *Transportation Research Part A: Policy and Practice*, v43 p814-828.

[29] Shiau, C.-S., C. Samaras, R. Hauffe and **J.J. Michalek** (2009) "Impact of battery weight and charging patterns on the economic and environmental benefits of plug-in hybrid vehicles," *Energy Policy* v37 p2653-2663.

[30] Shiau, C.-S. and **J.J. Michalek** (2009) "Should designers worry about market systems?" *ASME Journal of Mechanical Design*, v131 011011 p1-9.

[31] Khajavirad, A. and **J.J. Michalek** (2008) "A decomposed approach for solving the joint product family selection and design problem with generalized commonality," *ASME Journal of Mechanical Design*, v130 p071101.

[32] Li, Y., Z. Lu and **J.J. Michalek** (2008) "Diagonal quadratic approximation for parallelization of analytical target cascading." *ASME Journal of Mechanical Design* v130 n5 p051402-1-11.

[33] **Michalek, J.J.**, O. Ceryan, P.Y. Papalambros, and Y. Koren (2006) "Balancing marketing and manufacturing objectives in product line design," *ASME Journal of Mechanical Design*, v128 n6 p1196-1204.

[34] **Michalek, J.J.**, F.M. Feinberg and P.Y. Papalambros (2005) "Linking marketing and engineering product design decisions via analytical target cascading," *Journal of Product Innovation Management*, v22 p42-62.

[35] **Michalek, J.J.** and P.Y. Papalambros (2005) "An efficient weighting update method to achieve acceptable consistency deviation in analytical target cascading," *ASME Journal of Mechanical Design*, v127 p206-214.

[36] **Michalek, J.J.** and P.Y. Papalambros (2005) "Technical brief: weights, norms, and notation in analytical target cascading," *ASME Journal of Mechanical Design*, v127 p499-501.

[37] **Michalek, J.J.**, P.Y. Papalambros, and S.J. Skerlos (2004) "A study of fuel efficiency and emission policy impact on optimal vehicle design decisions," *ASME Journal of Mechanical Design*, v126 p1062-1070.

[38] **Michalek, J.J**., R. Choudhary and P.Y. Papalambros (2002) "Architectural layout design optimization," *Engineering Optimization*, v34 n5 pp461-484.

[39] **Michalek, J.J.** and P.Y. Papalambros (2002) "Interactive design optimization of architectural layouts," *Engineering Optimization*, v34 n5 pp485-501.

In Review

[40] Sakti, A., I.M.L. Azevedo, E.R.H. Fuchs, **J.J. Michalek**, K.G. Gallagher and J.F. Whitacre (2016) "A new framework for technology forecasting: the case of Li-ion batteries for plug-in electric vehicles," in review.

[41] Seki, S., I. Azevedo, W.M. Griffin and **J.J. Michalek** (2016) "Potential for cost effective ethanol fuels from natural gas: case study of Pennsylvania," in review.

[42] Tamayao, M., **J.J. Michalek**, C. Hendrickson and I. Azevedo (2016) "Regional variability and uncertainty of electric vehicle life cycle CO2 emissions across the United States," in review.

Full-length Peer-Reviewed Conference Publications

[43] Heckmann, C.G., **J.J. Michalek**, W.R. Morrow, and Y. Liu (2013) "Sensitivity of vehicle market share predictions to alternative discrete choice model specifications," *ASME International Design Engineering Technical Conferences*, August 2013, Portland, OR.

[44] Sylcott, B, **J.J. Michalek** and J. Cagan (2013) "Understanding the role of interaction effects in visual conjoint analysis," *ASME International Design Engineering Technical Conferences*, August 2013, Portland, OR.

[45] Yuksel, T. and **J.J. Michalek** (2012) "Development of a simulation model to analyze the effect of thermal management on battery life," *Society of Automotive Engineers World Congress*, April 24-26, Detroit, MI.

[46] Yuksel, T. and **J.J. Michalek** (2012) "Evaluation of the effects of thermal management on battery life in plug-in hybrid electric vehicles," *The Battery Congress*, April 23-24, Ann Arbor, MI.

[47] **Michalek, J.J.**, C.T. Hendrickson and J. Cagan (2011) "Using economic input-output life cycle assessment to guide sustainable design," *ASME International Design Engineering Technical Conferences*, August 28-31, Washington DC.

[48] Resende, C., C.G. Heckmann and **J.J. Michalek** (2011) "Robust design for profit maximization under uncertainty of consumer choice model parameters using the delta method," *ASME International Design Engineering Technical Conferences*, August 28-31, Washington DC.

[49] Sakti, A., S. Khan, T. Langer, **J.J. Michalek**, and J.F. Whitacre (2011) "Techno-economic analysis of Lithium-ion batteries for personal vehicle electrification," *National Academies Transportation Research Board Annual Meeting*, January 23-27, Washington D.C.

[50] Traut, E., C.T. Hendrickson, E. Klampfl, Y. Liu and **J.J. Michalek** (2011) "Optimal Design and Allocation of Electrified Vehicles and Dedicated Charging Infrastructure for Minimum Greenhouse Gas Emissions," *National Academies Transportation Research Board Annual Meeting*, January 23-27, Washington D.C.

[51] Shiau, C.-S., S. Peterson and **J.J. Michalek** (2010) "Optimal plug-in hybrid electric vehicle design and allocation for minimum life cycle cost, petroleum consumption and greenhouse gas emissions," *Proceedings of the ASME International Design Engineering Technical Conferences, Advance Vehicle and Tire Technologies Conference*, August 15-18, Montreal, Quebec, Canada.

[52] Shiau, C.-S. and **J.J. Michalek** (2010) "A mixed-integer nonlinear programming model for deterministic global optimization of plug-in hybrid vehicle design and allocation," *Proceedings of the ASME International Design Engineering Technical Conferences, Design Automation Conference*, August 15-18, Montreal, Quebec, Canada.

[53] Kaushal, N., C.-S. Shiau and **J.J. Michalek** (2009) "Optimal plug-in hybrid electric vehicle design and allocation for diverse charging patterns," *Proceedings of the International Design Engineering Technical Conferences*, Aug 30 – Sept 2, San Diego, CA, USA.

[54] Shiau, C.-S., **J.J. Michalek** and C. T. Hendrickson (2009) "A structural analysis of vehicle design responses to corporate average fuel economy standards," *Transportation Research Board Annual Meeting*, Washington D.C.

[55] Shiau, C.-S., C. Samaras, R. Hauffe and **J.J. Michalek** (2009) "Impact of battery weight and charging patterns on the economic and environmental benefits of plug-in hybrid vehicles," *Transportation Research Board Annual Meeting*, Washington D.C.

[56] Hauffe, R., C. Samaras and **J.J. Michalek** (2008) "Plug-in hybrid vehicle simulation: How battery weight and charging patterns impact cost, fuel consumption, and CO2 emissions," *Proceedings of the ASME International Design Engineering Technical Conferences*, August 3-6, Brooklyn, NY, USA.

[57] Khajavirad, A. and **J.J. Michalek** (2008) "A deterministic Lagrangian-based global optimization approach for large scale decomposable problems," *Proceedings of the ASME International Design Engineering Technical Conferences*, August 3-6, Brooklyn, NY, USA.

[58] McGaughey, A. and **J. J. Michalek** (2008) "Wiki-based learning in the mechanical engineering classroom," *American Society for Engineering Education Annual Conference*, June 22-25, Pittsburgh, PA, USA.

[59] Shiau, C.-S. and **J.J. Michalek** (2008) "Should designers worry about market systems?" *Proceedings of the ASME International Design Engineering Technical Conferences*, August 3-6, Brooklyn, NY, USA.

[60] Shiau, C.S. and **J.J. Michalek** (2008) "Optimal product design under price competition," *Proceedings of the ASME International Design Engineering Technical Conferences*, August 3-6, Brooklyn, NY, USA.

[61] Li, Y., Z. Lu and **J.J. Michalek** (2007) "Diagonal quadratic approximation for parallelization of analytical target cascading." *Proceedings of the 2007 ASME International Design Engineering Technical Conferences*, Sept 4-6, Las Vegas, NV, USA.

[62] Khajavirad, A. and **J.J. Michalek** (2007) "A single-stage gradient-based approach for solving the joint product family platform selection and design problem using decomposition," *Proceedings of the 2007 ASME International Design Engineering Technical Conferences*, Sept 4-6, Las Vegas, NV, USA.

[63] Khajavirad, A. and **J.J. Michalek** (2007) "An extension of the commonality index for product family optimization," *Proceedings of the 2007 ASME International Design Engineering Technical Conferences*, Sept 4-6, Las Vegas, NV, USA.

[64] Orsborn, S., S. Swamy, **J. Michalek** and J. Cagan (2007) "Measurement of headlight form preference using choice-based conjoint analysis," *Proceedings of the 2007 ASME International Design Engineering Conferences*, Sept 4-6, Las Vegas, NV, USA.

[65] Shiau, C.S., I.H. Tseng, D. Heutchy and **J. Michalek** (2007) "Design optimization of a laptop computer using aggregate and mixed logit demand models with consumer survey data." *Proceedings of the 2007 ASME International Design Engineering Conferences*, Sept 4-6, Las Vegas, NV, USA.

[66] Shiau, C.S. and **J. Michalek** (2007) "A game theoretic approach for finding market equilibria for automotive design under environmental regulation," *Proceedings of the 2007 ASME International Design Engineering Technical Conferences*, Sept 4-6, Las Vegas, NV, USA.

[67] **Michalek, J.J.** and P.Y. Papalambros (2006) "BB-ATC: Analytical target cascading using branch and bound for mixed integer nonlinear programming," *Proceedings of the 2006 ASME International Design Engineering Technical Conferences*, Sept. 10-13, Philadelphia, PA, USA.

[68] **Michalek, J.J.**, O. Ceryan, P.Y. Papalambros, and Y. Koren (2005) "Manufacturing investment and allocation in product line design decision-making," *Proceedings of the 2005 ASME International Design Engineering Technical Conferences*, DETC2005-84812, Sept. 26-28, Long Beach, CA, USA. [**Best Paper Award**]

[69] Choudhary, R. and **J. Michalek** (2005) "Design optimization in computer aided architectural design," *International Conference of the Association for Computer Aided Architectural Design Research In Asia*, April 28-30, 2005, New Delhi, India.

[70] **Michalek, J.J.**, F.M. Feinberg and P.Y. Papalambros (2004) "An optimal marketing and engineering design model for product development using analytical target cascading," *Proceedings of the 2004 Tools and Methods for Competitive Engineering Conference*, Lausanne, Switzerland, April 12-16, 2004.

[71] **Michalek, J.J.** and P.Y. Papalambros (2004) "An efficient weighting update method to achieve acceptable consistency deviation in analytical target cascading," *Proceedings of the 2004 ASME Design Engineering Technical Conferences*, DETC2004-57134, Sept. 28 - Oct. 2, Salt Lake City, Utah, USA.

[72] **Michalek, J.J.**, P.Y. Papalambros and S.J. Skerlos (2003) "A study of emission policy effects on optimal vehicle design decisions," *Proceedings of the ASME Design Engineering Technical Conferences*, DETC2003/DAC-48767, September 2-6, Chicago, IL, USA.

