

Karl R. Haapala, Ph.D.

School of Mechanical, Industrial, and Manufacturing Engineering
Oregon State University, 204 Rogers Hall, Corvallis, OR 97331
Email: Karl.Haapala@oregonstate.edu
Web: web.engr.oregonstate.edu/~haapalak

EDUCATION

- 2008 Ph.D., Mechanical Eng.-Eng. Mechanics, Michigan Technological University
(Advisor: J.W. Sutherland)
- 2003 M.S., Mechanical Engineering, Michigan Technological University
(Advisor: J.W. Sutherland)
- 2001 B.S., Mechanical Engineering, Michigan Technological University

Certifications and Other Academic Preparation

- 2006 Graduate Certificate in Sustainability, Michigan Technological University
- Spring 2005 NSF IGERT Exchange, Public Policy Ph.D. program, Southern University-Baton Rouge, Louisiana
- 2001 Certificate in International Business, Michigan Technological University
- 1996-1997 International Studies, University of Oulu (Finland) Open Campus Program

EXPERIENCE

- 12/08-present *Assistant Professor*, School of Mechanical, Industrial, and Manufacturing Engineering, Oregon State University
Performing research, teaching, and service activities in Industrial and Manufacturing Engineering program, focused on sustainable manufacturing.
- 09/13-present *Assistant Director*, Industrial Assessment Center, Oregon State University
Assisting the OSU IAC Director in center administration and student mentoring. Serving as a principal auditor on five industrial assessments, annually.
- 09/11-09/13 *Faculty Mentor*, Industrial Assessment Center, Oregon State University
Served as the principal auditor on industrial energy and productivity assessments along with a student team, including onsite assessment and final report review.
- 09/11-09/12 *Swigert Faculty Fellow*, School of Mechanical, Industrial, and Manufacturing Engineering, Oregon State University
One-year fellowship to advance manufacturing research in Oregon.
- 08/08-12/08 *Research Engineer and Instructor*, Dept. of Mechanical Engineering - Engineering Mechanics, Michigan Technological University
Assisted with proposal development for funded research of sustainability-related issues. Responsible for introductory Service Systems Engineering course.

- 01/04-08/08 *Graduate Research Assistant*, Dept. of Mechanical Engineering - Engineering Mechanics, Michigan Technological University
Conducted research into sustainable manufacturing. Developed environmental performance models of steelmaking, sand casting, and heat treatment processes.
- 05/06-08/06 *Visiting Researcher*, Laboratory of Process Metallurgy, Dept. of Process and Environmental Engineering, University of Oulu, Finland
Performed debugging, model development, and editing of user manual for manufacturing process flow software. Developed software tutorial for new users.
- 05/05-08/05 *Summer Intern*, Advanced Materials Technology, Caterpillar Inc., Peoria, IL
Developed models of resource use, energy consumption, and waste streams for electric arc furnace steelmaking and sand casting. Reported initial modeling results for two steel chemical compositions.
- 09/03-12/03 *Research Assistant*, Dept. of Mechanical Engineering - Engineering Mechanics, Sustainable Futures Institute, Michigan Technological University
Participated in industry consortium and institute start-up activities including editing proposals and marketing materials. Edited technical publications.
- 08/01-08/03 *Graduate Research Assistant*, Dept. of Mechanical Engineering - Engineering Mechanics, Michigan Technological University
Developed models to quantify the raw materials and wastes for the production of heavy equipment components made of steel. Edited technical papers/proposals.
- 05/02-08/02 *Summer Intern*, Flex-N-Gate Forming Technologies, LLC, Warren, MI
Participated in the development and implementation of an Environmental Management System toward an unconditional recommendation for ISO14000 registration. Recommended facility energy and waste reduction opportunities.
- 06/01-08/01 *Undergraduate Research Assistant* (NSF-REU), Dept. of Mechanical Engineering - Engineering Mechanics, Michigan Technological University
Conducted research into minimum quantity lubrication and properties affecting metal cutting fluid life.
- 05/00-12/00 *Undergraduate Research Assistant* (Norsk Hydro), Dept. of Mechanical Engineering - Engineering Mechanics, Michigan Technological University
Prepared specimens, performed experiments, and made strain measurements in support of research into the hydroforming limits of extruded aluminum tubing.

Teaching and Research Interests

Life cycle engineering, manufacturing process modeling for environmental performance, production engineering, sustainable engineering education, novel sustainability approaches, e.g., micro-/nano-manufacturing processes and sustainable manufacturing systems.

RECOGNITION

Honors from the Profession

- LEO Best Paper Award (2012), “Integrating Sustainability Assessment into Manufacturing Decision Making,” 19th CIRP Conf. on Life Cycle Engineering (with M.S. student H. Zhang)

Awards from the Profession

- NSF Travel Grant (2014) for the 4th International Forum on Sustainable Manufacturing
- SME Warren DeVries Outstanding Young Manufacturing Engineer Award (2014)
- SME/IAC Partnership Participation Award (2013)
- SME Faculty Advisor Professional Development Award (2012)
- NSF (National Science Foundation) CI-TEAM PI Meeting Travel Award (2011)
- Hewlett Foundation ESWI-S Proposal Incentive Stipend (2011)
- NSF/AAAI Artificial Intelligence and Sustainable Design Symposium Travel Award (2011)
- NSF CE-21 Meeting Travel Award (2011)
- NSF CIRP (International Academy for Production Engineering) Fellowship (2009)

University Honors and Awards

- OSU International Programs Faculty Grant (2012)
- Swigert Faculty Fellowship (2011-12)
- NSF IGERT Traineeship (2004-08)
- MTU Sustainable Futures Institute Graduate Scholar (2006-08)
- Caterpillar Research Assistantship (2005-06)
- MTU Graduate Student Council Travel Grant (2004, 2005, 2008)
- MTU Proposal Incentive Award (2002, 2003, 2005)
- DeVlieg Doctoral Scholarship (2005)
- Century II Henes Fellowship (2004)
- MTU Graduate Student Council Leader Award (2003)
- Ford Motor Co. Fellowship (2001-03)
- Fundamentals of Engineering Exam (passed 2001)

MEMBERSHIPS AND HONORARY SOCIETIES

Professional and Honorary Societies

- American Society of Mechanical Engineers
- Society of Manufacturing Engineers
- Institute of Industrial Engineers
- Sigma Xi (inducted 2008)
- Phi Kappa Phi (inducted 2006)
- Pi Tau Sigma (inducted 2000)

State Research Institutes

Oregon Nanoscience and Microtechnologies Institute (ONAMI), Member (2009-present)

Oregon Built Environment & Sustainable Technologies (BEST) Center, Member (2009-present)

GRADUATE STUDENT ADVISING AND MENTORING

Ph.D. Student Advisees – Major Advisor

Current

- Hao Zhang, IE (OSU, co-advisor J. Calvo), exp. 2014, Sustainable Manufacturing Systems
- Babak Lajevardi, IE (OSU, co-advisor B. Paul), exp. 2015, Sustainable Energy Systems
- Amin Mirkouei, IE (OSU), exp. 2016, Sustainable Energy Systems
- Venkata Rajesh Saranam, IE (OSU, co-advisor B. Paul), exp. 2017, Nanomanufacturing

M.S. Student Advisees – Major Advisor

Graduated

- Malcolm O. Brown, IE (OSU), June 2011, “A Process Based Modeling Approach for Economic and Environmental Assessment of Nano-Assisted Manufacturing”
- Misha V. Sahakian, IE (OSU), September 2011, “Machining and Toxicological Performance of a Zinc Oxide Metalworking Nanofluid”
- Dane D. Eastlick, ME (OSU), March 2012, “Improving Manufacturing Sustainability Assessment in Product Design”
- Ahmed J. Alsaffar, IE (OSU), March 2012, “Process-Based Modeling for Cradle-to-Gate-Energy and Carbon Footprint Reduction in Product Design”
- Hao Zhang, IE (OSU), June 2012, “Integrating Sustainable Manufacturing Assessment into Decision Making for a Manufacturing Work Cell”
- Preedanood (Mim) Prempreeda, IE (OSU), September 2012, “Investigation of the Environmental Impacts of Wind Energy and Supplemental Energy Systems using a Life Cycle Approach”
- Pantea Mirzaie, IE (OSU), May 2013, “A Supply Chain Model for Optimizing Fixed and Mobile Bio-Oil Refineries at a Regional Scale”
- Faraz Niyaghi, IE (OSU), May 2013, “Evaluation of Zinc Oxide Metalworking Nanofluid Stability And Related Biological Response”
- Qi Gao, IE (OSU), December 2013, “An Economic and Environmental Assessment Model for Microchannel Device Manufacturing”
- Zachary Southworth, IE (OSU), December 2013, “Bottom-up Cost Modeling for Vanadium Redox Flow Battery Component Manufacturing”
- Seyedhamed Seyedmahmoudi, IE (OSU), May 2014, “Sustainability Assessment during Early Product Development: The Manufacturing Case and the Use Case”
- Michael Eastwood, ME (OSU), June 2014, “Assessing Steel Bevel Gear Design Alternatives for Sustainability Performance through Unit Manufacturing Process Modeling”

Current

- Alex Cimino-Hurt, IE (OSU), exp. 2014, Sustainable Energy Systems
- Tasha Larson, IE (OSU), exp. 2014, Sustainable Design and Manufacturing
- Ian Garretson, IE (OSU), exp. 2015, Sustainable Design and Manufacturing

Diploma Thesis (Master Degree) Advisee

Graduated

- Natalie Traut, Mechanical and Process Engineering (University of Kaiserslautern, Germany), June 2011, Design of Wave Energy Devices with Remanufacturing Considerations (co-Supervisor: Dipl.-Ing. Johannes Siebel, University of Kaiserslautern, Germany)

M.Eng. Student Advisees – Major Advisor

Current

- Walter (Clint) C. Clow, IE (OSU), exp. 2014

Graduated

- Nima Dolatnia, IE (OSU), April 2013

Ph.D. Dissertation Committee Service (* service as Graduate Council Representative)