Other Conference Publications

[73] Shiau, C.-S., **J.J. Michalek** and C.T. Henderson (2009) "A structural analysis of vehicle design responses to corporate average fuel economy policy," *National Academies Transportation Research Board Annual Meeting*, January 2009, Washington, DC, USA.

[74] Shiau, C.S. and **J.J. Michalek** (2009) "Optimal product design under price competition," *National Academies Transportation Research Board Annual Meeting*, January 2009, Washington DC, USA.

[75] Shiau, C.-S., R. Hauffe, C. Samaras and **J.J. Michalek** (2009) "Impact of battery weight and charging patterns on the economic and environmental benefits of plug-in hybrid vehicles," *National Academies Transportation Research Board Annual Meeting*, January 2009, Washington DC, USA.

[76] Khajavirad, A., **J.J. Michalek** and T.W. Simpson (2007) "An efficient decomposed genetic algorithm for joint product family selection and optimization," *Proceedings of the 2007 AIAA Multidisciplinary Design Optimization Specialists Conference*, April 23-26, Honolulu, Hawaii, USA.

[77] Cooper, A.B., P. Georgiopoulos, **J.J. Michalek**, and P.Y. Papalambros (2004) "A simulation-based vehicle design strategy for acquisition and requirements validation," *Proceedings of the 2004 Society of Automotive Engineers World Congress*, March 11-18, Detroit, MI. A shortened version also appeared at the *US-ASMO SMART Conference, Dearborn, Michigan, Sept. 8-11, 2003*.

Book Chapters

[78] Khajavirad, A., **J.J. Michalek** and T.W. Simpson (2014) "Solving the joint product platform selection and product family design problem: An efficient decomposed multiobjective genetic algorithm with generalized commonality," in *Advances in Product Family and Product Platform Design: Methods & Applications*, Eds: T. Simpson, R. Jiao, Z. Siddique, K. Hölttä-Otto, Springer, New York.

[79] **Michalek, J.J.** (2007) "Designing better products by coordinating marketing research and engineering," in *Modern Marketing Research: Concepts, Methods and Cases*, eds: F. Feinberg, T. Kinnear and J. Taylor.

[80] Skerlos, S.J., W.R. Morrow, and **J.J. Michalek** (2006) "Sustainable design engineering and science: selected challenges and case studies," chapter 3.10 in *Sustainability Science and Engineering, Volume 1: Defining Principles*, edited by M. Abraham, Elsevier Science.

Magazine Publications:

[81] **Michalek, J.J.**, M. Chester and C. Samaras (2012) "Getting the most out of electric vehicle subsidies," *Issues in Science and Technology*, Summer 2012, p25-27.

[82] **Michalek, J.J.** (2008) "Design for market systems: Integrating social, economic, and physical sciences to engineer product success," *Mechanical Engineering*, v 130, n11, p32-36.

Policy Briefs:

[83] **Michalek, J.J.** (2015) *Electric Vehicle Benefits and Costs in the United States*, policy brief, Carnegie Mellon University, May 2015. Presented to members of the U.S. Environmental Protection Agency, California Air Resources Board, California Energy Commission, California State Senate and Assembly, and several national labs and universities, 2015.

[84] **Michalek, J.J.** (2015) *Electric Vehicle Adoption Potential in the United States*, policy brief, Carnegie Mellon University, May 2015. Presented to members of the U.S. Environmental Protection Agency, California Air Resources Board, California Energy Commission, California State Senate and Assembly, and several national labs and universities, 2015.

[85] **Michalek, J.J.**, M. Chester, P. Jaramillo, and C. Samaras (2011) *Air Emissions and Oil Displacement Benefits from Plug-in Vehicles*, policy brief, Carnegie Mellon University, September 2011. Presented to members of the Congressional Budget Office, the Congressional Research Service, the Senate Energy and Natural Resources Committee, the Senate Commerce, Science and Transportation Committee, and members of the U.S. House of Representatives, March 13-14, 2012.

[86] **Michalek, J.J.** and C. Samaras (2009) *Economic, Environmental, and Security Implications of Plug-in Hybrid Electric Vehicles*, policy brief, Carnegie Mellon University, April 2009. Presented to members of the House Energy and Commerce Committee, the House Committee on Science and Technology, the Select Committee on Energy Independence and Global Warming, the Congressional Research Service, and members of the U.S. House and Senate, April 16-20, 2009.

Dissertations and Theses:

[87] **Michalek, J.J.**, (2005) *Preference Coordination in Engineering Design Decision-Making*, Ph.D. Dissertation, Department of Mechanical Engineering, University of Michigan. Committee: Panos Papalambros*, Fred Feinberg, Steven Skerlos, Richard Gonzalez.

[88] **Michalek, J.J.** (2001) *Interactive Layout Design Optimization*, M.S. Thesis, Department of Mechanical Engineering, University of Michigan, Ann Arbor, Michigan, USA, 2001. Committee: Panos Papalambros*, Kazuhiro Saitou.

Working Papers:

[89] Hassan, M.N.A., W.M. Griffin, **J.J. Michalek** and H.S. Matthews (2014) "Cost and GHG emissions of cellulosic ethanol from biomass residues in Malaysia: implications for energy security in the transportation sector," working paper.

[90] Jenn, A., I.L. Azevedo and **J.J. Michalek** (2016) "A tale of two policies: how fuel economy standards and alternative vehicle sales incentives can increase emissions," working paper.

[91] Jenn, A., I.L. Azevedo and J.J. Michalek (2016) "Understanding the effect of policy designs on the future light-duty vehicle fleet," working paper.

[92] Karabasoglu, O., B. Yuksel, G. Li, and **J.J. Michalek** (2016) "Globally optimal co-design and control of electrified vehicles for minimum life cycle cost," working paper.

[93] Karabasoglu, O., B. Yuksel and **J.J. Michalek** (2016) "Potential of predictive control strategies to reduce cost and component sizing of plug-in hybrid powertrains," working paper

[94] Karabasoglu, O., L. Pan and **J.J. Michalek** (2016) "Life cycle implications of terrain on plug-in and hybrid powertrains," working paper.

[95] Kimball, P., O. Karabasoglu, and **J.J. Michalek** (2016) "Global control optimization of supercapacitor-battery electric vehicles," working paper.

[96] Mashayekh, Y., **J.J. Michalek**, C. Hendrickson and C. Samaras (2016) "Partial automation of light-duty vehicles yields energy benefits," working paper.

[97] Traut, E., **J.J. Michalek** and C. Hendrickson (2016) "Comparative impacts of fast charging and battery exchange on life cycle cost and GHG emissions of plug-in vehicles," working paper.

[98] Yuksel, T., **J.J. Michalek**, S. Litster and V. Viswanathan (2016) "Plug-in hybrid electric vehicle LiFePO4 battery life implications of thermal management, driving conditions, and regional climate" working paper.

[99] Yuksel, T. and **J.J. Michalek** (2016) "Optimization of Li-ion batteries for vehicle electrification: a case study to compare chemistries," working paper.

[100] Weis, A., P. Jaramillo and **J.J. Michalek** (2015) "Life cycle implications of plug-in electric vehicles in the PJM interconnection," working paper.

ADVISING

Ph.D. Research

Shiau, Ching-Shin Norman – *Design Decision Making for Market Systems and Environmental Policy with Vehicle Design Applications*, Ph.D. Mechanical Engineering, (2006-2010). Present position: Design Engineering Staff Engineer, Seagate Technologies, Taiwan.

Khajavirad, Aida – *Convexification Techniques for Global Optimization of Nonconvex Nonlinear Optimization Problems*, Ph.D. Mechanical Engineering (2006-2011), co-advised with Nick Sahinidis. Present position: Assistant Professor, Operations Research and Industrial Engineering, Department of Mechanical Engineering, University of Texas at Austin.

Karabaşoğlu, Orkun – *Influence of Driving Patterns and Optimal Robust Powertrain Combined Design and Control of Plug-in Vehicle Cost, Life Cycle Emissions, Component Sizing, and Battery Stress*, Ph.D. Mechanical Engineering (2008-2013). Present position: Assistant Professor, Electrical and Computer Engineering, SYSU-CMU Joint Institute of Engineering, Visiting Professor, Electrical and Computer Engineering, Carnegie Mellon University.

Traut, Elizabeth – *Life Cycle Cost and Environemtnal Implications of U.S. Electric Vehicle and Charging Infrastructure Scenarios*, Ph.D. Mechanical Engineering (2008-2013), co-advised with Prof. Chris Hendrickson. Present position: Postdoctoral Research Fellow, Civil and Environmental Engineering, Carnegie Mellon University.

Resende, Camilo – Ph.D. student, Mechanical Engineering (2009-2010), left program for medical school.

Sakti, Apurba – *Quantification of Performance and Cost Trajectory of Li-ion Battery Designs for Personal Vehicle Electrification in the Near Future*, Ph.D. Engineering & Public Policy (2010-2013), co-advised with Prof. Jay Whitacre. Present Position: Postdoctoral Associate, Energy Initiative and Chemical Engineering, Massachusetts Institute of Technology.

Haaf, Christine Grace Heckmann – *Vehicle Demand Forecasting with Discrete Choice Models*, Ph.D. Mechanical Engineering (2010-2014). Present Position: Associate, McKinsey & Company.

Jenn, Alan – *Advanced and Alternative Fuel Vehicle Policies: Regulations and Incentives in the United States*, Ph.D. Engineering and Public Policy (2014), officially advised by Prof. Inês Azevedo but I co-advised several studies. Present Position: Postdoctoral Researcher, University of California, Davis.

Min, Jihoon – *Energy Efficient Lighting: Consumer Preferences, Choices, and System Wide Effects*, Ph.D. Engineering and Public Policy (2010-2014), co-advised with Prof. Inês Azevedo. Present Position: Research Scholar, International Institute for Applied Systems Analysis.

Tamayao, Mili-Ann – *Urbanization and Vehicle Electrification in the U.S.: CO_2 Emissions Estimation and Implications for Climate Policy*, Ph.D. Engineering and Public Policy (2012-2014), co-advised with Prof. Chris Hendrickson. Present Position: Assistant Professor, Industrial Engineering and Operations Research, University of the Philippines.

Weis, Allison – *Electric Vehicles and the Grid: Interactions and Environmental and Health Impacts*, Ph.D. Engineering and Public Policy (2010-2014), co-advised with Prof. Paulina Jaramillo. Present Position: Senior Stationary Storage Modeling Engineer, Tesla Motors.

Yuksel, Tugce – *Quantification of Temperature Implications and Investigation of Battery Design Options for Electrified Vehicles*, Ph.D. Mechanical Engineering (2010-2015).

Helveston, John – Ph.D. candidate, Engineering and Public Policy (2011-pres), co-advised with Prof. Erica Fuchs.

Yip, Arthur – Ph.D. candidate, Engineering and Public Policy (2015 – pres), co-advised with Prof. Kate Whitefoot.

M.S. Research Project-Based Degree

Li, Yanjing – *Diagonal Quadratic Approximation for Parallel Computing with Analytical Target Cascading*, M.S. Mathematical Sciences, 2006

Swamy, Surya – *Global Optimization of Mixed-Integer Nonlinear Systems using Decomposition and Lagrangian Branch-and-Cut*, M.S. Mechanical Engineering, 2007

Kaushal, Nikhil – *Optimal Plug-in Hybrid Electric Vehicle Design and Allocation for Diverse Charging Patterns*, M.S. Mechanical Engineering, 2009

Krishnakumar, Varun – *Global Design Optimization using Black-Box Optimization Techniques*, M.S., Mechanical Engineering, 2009

Tsu-Wei Cherng – *Charging Infrastructure for Electric Vehicles*, Mechanical Engineering, 2011-2012

Gao, Nan -- *Battery Degradation and Thermal Management for Plug-in Vehicles*, M.S. Mechanical Engineering, 2013-2014

M.S. Independent Research Project

Hsieh, Sandy – *Review of Vehicle Simulation Software* – M.S. Mechanical Engineering, 2006

Chen, Esther – *Review of Multiattribute Utility Theory* – M.S. Mechanical Engineering, 2008

Yuksel, Burak – *Optimal Design and Control of Plug-in Vehicles* – Independent Study, Istanbul Technical University.

Yoon, Hyungchul Paul – *Plug-in Vehicle Optimization for Real-World Driving*, Mechanical Engineering, 2011

Li, Guo – *Optimal Design and Control of Plug-in Vehicles*, Mechanical Engineering, 2012-2013

Pan, Lu – *Impact of Terrain on Life Cycle Implications of Conventional and Electrified Vehicles*, Mechanical Engineering, 2012-2013
Mehta, Darshit – *Optimization of Electric Vehicle Battery and Thermal Management Systems*, Mechanical Engineering, 2015.

Undergraduate Research
Gitomer, Ali – *Review of Automotive Demand Models* – Visiting student, Northwestern University
Hamilton, Andrew – *Study of Consumer Preferences for Hybrid Vehicles* – B.S. Mechanical Engineering, 2008
Hauffe, Richard – *Effects of Battery Weight on Plug-in Hybrid Vehicle Performance* – B.S. Mechanical Engineering, 2008
Lee, Jonghyun – *Review of Environmental Policy for Vehicle Design* – B.S. Mechanical Engineering, 2008
Lewis, Anne Marie – *Optimization of Infrastructure for Ethanol Distribution* – B.S. Mechanical Engineering, 2008
Mikkilineni, Sarat – *Uncertainty in Choice Modeling* – B.S. Mechanical Engineering, 2008
Khwaja, Osman – *Effects of Terrain on Vehicle Efficiency of Electrified Powertrains*, Independent Study, Princeton University, 2011.
Kimball, Paul – *Control Systems for Electrified Vehicles*, 2011-2012
Stabile, Rebecca – *Synthetic Drive Cycle Generation and Fuel Economy Estimation*, 2011-2012.
Finlayson, Andrew -- *Synthetic Drive Cycles and Plug-in Vehicle Simulation*, 2012-2013.

Ph.D. Committee Service
Olson, Jesse –*The Collective Potential: Achieving Organizational Potential by Design*, Ph.D. Mechanical Engineering, Carnegie Mellon University, 2005 [chair: Jonathan Cagan].
Orsborn, Seth –*Quantifying aesthetic preference through statistics applied to an agent-based shape grammar implementation*, Ph.D. Mechanical Engineering, Carnegie Mellon University, 2007 [chair: Jonathan Cagan].
Wakeley, Heather – *Alternative Transportation Fuels: Infrastructure Requirements and Environmental Impacts for Ethanol and Hydrogen*, Ph.D. Civil and Environmental Engineering, Carnegie Mellon University, 2007 [chair: Chris Hendrickson]
Logue, Jennifer – *Characterizing Air Toxics Exposure and Risk in Allegheny County and Evaluating EPA Modeling Tools for Policy Making*, Ph.D. Engineering and Public Policy, Mechanical Engineering, Carnegie Mellon University, 2009 [chair: Allen Robinson].
You, Fengqi – *Mixed Integer Nonlinear Programming Models and Algorithms for Enterprise-Wide Supply Chain Optimization under Uncertainty*, Ph.D. Chemical Engineering, Carnegie Mellon University, 2009 [chair: Ignacio Grossmann].
Hannah, Lindsay – *Combinatory Adaptive Optimization with Multi-Agent Systems* Ph.D., Mechanical Engineering, Carnegie Mellon University, 2009 [chair: Jonathan Cagan].
Hatton, Ross – *Geometric Mechanics of Locomotion and Optimal Coordinate Choice*, Ph.D., Carnegie Mellon University, Mechanical Engineering, 2011 [chair: Howie Choset].
Hassan, Mohd Nor Azman – *GHG Emissions and Costs of Developing Biomass Energy in Malaysia: Implications for Energy Security in the Transportation and Electricity Sectors*, Ph.D. Carnegie Mellon University, Engineering and Public Policy, 2012 [chair: W. Michael Griffin].
Nadadur, Gopal – *Anthropometry-based Sustainable Design for Multiple Global Populations*, Ph.D., The Pennsylvania State University Department of Mechanical and Nuclear Engineering, 2012 [chair: Matthew Parkinson].

Peterson, Scott – *Plug-in Hybrid Electric Vehicles: Battery Degradation, Grid Support, Emissions, and Battery Size Tradeoffs*, Ph.D., Carnegie Mellon University, Engineering and Public Policy, 2012 [chair: Jay Apt].

Venkatesh, Aranya – *Towards Robust Energy Systems Modeling: Examining Uncertainty in Fossil Fuel-Based Life Cycle Assessment Approaches*, Ph.D. Carnegie Mellon University, Civil and Environmental Engineering 2012 [chair: Chris Hendrickson].

Kamath, Ravindra -- *Strategies for Optimization and Heat Integration in Integrated Gasification Combined Cycle Systems*, Ph.D. Chemical Engineering, Carnegie Mellon University, 2012 [chair: Larry Biegler].

Hess, Kacy – *In Situ, Through-Thickness Potential and Current Distribution Measurements in Electrochemical Energy Conversion and Storage Devices*, Ph.D. Mechanical Engineering, Carnegie Mellon University, 2013 [chair: Shawn Litster].

Sylcott, Brian – *Understanding How Consumers Process Product Form and Function and How They Balance Their Preferences for Each*, Ph.D. Mechanical Engineering, Carnegie Mellon University, 2013 [chair: Jonathan Cagan].

Baker, Kyri – *Coordination of Resources across Areas for the Integration of Renewable Generation: Operation, Sizing, and Siting of Storage Devices*, Ph.D. Electrical and Computer Engineering, Carnegie Mellon University, 2014 [chair: Gabriela Hug-Glanzmann].

Jenn, Alan – *Analysis of Transportation Policies: Regulations and Incentives in the United States*, Ph.D. Engineering and Public Policy, Carnegie Mellon University, 2014 [chair. Inês Azevedo].

Dowling, Alex -- *Equation Oriented Flowsheet Optimization for Advanced Energy Processes*, Ph.D. Chemical Engineering, Carnegie Mellon University, 2015 [chair: Larry Biegler].

Heo, Jinhyok – *Evaluation of Air Quality Impacts on Society: Methods and Application*, Ph.D. Engineering and Public Policy, Carnegie Mellon University, 2014 [chair: Peter Adams].

Chen, Mo – *Vehicle and Vehicle-related Policy Analysis in China*, Engineering and Public Policy, Carnegie Mellon University (current) [chair: Paul Fischbeck].

Tee, Chin Yen – *Market Design and Risk Management for Flexibility in the Future Electric Transmission System*, Engineering and Public Policy, Carnegie Mellon University (current) [chair: Marija Ilic].

Zhang, Qi – *Enterprise-wide Optimization for Industrial Demand Side Management under Uncertainty*, Chemical Engineering, Carnegie Mellon University (current) [chair: Ignacio Grossmann].

TEACHING/RESEARCH INITIATIVES

Design Decisions Wiki (since 2006)

Established a wiki website as a central research and educational resource for sharing information about design and tools to analyze and support decision-making. As of July 2012, the wiki has over 500 articles and 3 million page views: http://ddl.me.cmu.edu/ddwiki.

TEACHING EXPERIENCE

24-785 Engineering Optimization (2010-pres)

This course introduces students to 1) the process of formally representing an engineering design or decision-making problem as a mathematical problem and 2) the theory and numerical methods needed to understand and solve the mathematical problem. Theoretical topics focus on constrained nonlinear programming, including necessary and sufficient conditions for local and global optimality and numerical methods for solving nonlinear optimization problems. Additional topics such as linear programming, mixed integer programming, global optimization, and stochastic methods are briefly introduced. Model construction and interpretation are explored with metamodeling and model reformulation techniques, study of model boundedness, constraint activity, and sensitivity analysis. Matlab is used in homework assignments for visualization and algorithm development, and students apply theory and methods to a topic of interest in a course project.

19-670 / 24-680 Quantitative Entrepreneurship: Analysis for New Technology Commercialization (2008-pres)

Formerly 19-484/24-484/19-784/24-784 Decision Tools for Engineering Design and Entrepreneurship

Co-instructor: Prof. Erica Fuchs

This course provides engineers with a multidisciplinary mathematical foundation for integrated modeling of engineering design and enterprise planning decisions in an uncertain, competitive market. Topics include economics in product design, manufacturing and operations modeling and accounting, consumer choice modeling, survey design, conjoint analysis, decision-tree analysis, optimization, model integration, and professional communication skills. Students will apply theory and methods to a team project for a new product or emerging technology of their choice, developing a business plan to defend technical and economic competitiveness. Students may select emerging technologies from research at Carnegie Mellon for study in the course, and in some years venture capitalists and other industry leaders may take part in critiquing student projects. This course assumes fluency with calculus and some prior programming experience.

24-441 / 24-442 Engineering Design II: Conceptualization and Realization, Carnegie Mellon University (2006-pres)

In this course, students gain hands-on, practical experience applying engineering principles, theories, thought processes, and problem-solving approaches to the design and prototyping of a physical product. Students develop skills for working in teams, working with open-ended problems, and making appropriate engineering assumptions. Students are expected to research the topic area, identify opportunities and design criteria, generate creative concepts, synthesize detailed design of the concept, analyze the design on a number of criteria to make improvements, and prototype and communicate the final solution.

24-789C Quantitative Methods for Product Design and Development, Carnegie Mellon University (2006)
This course provides a multidisciplinary mathematical foundation for integrated modeling in product design and development. In this course, students learn introductory theory and methods for building and solving optimization models integrating producer, consumer, competitor, regulator, and designer perspectives. Topics include optimization methods with a focus on nonlinear programming, choice modeling, conjoint analysis, game theory, policy analysis, decomposition and model integration. Students apply methods to a team project and engage in independent research to deepen knowledge on a relevant topic of interest.

ENGR490 Engineering for Community, University of Michigan (2003-2004)
Worked to co-design, develop, and implement a new interdisciplinary engineering course focusing on learning through experience and field work, international and local community development, social and cultural awareness, sustainability, appropriate technology, and communication skills.

Graduate Student Instruction Mentor, University of Michigan (2003-2004)
University of Michigan Center for Research on Learning and Teaching
Trained and assisted graduate student instructors, facilitated student feedback on teaching and provided teaching observations and evaluations.

ME 499/599 Analytical Product Design, University of Michigan (2003, 2004)
Helped to develop and implement a new interdisciplinary course on model-based product development. Gave lecturers, provided student support, and developed computer tools for students.

ME 555 Design Optimization, University of Michigan (2003)
Acted as a course aid for the graduate-level course on design optimization. Developed new material and gave lectures and demonstrations.