Graduated

- Santosh Tiwari, IE (OSU, Advisor: B.K. Paul), March 2010, “Nickel Nanoparticle-Assisted Diffusion Brazing of Stainless Steel for Microfluidic Applications”
- Robert Nagel, ME (OSU, Advisor: R.B. Stone), June 2010, “A Design Framework for Identifying Automation Opportunities”
- Valmikanathan Onbattuvelli, IE (OSU, Advisor: S.A. Atre), December 2010, “The Effects of Nanoparticle Addition on the Powder Injection Molding of SiC and AlN”
- Kerry Poppa, ME (OSU, Advisor: R.B. Stone), August 2011, “Theory and Application of Vector Space Similarity Measures in Computer Assisted Conceptual Design”
- Diane Van Scoter, IE (OSU, Advisor: T.L. Doolen), October 2011, “Discovering the Relationship between Project Complexity and Critical Success Factors”
- Prawin Paulraj, IE (OSU, Advisor: B.K. Paul), February 2012, “Adhesive Microlamination Protocol for Low-Temperature Microchannel Arrays”
- Ravindrath Eluri, IE (OSU, Advisor: B.K. Paul), March 2012, “Nanoparticle-Assisted Diffusion Brazing of Metal Microchannel Arrays: Nanoparticle Synthesis, Deposition and Characterization”
- Yasaman Mehravar, IE (OSU, Advisor: R.L. Logendran), April 2013, “Hybrid Flowshop Scheduling with Dual Resources in a Supply Chain”
- Paravee Vas-Umnuay*, ChemE (OSU, Advisor: C.-H. Chang), April 2013, “Growth, Characterization and Applications of Copper Sulfide Thin Films by Solution-Based Processes”
- Bryan O’Halloran, ME (OSU, Advisor: R. Stone), May 2013, “A Framework to Model Reliability and Failures in Complex Systems During the Early Engineering Design Process”
- Barath Palanisamy, IE (OSU, Advisor: B.K. Paul), June 2013, “Micromixer Assisted Continuous Flow Synthesis of Nanoparticles of Binary Compounds and Their Application”
- Wei-Tau (Mike) Lee, IE (OSU, Advisor: K.L. Funk), November 2013, “About Good Work”
- Lapyote Prasittisopin*, CivEng (OSU, Advisor: D. Trejo), December 2013, “Chemical Transformation of Rice Husk Ash for Sustainable, Constructable, and Durable Binary Cementitious System”
- Mir Abbas Bozorgirad, IE (OSU, Advisor: R.L. Logendran), December 2013, “Bi-Criteria Group Scheduling with Learning in Hybrid Flow Shops”
- Daniel Peterson, IE (OSU, Advisor: B.K. Paul), May 2014, Fluidic and Thermal Modeling for the High Production Rate Synthesis of High Quality Nanoparticles
- Joseph Piacenza, ME (OSU, Advisor: C. Hoyle), May 2014, “Design of Robust Infrastructure Systems Incorporating User Behavior”
- Mohammad Yazdani, IE (OSU, Advisor: R.L. Logendran), May 2014, “Group Scheduling in Electronics Manufacturing with Integration of Internal and External Setup Times”

Current

- Woraruthai (Aom) Choothian, IE (OSU, Advisor: T.L. Doolen), exp. 2014
- Saeed Ghanbartehrani, IE (OSU, Advisor: J.D. Porter), exp. 2015
- Justin Pommerenck*, ChemE (OSU, Advisor: A. Yokochi), exp. 2015

M.S. Thesis Committee Service (* service as Graduate Council Representative)

Graduated

- James Vlieg, IE (OSU, Advisor: B.K. Paul), June 2010, “Development of a Radial Microlamination Architecture for the Fabrication of Cylindrical Microchannel Arrays”
- Luke Fisher, ME (OSU, Advisor: R.B. Peterson), June 2010, “Single- and Multi-functional Arrayed Microchannel Fluidic Devices”
- Gopi Lingam, IE (OSU, Advisor: B.K. Paul), September 2010, “Cooling Rate Limitations in the Diffusion Bonding of Large Microchannel Arrays”
- Clayton Hires, IE (OSU, Advisor: B.K. Paul), December 2010, “Uniform Residence Time in Micro-Assisted Solution Deposition of CdS Thin-Films for CIGS Photovoltaic Cells”
- Ji Ling, IE (OSU, Advisor: T.L. Doolen), April 2011, “An Investigation of Chinese Quality Circle Effectiveness: Critical Success Factors and Outcomes”
- Lindsay Wiseman, IE (OSU, Advisor: T.L. Doolen), May 2011, “Evaluating the Effectiveness and Efficiency of Continuous Improvement Training”
- Trenton Carpenter, ME (OSU, Advisor: R.K. Paasch), June 2011, “Global Distributed Design of a Formula SAE Race Car”
- Vaibhav Pandya, IE (OSU, Advisor: R.L. Logendran), June 2011, “A Methodology for Scheduling Jobs in a Flexible Flowshop with Sequence Dependent Setup Times and the Possibility of Machine Skipping”
- Dongchen Lu, IE (OSU, Advisor: R.L. Logendran), November 2011, “Bi-Criteria Group Scheduling with Sequence-Dependent Setup Time in a Flow Shop”
- Juergen Lenz, IE (OSU, Advisor: S. Atre), March 2012, “Material and Process Design for Powder Injection Molding of Silicon Nitride for the Fabrication of Engine Components”
- Joseph Piacenza, ME (OSU, Advisor: C. Hoyle), April 2012, “Sustainable Building Design Framework: An Integrated Approach, candidate for MS in Mechanical Engineering”
- Jessica Young*, CivEng (OSU, Advisor: A.W. Stuedlin), May 2012, “Uplift Capacity and Displacement of Helical Anchors in Cohesive Soil”
- Leif Steigleder, IE (OSU, Advisor: B.K. Paul), June 2012, “A Microchannel Thermal Management System for Absorbent Based Hydrogen Storage”
- Babak Lajevardi, IE (OSU, Advisor: B.K. Paul), September 2012, “Laser Keyhole Welding for the Microlamination of a High-Temperature Microchannel Array”
- Keely Heintz*, ChemEng (OSU, Advisor: J. McGuire), August 2012, “Synthesis and Evaluation of PEO-Coated Materials for Microchannel-Based Hemodialysis”
- Samuel Brannon, IE (OSU, Advisor: B.K. Paul), June 2013, “Development of an Economical High Temperature Microchannel Recuperator for Solid Oxide Fuel Cells”
- Marc Whitehead, ME (OSU, Advisor: R. Albertani), June 2013, “Design and Manufacturing Study of Hydroelectric Turbines Using Recycled and Natural Fiber Composites”
- Adam P. Rahrer, ME (OSU, Advisor: R.B. Stone), September 2013, “Designing and Creating the Oregon State Age and Disability Simulation Suit”
- Erin Collins, ME (OSU, Advisors: R. Paasch, B. Batten), March 2014, “Alternative Design Considerations for a Wave Energy Converter: A Sustainability Approach”

Graduate Teaching Assistant Supervision

- Srikar Vallury, IE (OSU), Spring 2009, ME 413 lab development
- Misha Sahakian, IE (OSU), Fall 2009-Spring 2010, ME 413 and IE 336; **Recipient of the 2011 IE Outstanding GTA Award**
- Hao Zhang, IE (OSU), Fall 2010-Fall 2011, Fall 2012, ME 413 and IE 336
- Walter Clow, IE (OSU), Spring 2011, ME 413 and IE 336 lab development
- Anthony Nix, ME (OSU), Fall 2011, ME 413
- Qi Gao, IE (OSU), Winter 2012-Spring 2013, ME 413, IE/MFGE 336, manufacturing lab development; **Recipient of the 2013 IE Outstanding GTA Award and 2013 College of Engineering GTA Award**
- Kunal Kate, IE (OSU), Winter 2012, IE 336
- Joseph Piacenza, ME (OSU), Fall 2012, ME 413; **Recipient of the 2014 ME Outstanding GTA Award**
- Yasaman Mehravaran, IE (OSU), Winter 2013, MFGE 336
- Ian Garretson, IE (OSU), Fall 2013, ME 413
- Amin Mirkouei, IE (OSU), Fall 2013, ME 413; Spring 2014, MFGE lab development
- Kijoon Lee, IE (OSU), Fall 2013, ME 413
- Hamed Seyedmahmoudi, IE (OSU), Winter 2014, MFGE 336
- Tylee Cairns, IE (OSU), Winter 2014, MFGE 336
- Katarina Morowsky, IE (OSU), Winter 2014, MFGE 336; **Recipient of the 2014 IE Outstanding GTA Award**

Other Graduate Student Supervision and Mentoring

- Vikas Malpani, ME (MTU), 2007, paper contributor
- Hannes Hapke, EE (OSU), 2009, paper contributor
- Babak Lajevardi, IE (OSU), Spring 2010, graduate researcher, environmental optimization of manufacturing systems
- Gorka Rodrigo Asensio, IE (Universidad Politécnica de Valencia, Spain), October 2010 – April 2011, research intern, sustainable wind energy research
- Mohsen Ebrahimi, IE (OSU), Fall 2013, graduate researcher, manufacturing process development and analysis

SELECTED GIFT, GRANT, AND CONTRACT SUPPORT (\$1,026,408 OF \$4,113,781)

Funded Projects: Oregon State University (Total: \$908,678 of \$3,898,090)

1. *As Senior Person:* "I/UCRC: IT-Enabled Design and Realization of Engineered Products and Systems," (PI: R. Stone, co-PI: I. Tumer), National Science Foundation, \$60,000 (1 yr.), awarded April 2014.
2. *As PI:* "Exploring Sustainable Process Capability Windows for a New Electrically-Assisted-Machining (EAM) Process," (co-PI: R. Malhotra), OSU General Research Fund, \$9,660, submitted October 15, 2013, awarded November 21, 2013.
3. *As PI:* "Standard Methods for Sustainable Assembly in Aerospace Manufacturing," National Institute of Standards and Technology, 2/1/2013-12/31/2013, \$50,000, submitted February 26 2013, awarded September 2013.

4. *As co-PI*: “OMI Project: Using Process and System Modeling to Understand Manufacturing Costs, Part 1,” (PI: J. Calvo), \$24,000 (Sheldon Manufacturing Inc., \$12,000, Oregon Metals Initiative, \$12,000), awarded July 2013.
5. *As PI*: “OMI Project: A Sustainability Assessment Method and Tool for Metal Aircraft Component Manufacturing and Assembly (Phase 3),” \$100,000 (The Boeing Company, \$50,000, Oregon Metals Initiative, \$50,000), awarded July 2013.
6. *As PI*: “Toxicological Performance of Metalworking Nanofluids,” \$4,000 (gift), Master Chemical Corp., received April 2013.
7. *As Senior Person*: “Planning Grant: I/UCRC for e-Design: IT Enabled Design and Realization of Engineered Products and Systems,” (PI: I. Tumer, co-PI: R. Stone), National Science Foundation, \$14,380 (1 yr.), awarded March 2013.
8. *As PI*: “Redox Flow Battery Cost Model Development (Phase 1),” Pacific Northwest National Laboratory, 2/5/2013-09/30/2013, \$59,871 (8 mo.), awarded February 2013.
9. *As co-PI*: “IT Aire / Gresham City Hall Data Room Cooling Project,” (J. Junker, PI, OSU/IAC), Oregon BEST Commercialization Grant, \$101,040 (1 yr.), submitted October 1, 2012, awarded February 2013.
10. *As PI*: “Non-Destructive Testing of Wood Products,” \$400 (gift), Coyle Treepieces, October 2012.
11. *As co-PI*: “Pan-American Advanced Studies Institute (PASI) on Manufacturing Innovation through Sustainable Design,” (Dr. R. Chinnam, PI Wayne State; Drs. G. Okuden Kremer and I. Esparragoza, co-PIs Penn State), National Science Foundation, \$99,990, submitted April 24, 2012, awarded September 2012.
12. *As PI*: “OMI Project: Development of a Sustainability Assessment Method and Tool for Metal Aircraft Components Manufacturing and Assembly (Phase 2),” The Boeing Company and Oregon Metals Initiative, \$92,646 (OMI: \$41,715; Boeing: \$50,931, submitted June 2012, awarded July 2012.
13. *As PI*: “Sustainable Product Development Collaboratory,” Oregon State University International Programs Faculty Grant, \$2,018, submitted December, 2011, awarded January 25, 2012.
14. *As Key Personnel*: “Oregon State University Industrial Assessment Center (OSU IAC),” (PI: J. Junker), Oregon BEST, \$35,000 (Haapala: \$35,000), matching funds for graduate student support on U.S. DOE project, awarded September 2011.
15. *As Key Personnel*: “Oregon State University Industrial Assessment Center (OSU IAC),” (co-PIs: Dr. G. Wheeler, J. Junker), U.S. Department of Energy, \$1,751,959 (Haapala: \$250,000), 5 years, submitted August 2, 2011, awarded September 2011.
16. *As PI*: “Life Cycle Analysis: Sustainable Manufacturing and Supply Chains (BA/IE 5xx/4xx),” Oregon State University COB/COE Seed Grant, \$10,000 (Haapala: \$5,000), submitted March 30, 2011, awarded May 2011.
17. *As PI*: “Development of a Unit Process Life Cycle Inventory,” Wichita State University, \$8,031.11, submitted October 26, 2010, awarded March 2011.