Rackham-CRLT Seminar on College Teaching, University of Michigan (2003)
Participated in the selective Center for Research on Learning and Teaching Preparing Future Faculty Seminar on College Teaching to sharpen teaching philosophy, learn about the structure of higher education institutions in the United States, and develop teaching skills.

Multicultural Classroom Facilitation Training, University of Michigan (2003)
Participated in a training course emphasizing teaching through dialogue and focusing on issues of multiculturalism, diversity, and social and cultural awareness.

Detroit Area Pre-College Engineering Program, University of Michigan (2002-2003)
Exposed middle-school students from minority and low-income areas to engineering by providing hands-on examples and activities in order to improve accessibility of the field. Position: instructor.

Michigan Mentor Program, University of Michigan (2000-2002)
Worked with two middle school students one-on-one to provide exposure to the engineering disciplines and work with them to explore career possibilities in engineering and beyond.

ME 450 Design and Manufacturing III, University of Michigan (2000-2001)
Assisted in teaching and advising the capstone mechanical engineering design course. Developed new course material and restructured the syllabus. Initiated and supported interdisciplinary student coursework and project interaction with the University Of Michigan School of Art and Design and the Parsons School of Design. Developed an interactive course web portal to support distance collaboration.

Programming Tutor, Carnegie Mellon University (1997)
Tutored undergraduates in programming the C++ language.

CONSULTING EXPERIENCE

New York State Energy Research and Development Authority (NSERDA) (2014-*present*)
With Industrial Economics, Inc.

INDUSTRY EXPERIENCE

Research Engineer, Intern
Xerox – The Document Company, Rochester, NY (summer 1999)
Designed and implemented improvements to a distributed embedded digital control system for paper path handling.

Design Engineer, Intern
General Motors, Warren, MI (summer 1998)
Worked with a multidisciplinary team including engineering, industrial design, and sculpture to design and prototype a future concept vehicle with engineering documentation to show concept feasibility.

Reliability Engineer, Intern
General Motors, Warren, MI (summer 1997)
Developed and implemented a procedure to quantify the reliability of commercial components of machinery and equipment in the assembly plant environment.

Designer
Linear Systems Corporation, Rochester, MI (1994-1996)
Designed automotive tooling. Trained employees in AutoCAD. Developed new CAD tools.

ORGANIZATIONAL LEADERSHIP AND MEMBERSHIP

Leadership
Director, Vehicle Electrification Group (since 2012)
Co-Director, Vehicle Electrification Group (2009-2012)
Acting Co-Director, Master in Product Development program, (2008-2009)
Director, Design Decisions Laboratory, Carnegie Mellon University (since 2005)
Chair, Publicity and Newsletter Committee, ASME Design Engineering Division, (2007-2009)

Membership
Member, Center for Climate and Energy Decision Making, Carnegie Mellon University (since 2011)

Member, Electricity Industry Center, Carnegie Mellon University (since 2011)
Member, Center for Product Strategy and Innovation, Carnegie Mellon University (2008-2010)
Member, Green Design Institute, Carnegie Mellon University (since 2006)
Member, ASME: American Society of Mechanical Engineers (since 1997)
Member, INFORMS: Institute for Operations Research and the Management Sciences (since 2005)
Member, TRB: National Academies Transportation Research Board Alterative Transportation Fuels and Technologies Committee (2014-2016)

Graduate Student Activities
Engineers Without Borders / BLUElab, University of Michigan, Education Chair (2003-2005)
Graduate Student Mentor (2003-2004)
Amnesty International Student Group on Economic and Social Rights (2003-2004)
Public Service Announcement Director, WCBN-FM Ann Arbor (2002-2004)
University of Michigan Graduate Student Symposium, Design and Manufacturing Chair (2001)
Interdisciplinary Antilium Education and Research Collaboration Initiative (2001-2005)
New Foreign Graduate Student Mentor (2000-2002)
New Graduate Student Recruiter (2000)

RESEARCH GRANTS AND AWARDS

Principal Investigator: (total $2M)

[1] Toyota Motor Corporation, "Advanced Vehicle Research," January, 2015.

[2] Toyota Motor Corporation, "Vehicle Electrification Research and Policy," August 2013.

[3] Toyota Motor Corporation, "Autonomous Vehicle Research," [co-PI Chris Hendrickson] June 2013.

[4] Toyota Motor Corporation, "Advanced Vehicle Research," October 2012.

[5] Toyota Motor Corporation, "PHEV Research," [co-PI Jay Whitacre], September 2011.

[6] Ford Motor Company, "Electrified Vehicles in China: Identifying Consumer Preferences and Key Factors that Impact Adoption," Sept 2011 – Aug 2014.

[7] Toyota Motor Corporation, "Life Cycle Cost and Environmental Assessment of Plug-in Vehicles," [co-PIs Jay Whitacre, Constantine Samaras], August 2010.

[8] Toyota Motor Corporation, "Systems Analysis of Plug-in Hybrid Electric Vehicles," [co-PIs Jay Whitacre, Constantine Samaras], April 2009.

[9] National Science Foundation, CAREER Award, "Driving Design: Modeling the Influence of Market Forces and Public Policy on Engineering Design Decision-Making," Aug 2008 – Aug 2013.

[10] Ford Motor Company, "Engineering and Market Simulation for Optimal Product Planning under Environmental Regulation," Aug 2008 – Aug 2011.

[11] Carnegie Mellon Institute for Entrepreneurship, Innovation and Technology course development grant for "Quantitative Methods for Product Design and Development," Aug 2007 – July 2012.

[12] Pennsylvania Infrastructure Technology Alliance, "A Systems Decomposition Approach for Optimization of Product Families to Balance Market and Engineering Needs," Jan – Dec 2007 [Co-PIs Peter Boatwright, Tim Simpson].

[13] Pennsylvania Infrastructure Technology Alliance, "Hierarchical Design Optimization of Complex Systems," Jan – Dec 2006 [Co-PIs Jon Cagan, Zhaosong Lu].

Co-Principal Investigator (total $12M)

[14] Environmental Protection Agency Air, Climate, and Energy (ACE) Center, "Center for Air, Climate, and Energy Solutions (CACES)", 2015-2020.

[15] Carnegie Mellon University Transportation Center, "Evaluating the Opportunities for Cost Savings and Environmental Benefits of Coupling Solar Energy and Electric Vehicles in City of Pittsburgh Municipal Operations," 2015.

[16] Fuels Institute "Comparative Analysis of the Economic and Environmental Impacts of CNG and LNG for the Transportation Sector," 2014-2015.

[17] Fuel Freedom Foundation "Assessment of Comparative Economic and Environmental Impacts of Alternative Light Duty Vehicle Liquid Fuels Produced from Natural Gas," 2014-2015.

[18] Carnegie Mellon Metro 21 "Evaluating the Opportunities for Cost Savings and Environmental Benefits of Coupling Solar Energy and Electric Vehicles in City of Pittsburgh Municipal Operations," 2014-2015 [PI: Constantine Samaras].

[19] Research for Advanced Manufacturing in Pennsylvania "Manufacturing Modeling Tools for Domestic Energy Storage Production: Process-Based Cost Modeling," 2012-2014 [PI: Erica Fuchs].

[20] Carnegie Institute of Technology "Institutionalizing and Disseminating Engineering Entrepreneurship," 2012-2013 [PI: Erica Fuchs].

[21] National Science Foundation, SciSIP Program (2011) "GOALI: Think Globally Act Locally – China and the Future of Energy-Saving Vehicle Technologies," Sept 2011 – Aug 2014 [PI: Erica Fuchs].

[22] Mellon Foundation award for "Course Instructor Outreach to Carnegie Mellon's Center for Technology Transfer," 2008-2009 [PI: Erica Fuchs].

[23] National Science Foundation, MUSES Program "Material Use, Infrastructure Change, and Environmental Impacts for Alternative Fuels and Vehicles," Sept 2006 – Aug 2011 [PI: Lester Lave. Co-PIs: Chris Hendrickson, H. Scott Matthews, W. Michael Griffin].

[24] United States Environmental Protection Agency P3 Award People Prosperity and the Planet Award for project "AWARE: A Step Toward Building a Sustainable Economy by Informing Consumer Purchasing Decisions at the Point of Sale," Sept 2004 – May 2005 [PI: Steven Skerlos, co-investigator W. Ross Morrow].

Student Awards (total $300k)

[25] Link Foundation "Environmental Implications of Consumer Preferences and Policy Incentives for Plug-in Vehicles in China and the U.S." student: Helveston 2014-2015.

[26] National Science Foundation Graduate Research Fellowship "Can Controlled Charging of Electric Vehicles Reduce the Economic and Environmental Implications of Integrating

Wind Power into the Electricity Grid?" student: Allison Weis, 2011, June 2012 - May 2015.

[27] National Science Foundation Graduate Research Fellowship "How Does Energy Policy Affect Vehicle Design?" student: Elizabeth Traut, 2009, June 2009 – May 2012.

[28] Steinbrenner Institute for Environmental Education and Research "How Does Energy Policy Affect Vehicle Design?" student: Elizabeth Traut, August 2009 – July 2010.

HONORS AND AWARDS

Faculty

Philip L. Dowd Fellowship Award, College of Engineering, Carnegie Mellon University (2015)
Best Article Award, European Marketing Academy, International Journal of Research in Marketing, Best Article in 2011
Best Course, awarded by the Carnegie Mellon Mechanical Engineering Class of 2010
American Society of Mechanical Engineers, Design Automation Outstanding Young Investigator Award (2009)
George Tallman Ladd Research Award for outstanding research and professional accomplishments and potential (2008)
Best Use of Technology in the Classroom, awarded by the Carnegie Mellon Mechanical Engineering Class of 2006
American Society of Mechanical Engineers Design Automation Conference Best Paper Award (2005)

Student

NSF Engineering Research Center for Reconfigurable Manufacturing Systems Ph.D. Student of the Year Award (2005)
Elaine Harden Award for Outstanding Leadership in College, University and Community Activities, (2005) – University of Michigan BLUElab Executive Committee
Martin Luther King Jr. Spirit Award for co-development of new Engineering for Community course (2004) – University of Michigan
Michigan Teaching Fellow (2003) – University of Michigan Horace H. Rackham School of Graduate Studies and the Center for Research on Learning and Teaching
University of Michigan Mechanical Engineering Graduate Student Council Second Place Award for Research Poster Competition at the Graduate Student Symposium (2003)
Rackham Interdisciplinary Institute Fellowship (2001-2002)
Devlieg Fellowship and Scholarship (2000)
Engineering Graduate Fellowship (1999)
Graduated first in the ME class of 1999 at Carnegie Mellon with University Honors
Motorola Second Place Research Award for Sigma Xi Undergraduate Research Symposium (1999)
Carnegie Institute of Technology Third Place Research Award for Sigma Xi Undergraduate Research Symposium (1999)
Bennett Award for Academic Achievement (1999)
Department Research Honors, Carnegie Mellon Mechanical Engineering (1999)
Student Leadership Award, Carnegie Mellon University (1999)

ACADEMIC SERVICE (since 2005)

Editor:
- ASME Design Engineering Division Newsletter Editor (2006-2009)
- Concurrent Engineering: Research and Applications, An International Journal (guest editor, Special Issue on Managing Modularity and Commonality in Product and Process Development, 2005-2006)

Reviewer:
- AIAA Journal
- AMA American Marketing Association Conference
- Applied Energy
- ASME Journal of Mechanical Design
- ASME Design Engineering Technical Conferences
- Concurrent Engineering - Research and Applications
- Design Science
- Energies
- Energy Journal
- Energy Policy
- Engineering Optimization
- Environmental Research Letters
- Environmental Science and Technology
- IEEE Spectrum
- IEEE Transactions on Automation Science and Engineering
- IEEE Transactions on Engineering Management
- IEEE Transactions on Power Systems
- IEEE Transactions on Smart Grid
- International Journal of Hydrogen Energy
- International Journal of Information Technology and Decision Making
- International Journal of Manufacturing Technology and Management
- International Journal of Product Development
- Journal of Cleaner Production
- Journal of Intelligent Manufacturing
- Marketing Science (INFORMS)
- National Petroleum Council
- National Research Council
- National Science Foundation
- Nature Energy
- Research in Engineering Design
- Structural and Multidisciplinary Optimization
- Sustainable Transportation
- Transport Policy
- Transportation Research Board
- Transportation Research Part A: Policy and Practice
- Transportation Research Part D: Transport and Environment
- Transportation Science
- Union of Concerned Scientists

Conference Session Organizer / Review Coordinator:
- ASME International Design Engineering Technical Conferences

INFORMS Annual Meeting

Conference Session Chair:
ASME Design Engineering Technical Conferences
INFORMS Annual Meeting

Outreach:
Policy Briefing, National Renewable Energy Laboratory (2016)
Policy Briefing, Environmental Protection Agency (2016)
Policy Briefing: California Energy Commission (2015)
Policy Briefing: California Air Resources Board (2015)
Policy Briefing: California State Senate Transportation Committee (2015)
Policy Briefing: California State Assembly Transportation Committee (2015)
Policy Briefing: Office of State Senator Fran Pavley (2015)
Policy Briefing: California State Assembly Natural Resources Committee (2015)
Policy Briefing, Union of Concerned Scientists (2015)
Policy Briefing, U.S. Congressional Budget Office (2012)
Policy Briefing, U.S. Congressional Research Service (2012)
Policy Briefing, U.S. Senate Energy and Natural Resources Committee (2012)
Policy Briefing, U.S. Senate Commerce, Science and Transportation Committee (2012)
Policy Briefing, Office of U.S. Representative Levin (2012)
Policy Briefing, National Academy of Engineering, Maxine Savitz, Vice President (2012)
National Petroleum Council study on Future Transportation Fuels, Electricity Subgroup (2010-2012)
Policy Briefing, U.S. House of Representatives Energy and Commerce Committee (2009)
Policy Briefing, U.S. House of Representatives Committee on Science and Technology (2009)
Policy Briefing, U.S. House of Representatives Select Committee on Energy Independence and Global Warming (2009)
Policy Briefing, U.S. Congressional Research Service (2009)
Policy Briefing, Office of U.S. Senator Specter (2009)
Policy Briefing, Office of U.S. Representative Markey (2009)
Green Design Apprenticeship, 6 day course for high-school students (2007-present)
Society of Women Engineers High School Day Workshop (2005-2008)

Society Service:
Transportation Research Board of the National Academies, Alternative Transportation Fuels and Technologies Committee (member since 2014, friend since 2013)
Transportation Research Board of the National Academies, Transportation Energy Committee (friend since 2013)
ASME Design Engineering Division, Chair: Publicity and Newsletter Committee (2007-2009)
ASME Design Automation Committee (since 2005)

University Service:
Carnegie Institute of Technology Ad Hoc Promotion and Tenure Committee (2014-2015)
Chair, Carnegie Mellon Mechanical Engineering Communications Committee (2013-2014)
Department Head Search Committee, Engineering and Public Policy (2013-2014)
Chair, Carnegie Mellon Engineering and Public Policy Graduate Education Committee (since 2013)
Department Head Search Committee, Mechanical Engineering (2012)
Acting co-director, Master in Product Development program, (2008-2009)

Carnegie Mellon Mechanical Engineering Curriculum Assessment Committee (since 2010)
Carnegie Mellon Mechanical Engineering Undergraduate Education Committee (2006-2011)
Carnegie Mellon Mechanical Engineering Library Committee (2006-2008)
Carnegie Mellon Engineering and Public Policy Qualifying Examination Service (since 2006)
Carnegie Mellon Mechanical Engineering Qualifying Examination Service (since 2005)
Carnegie Mellon Mechanical Engineering Seminar Series Committee (2005-2006)

INVITED LECTURES

[1] *Electric Vehicle Adoption Potential in the United States*, National Renewable Energy Laboratory, Feb 2, 2016, Golden, CO.

[2] *Electric Vehicles: Benefits, Costs, and Policies in the United States*, National Renewable Energy Laboratory, Feb 2, 2016, Golden, CO.

[3] *Electric Vehicles: Benefits, Costs, Policies, and Adoption Potential in the United States*, Environmental Protection Agency, Office of Transportation and Air Quality, Jan 20, 2016, Ann Arbor, MI.

[4] *Electric Vehicles: Benefits, Costs, Policies, and Adoption Potential in the United States*, Centro para a Excelência e Inovação na Indústria Automóvel, Dec 15, 2016, Matosinhos, Portugal.

[5] *Electric Vehicles: Benefits, Costs, Policies, and Adoption Potential in the United States*, Instituto Superior Téchnico, Universidade de Lisboa, Dec 11, 2015, Lisbon, Portugal.

[6] *Electric Vehicles: Benefits, Costs, and Adoption Potential in the United States*, California Energy Commission, June 2015, Sacramento, CA.

[7] *Electric Vehicles: Benefits, Costs, and Adoption Potential in the United States*, California Air Resources Board, June 2015, Sacramento, CA.

[8] *Electric Vehicles: Benefits, Costs, and Adoption Potential in the United States*, University of California, Davis, June 2015, Davis, CA.

[9] *Electric Vehicles: Benefits, Costs, and Adoption Potential in the United States*, Union of Concerned Scientists, June 2015, Oakland, CA.

[10] *Carnegie Mellon Vehicle Electrification Group*, Toyota Motor Sales, September 12, 2014, Torrance, CA.

[11] *Vehicle Automation: Implications for Advanced Vehicle Energy Technologies*, University of Michigan Transportation Research Institute Global Symposium (invited by Jacob Ward, US DOE), April 23, 2014, Ann Arbor, MI.

[12] *Plug-in Vehicle Life Cycle Benefits and Costs: Implications and Strategies*, University of Illinois at Urbana-Champaign, February 28, 2013, Champaign, IL.

[13] *The Costs and Benefits of Plug-in Vehicles: How Much Can We Control?* University of California, San Diego, February 22, 2013, San Diego, CA.

[14] *Air Emissions and Oil Displacement Benefits from Plug-in Vehicles*, Society of Automotive Engineers Hybrid and Electric Vehicle Symposium, February 20, 2013, Anaheim, CA.

[15] *Effect of Location and Driving Conditions on Plug-in Vehicle Benefits*, Transportation Research Board of the National Academies, January 13, 2013, Washington D.C.

[16] *Quantifying Plug-in Vehicle Benefits*, Argonne National Laboratory, Aug 17, 2012, Argonne, IL.

[17] *Thoughts on the Field of Design for Market Systems*, Northwestern University, Aug 16, 2012, Evanston, IL.

[18] *Are Plug-in Vehicles Worth the Cost? Valuing Air Emissions and Oil Displacement Benefits in the U.S.*, March 14, 2012 Toyota Motor North America, Washington, DC.

[19] *Are Plug-in Vehicles Worth the Cost? Valuing Air Emissions and Oil Displacement Benefits in the U.S.*, Sept 2011, Cambridge University, U.K.

[20] *Life Cycle Cost, Air Emissions, and Oil Displacement Potential of Plug-in Vehicles*, Ford Motor Company, July 2011, Dearborn, MI.

[21] *On the Life Cycle Implications of Plug-in Hybrid Electric Vehicles*, University of California Berkeley, Oct 22, 2010, Berkeley, CA.

[22] *On the Life Cycle Implications of Plug-in Hybrid Electric Vehicles*, Stanford University, Precourt Energy Efficiency Center, Oct 21, 2010, Stanford, CA.

[23] *Product Design in Strategic Firm Decision-Making*, Stanford Graduate School of Business, Operations, Information and Technology Group, Oct 20, 2010, Stanford, CA.

[24] *On the Life Cycle Implications of Plug-in Hybrid Electric Vehicles*, University of California Davis, ITS-STEPS Seminar, Oct 19, 2010, Davis, CA.

[25] *Do More Batteries Make a Plug-in Better? Economic and Environmental Analysis of Plug-in Hybrid Electric Vehicles*, Society of Automotive Engineers Government-Industry Meeting, January 28, 2010, Washington, D.C.

[26] *Market Forces and Public Policy in Engineering Systems Optimization*, Massachusetts Institute of Technology, Engineering Systems Division, June 12, 2009, Boston, MA.

[27] *Design for Market Systems: Integrating Social, Economic, and Physical Sciences to Engineer Product Success*, University of Maryland – College Park, Design and Reliability of Systems Division, January 14, 2009, College Park, MD.

[28] *Design for Market Systems: Integrating Social, Economic, and Physical Sciences to Engineer Product Success*, The Pennsylvania State University, Industrial and Manufacturing Engineering, October 16, 2008, State College, PA.

[29] *Driving Design: Modeling Market Forces and Public Policy in Vehicle Design*, State University of New York at Buffalo, Mechanical and Aerospace Engineering, April 10, 2008, Buffalo, NY.

[30] *Should Designers Worry about Market Structure?*, The Pennsylvania State University, Engineering Design, April 4, 2008, State College, PA.

[31] *Modeling Energy Policy and Consumer Choice in Vehicle Design Optimization*, Ford Motor Company, Systems Analytics and Environmental Sciences, July 25, 2007, Detroit, MI.

[32] *Realizable Product Line Optimization: Coordinating Product Positioning and Design for Heterogeneous Markets*, Tepper School of Business, Carnegie Mellon University, Feb. 24, 2006, Pittsburgh, PA.

[33] *A Model for Studying the Impact of Fuel Economy and Emission Policy on Profit-Driven Vehicle Design Decisions in a Competitive Market*, Green Design Institute, Carnegie Mellon University, Oct. 20, 2005, Pittsburgh, PA.

[34] *Preference Coordination in Engineering Design Decision-Making*, Mechanical Engineering, Northwestern University, March 31, 2005, Evanston, IL.

[35] *Preference Coordination in Engineering Design Decision-Making*, General Motors Research and Development Seminar, Oct. 27, 2004, Detroit, MI.

[36] *Individual, Social and Economic Preference in Engineering Design Decision-Making*, Eindhoven University of Technology, April 22, 2004, Eindhoven, The Netherlands.

[37] *Automotive Design and Environmental Policy in the US Market*, Delft University of Technology, April 21, 2004, Delft, The Netherlands.

[38] *Coordination of Preferences Using Hierarchical Optimization of Complex Systems*, Ecole Centrale de Nantes, April 19, 2004, Nantes, France.

[39] *Automotive Design and Environmental Policy in the US Market*, Technischen Universität Berlin, April 8, 2004, Berlin, Germany.