18. *As PI*: “OMI Project: Development and Application of a Metal Cutting Tool Selection Procedure,” (Dr. D. Kim, co-PI), Benchmade Knife Company and Oregon Metals Initiative, \$30,000 (Haapala: \$15,000), submitted July 20, 2010, awarded October 2010.
19. *As PI*: “OMI Project: Development of a Knife Testing Device,” Benchmade Knife Company and Oregon Metals Initiative, \$20,000, submitted July 20, 2010, awarded October 2010.
20. *As PI*: “OMI Project: Development of a Sustainability Assessment Method for Fabrication of Metal Aircraft Components,” The Boeing Company and Oregon Metals Initiative, \$102,000, submitted July 15, 2010, awarded November 2010.
21. *As PI*: “Manufacturing Engineering Educational Laboratory: Automated Manufacturing System Upgrade,” OSU Technology Resource Fee (TRF), \$3,800, awarded June 10, 2010, Commenced September 2010.
22. *As Senior Personnel*: “Task 2.1: Identification of Alternative Manufacturing Strategies” in “FY 2010 Tactical Energy Systems Development,” (Dr. R. Peterson, PI and Dr. B. K. Paul, co-PI), U.S. Army CERDEC, \$1,079,659 (Haapala: \$61,495 of Task 2: \$313,372), awarded May 2010, Commenced October 2010.
23. *As PI*: “CI-TEAM Demonstration Project: Collaborative Research: A Sustainable Product Development Collaboratory,” (Dr. K.-Y. Kim, et al. Wayne State (lead) and Dr. G.E. Okuden Kremer, Penn State), National Science Foundation, OSU: \$64,940 (2 yrs., of a total of \$250,000 to three universities), submitted April 27, 2010, awarded October 2010.

Funded Projects: Michigan Technological University (Total: \$117,730 of \$141,311)

1. *As co-PI*: “Environmental Performance of Manufacturing Operations,” Dr. J. W. Sutherland (PI, MTU), Caterpillar Inc., \$141,311 (Haapala: \$117,730), 4 years, submitted October 2005, awarded November 2005.

SCHOLARSHIP

Book Chapters and Contributions to Other Volumes

(* Graduate Student; ** Undergraduate Student; † Corresponding Author)

1. Clarke-Sather, A. R.*†, T. L. Jenkins*, **K. R. Haapala**, and J. W. Sutherland, 2010, “Sustainable Production,” *Encyclopedia of Geography*, B. Warf, Ed., SAGE Publications, Thousand Oaks, CA, pp. 2763-2767. (Invited)
2. Hapke, H.M.*†, Wu, Z., **K.R. Haapala**, and T.K.A. Brekken, 2011, “Wind Power, Energy Technology, and Environmental Impact Assessment,” Chapter 16 in *Volume II: The Global Supply Web: Designing Managing, and Measuring; The Business of Sustainability: Trends, Policies, Practices, and Stories of Success*, S. G. McNall, J. C. Hershauer, and G. Basile, eds., Praeger, An Imprint of ABC-CLIO, LLC, Santa Barbara, CA. (Invited)
3. **Haapala, K.R.** †, S.V. Atre, R. Enneti, I.C. Garretson*, H. Zhang*, 2014, “Materials Processing,” Chapter 3 in *Energy Efficient Manufacturing with Applications*, Wiley-Scrivener; 1 Ed. (December 8, 2014), Salem, MA.

Refereed Journal Publications

(* Graduate Student; ** Undergraduate Student; † Corresponding Author)

1. Sutherland, J. W.†, K. L. Gunter*, **K. R. Haapala***, K. Khadke*, S. J. Skerlos, J. B. Zimmerman*, W. W. Olson, and R. Sadasivuni, 2003, “Environmentally Benign Manufacturing: Status and Vision for the Future,” *Transactions of NAMRI/SME*, Vol. 31, p. 345-352, also appeared as SME Paper MR03-188.
2. Kumar, V.*, **K. R. Haapala***, J. L. Rivera*, M. J. Hutchins*, W. J. Endres, J. K. Gershenson, D. J. Michalek, and J. W. Sutherland†, 2006, “Infusing Sustainability Principles into Manufacturing/ Mechanical Engineering Curricula,” *SME Journal of Manufacturing Systems*, Vol. 24, No. 3, p. 215-225.
3. Sutherland, J. W.† and **K. R. Haapala***, 2007, “Optimization of Steel Production to Improve Lifecycle Environmental Performance,” *CIRP Annals - Manufacturing Technology*, Vol. 56, No. 1, p. 5-8.
4. **Haapala, K. R.***, J. L. Rivera*, and J. W. Sutherland†, 2008, “Application of Life Cycle Assessment Tools to Sustainable Product Design and Manufacturing,” *International Journal of Innovative Computing, Information and Control*, Vol. 4, No. 3, p. 577-591.
5. **Haapala, K. R.***, K. L. Brown*, and J. W. Sutherland†, 2008, “A Life Cycle Environmental and Economic Comparison of Product-Service Systems,” *Transactions of NAMRI/SME*, Vol. 36, p. 333-340.
6. Sutherland, J. W.†, D. P. Adler*, **K. R. Haapala***, and V. Kumar*, 2008, “A Comparison of Manufacturing and Remanufacturing Energy Intensities with Application to Diesel Engine Production,” *CIRP Annals - Manufacturing Technology*, Vol. 57, No. 1, pp. 5-8.
7. **Haapala, K. R.†**, J. L. Rivera*, and J. W. Sutherland, 2009, “Reducing Environmental Impacts of Steel Product Manufacturing,” *Transactions of NAMRI/SME*, Vol. 37, pp. 419-426.
8. Sutherland, J. W., T. L. Jenkins*, and **K. R. Haapala†**, 2010, “Development of a Cost Model and its Application in Determining Optimal Size of a Diesel Engine Remanufacturing Facility,” *CIRP Annals - Manufacturing Technology*, Vol. 59, No. 1, pp. 49-52.
9. Bohm, M. R.†, **K. R. Haapala**, K. Poppa*, A. Nix*, R. B. Stone, I. Y. Tumer, 2010, “Integrating Life Cycle Assessment into the Conceptual Phase of Design to Aid Decision Making,” *Journal of Mechanical Design*, Vol. 132, No. 9, 091005 (12 pp.).
10. **Haapala, K.R.†**, A.V. Catalina, M.L. Johnson, J.W. Sutherland, 2012, “Development and Application of Models for Steelmaking and Casting Environmental Performance,” *ASME Journal of Manufacturing Science and Engineering*, Vol. 134, No. 5, 051013 (13 pp.).
11. Kim, K.Y. †, **K.R. Haapala**, G.E. Okudan Kremer, and M.K. Barbour, 2012, “Cyber Collaboratory-based Sustainable Design Education: A Pedagogical Framework,” *Journal of Computational Science and Education*, Vol. 3, No. 2, pp. 2-10.
12. Bozorgirad, M.A.*, H. Zhang*, **K.R. Haapala†**, and G.S. Murthy, 2013, “Environmental Impact and Cost Assessment of Incineration and Ethanol Production as Municipal Solid Waste Management Strategies,” *The International Journal of Life Cycle Assessment*, Vol. 18, No. 8, pp. 1502-1512.

13. **Haapala, K.R.**†, F. Zhao, J. Camelio, J.W. Sutherland, S.J. Skerlos, D.A. Dornfeld, I.S. Jawahir, A.F. Clarens, J.L. Rickli*, 2013, “A Review of Engineering Research in Sustainable Manufacturing,” *ASME Journal of Manufacturing Science and Engineering*, Vol. 135, No. 4, 041013 (16 pp.).
14. Zhang, H. *, J. Calvo-Amodio, and **K.R. Haapala**†, 2013, “A Conceptual Model for Assisting Sustainable Manufacturing Enterprise through System Dynamics,” *SME Journal of Manufacturing Systems*, Vol. 32, No. 4, pp. 543-549, DOI: 10.1016/j.jmsy.2013.05.007.
15. Niyaghi, F.*, Haapala, K.R.†, Harper, S.L., and Weismiller, M.C., 2014, “Stability and Biological Responses of Zinc Oxide Metalworking Nanofluids (ZnO MWnF™),” *Tribology Transactions*, Vol. 57, No. 4, pp. 730-739.
16. **Haapala, K.R.**† and P. Prempreeda*, 2014, “Comparative Life Cycle Assessment of 2.0 MW Wind Turbines,” *International Journal of Sustainable Manufacturing*, Vol. 3, No. 2, pp. 170-185.
17. **Haapala, K.R.**† and P. Prempreeda*, 2014, “Environmental Impacts of Integrating Wind Energy Systems and Supplemental Energy Generation and Storage Systems,” *International Journal of Sustainable Manufacturing*, Vol. 3, No. 2, pp. 186-206.
18. Zhang, H.* and **K.R. Haapala**†, 2014, “Integrating Sustainable Manufacturing Assessment into Decision Making for a Production Work Cell,” *Journal of Cleaner Production*, Available online 22 January 2014, <http://dx.doi.org/10.1016/j.jclepro.2014.01.038>, in press.
19. Seyedmahmoudi, S.H.*, **K.R. Haapala**†, K.-Y. Kim, and G.E. Kremer, 2014, “Energy and Carbon Footprint Reduction during Textile-based Product Design and Manufacturing,” *International Journal of Strategic Engineering Asset Management*, in press.
20. Zhang, H.*, **K.R. Haapala**†, and J. Calvo-Amodio, 2014, “Establishing Foundational Concepts for Sustainable Manufacturing Systems Assessment,” *International Journal of Strategic Engineering Asset Management*, in press.
21. Lajevardi, B.*†, **K. R. Haapala**, and J. Junker, 2014, “Real-time Monitoring and Evaluation of Energy Efficiency and Thermal Management of Data Centers,” *SME Journal of Manufacturing Systems*, in press.