PROFESSIONAL PRESENTATIONS

[40] *Consequential Life-Cycle Air Emissions Externalities for Plug-in Electric Vehicles in the PJM Interconnection*, Transportation Research Board Annual Meeting, Jan 2016, Washington, D.C.

[41] *Effect of Regional Grid Mix, Driving Patterns, and Climate on the Comparative Carbon Footprint of Electric and Gasoline Vehicles*, Transportation Research Board Annual Meeting, Jan 2016, Washington, D.C.

[42] *Unintended Consequences*: *Why U.S. Alternative Fuel Vehicle Adoption Increases Fleet Gasoline Consumption and Greenhouse Gas Emissions under Federal Corporate Average Fuel Economy and Greenhouse Gas Emission Policy*, United States Association for Energy Economics, Oct 27, 2015, Pittsburgh, PA.

[43] *Life Cycle Air Emissions Externality Implications of Electric Vehicle Adoption in the United States*: *A Comparison of Empirical and Normative Approaches*, United States Association for Energy Economics, Oct 27, 2015, Pittsburgh, PA (speaker: Jaramillo).

[44] *Emissions from Electric Vehicle Charging in the United States*, Climate and Energy Decision Making Center Annual Meeting, May 21, 2015, Pittsburgh, PA.

[45] *Forecasting Light-Duty Vehicle Demand using Alternative-Specific Constants for Endogeneity Correction vs. Calibration,* Transportation Research Board Annual Meeting, Jan 14, 2015, Washington, DC.

[46] *Emissions and Cost Implications of Controlled Electric Vehicle Charging in the PJM Interconnection*, Transportation Research Board Annual Meeting, Jan 14, 2015, Washington, DC.

[47] *Energy Implications of Partial Vehicle Automation*, Transportation Research Board Annual Meeting, Jan 13, 2015, Washington, DC. (speaker: Hayeri).

[48] *Greenhouse Gas Emissions from Alternative Fuel Vehicle Incentives in CAFE Policy*, Transportation Research Board Annual Meeting, Jan 13, 2015 (poster), Washington, DC.

[49] *A Techno-Economic Analysis and Optimization of Li-ion Batteries for Light-Duty Passenger Vehicle Electrification*, Transportation Research Board Annual Meeting, Jan 13, 2015 (poster), Washington, DC.

[50] *Regional Uncertainty and Variability of Electric Vehicle Life Cycle CO_2 Emissions in the U.S.*, Transportation Research Board Annual Meeting, Jan 13, 2015 (poster), Washington, DC.

[51] *Effects of Regional Temperature on Electric Vehicle Efficiency, Range and Emissions in the United States*, Transportation Research Board Annual Meeting, Jan 12, 2015, Washington, DC (speaker: Yuksel).

[52] *A Techno-Economic Analysis and Optimization of Li-ion Batteries for Light-Duty Passenger Vehicle Electrification,* Carnegie Mellon Electrochemical Systems Group, Nov 14, 2014, Pittsburgh, PA.

[53] *Regional Emissions from Electric Vehicles*, Carnegie Mellon Electricity Industry Center, Oct 21, 2014, Pittsburgh, PA.

[54] *Costs and Emissions Implications of Controlled Electric Vehicle Charging*, Climate and Energy Decision Making Center Annual Meeting, May 20, 2014, Pittsburgh, PA.

[55] *Consumer Preferences for Hybrid and Electric Vehicles in China and the United States: Implications for Policy and Environment*, Transportation Research Board Annual Meeting, January 2014, Washington D.C. (speaker: Helveston).

[56] *Sensitivity of Vehicle Market Share Predictions to Alternative Discrete Choice Model Specifications*, Transportation Research Board Annual Meeting, January 2014, Washington D.C.

[57] *Comparative Life-Cycle Cost of Electric Vehicle Battery Exchange Versus Fast Charging Stations*, Transportation Research Board Annual Meeting, January 2014, Washington D.C.

[58] *Influence of Driving Patterns on Life-Cycle Cost and Emissions of Hybrid and Plug-in Electric Vehicle Powertrains*, Transportation Research Board Annual Meeting, January 2014, Washington D.C.

[59] *Global Control Optimization of Electric Vehicles with Supercapacitor-Battery Systems Over a Set of Real-World Speed and Elevation Profiles via Dynamic Programming,* Transportation Research Board Annual Meeting, January 2014, Washington D.C.

[60] *Life Cycle Cost of Electric Vehicle Fast Charging and Battery Swapping Stations*, INFORMS Annual Meeting, October 2013, Minneapolis, MN.

[61] *Consumer Preferences for Hybrid and Electric Vehicles in China and the United States*, INFORMS Annual Meeting, October 2013, Minneapolis, MN (speaker: Helveston).

[62] *Sensitivity of Vehicle Market Share Predictions to Alternative Discrete Choice Model Specifications*, ASME International Design Engineering Technical Conferences, August 2013, Portland, OR (speaker: Haaf).

[63] *Toward Understanding the Role of Interaction Effects in Visual Conjoint Analysis*, ASME International Design Engineering Technical Conferences, August 2013, Portland, OR (speaker: Sylcott).

[64] *Electric Vehicles: A Techno-Economic and Environmental Assessment of Costs, Benefits, Challenges, and Strategies*, Carnegie Mellon University (departmental seminar), April 26, 2013, Pittsburgh, PA.

[65] *Cost-Effectiveness of PHEV Battery Capacity and Charging Infrastructure*, Transportation Research Board of the National Academies, poster presentation, January 15, 2013, Washington, D.C.

[66] *Evaluation of the Effects of Thermal Management on Battery Life in PHEVs*, Transportation Research Board of the National Academies, poster presentation, January 15, 2013, Washington, D.C. (speaker: Yuksel)

[67] *U.S. Residential Charging Potential for Plug-in Vehicles*, Transportation Research Board of the National Academies, poster presentation, January 15, 2013, Washington, D.C. (speaker: Traut)

[68] *Valuation of Plug-in Vehicle Life Cycle Air Emissions and Oil Displacement Benefits*, Transportation Research Board of the National Academies, poster presentation, January 15, 2013, Washington, D.C.

[69] *Influence of Driving Patterns on Life Cycle Benefits of Hybrid and Plug-in Electric Vehicles*, International Mechanical Engineering Congress and Exposition, November 2012, Houston, TX. (speaker: Karabasoglu)

[70] *Optimal Combined Design and Control of Electrified Vehicles for Globally Minimum Life Cycle Cost*, International Mechanical Engineering Congress and Exposition, November 2012, Houston, TX. (speaker: Karabasoglu)

[71] *Supercapacitor-Battery System Design and Control for Plug-in Electric Vehicles and Life Cycle Economic and Environmental Implications*, International Mechanical Engineering Congress and Exposition, November 2012, Houston, TX. (speaker: Karabasoglu)

[72] *Controlled Plug-in Vehicle Charging in High Wind Penetration Scenarios*, INFORMS Annual Meeting, Oct 2012, Phoenix, AZ. (speaker: Weis)

[73] *Globally Optimal Robust Design and Control of Plug-in Hybrid Electric Vehicles*, INFORMS Annual Meeting, Oct 2012, Phoenix, AZ. (speaker: Karabasoglu)

[74] *Global Control Optimization of Supercapacitor-Battery Electric Vehicles*, INFORMS Annual Meeting, Oct 2012, Phoenix, AZ. (speaker: Karabasoglu)

[75] *Driving Design: Modeling the Influence of Market Forces and Public Policy on Vehicle Design Decisions*, National Science Foundation Civil, Mechanical, and Manufacturing Innovation Conference, July 23, 2012, Boston, MA.

[76] *Development of a Simulation Model to Analyze the Effect of Thermal Management on Battery Life*, SAE World Congress, April 25, 2012, Detroit, MI (speaker: Yuksel)

[77] *Evaluation of the Effects of Thermal Management on Battery Life in Plug-in Hybrid Electric Vehicles*, The Battery Congress, April 23, 2012, Ann Arbor, MI (speaker: Yuksel)

[78] *Are Plug-in Vehicles Worth the Cost? Valuing Air Emissions and Oil Displacement Benefits in the U.S.*, INFORMS Annual Meeting, Nov 2011, Charlotte, N.C.

[79] *Using Economic Input-Output Life Cycle Assessment to Guide Sustainable Design*, INFORMS Annual Meeting, Nov 2011, Charlotte, N.C. (speaker: Traut)

[80] *Optimal Design and Allocation of Electrified Vehicles and Dedicated Charging Infrastructure for Minimum Greenhouse Gas Emissions*, INFORMS Annual Meeting, Nov 2011, Charlotte, N.C. (speaker: Traut)

[81] *Minimizing the Integration Costs of Wind Using Curtailment and Electric Vehicle Charging*, U.S. Association for Energy Economics North American Conference, Oct 2011, Washington D.C. (speaker: Weis)

[82] *Robust Design for Profit Maximization under Uncertainty of Consumer Choice Model Parameters Using the Delta Method*, ASME International Design Engineering Technical Conferences, Aug 2011, Washington D.C. (speaker: Heckmann)

[83] *Using Economic Input-Output Life Cycle Assessment to Guide Sustainable Design*, ASME International Design Engineering Technical Conferences, Aug 31, 2011, Washington D.C.

[84] *Are Plug-in Vehicles Worth the Cost?*, ASME International Design Engineering Technical Conferences, Aug 30, 2011, Washington D.C.

[85] *A Perspective on Rebound Effects and Demand/Supply Equilibrium*, 2011 Climate and Energy Decision Making Workshop, June 2011, Washington D.C. (speaker: Hendrickson)

[86] *NHTS Survey Day Driving Distance and Estimated Variability to inform Electric Vehicle Range Design*, Using National Household Travel Survey (HNTS) Data for Transportation Decision Making Workshop, June 2011, Washington, D.C. (speaker: Traut)

[87] *Costs and Benefits of Plug-in Vehicles*, Carnegie Mellon Steinbrenner Media Fellowship, June 2011, Pittsburgh, PA.

[88] *Optimal Design and Allocation of Electrified Vehicles and Dedicated Charging Infrastructure for Minimum Greenhouse Gas Emissions*, International Society of Industrial Ecology Conference, June 2011, Berkeley, CA. (speaker: Traut)

[89] *Techno-Economic Analysis of Lithium-Ion Batteries for Personal Vehicle Electrification*, with Apurba Sakti, Technology Management and Policy Conference, May 2011, State College, PA.

[90] *Optimal Design and Allocation of Electrified Vehicles and Dedicated Charging Infrastructure for Minimum Greenhouse Gas Emissions*, Mascaro Center's Engineering Sustainability Conference 2011, April 2011, Pittsburgh, PA.

[91] *Air Emissions and Oil Displacement Benefits from Plug-in Vehicles*, policy brief presented to members of the Congressional Budget Office, the Congressional Research Service, the Senate Energy and Natural Resources Committee, the Senate Commerce, Science and Transportation Committee, and members of the U.S. House of Representatives, March 13-14, 2012, Washington, D.C.

[92] *Techno-Economic Analysis of Lithium-Ion Batteries for Personal Electrification*, with Apurba Sakti. National Academies Transportation Research Board Annual Meeting, January 23-27, 2011, Washington, D.C.

[93] *Optimal Design and Allocation of Electrified Vehicles and Dedicated Charging Infrastructure for Minimum Greenhouse Gas Emissions*, with Elizabeth Traut, National Academies Transportation Research Board Annual Meeting, January 23-27, 2011, Washington D.C.

[94] *Driving Design: Modeling the Influence of Market Forces and Public Policy on Vehicle Design Decisions*, Civil, Mechanical and Manufacturing Innovation Conference, January 4-7, 2011, Atlanta, GA.

[95] *Material Use, Infrastructure Change, and Environmental Impacts of Alternative Fuels and Vehicles*, Civil, Mechanical and Manufacturing Innovation Conference, January 4-7, 2011, Atlanta, GA.

[96] *Are Plug-in Vehicles Worth the Cost?*, INFORMS Annual Meeting, Nov 9, 2010, Austin, TX.

[97] *A MINLP Model for Global Optimization of Plug-in Vehicle Design and Allocation to Minimize Life Cycle Cost and Greenhouse Gas Emissions*, INFORMS Annual Meeting, Nov 8, 2010, Austin, TX.

[98] *Why Your Plug-in Hybrid Electric Vehicle with a 40-mile Battery May Only Go 25*, with Orkun Karabasoglu, INFORMS Annual Meeting, Nov 9, 2010, Austin, TX.

[99] *Optimal Plug-in Hybrid Electric Vehicle Design and Allocation for Minimum Life Cycle Cost, Petroleum Consumption, and Greenhouse Gas Emissions*, ASME International Design Engineering Technical Conferences, Advanced Vehicle and Tire Technology Conference, Aug 2010, Montreal, CA.

[100] *A MINLP Model for Global Optimization of Plug-in Hybrid Electric Vehicle Design and Allocation to Minimize Life Cycle Greenhouse Gas Emissions*, ASME International Design Engineering Technical Conferences, Design Automation Conference, Aug 2010, Montreal, CA.

[101] *MINLP Global Optimization of Plug-in Hybrid Vehicle Design and Allocation for Minimum Cost and GHG Emissions*, INFORMS Conference on Energy, Sustainability and Climate Change, Feb 2010, Gainesville, FL, USA.

[102] *Do More Batteries Make a Plug-in Better? Economic and Environmental Analysis of Plug-in Hybrid Electric Vehicles*, Society of Automotive Engineers Government-Industry Meeting, Jan 2010, Washington D.C., USA.

[103] *Do More Batteries Make a Plug-in Better? Economic and Environmental Analysis of Plug-in Hybrid Electric Vehicles*, Institute for Operations Research and the Management Sciences (INFORMS) Annual Meeting, Oct 11, 2009, San Diego, CA, USA.

[104] *Optimal Plug-in Hybrid Electric Vehicle Design and Allocation for Diverse Driving Patterns*, ASME Design Engineering Technical Conferences, Sept 1 2009, San Diego, CA, USA.

[105] *Do More Batteries Make a Plug-in Better? Economic and Environmental Analysis of Plug-in Hybrid Electric Vehicles*, MIT Engineering Systems Symposium, June 17, 2009, Boston, MA, USA.

[106] *A Structural Analysis of Vehicle Design Responses to Corporate Average Fuel Economy (CAFE) Policy*, poster presentation, MIT Engineering Systems Symposium, June 16, 2009, Boston, MA, USA.

[107] *Economic, Environmental, and Security Implications of Plug-in Hybrid Electric Vehicles,* Presented to staff members of the House Energy and Commerce Committee, the House Committee on Science and Technology, the Select Committee on Energy Independence and Global Warming, the Congressional Research Service, and offices of U.S. House and Senate members, April 16 and April 20, 2009, Washington D.C., USA.

[108] *A Structural Analysis of Vehicle Design Responses to CAFE Policy*, National Academies Transportation Research Board Annual Meeting, January 2009, Washington DC, USA.

[109] *Impact of Battery Weight and Charging Patterns on the Economic and Environmental Benefits of Plug-in Hybrid Vehicles*, National Academies Transportation Research Board Annual Meeting, January 2009, Washington DC, USA.

[110] *A Structural Analysis of Vehicle Design Responses to CAFE Policy*, Institute for Operations Research and Management Sciences (INFORMS) Annual Meeting, November 2008, Washington, DC, USA.

[111] *A Deterministic Lagrangian-Based Global Optimization Approach for Decomposable Nonconvex Mixed-Integer Problems*, Institute for Operations Research and Management Sciences (INFORMS) Annual Meeting, November 2008, Washington, DC, USA.

[112] *Optimal Product Design in a Competitive Market*, Institute for Operations Research and Management Sciences (INFORMS) Annual Meeting, November 2008, Washington, DC, USA.

[113] *Consumer Heterogeneity and Channel Structures in Optimal Product Design*, Institute for Operations Research and Management Sciences (INFORMS) Annual Meeting, November 2008, Washington, DC, USA.

[114] *Global Optimization of the Joint Product Family Platform Selection and Design Problem*, Institute for Operations Research and Management Sciences (INFORMS) Annual Meeting, November 2008, Washington, DC, USA.

[115] *Impact of Battery Weight and Charging Patterns on Plug-in Hybrid Vehicles*, ASME International Design Engineering Technical Conferences, August 2008, New York, NY, USA.

[116] *Should Designers Worry about Market Systems?*, ASME International Design Engineering Technical Conferences, August 2008, New York, NY, USA.

[117] *Optimal Product Design under Price Competition*, ASME International Design Engineering Technical Conferences, August 2008, New York, NY, USA.

[118] *A Deterministic Lagrangian-based Global Optimization Approach for Large-Scale Decomposable Problems*, ASME International Design Engineering Technical Conferences, August 2008, New York, NY, USA.

[119] *Wiki-Based Learning in the Mechanical Engineering Classroom*, American Society for Engineering Education (ASEE) Annual Conference and Exposition, June 2008, Pittsburgh, PA, USA.

[120] *Applications of Lagrangian Branch and Cut for Hierarchical Engineering Systems*, Institute For Operations Research and the Management Sciences (INFORMS) Annual Meeting, November 2007, Seattle, WA, USA.

[121] *A Quantitative Approach to Achieving Optimal Balance between Product Variety and Manufacturability*, Institute For Operations Research and the Management Sciences (INFORMS) Annual Meeting, November 2007, Seattle, WA, USA.

[122] *Product Line Design Optimization for Heterogeneous Markets*, Institute For Operations Research and the Management Sciences (INFORMS) Annual Meeting, November 2007, Seattle, WA, USA.

[123] *Diagonal Quadratic Approximation for Parallelization of Analytical Target Cascading*, ASME International Design Engineering Technical Conferences, September 2007, Las Vegas, NV, USA.

[124] *A Game Theoretic Approach to Finding Market Equilibria for Automotive Design under Environmental Regulation*, ASME International Design Engineering Technical Conferences, September 2007, Las Vegas, NV, USA.

[125] *Design Optimization of a Laptop Computer using Aggregate and Mixed Logit Demand Models with Consumer Survey Data*, ASME International Design Engineering Technical Conferences, September 2007, Las Vegas, NV, USA.

[126] *Measurement of Headlight Form Preference using Choice-Based Conjoint Analysis*, ASME International Design Engineering Technical Conferences, September 2007, Las Vegas, NV, USA.

[127] *An Extension of the Commonality Index for Product Family Optimization*, ASME International Design Engineering Technical Conferences, September 2007, Las Vegas, NV, USA.

[128] *A Single-Stage Gradient-Based Approach for Solving the Joint Product Family Platform Selection and Design Problem using Decomposition*, ASME International Design Engineering Technical Conferences, September 2007, Las Vegas, NV, USA.

[129] *A Decomposed Genetic Algorithm for Solving the Joint Product Family Optimization Problem*, AIAA Multidisciplinary Design Optimization Specialists Conference, April, Honolulu, Hawaii, USA.

[130] *Balancing Marketability and Manufacturability in Product Line Design Optimization*, Institute For Operations Research and the Management Sciences (INFORMS) Annual Conference, November 2006, Pittsburgh, PA.

[131] *The Impact of Environmental Policy on Profit-Driven Vehicle Design Optimization*, Institute For Operations Research and the Management Sciences (INFORMS) Annual Conference, November 2006, Pittsburgh, PA.

[132] *Analytical Target Cascading using Branch and Bound for Mixed Integer Nonlinear Programming*, ASME International Design Engineering Technical Conferences, September 2006, Philadelphia, PA, USA.

[133] *Balancing Marketing and Manufacturing Objectives in Product Line Design*, ASME International Design Engineering Technical Conferences, September 2005, Long Beach, CA, USA.

[134] *An Efficient Weighting Update Method to Achieve Acceptable Consistency Deviation in Analytical Target Cascading*, ASME International Design Engineering Technical Conferences, September 2004, Salt Lake City, Utah, USA.

[135] *An Efficient Weighting Update Method to Achieve Acceptable Consistency Deviation in Analytical Target Cascading*, Automotive Research Center Conference, May 2004, Ann Arbor, MI, USA.

[136] *An Optimal Marketing and Engineering Design Model for Product Development Using Analytical Target Cascading*, Tools and Methods of Competitive Engineering Conference, April 2004, Lausanne, Switzerland.

[137] *A Simulation-based Vehicle Design Strategy for Requirements Validation*, Automotive Research Center Conference, May 12, 2003, Chrysler Headquarters, Auburn Hills, MI, USA.

[138] *A Study of Emission Policy Effects on Optimal Vehicle Design Decisions*, ASME Design Engineering Technical Conferences, September 2003, Chicago, IL, USA.

VIDEOS

[1] Did You Know That Extreme Weather Affects an Electric Car's Range? Inside Science, Nov 2015

[2] Electric Vehicle Benefits & Costs in the U.S., Carnegie Mellon University, June 2015

[3] Electric Vehicle Adoption Potential in the U.S., Carnegie Mellon University, June 2015

[4] Is Manufacturing in China a Wise Decision for a Small, Innovative US Company? Carnegie Mellon University Scott Institute for Energy Innovation, June 2015

[5] Jeremy Michalek: Vehicle Electrification, Carnegie Mellon University, April 2015

[6] CMU Energy Interview: Jeremy Michalek, Carnegie Mellon University, July 2013.

[7] Do Hybrid and Plug-in Cars Really Save the Environment? Carnegie Mellon University Scott Institute for Energy Innovation, Nov 2013

[8] CMU Energy Presentation: Plug-in Vehicles, Carnegie Mellon University, Sep 2012

PRESS RELEASES

[1] Which Vehicle Holds Smallest Carbon Footprint? Electrics in Some Regions, Hybrids in Others, Says Carnegie Mellon Study, July 16, 2015

[2] Carnegie Mellon Study Shows Electric Vehicle Range and Emissions Vary With Climate, Feb 24, 2015

[3] CMU Study Finds Chinese Consumers May Adopt Electric Vehicles First, Impacting Auto Market, Feb 16, 2015.

[4] Big Factories Won't Solve High Cost of Electric Vehicles, Carnegie Mellon Researchers Say, Oct 21, 2014

[5] Carnegie Mellon Study Says Electric Vehicles Could Be Cheaper to Recharge if Electricity Providers Control Charging Speeds, Jan 23, 2014

[6] Carnegie Mellon Researchers Find Consumers Choose More Efficient Light Bulbs when Energy Costs are Labeled, Jan 10, 2014.