Peer-Reviewed Conference Publications

(* Graduate Student; ** Undergraduate Student; † Corresponding Author)

1. Muehlfeld, C. M.**, R. T. Nesbitt*, B. Bloss*, S. J. Andrasko**, A. P. Thul**, **K. Haapala****, and J. E. Beard, 2002, “Design and Development of the 2001 Michigan Tech FutureTruck, a Power Split Hybrid Electric Vehicle,” *SAE 2002 World Congress & Exhibition*, March 4-7, Detroit, MI, p. 2115-2122.
2. **Haapala, K. R.***, K. N. Khadke*, and J. W. Sutherland†, 2004, “Predicting Manufacturing Waste and Energy for Sustainable Product Development via WE-Fab Software,” *Proceedings of the Global Conference on Sustainable Product Development and Life Cycle Engineering*, Sept. 29-Oct. 1, Berlin, Germany, p. 243-250.
3. Kumar, V.*, **K. R. Haapala***, J. L. Rivera*, M. J. Hutchins*, W. J. Endres, J. K. Gershenson, D. J. Michalek, and J. W. Sutherland†, 2005, “Towards Manufacturing/Mechanical Engineering Curricular Change in Support of a Sustainable Future,” *Looking Forward: Innovations in*

Manufacturing Engineering Education, CIMEC (CIRP International Manufacturing Engineering Education Conference) and 3rd SME International Conference on Manufacturing Education, San Luis Obispo, CA, p. 50-58.

4. Ju, C.* , L. P. Keranen*, **K. R. Haapala***, D. J. Michalek, and J. W. Sutherland†, 2005, “Issues Associated with MQL Implementation: Effect on Peripheral Milling Process Performance and Impact on Machining Economics,” *Proceedings of the 2005 ASME/IMECE*, IMECE2005-79259, November 5-11, Orlando, FL, on CD ROM.
5. Tumkor, S.†, V. Kumar*, **K. R. Haapala***, and J. W. Sutherland, 2006, “New Engineering Design Concepts for Sustainable Products,” *Proceedings of the ASEE Annual Conference*, June 18-21, Chicago, IL, on CD ROM.
6. **Haapala, K. R.***, J. L. Rivera*, and J. W. Sutherland†, 2006, “Environmentally Responsible Process Selection via Life Cycle Analysis,” *Proceedings of the 2006 International Symposium on Flexible Automation*, July 10-12, Osaka, Japan, on CD ROM.
7. **Haapala, K. R.*†**, M. J. Hutchins*, J. L. Rivera*, V. Kumar*, A. R. Clarke*, T. D. Eatmon*, R. A. Harris, M. H. Durfee, J. R. Mihelcic, D. R. Shonnard, and J. W. Sutherland, 2007, “Education, Research, and Training Aspects of the Sustainable Futures NSF IGERT Project,” *Proceedings of the 2007 ASEE North Midwest Sectional Conf.*, September 20-22, Houghton, MI, on CD-ROM.
8. Sutherland, J. W.†, J. L. Rivera*, K. L. Brown*, M. Law*, M. J. Hutchins*, T. L. Jenkins*, and **K. R. Haapala***, 2008, “Challenges for the Manufacturing Enterprise to Achieve Sustainable Development,” *Manufacturing Systems and Technologies for the New Frontier: The 41st CIRP Conference on Manufacturing Systems*, Keynote Paper, May 26-28, Tokyo, Japan, M. Mitsuishi, K. Ueda, and F. Kimura, eds., pp. 15-18.
9. Rickli, J. R.* , A. R. Clarke*, **K. R. Haapala***, M. Addo*, J. A. Camelio, and J. W. Sutherland†, 2008, “Reducing the Environmental and Social Impacts of E-waste Recovery through Technology and Policy,” *Proceedings of the Global Conf. on Sustainable Product Development and Life Cycle Engineering: Sustainability and Remanufacturing IV*, September 29-October 1, Busan, Korea, pp. 201-206.
10. **Haapala, K. R.†**, S. K., Tiwari*, and B. K. Paul, 2009, “An Environmental Analysis of Nanoparticle-Assisted Diffusion Brazing,” *Proceedings of the 2009 ASME International Manufacturing Science & Engineering Conference (MSEC)*, Paper MSEC2009-84308, October 4-7, West Lafayette, IN, 8 pp., on CD-ROM.
11. Brown, M. O.* and **K. R. Haapala†**, 2010, “Challenges Facing Engineers in Evaluating Life Cycle Impacts of Emerging Technologies,” *Proceedings of the 17th CIRP International Conference on Life Cycle Engineering (LCE2010)*, Hefei, China, May 19-21, pp. 17-22.
12. Lee, W.-T.*†, **K. R. Haapala**, and K. H. Funk II, 2010, “Defining the Dimensions of Human Work for Industrial Sustainability Assessment,” *Proceedings of the 17th CIRP International Conference on Life Cycle Engineering (LCE2010)*, Hefei, China, May 19-21, pp. 384-389.
13. Chiu, M.-C.* , A. J. Alsaffar*, G. E. Okudan, and **K. R. Haapala†**, 2010, “Reducing Supply Chain Costs and Carbon Footprint during Product Design,” *Proceedings of the 2010 IEEE International Symposium on Sustainable Systems and Technology*, May 16-19, Washington, DC, 6 pp., on CD-ROM.

14. Hapke, H.* , **K. R. Haapala**†, Z. Wu, T. K. A. Brekken, 2010, “Life Cycle Assessment of Modern Wind Power Plants,” *Proceedings of the 2010 ASME IDETC/CIE: 15th Design for Manufacturing and the Lifecycle Conference (DFMLC)*, DETC2010-28749, August 15-18, Montreal, Canada, 8 pp., on CD-ROM.
15. Bohm, M. R.†, **K. R. Haapala**, K. Poppa*, R. B. Stone, and I. Y. Tumer, 2010, “Environmental Analysis of Consumer Products During the Conceptual Phase of Product Design,” *Proceedings of the 2010 ASME IDETC/CIE: 15th Design for Manufacturing and the Lifecycle Conference (DFMLC)*, Paper DETC2010-28265, August 15-18, Montreal, Canada, 12 pp., on CD-ROM.
16. Brown, M.O.* , **K. R. Haapala**†, B. K. Paul, R. D. Glover*, and J. E. Hutchison, 2010, “Addressing Uncertainty in the Environmental Analysis of Nickel Nanoparticle Production,” *Proceedings of the 2010 ASME International Manufacturing Science & Engineering Conference (MSEC)*, Paper MSEC2010-34251, October 12-15, Erie, PA, 8 pp., on CD-ROM.
17. **Haapala, K.R.**†, K. Poppa*, R. B. Stone, and I. Y. Tumer, 2011, “Automating Environmental Impact Assessment during the Conceptual Phase of Product Design,” *AAAI 2011 Spring Symposium: Artificial Intelligence and Sustainable Design*, Association for the Advancement of Artificial Intelligence, March 21-23, Stanford University, Stanford, CA, Paper SS11-02-011, pp. 53-59.
18. Olson, E.C.* , **K.R. Haapala**†, G.E. Okudan, 2011, “Integration of Sustainability Issues during Early Design Stages in a Global Supply Chain Context,” *AAAI 2011 Spring Symposium: Artificial Intelligence and Sustainable Design*, Association for the Advancement of Artificial Intelligence, March 21-23, Stanford University, Stanford, CA, Paper SS11-02-016, pp. 84-90.
19. Brown, M. O.* †, **K.R. Haapala**, R. T. Eluri*, B. K. Paul, S. D. Leith, and D. A. King, 2011, “Environmental Impacts of Microchannel Air Preheater Manufacturing under Different Scenarios,” *Proceedings of the IIE Annual Conference and Expo 2011 (IERC 2011)*, May 21-25, Reno, NV.
20. Olson, E.*†, G. Okudan, M.-C. Chiu, **K. R. Haapala**, 2011, “Positioning Product Architecture as the Driver for Carbon Footprint & Efficiency Trade-offs in A Global Supply Chain,” *International Conference on Industrial Engineering and Systems Management (IESM 2011)*, May 25 - 27, 2011, Metz, France.
21. Sahakian, M.V.*†, Brown, M.O.* , S.V. Atre, and **K. R. Haapala**, 2011, “Environmental and Cost Assessment of Several Injection Molded Materials,” *Proceedings of the 2011 ASME International Manufacturing Science & Engineering Conference (MSEC)*, MSEC2011-50057, June 13-17, Corvallis, OR.
22. Alsaffar, A.J.* †, **K. R. Haapala**, and Z. Wu, 2011, “Consideration of Manufacturing Processes and the Supply Chain in Product Design,” *Proceedings of the 2011 ASME International Manufacturing Science & Engineering Conference (MSEC)*, MSEC2011-50232, June 13-17, Corvallis, OR.
23. **Haapala, K.R.**†, F. Zhao, J. Camelio, J. W. Sutherland, S. J. Skerlos, D. A. Dornfeld, I. S. Jawahir, H. C. Zhang, and A. F. Clarens, 2011, “A Review of Engineering Research in Sustainable Manufacturing,” *Proceedings of the 2011 ASME International Manufacturing Science & Engineering Conference (MSEC)*, MSEC2011-50300, June 13-17, Corvallis, OR.

24. Zhang, H.*[†], **Haapala, K. R.**[†], M. E. Vanlue**^{*}, and K. H. Funk II, 2011, “Environmental Impact and Cost Assessment of Product Service Systems using IDEF0 Modeling,” *Proceedings of the NAMRI/SME*, Vol. 39, June 13-17, Corvallis, OR.
25. Kim, K.-Y.[†], **K. R. Haapala**, G. E. Okudan Kremer, E. A. Murat, R. B. Chinnam, and L. F. Monplaisir, 2011, “A Conceptual Framework for a Sustainable Product Development Collaboratory to Support Integrated Sustainable Design and Manufacturing,” *Proceedings of the 2011 ASME IDETC/CIE: 16th Design for Manufacturing and the Lifecycle Conference (DFMLC)*, Paper DETC2011-48922, August 28-31, Washington, D.C.
26. Eastlick, D. D.*[†], M. V. Sahakian*, and **K. R. Haapala**, 2011, “Sustainable Manufacturing Analysis for Titanium Components,” *Proceedings of the 2011 ASME IDETC/CIE: 16th Design for Manufacturing and the Lifecycle Conference (DFMLC)*, Paper DETC2011-48854, August 28-31, Washington, D.C.
27. Zhang, H.*[†] and **K. R. Haapala**, 2012, “Integrating Sustainability Assessment into Manufacturing Decision Making,” *Leveraging Technology for a Sustainable World: Proceedings of the 19th CIRP Conference on Life Cycle Engineering*, Berkeley, CA, May 23-25, D.A. Dornfeld and B.S. Linke, eds., Springer, pp. 551-556.
28. Lee, W.-T.*[†], **K. R. Haapala**, M. E. Edwards, and K. H. Funk II, 2012, “A Framework for the Evaluation and Redesign of Human Work Based on Societal Factors,” *Leveraging Technology for a Sustainable World: Proceedings of the 19th CIRP Conference on Life Cycle Engineering*, Berkeley, CA, May 23-25, D.A. Dornfeld and B.S. Linke, eds., Springer, pp. 575-580.
29. Alsaffar, A.J.*[†], **K.R. Haapala**, K.-Y. Kim, and G.E. Okudan Kremer, 2012, “A Process-Based Approach for Cradle-to-Gate Energy and Carbon Footprint Reduction in Product Design,” *Proceedings of the 2012 ASME International Manufacturing Science & Engineering Conference (MSEC)*, MSEC2012-7405, June 4-8, Notre Dame, IN.
30. Eastlick, D.D.*[†] and **K. R. Haapala**, 2012, “Increasing the Utility of Sustainability Assessment in Product Design,” *Proceedings of the 2012 ASME IDETC/CIE: 17th Design for Manufacturing and the Lifecycle Conference (DFMLC)*, Paper DETC2012-71144, August 12-15, Chicago, IL.
31. Philip, N.*[†], G.E. Okudan, **K. R. Haapala**, and K.-Y. Kim, 2012, “Computer-aided Generation of Modular Designs Considering Component End-of-Life Options: Implications for the Supply Chain,” *Proceedings of the 2012 ASME IDETC/CIE: 17th Design for Manufacturing and the Lifecycle Conference (DFMLC)*, Paper DETC2012-71180, August 12-15, Chicago, IL.
32. Gilchrist, B.P.*[†], I.Y. Tumer, R.B. Stone, Q. Gao*, and **K. R. Haapala**, 2012, “Comparison of Environmental Impacts of Innovative and Common Products,” *Proceedings of the 2012 ASME IDETC/CIE: 17th Design for Manufacturing and the Lifecycle Conference (DFMLC)*, Paper DETC2012-70559, August 12-15, Chicago, IL.
33. Philip, N.*[†], G. Okudan[†], **K.R. Haapala**, K.-Y. Kim, 2013, “A Comparison of Modularity Methods for Their Implications on Sustainability,” *Proceedings of the IIE Annual Conference and Expo 2013 (ISERC 2013)*, May 18-22, San Juan, Puerto Rico.
34. Zhang, H. *[†], F. J. Calvo-Amodio, and **K.R. Haapala**, 2013, “Assisting Sustainable Manufacturing Enterprise through System Dynamics: A Conceptual Model,” *Proceedings of the NAMRI/SME*, Vol. 41, June, Madison, WI.

35. Gilchrist, B. *†, D. Van Bossuyt, R. Arlitt, **K.R. Haapala**, I. Tumer, R. Stone, 2013, “Functional Impact Comparison of Common and Innovative Products,” *Proceedings of the 2013 ASME IDETC/CIE: 18th Design for Manufacturing and the Lifecycle Conference (DFMLC)*, Paper DETC2013-12599, August 4-7, Portland, OR.
36. Piacenza, J. *†, S.H. Seyedmahmoudi*, **K.R. Haapala**, I. Tumer, C. Hoyle, 2013, “Comparison of Sustainability Performance for Cross Laminated Timber and Concrete,” *Proceedings of the 2013 ASME IDETC/CIE: 18th Design for Manufacturing and the Lifecycle Conference (DFMLC)*, Paper DETC2013-12267, August 4-7, Portland, OR.
37. Eastwood, M.D. *†, **K.R. Haapala**, M.D. Carter, P. Liner, 2013, “Product and Process Design For Sustainable Assembly,” *Proceedings of the 2013 ASME IMECE (International Mechanical Engineering Conference and Exposition)*, Paper IMECE2013-63272, November 15-21, San Diego, CA.
38. Zhang, H. *, F. J. Calvo-Amodio†, and **K.R. Haapala**, 2013, “A Systems Thinking Approach for Modeling Sustainable Manufacturing Problems in Enterprises,” *American Society for Engineering Management 2013 International Annual Conference*, October 2-5, Minneapolis, MN, 11 pp.
39. Mirkouei, A.*† and **K.R. Haapala**, 2014, “Integration of Machine-Learning and Mathematical Programming Methods into the Biomass Feedstock Supplier Selection Process,” *24th International Conference on Flexible Automation and Intelligent Manufacturing (FAIM)*, May 20-23, San Antonio, TX.
40. Lajevardi, B.*†, K. R. Haapala, and J.F. Junker, 2014, “Real-time Monitoring and Evaluation of Energy Efficiency and Thermal Management of Data Centers,” *Proceedings of the NAMRI/SME*, Vol. 42, NAMRC42-4465, June 9-12, Detroit, MI.
41. Lajevardi, B.*†, K. R. Haapala, and J.F. Junker, 2014, “An Energy Efficiency Metric for Data Center Assessment,” *Proceedings of the IIE/ISERC*, Paper I657, May 31-June 3, Montreal, Quebec, Canada.
42. Cimino-Hurt, A.*† and K. R. Haapala, 2014, “A Framework for Assessing Environmental and Operational Performance of New Manufacturing Process Technology,” *Proceedings of the IIE/ISERC*, Paper I1095, May 31-June 3, Montreal, Quebec, Canada.
43. Girod, O.J.**, H. Zhang*, J. Calvo-Amodio†, K. R. Haapala, and J. B. Mason, 2014, “A Proposed Hybrid-Dynamic Transition Phase for High Mix Low Volume Manufacturers,” *Proceedings of the IIE/ISERC*, Paper I0969, May 31-June 1, Montreal, Quebec, Canada.
44. Garretson, I.*†, C. Eastwood**, M. Eastwood*, K.R. Haapala, 2014, “A Software Tool For Unit Process-Based Sustainable Manufacturing Assessment Of Metal Components,” *Proceedings of the 2014 ASME IDETC/CIE: 19th Design for Manufacturing and the Lifecycle Conference (DFMLC)*, Paper DETC2014-34557, August 17-20, Buffalo, NY.
45. Anderson, J.*, I.C., Garretson*†, K.R. Haapala, 2014, “Gate-To-Gate Sustainability Assessment For Small-Scale Manufacturing Businesses: Caddisfly Jewelry Production,” *Proceedings of the 2014 ASME IDETC/CIE: 19th Design for Manufacturing and the Lifecycle Conference (DFMLC)*, Paper DETC2014-34559, August 17-20, Buffalo, NY.

Other Publications and Posters

(* Graduate Student; ** Undergraduate Student; † Corresponding Author)

1. Poster: **Haapala, K. R.** †, 2006, “Predicting Environmental Performance of Manufacturing Operations for Steel Products,” Graduate Research Poster Session, Oct. 13-14, Michigan Technological University, Houghton, MI.
2. Poster: Okudan Kremer, G. E. †, Chiu, M.-C.*, **K. R. Haapala**, and A. J. Alsaffar*, 2010, “Cost and Sustainability Trade-off Analysis for Product Design, Manufacturing, and Supply Chain Management Dependencies,” *Building Partnerships and Pathways to Address Engineering Grand Challenges Conference*, February 8-10, El Paso, TX, *presented by Dr. Okudan Kremer*.
3. Poster: Brown, M. O. †*, **K. R. Haapala**, B. K. Paul, R. D. Glover*, and J. E. Hutchison, 2010, “Application of Life Cycle Assessment for Greener Synthesis of Nickel Nanoparticles,” Greener Nano 2010 (GN 10): Reducing Principles to Practice, June 16-18, Portland, OR.
4. Paper: Eatmon, T. D.† and **K. R. Haapala**, 2010, “Climate Solutions from Nanoscience to Geoengineering: Risk, Scale, and Scientific Uncertainty in Public Policymaking,” 2010 AESS (Association for Environmental Studies and Sciences) Conference, June 17-20, Portland, OR.
5. Poster: Brown, M. O. †*, **K. R. Haapala**, B. K. Paul, R. D. Glover, and J. E. Hutchison, 2010, “Application of Life Cycle Assessment for Greener Synthesis of Nickel Nanoparticles,” Oregon Nanoscience and Microtechnologies Institute (ONAMI) MegaMixer, August 27, Corvallis, OR.
6. Abstract: Sahakian, M.V. †*, **K.R. Haapala**, J.W. Marr, E.C. Eide, E.Y. Lenger, and M.D. Carter, 2010, “Sustainability Assessment of Titanium Aircraft Component Manufacturing,” 4th International Conference on Business & Sustainability, November 4-5, 2010, Portland, OR.
7. Poster: Prempreeda, P. †*, G. Rodrigo-Asensio*, **K. R. Haapala**, and T.K.A. Brekken, 2011, “Environmental Impact of Wind Energy and Supplemental Energy Sources in Northern Oregon,” *Oregon BEST Fest '11*, September 12, Portland, OR.
8. Poster: Clow, W.C. †*, **K.R. Haapala**, E.Y. Lenger, and M.D. Carter, 2011, “A Method and Tool for Manufacturing Sustainability Assessment,” 5th International Conference on Business & Sustainability, November 3-4, 2011, Portland, OR.
9. Abstract: Clow, W.C.*†, **K.R. Haapala**, M.D. Carter, E.Y. Lenger, and J.W. Marr, 2012, “A Process-Based Method for Sustainable Manufacturing Assessment,” *Proceedings of the IIE Annual Conference and Expo 2012 (ISERC 2012)*, May 19-23, Orlando, FL.
10. Extended Abstract: Niyaghi, F.* †, **K.R. Haapala**, S.L. Harper, M.C. Weismiller, 2013, “Evaluation of ZnO Metalworking Nanofluids (MWnF™),” STLE 68th Annual Meeting & Exhibition, May 5-9, Detroit, MI.

Thesis and Dissertation

1. Haapala, K. R., 2003, *A Model for Predicting Manufacturing Waste in Product Design and Process Planning*, **M.S. Thesis**, Department of Mechanical Engineering-Engineering Mechanics, Michigan Technological University, Houghton, MI. (Advisor: John W. Sutherland)
2. Haapala, K. R., 2008, *The Development of Models for Environmental Performance Improvement of Steel Product Manufacturing*, **Ph.D. Dissertation**, Department of Mechanical Engineering-Engineering Mechanics, Michigan Technological University, Houghton, MI. (Advisor: John W. Sutherland)

Reports and Paper Contributions

1. Haapala, K. R., S. J. Pavnaskar, S. S. Kinare, and K. N. Khadke, 2001, "Study of Environmental Issues Related to the Manufacture, Use and Post-Use of Off-Highway Trucks," Course Project Report, Engineering for the Environment (ENG4500).
2. Haapala, K. R., 2002, "Implementation of an Environmental Management System and Associated Pollution Prevention Opportunities," RETAP P2 Internship Program Report for Flex-N-Gate Forming Technologies, LLC, Warren, MI.
3. Haapala, K. R., J. Miller, and A. Zobenica, 2002, "Piston Sub-Assembly Analysis," Course Project Report, Environmentally Responsible Design and Manufacturing (MEEM4685).
4. Bekkala, G., S. Pandit, and J. Sutherland, 2002, "A Framework for Characterizing the Impact of Product Design Decisions on Environmental Performance," *Proceedings of the Japan-USA Symposium on Flexible Automation*, pp. 1369-1376 (assisted with research and manuscript preparation).
5. Haapala, K. R., 2005, "Modeling Energy, Resources, and Wastes for Electric Arc Furnace Melting and Sand Casting of Steel," Summer Internship Report, Caterpillar Inc., Peoria, IL.
6. Haapala, K. R., 2005, "Implementation of the European Union End-of-Life Vehicles Directive and Implications for the Automotive Industry," Course Project Report, Foundations of Public Policy (PPOL714, SUBR).
7. Haapala, K. R. and J. L. Rivera, 2005, "Role of the Manufacturing Industry in a Sustainable Society," Course Project Report, Sustainable Futures II (PPOL625, SUBR).
8. Haapala, K. R., 2005, "Using SimaPro 6.0 Software: Life Cycle Analysis and Environmental Impacts of Ground Engaging Tools," Course Project Report, Sustainable Futures I (ENG5510).
9. Sutherland, J. W., 2006, "Global Manufacturing and the Sustainability Challenge," *Technology Century Magazine*, The Engineering Society of Detroit, December 2006/January 2007, pp. 23-25 (assisted with research and manuscript preparation).
10. Zhang, Q., D. M. Johnson, M. Young, L. T. Helmuth, 2008, "Reducing the Environmental Impact of Material Conversion Process," Project Report for Dow Corning, September (assisted with literature survey and report preparation).
11. Clow, W.C., Sahakian, M.V., Eastlick, D.D., K.R. Haapala, 2011, "Development of a Sustainability Assessment Method for Fabrication of Metal Aircraft Components," Final Project Report for The Boeing Company, October 7.
12. Zhang, H., A. Suriya, K.R. Haapala, D.S. Kim, 2011, "Development and Application of a Metal Cutting Tool Selection Procedure," Final Report for the Benchmade Knife Company, Inc., October 31.
13. Niyaghi, F. and K.R. Haapala, 2013, "Feasibility of Non-Destructive Testing of Wooden Helmets," Final Report for Coyle Treepieces, January 25.
14. Eastwood, M.D., Eastwood, C.J., Garretson, I.C., and K.R. Haapala, 2013, "Sustainability Assessment for Aircraft Component Manufacturing and Assembly," Phase 2 Final Project Report for The Boeing Company, July 9.