[7] Carnegie Mellon Researchers Find Limited Residential Parking a Barrier to Electric Vehicle Adoption, Nov 11, 2013.

[8] Carnegie Mellon Researchers Report Hybrid Cars are Greener for City Drivers, June 17, 2013.

[9] Fiscal Cliff Bill Tax Credits for Electric Vehicle Chargers Found Not Cost Effective, Jan 7, 2013.

[10] Carnegie Mellon Study Finds Benefits of Plug-in Vehicles Depend on Battery Size, Sept 26, 2011.

SELECTED MEDIA STORIES

[1] *Science:* The Best - and Worst - Places to Drive Your Electric Car, Feb 20, 2015.

[2] *WIRED:* Chevy Could Beat Tesla to Building the First Mainstream Electric Car, Jan 13, 2015.

[3] *The New York Times*: EVs Could Be a Key Part of a Changing Electricity Grid, Jan 23, 2014.

[4] *Bloomberg Businessweek:* Toyota Sees Hydrogen Car Fill-Ups at Dealers to Trash Dumps, *Jan 7, 2014.*

[5] *The New York Times*: Electric Cars Give Rise to a Recharging Industry, Nov 12, 2013.

[6] *The Daily Beast*: Electric Vehicles May Be the Green Car of the Future, But Hybrids Are the Green Car of the Present, Jan 24, 2013.

[7] *The Washington Post*: Hybrid, electric or gas: What's a car buyer interested in the environment to do? March 19, 2012.

[8] *Bloomberg News*: U.S. Battery, Plug-in Car Push Costs Exceed Rewards, New Study Says, Sept 26, 2011.

[9] *The Wall Street Journal*: High Battery Cost Curbs Electric Cars, Oct 17, 2010.

[10] *Bloomberg News*: GM Volt Cost May Limit Value to Drivers, Study Finds, February 26, 2009.

ALL MEDIA STORIES

[1] *Atlanta Journal Constitution*: Electric Cars Going Mainstream Sooner, Jan 27, 2016.

[2] *Eco-Business:* Boosting EVs with Cloud Power, Dec 17, 2015.

[3] *Inside Science TV:* Extreme Weather Affects an Electric Car's Range, Dec 13, 2015.

[4] *SFGate:* Could Climate Impact Electric Car Range? Nov 12, 2015.

[5] *Futurity:* Prius or Leaf? Carbon Footprint Hinges on Location, July 20, 2015.

[6] *Bloomberg:* The $5 Billon Race to Build a Better Battery, April 14, 2015.

[7] *CMU Engineering Podcast:* How does climate affect your electric car's performance?, April 10, 2015.

[8] *WIRED:* Electric Cars can Explain our Highway Funding Fiasco, Apr 8, 2015.

[9] *Takepart:* Find Out if You Live in the Best - or Worst - State for Electric Cars, Mar 11, 2015.

[10] *NDTV:* Weather Conditions Affect Mileage of Electric Cars, Mar 4, 2015.

[11] *Green Car Reports:* Chinese Car Buyers May Be More Open to Electric Cars than Americans: Study, Mar 3, 2015.

[12] *Ecomento.com:* Electric Cars Appeal to More Chinese than American Buyers, Mar 3, 2015.

[13] *The Economic Times:* Efficiency of Electric Cars Depends on Weather, Mar 2, 2015.

[14] *Fast Company:* Where It's Best and Worst to Drive an Electric Vehicle, Mar 2, 2015.

[15] *Mother Nature Network:* Cold Weather Kills Electric Car Range, Feb 27, 2015.

[16] *Charged Electric Vehicles Magazine:* New Study: Chinese More Receptive to EVs than Americans, Feb 26, 2015.

[17] *Laboratory Equipment:* Location Influences Electric Car Range, Emissions, Feb 26, 2015.

[18] *Product Design & Development:* EV Range Depends on Where You Live, Feb 25, 2015.

[19] *Engineering.com:* China May Adopt EV Before Other Markets, Feb 23, 3015.

[20] *Science:* The Best - and Worst - Places to Drive Your Electric Car, Feb 20, 2015.

[21] *Design News:* Chevy Bolt Announcement Signals Battery Improvement, Feb 17, 2015.

[22] *Discovery News:* Electric vs. Fuel Cell Cars: 'Green' Autos Explained, Jan 30, 2015.

[23] *Live Science:* Electric vs. Fuel Cell Vehicles: 'Green' Auto Tech Explained, Jan 28, 2015.

[24] *WIRED:* Chevy Could Beat Tesla to Building the First Mainstream Electric Car, Jan 13, 2015.

[25] *CQ Roll Call - Policy Pulse:* Looking Into the Future on Electric Vehicle Adoption, Jan 12, 2015.

[26] *Pittsburgh Tribune-Review:* Alcoa, Israeli Company Collaborate on Aluminum-Air Battery, Jan 10, 2015.

[27] *Design News*: Chevy Bolt Announcement Signals Battery Improvement, Feb 17, 2015.

[28] *The Engineer*: Improved Battery Design is Key to Cost Savings, Nov 4, 2014.

[29] *New York Times Automobiles*: Wheelies: The Real Deal Jeap Edition, Oct 24, 2014.

[30] *Network World*: Carnegie Mellon: Bigger May Not be Better with Battery Makers, Oct 21, 2014.

[31] *Automotive News*: Pulling the plug: EV battery module exchange put to test, Oct 20, 2014.

[32] *Pittsburgh Post-Gazette*: Alternative vehicle fuels a growing niche market, April 29, 2014.

[33] *Pittsburgh Post-Gazette*, "Shedding light on true cost of bulbs," Feb 7, 2014.

[34] *WESA, Pittsburgh's NPR News Station*: New Method of Charging Electric Cars Could Bring Savings, Feb 3, 2014.

[35] *The Daily Fusion*: EVs Could Be Recharged Cheaper With Controlled Charging Speeds, Jan 27, 2014.

[36] *The Pittsburgh Tribune-Review*: Plugging electric vehicles in at cheapest time could save on power bills, CMU finds, Jan 24, 2014.

[37] *The New York Times*: EVs Could Be a Key Part of a Changing Electricity Grid, Jan 23, 2014.

[38] *EV World*: CMU Study Sees Parking as Next Electric Car Barrier, Jan 14, 2014.

[39] *Design News*, "Will parking problems slow the rise of electric vehicles?" January 14, 2014.

[40] *Futurity*, "Labels sway consumers to pick 'green' bulbs," January 13, 2014.

[41] *Earth Techling*, "Good labeling might increase green light bulb sales," January 2014.

[42] *Bloomberg Businessweek*: Toyota Sees Hydrogen Car Fill-Ups at Dealers to Trash Dumps, Jan 7, 2014.

[43] *Allegheny Front*: Charging a Challenge for Electric Car Owners, Nov 22, 2013.

[44] *WESA 90.5FM*: Lack of Parking May Be One of the Electric Car's Biggest Hurdles, Nov 18, 2013.

[45] *The Car Connection*: Electric Car Adoption Lagging Because Drivers Have Nowhere to Park & Charge Them, Nov 13, 2013.

[46] *The New York Times*: Electric Cars Give Rise to a Recharging Industry, Nov 12, 2013.

[47] *The Daily Fusion*: Insufficient Parking Space Hinders Electric Vehicle Adoption, Nov 12, 2013.

[48] *Green Car Congress*: CMU study finds limited dedicated residential parking and charging a significant barrier to mainstream EV adoption, Nov 12, 2013.

[49] *Autoblog Green*: In city driving, hybrids really outshine the competition, June 22, 2013.

[50] *EV World*: Hybrids better choice for city drivers, CMU study finds, June 18, 2013.

[51] *Pittsburgh Post Gazette:* Business news briefs: Study says hybrid, electric vehicles not always beneficial, June 18, 2013.

[52] *ASME.org*, "The Expo Advantage," March 2013.

[53] *Pocono Record*: Hybrids Deserve Better, Feb 18, 2013.

[54] *The Allegheny Front on WESA, Pittsburgh's NPR News Station:* "CMU studies electric vs. hybrid cars," Feb 9, 2013.

[55] *The Daily Beast*: "Electric vehicles may be the green car of the future, but hybrids are the green car of the present," Jan 24, 2013.

[56] *CBS-KDKA Ch.2*: "CMU engineering students developing new consumer products," Dec 10, 2012.

[57] *NBC-WTAE Ch.4*: "Young engineers showcase prototypes at CMU expo ," Dec 10, 2012.

[58] *Pittsburgh Post-Gazette*: "Innovation 101: CMU students iron out details to improve consumer products," Dec 10, 2012.

[59] *Green Car Congress*: "CMU/Ford study assesses optimal mix of conventional, hybrid, plug-in hybrid and electric vehicles for minimizing GHG and cost," Oct 31, 2012.

[60] *Green Car Congress*: "CMU study finds small battery PHEVs and gasoline hybrids the least-cost policy solution to reducing gasoline consumption," Oct 29, 2012.

[61] *Design News*: "Could Pure Electrics Emit More than Hybrids?" Nov 15, 2012.

[62] *The Street*: "Tesla Motors pollutes today for a greener tomorrow," Nov 7, 2012.

[63] *Edmunds*: "California ZEV mandate -- Would a gas tax be better?" Oct 17, 2012.

[64] *Automotive World*: "US: PHEVs give better subsidy yields than EVs - study", July 26, 2012.

[65] *CBS-KDKA Ch.2:* "The Sunday Business Page," Interview with J. Michalek, P. White and W. Shim, May 13, 2012.

[66] *CBS-WTAE Ch. 2 News*: "CMU engineering students present inventions," May 7, 2012.

[67] *ABC-WTAE Ch. 4 Action News*: "CMU students showcase designs at senior design expo," May 7, 2012.

[68] *WPXI-Pittsburgh Ch. 11 Nightly News*: "CMU students show off their new and improved products," May 7, 2012.

[69] *The Washington Post*: "Hybrid, electric or gas: What's a car buyer interested in the environment to do?" March 19, 2012.

[70] *Autoblog Green*: "Why plug-in vehicles with "small" battery packs should be subsidized in a big way," Oct 6, 2011.

[71] *The Truth About Cars*: "Report knocks 'big battery' plug-in subsidies, will the DOE notice?" Sept 28, 2011.

[72] *TheGreenCarWebsite.co.uk*: "Are small batteries the future for hybrid cars," Sept 28, 2011.

[73] *Greenwire*: "Incentives should target hybrids, not pure EVs -- report," E&E Publishing, Washington D.C., Sept 28, 2011.

[74] *K-Car Network* (2011) "美国最新研究表明纯电动车耗费成本较高" 盖世汽车网, Sept 27, 2011.

[75] *Green Car Congress*: "CMU study finds that HEVs and PHEVs with small battery packs offer more emissions and oil displacement benefits per dollar spent than large pack PHEVs and BEVs; policy implications," Sept 27, 2011.

[76] *Alt Energy Stocks*: (2011) "Plug-in vehicles have been weighed in the balance and found wanting," Sept 27, 2011.

[77] *HybridCars* (2011) "Carnegie Mellon study says hybrids are better target for government investment than EVs," Sept 26, 2011.

[78] *Bloomberg Businessweek*: "U.S. Battery, Plug-in Car Push Costs Exceed Rewards, New Study Says," Sept 26, 2011.

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