15. Eastwood, M.D., Eastwood, C.J., Garretson, I.C., and K.R. Haapala, 2014, "Sustainability Assessment for Aircraft Component Manufacturing and Assembly," Phase 3 Final Project Report for The Boeing Company, June 25.
16. Lajevardi, B., Junker, J.F., and K.R. Haapala, 2014, "Data Center Cooling System Evaluation," White Paper for IT Aire, July 20.

Presentations at Professional Conferences

1. Panelist on "Teaching Political Science Across Disciplines," Michigan Conference of Political Sciences – 36th Annual Meeting, Oct. 15-16, 2004, Mt. Pleasant, MI.
2. "Issues Associated with MQL Implementation: Effect on Peripheral Milling Process Performance and Impact on Machining Economics," ASME/IMECE, Nov. 5-11, 2005, Orlando, FL. See paper above.
3. "Optimization of Steel Production to Improve Lifecycle Environmental Performance," CIRP General Assembly, August 19-25, 2007, Dresden, Germany. See paper above.
4. "Education, Research, and Training Aspects of the Sustainable Futures NSF IGERT Project," ASEE North Midwest Section Conference, Sep. 20-22, 2007, Houghton, MI. See paper above.
5. "A Life Cycle Environmental and Economic Comparison of Product-Service Systems," 36th Annual North American Manufacturing Research Conference, May 20-23, 2008, Monterrey, Mexico. See paper above.
6. "Reducing Environmental Impacts of Steel Product Manufacturing," 37th Annual North American Manufacturing Research Conference, May 19-22, 2009, Greenville, SC. See paper above.
7. "An Environmental Analysis of Nanoparticle-Assisted Diffusion Brazing," 2009 ASME Manufacturing Science & Engineering Conference (MSEC), October 4-7, West Lafayette, IN. See paper above.
8. "Reducing Supply Chain Costs and Carbon Footprint during Product Design," 2010 IEEE International Symposium on Sustainable Systems and Technology, May 16-19, Washington, DC, See paper above. (*Presented by M.-C. Chiu, Penn State*)
9. "Challenges Facing Engineers in Evaluating Life Cycle Impacts of Emerging Technologies," 17th CIRP International Conference on Life Cycle Engineering (LCE2010), Hefei, China, May 19-21, See paper above.
10. "Defining the Dimensions of Human Work for Industrial Sustainability Assessment," 17th CIRP International Conference on Life Cycle Engineering (LCE2010), Hefei, China, May 19-21, See paper above.
11. "Application of Life Cycle Assessment for Greener Synthesis of Nickel Nanoparticles," Greener Nano 2010 (GN 10): Reducing Principles to Practice, June 16-18, Portland, OR. (*Presented with M.O. Brown, M.S. Advisee*), See poster above.
12. "Climate Solutions from Nanoscience to Geoengineering: Risk, Scale, and Scientific Uncertainty in Public Policymaking," 2010 Association for Environmental Studies and Sciences Conference, June 17-20, Portland, OR. (*Presented by T.D. Eatmon, Alleghany College*), See paper above.

13. "Life Cycle Assessment of Modern Wind Power Plants," 2010 ASME IDETC/CIE: 15th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 15-18, Montreal, Canada, See paper above.
14. "Environmental Analysis of Consumer Products During the Conceptual Phase of Product Design," 2010 ASME IDETC/CIE: 15th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 15-18, Montreal, Canada, See paper above. (*Presented by M.R. Bohm, University of Louisville*)
15. "An Approach for Sustainable Manufacturing," SAE 2010 Aerospace Manufacturing and Automated Fastening Conference & Exhibition, September 28-30, Wichita, KS.
16. "Addressing Uncertainty in the Environmental Analysis of Nickel Nanoparticle Production," 2010 ASME International Manufacturing Science & Engineering Conference (MSEC), October 12-15, Erie, PA, See paper above (*Presented by M.O. Brown, M.S. advisee*).
17. "Sustainability Assessment of Titanium Aircraft Component Manufacturing," 4th International Conference on Business & Sustainability, November 4-5, 2010, Portland, OR.
18. "Automating Environmental Impact Assessment during the Conceptual Phase of Product Design," 2011 Spring Symposium Series: Artificial Intelligence and Sustainable Design, Association for the Advancement of Artificial Intelligence, March 21-23, Stanford University, Stanford, CA, (*Presented by K. Poppa, Oregon State Ph.D. student*), See paper above.
19. "Integration of Sustainability Issues during Early Design Stages in a Global Supply Chain Context," 2011 Spring Symposium Series: Artificial Intelligence and Sustainable Design, Association for the Advancement of Artificial Intelligence, March 21-23, Stanford University, Stanford, CA, See paper above.
20. "Environmental Impacts of Microchannel Air Preheater Manufacturing under Different Scenarios," IIE Annual Conference and Expo 2011 (IERC 2011), Reno, NV, (*Presented by M.O. Brown, M.S. advisee*), See paper above.
21. "Toward Collaborative E-learning for Sustainable Design and Manufacturing," IIE Annual Conference and Expo 2011 (IERC 2011), Reno, NV, (with Kim, K.-Y., G. E. Okudan Kremer, E. A. Murat, and R. B. Chinnam), (*Presented by K.-Y. Kim, Wayne State University*), abstract.
22. "Positioning Product Architecture as the Driver for Carbon Footprint & Efficiency Trade-offs in A Global Supply Chain," International Conference on Industrial Engineering and Systems Management (IESM 2011), May 25 - 27, 2011, Metz, France, (*Presented by G.E. Okudan Kremer, Pennsylvania State University*).
23. "Environmental Impact and Cost Assessment of Product Service Systems using IDEF0 Modeling," 39th North American Manufacturing Research Conference (NAMRC), June 13-17, 2011, Corvallis, OR, (*Presented by H. Zhang, M.S. advisee*), see paper above.
24. "Environmental and Cost Assessment of Several Injection Molded Materials," 2011 ASME International Manufacturing Science & Engineering Conference (MSEC), June 13-17, Corvallis, OR, (*Presented by M.V. Sahakian, M.S. advisee*), see paper above.
25. "Consideration of Manufacturing Processes and the Supply Chain in Product Design," 2011 ASME International Manufacturing Science & Engineering Conference (MSEC), June 13-17, Corvallis, OR, (*Presented by A.J. Alsaffar, M.S. advisee*), see paper above.

26. "A Review of Engineering Research in Sustainable Manufacturing," 2011 ASME International Manufacturing Science & Engineering Conference (MSEC), Manufacturing Engineering Division Biennial State of the Art Paper, June 13-17, Corvallis, OR, (*Presented by J. Camelio, Virginia Tech University and F. Zhao, Purdue University*), see paper above.
27. "A Conceptual Framework for a Sustainable Product Development Collaboratory to Support Integrated Sustainable Design and Manufacturing," 2011 ASME IDETC/CIE: 16th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 28-31, Washington, D.C., see paper above.
28. "Sustainable Manufacturing Analysis for Titanium Components," 2011 ASME IDETC/CIE: 16th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 28-31, Washington, D.C., see paper above.
29. Panelist on Faculty Panel on Graduate Studies, 2012 IIE Western Regional Conference, March 2-4, Corvallis, OR.
30. "A Process-Based Method for Sustainable Manufacturing Assessment," IIE Annual Conference and Expo 2012 (ISERC 2012), May 19-23, Orlando, FL, (*Presented by W.C. Clow, M.S. advisee*), see abstract above.
31. "Integrating Sustainability Assessment into Manufacturing Decision Making," 19th CIRP International Conference on Life Cycle Engineering (LCE2012), Berkeley, CA, May 23-25, 2012, (*Presented by H. Zhang, M.S. advisee*), see paper above.
32. "A Framework for the Evaluation and Redesign of Human Work Based on Societal Factors," 19th CIRP International Conference on Life Cycle Engineering (LCE2012), Berkeley, CA, May 23-25, 2012, see paper above.
33. "A Process-Based Approach for Cradle-to-Gate Energy and Carbon Footprint Reduction in Product Design," 2012 ASME International Manufacturing Science & Engineering Conference (MSEC), MSEC2012-7405, June 4-8, 2012, Notre Dame, IN, (*Presented by A.J. Alsaffar, M.S. advisee*), see paper above.
34. "Increasing the Utility of Sustainability Assessment in Product Design," 2012 ASME IDETC/CIE: 17th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 12-15, Chicago, IL, see paper above.
35. "Computer-aided Generation of Modular Designs Considering Component End-of-Life Options: Implications for the Supply Chain," 2012 ASME IDETC/CIE: 17th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 12-15, Chicago, IL (*Presented by G.E. Okudan Kremer, Pennsylvania State University*), see paper above.
36. "Comparison of Environmental Impacts of Innovative and Common Products," 2012 ASME IDETC/CIE: 17th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 12-15, Chicago, IL, (*Presented by B.P. Gilchrist, Oregon State University student*), see paper above.
37. "Environmental Impacts of Wind and Supplemental Energy Systems," Oregon BEST FEST, September 13, 2012, Portland, OR (*Presented by P. Prempreeda, M.S. advisee*).

38. "Evaluation of ZnO Metalworking Nanofluids (MWnF™)," STLE 68th Annual Meeting & Exhibition, May 5-9, 2013, Detroit, MI (*Presented by F. Niyaghi, M.S. advisee*), see extended abstract above.
39. "A Comparison of Modularity Methods for Their Implications on Sustainability," IIE Annual Conference and Expo 2013 (IERC 2013), May 18-22, San Juan, Puerto Rico, (*Presented by G.E. Okudan Kremer, Pennsylvania State University*), see paper above.
40. "Assisting Sustainable Manufacturing Enterprise through System Dynamics: A Conceptual Model," NAMRI/SME, Vol. 41, June, Madison, WI, (*Presented by H. Zhang, Ph.D. advisee*), see paper above.
41. Panelist for the Early Career Forum, 2013 ASME Manufacturing Science & Engineering Conference (MSEC), June 10-13, University of Wisconsin, Madison, WI.
42. "Functional Impact Comparison of Common and Innovative Products," 2013 ASME IDETC/CIE: 18th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 4-7, Portland, OR, (*Presented by B. Gilchrist, M.S. student co-author*), see paper above.
43. "Comparison of Sustainability Performance for Cross Laminated Timber and Concrete," 2013 ASME IDETC/CIE: 18th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 4-7, Portland, OR, (*Presented by J. Piacenza, Ph.D. student co-author*), see paper above.
44. Zhang, H. *, F. J. Calvo-Amodio†, and K.R. Haapala, 2013, "A Systems Thinking Approach for Modeling Sustainable Manufacturing Problems in Enterprises," American Society for Engineering Management 2013 International Annual Conference, October 2-5, Minneapolis, MN, (*Presented by H. Zhang, Ph.D. advisee*), see paper above.
45. "A Systems Thinking Approach for Modeling Sustainable Manufacturing Problems in Enterprises," *American Society for Engineering Management 2013 International Annual Conference*, October 2-5, Minneapolis, MN (*Presented by H. Zhang, Ph.D. advisee*), see paper above.
46. "Product And Process Design for Sustainable Assembly," 2013 ASME IMECE (International Mechanical Engineering Conference and Exposition, November 15-21, San Diego, CA, (*Presented by M. Eastwood, M.S. advisee*), see paper above.
47. "Integration of Machine-Learning and Mathematical Programming Methods into the Biomass Feedstock Supplier Selection Process," *24th International Conference on Flexible Automation and Intelligent Manufacturing (FAIM)*, May 20-23, 2014, San Antonio, TX (*Presented by A. Mirkouei, Ph.D. advisee*), see paper above.
48. "An Energy Efficiency Metric for Data Center Assessment," *IIE/ISERC*, May 31-June 3, 2014 Montreal, Quebec, Canada (*Presented by B. Lajevardi, Ph.D. advisee*), see paper above.
49. "Real-time Monitoring and Evaluation of Energy Efficiency and Thermal Management of Data Centers," *Proceedings of the NAMRI/SME*, Vol. 42, NAMRC42-4465, June 9-12, 2014, Detroit, MI (*Presented by B. Lajevardi, Ph.D. advisee*), see paper above.
50. "A Framework for Assessing Environmental and Operational Performance of New Manufacturing Process Technology," *IIE/ISERC*, May 31-June 3, 2014, Montreal, Quebec, Canada (*Presented by A. Cimino-Hurt, M.S. advisee*), see paper above.

51. "A Proposed Hybrid-Dynamic Transition Phase for High Mix Low Volume Manufacturers," *IIE/ISERC*, May 31-June 1, 2014, Montreal, Quebec, Canada (*Presented by O. Girod, B.S. Honors thesis advisee*), see paper above.
52. "A Software Tool For Unit Process-Based Sustainable Manufacturing Assessment of Metal Components," 2014 ASME IDETC/CIE: 19th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 17-20, Buffalo, NY (*Presented by I. Garretson, M.S. advisee*), see paper above.
53. "Gate-To-Gate Sustainability Assessment For Small-Scale Manufacturing Businesses: Caddisfly Jewelry Production," 2014 ASME IDETC/CIE: 19th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 17-20, Buffalo, NY (*Presented by I. Garretson, M.S. advisee*), see paper above.

Other Presentations, Seminars, and Lectures

1. "Caterpillar Internship 2005: Modeling Manufacturing Process Energy, Resources, and Wastes," Sustainable Futures Institute (SFI) Brown Bag Seminar, Sep. 7, 2005, Michigan Technological University.
2. "Predicting Environmental Performance of Manufacturing Operations for Steel Products," Sustainable Futures Institute Research Colloquium, Jan. 18, 2006, Michigan Technological University.
3. "Environmental Performance of Manufacturing Operations," for the Factory Team, June 9, 2006, University of Oulu, Finland.
4. "An Overview of the Sustainable Futures Institute at Michigan Tech," for the Factory Team, June 13, 2006, University of Oulu, Finland.
5. "Michigan Tech and the Sustainable Futures Institute," for the Laboratory of Process Metallurgy, Aug. 2, 2006, University of Oulu, Finland.
6. "Optimization of EAF Steelmaking Environmental Performance: A Process Modeling Approach," Sigma Xi Research Colloquium, April 14, 2007, Michigan Technological University.
7. "Sustainable Design and Manufacturing," Facilitators: K.R. Haapala and M.J. Hutchins, SFI Colloquium in Sustainability, July 11, 2007, Michigan Technological University.
8. "Optimization of Steel Production to Improve Lifecycle Environmental Performance," SFI Colloquium in Sustainability, Aug. 8, 2007, Michigan Technological University.
9. "Decision-Making for Sustainable Manufacturing," Project Presentation, March 13, 2008, Caterpillar Inc., Peoria, IL.
10. "Incorporating Environmental Sustainability Concepts into Manufacturing Decision Making," CII Henes Fellow Lecture, March 21, 2008, Michigan Technological University.
11. "Decision-Making for Sustainable Manufacturing," Project Presentation, August 14, 2008, Caterpillar Inc., Peoria, IL.
12. "Decision-Making for Sustainable Manufacturing," Project Presentation, August 15, 2008, Caterpillar Inc., Champaign, IL.

13. "Life Cycle Analysis," Guest Lecture, Entrepreneurship, Innovation, and Supply Chain in Environmental Management (BA 567), May 15, 2009, Oregon State University, Corvallis, OR.
14. "Manufacturing Engineering," Guest Lecture, Introduction to Industrial and Manufacturing Engineering (IE 285), November 16, 2009, Oregon State University, Corvallis, OR.
15. "Sustainable Engineering," Guest Lecture, Engineering Orientation I (ENGR 111), November 30, 2009, Oregon State University, Corvallis, OR.
16. "Improving Environmental Performance of Manufacturing Operations," Webinar, April 22, 2010, Boeing Sustainable Manufacturing National Working Group.
17. "Application of Life Cycle Assessment for Greener Synthesis of Nickel Nanoparticles," Poster, Oregon Nanoscience and Microtechnologies Institute (ONAMI) MegaMixer, August 27, 2010, Corvallis, OR. (*Presented with M.O. Brown, M.S. Advisee*), See poster above.
18. Invited Seminar, "Sustainability Assessment of Nanomanufacturing Processes," Sustainable Nanomanufacturing Workshop, June 13, 2011, Oregon State University, Corvallis, OR.
19. "Sustainability Assessment Method for Fabrication of Metal Aircraft Components," Poster, Boeing SHEA Fair, August 18, 2011, Gresham, OR.
20. Invited Speaker, "Sustainable Manufacturing Research," Presentation for National Institute of Standards and Technology (NIST), September 1, 2011, Gaithersburg, MD.
21. Invited Seminar, "Advanced Manufacturing and Sustainability," Smartmap Expo, September 29, 2011, TRAC Center, Pasco, WA.
22. Invited Seminar, "Research Case Studies from the OSU Industrial Sustainability Laboratory," OSU/ESH Corporate Partners Seminar, Oregon State University, November 11, 2011, Corvallis, OR.
23. Invited Speaker, "Development of a Sustainable Manufacturing Assessment Tool," Presentation for Boeing, February 29, 2012, Tukwila, WA.
24. Invited Speaker, "Sustainability Assessment in Design for Manufacturing," Mechanical Engineering Seminar, Portland State University, May 11, 2012, Portland, OR.
25. Invited Panelist, "Experiences with Screening UPLCI Studies," Building the Industry-University Network for Unit Process Life Cycle Inventories (UPLCI/CO2PE!) Workshop, May 23, 2012, Berkeley, CA.
26. Invited Lecturer, *Sustainability Management and Technology*, European Union ERASMUS Intensive Programme, Bethune Institut Universitaire de Technologie, May 27-June 9, 2012, Béthune, France.
27. Invited Speaker, "Research in Sustainable Manufacturing Assessment," Centre for Research in Interdisciplinary Studies in Sustainable Development, Université de Technologie Troyes, June 8, 2012, Troyes, France.
28. Invited Seminar Speaker, "Sustainability in Engineering Design and Manufacturing Engineering," Lundquist College of Business, University of Oregon, October 12, 2012, Eugene, OR.

29. Invited Seminar Speaker, "Sustainability Assessment of Titanium and Aluminum Product Manufacturing," Materials Science Seminar, Oregon State University, May 2, 2013, Corvallis, OR.
30. Invited Representative, Oregon State University DOE Industrial Assessment Center/SME Student Chapter Partnership, Booth at SME Annual Conference, June 2-3, 2013, Baltimore, MD.
31. Invited Speaker, "Sustainability Assessment of Metal Component Manufacturing and Assembly," National Institute of Standards and Technology (NIST), June 4, 2013, Gaithersburg, MD.
32. Invited Lecturer, "Sustainability Assessment for Metals Manufacturing," NSF Pan-American Studies Institute (PASI) on Manufacturing Innovation through Sustainable Design, July 13-27, 2013, Barranquilla, Colombia.
33. Presenter, "Enabling Sustainable and Resilient Supply Chains During Early Product Design," NSF I/UCRC Center for e-Design Strategic Planning Meeting, Corvallis, OR, July 31-August 1, 2013.
34. Invited Speaker, "Improving Environmental Performance of Cast Metal Products," Oregon Chapter of the American Foundry Society, Portland, OR, January 15, 2014.
35. Invited Participant and Panelist, Smart Manufacturing Workshop, National Institute of Standards and Technology (NIST), Gaithersburg, MD, June 16-17, 2014.
36. Invited Speaker: "A Unit Process Model Based Methodology to Assist Product Sustainability Assessment During Design for Manufacturing," 4th International Forum on Sustainable Manufacturing at the University of Kentucky, September 12, 2014, Lexington, KY.

Other Conferences/Meetings/Workshops Attended

1. Pollution Prevention (P2) Training, Michigan Department of Environmental Quality, Grand Rapids, MI, May 2002.
2. Regs 101: Environmental Regulations, Ann Arbor, MI, July 2002.
3. Water Treatment, Melvindale, MI, July 2002.
4. Engineering for the Environment Education Workshop, Houghton, MI, January 2003.
5. Sustainable Futures Institute Workshop, Houghton, MI, April 2004.
6. Japan-U.S.A. Symposium on Flexible Automation, Denver, CO, July 19-21, 2004.
7. SFI Orientation/Professional Development Week, Houghton, MI, August 2004.
8. 21st Annual Louisiana Remote Sensing & GIS Workshop, New Orleans, LA, April 19-21, 2005.
9. SFI Orientation/Professional Development Week, Houghton, MI, August 2005.
10. Addressing the Social Dimension of Sustainability in Engineering Education Workshop, ASEE North Midwest Section Conference, Houghton, MI, September 20-22, 2007.
11. Education and Outreach Programs Directed at Diverse Students and Faculty, NSF Division of Undergraduate Education (Dr. L. Crumpton-Young, NSF), Houghton, MI, October 6, 2008.

12. Greener Nano 2009, 4th Annual Greener Nanoscience Conference: Nanoscience for a Sustainable Future, Eugene, OR, March 2-3, 2009.
13. Wind Energy Technology (Part II), IEEE Industry Applications Society Professional Presentation (Steven W. Saylor, Vestas Americas), Portland, OR, April 14, 2009.
14. Institute of Industrial Engineers (IIE) New Faculty Colloquium, Miami, FL, May 30, 2009. (Nominated by School Head)
15. Center for Sustainable Engineering Workshop, Pittsburgh, PA, July 13-14, 2009. (Selected through application process.)
16. CIRP 2009 General Assembly, Boston, MA, August 23-27, 2009. (Selected through application process for travel award.)
17. Oregon BEST FEST 2009, Portland State University, Portland, OR, September 14, 2009. (Oregon BEST member)
18. 2009 Micro Nano Breakthrough Conference, Portland, Oregon, September 21-23, 2009. (ONAMI member)
19. CO₂PE! Workshop, 17th CIRP International Conference on Life Cycle Engineering (LCE2010), Hefei, China, May 19-21, 2010. (Open to conference participants)
20. College of Business C2C Project Faculty Discussion Group on the OSU College of Engineering, Corvallis, OR, May 25, 2010. (Focus group for new faculty employees)
21. NSF Workshop: Design Methods for Sustainability, Group 2: Manufacturing Issues, August 15, 2010, Montreal, Quebec, Canada. (Selected through application process)
22. NSF Proposal Writing Workshop, September 1-2, 2010, Lincoln, NE. (Selected through application process)
23. NSF Computing Education for the 21st Century Community Meeting, January 31-February 1, 2011, New Orleans, LA. (Invited as PI of an NSF CI-TEAM project)
24. Sustainable Aerospace Manufacturing Initiative (SAMI) Academic Workshop, March 10, 2011, Berkeley, CA. (Invited as a recognized researcher in sustainable manufacturing; ~20 attendees)
25. NSF CI-TEAM Principal Investigator's Meeting, May 24-26, 2011, Champaign-Urbana, IL. (Invited as PI of an NSF CI-TEAM project)
26. 5th International Conference on Business & Sustainability, November 4-5, 2011, Portland, OR.
27. Professional Science Master (PSM) in Renewable Energy Workshop, December 2, 2011, Oregon State University, Corvallis, OR.
28. Effective Practices for Teaching Hybrid (Blended) Courses, February 22, 2012, Oregon State University, Corvallis, OR.
29. Sustainable Textiles Symposium, May 14, 2012, Oregon State University, Corvallis, OR.
30. PhD Student Mentoring Workshop, February 25, 2013, Oregon State University, Corvallis, OR.
31. Green Chemistry Agenda Development Forum, Oregon BEST, November 6, 2013, Oregon State University, Corvallis, OR.

32. Advanced Manufacturing Impact Forum, ASME 2013 International Mechanical Engineering Congress & Exposition, November 18, 2013, San Diego, CA.
33. Navigating Federal Agencies and Target Opportunities, November 26, 2013, Oregon State University, Corvallis, OR.
34. NSF Workshop: Faculty Development Needs for Advanced Manufacturing in the USA, January 9-10, 2014, Washington, D.C.
35. NSF CAREER Workshops, Part 1: February 6, 2014, Part 2: April 9, 2014, Oregon State University, Corvallis, OR.
36. Clean Energy Manufacturing Initiative (CEMI) Western Regional Summit, U.S. Department of Energy, San Francisco, CA, April 17, 2014.

TEACHING

Oregon State University

- Winter 2014 *Instructor*, Production Engineering, MFGE 336
Guest Speaker, Sustainable Communities, NR350/SUS350
 Presented a lecture on life cycle assessment.
- Fall 2013 *Instructor*, Industrial Sustainability Analysis, MFGE 535
Curriculum Innovation: Gained university approval to offer the IE 599 special topic course as a grad-only course (MFGE 535), which serves the new Advanced Manufacturing focus area in the Industrial Engineering graduate program.
Instructor, Computer Aided Design and Manufacturing, ME 413
Guest Speaker, Introduction to Industrial and Manufacturing Engineering, IE/MFGE 285, Lecture on manufacturing engineering.
- Winter 2013 *Instructor*, Production Engineering, MFGE 336
Guest Speaker, Materials and Manufacturing Processes, MFGE 337
 Led two class periods on sustainable manufacturing topics.
Curriculum Innovation: (1) Developed a new sustainable manufacturing lab activity for MFGE 337 using GRANTA software Eco-Audit tool. **(2)** Worked with IME UPC and manufacturing faculty to modify MFGE 336 and MFGE 337, including exchange of course modules (sustainable manufacturing, machining theory) and new learning outcomes.
- Fall 2012 *Instructor*, ST/Industrial Sustainability Analysis, IE 599/499
Instructor, Computer Aided Design and Manufacturing, ME 413
Guest Speaker, Clean Technology Commercialization, BA 566
 Lecture and in-class activity on conducting a life cycle assessment.
Curriculum Innovation: Developed and delivered IE 499/499 based on IE 491/591 from Fall 2011 to include business elements in the form of guest speakers from academia and industry. The course name was changed to reflect this.

Winter 2012 *Instructor*, Production Engineering, IE 336
Guest Speaker, Materials and Manufacturing Processes, IE 337
Lecture life cycle assessment for sustainable nanomanufacturing.

Fall 2011 *Instructor*, ST/Sustainable Engineering Analysis, IE 591/491
Instructor, Computer Aided Design and Manufacturing, ME 413
Guest Speaker, Clean Technology Commercialization, BA 566
Lecture and in-class activity on conducting a life cycle assessment.

Spring 2011 *Course Development*, Computer Aided Design and Manufacturing, ME 413
Course Development, ST/Sustainable Engineering Analysis, IE 591/491
Curriculum Innovation: New course development (IE 591/491).
Expansion of programmable logic control laboratory capacity through TRF award (ME 413).

Winter 2011 *Instructor*, Production Engineering, IE 336

Fall 2010 *Instructor*, Computer Aided Design and Manufacturing, ME 413
Instructor, MECOP/CECOP Seminar, ENGR 407

Spring 2010 *Course Development*, Computer Aided Design and Manufacturing, ME 413
Curriculum Innovation: Expansion of programmable logic control laboratory capacity through TRF award (ME 413).

Winter 2010 *Instructor*, Production Engineering, IE 336
Curriculum Innovation: New course developed as part of revised undergraduate Manufacturing Engineering curriculum. Instructional responsibility for course on production engineering fundamentals, including development and delivery of lectures, homework, project, and exams (IE 336).

Fall 2009 *Guest Speaker*, Introduction to Industrial and Manufacturing Engineering, IE 285
Lecture on manufacturing engineering.
Guest Speaker, Engineering Orientation I, ENGR 111
Lecture on sustainable engineering.
Instructor, MECOP/CECOP Seminar, ENGR 407
Co-Instructor, Computer Aided Design and Manufacturing, ME 413
Curriculum Innovation: Developed/delivered new two-week module on industrial control systems, including a PLC lab exercise, as part of revised undergraduate Manufacturing Engineering curriculum (ME413).

Spring 2009 & Fall 2009 *Course Development*, Production Engineering, IE 336
Development of course materials; coordinated with teaching assistant and lab technician in development of hands-on student labs to support lectures.

Spring 2009 *Guest Speaker*, Entrepreneurship, Innovation, and Supply Chain in Environmental Management, BA 567
Lecture on life cycle analysis and its use by companies.

Winter 2009 *Co-Instructor*, Computer Aided Mechanical Design, ME 413
Curriculum Innovation: Developed/delivered two-week module on sustainable design and manufacturing, including a lab-based project (ME 413).

Michigan Technological University

Fall 2008 *Instructor*, Introduction to Service Systems Engineering, SSE 2100
Instructional responsibility for course on service management and systems engineering fundamentals, including lectures, homework, project, and exams.
Guest Speaker, Environmentally Responsible Design and Mfg., MEEM 4685
Presented modeling of manufacturing processes for environmental performance.

Fall 2007 &
Spring 2008 *Teaching Assistant*, Graduate Colloquium in Sustainability, ENG 5530
Co-organized interdisciplinary, interuniversity seminar series. Graded proposals, reports, and presentations for project teams. Maintained course website.

Spring 2006 *Guest Speaker*, Social Inequality, SS 3750
Discussed doctoral exchange at Southern University, an HBCU.

Fall 2004 &
Fall 2005 *Guest Lecturer*, Quality Engineering, MEEM 4650/5650
Prepared and delivered four lectures.

Spring 2004 *Teaching Assistant*, Environmentally Responsible Design and Mfg., MEEM 4685
Developed/graded assignments, project, and exams for on-campus and distance learning students. Prepared lectures; delivered one lecture. Maintained website.

Other Educational Contributions

1. Coordinated B.S. Manufacturing Engineering Curricular redesign, Oregon State University, Winter-Fall, 2009.
2. Developed Educational Module, "Sustainable Product Manufacturing," Center for Sustainable Engineering, Carnegie Mellon University, Summer 2010.

Student and Participant Evaluation

Oregon State University

Student responses to questions on Evaluation Form (Rated 1 - 6, with 6 being excellent).

Q1. "The course, as a whole, was:"

Q2. "The instructor's contribution to the course was:"

Course No.	Term	Enrollment	# Responding	Student Evaluation (#1/#2)	College Averages* (#1/#2)	Δ	Required/Elective
ME 413 ^a	Winter 2009	84	**	**	**	**	Elective
IE 505	Summer 2009	1	**	**	**	**	Elective
ENGR 407	Fall 2009	20	**	**	**	**	Required
ME 413 ^a	Fall 2009	42	28	5.1/5.3	4.7/4.9	+0.4/+0.4	Required
IE 336	Winter 2010	26	17	3.6/3.9	4.5/4.8	-0.9/-0.9	Required
ENGR 407	Fall 2010	20	**	**	**	**	Required
IE 505	Fall 2010	1	**	**	**	**	Elective
ME 413	Fall 2010	59	28	4.7/4.0	4.6/4.8	+0.1/-0.8	Required
IE 336	Winter 2011	26	20	3.4/3.6	4.5/4.7	-1.1/-1.1	Required
IE 505	Fall 2011	1	**	**	**	**	Elective
IE 491/591	Fall 2011	0/5	0/5	NA (491) 5.7/5.7 (591)	4.6/4.8*	+1.1/+0.9	Elective
ME 413	Fall 2011	72	66	4.1/4.0	4.6/4.8*	-0.5/-0.8	Required
IE 336	Winter 2012	41	38	3.9/3.8	4.6/4.8*	-0.7/-1.0	Required
IE 499/599	Fall 2012	0/6	0/5	NA (499) 5.5/5.8 (599)	4.6/4.8*	+0.9/+1.0	Elective
ME 413	Fall 2012	82	72	4.7/4.5	4.6/4.8*	+0.2/-0.3	Required
MFGE 336	Winter 2013	27	10	4.0/4.0	4.5/4.6*	-0.5/-0.6	Required
IE 505	Spring 2013	2	**	**	**	**	Elective
IE 505	Fall 2013	3	**	**	**	**	Elective
ME 413	Fall 2013	85	53	4.49/4.49	4.6/4.8*	-0.11/-0.31	Required
MFGE 535	Fall 2013	7	4	4.50/4.75	4.6/4.8*	-0.1/-0.05	Elective
MFGE 336	Winter 2014	75	61	3.40/3.60	NA/NA*	NA/NA	Required

* College averages are shown separately for each level (e.g., 400, 500) taught prior to Fall 2011.

** Not rated.

^a Team taught.

Michigan Technological University

Student responses to questions on Evaluation Form (Rated 1 - 5, with 5 being "strongly agree").

Q1. "Given the opportunity, I would take another course from this instructor."

Q2. "Taking everything into account, I would consider this instructor to be an excellent teacher:"

Term	Course	Students	Q1	Q2
Fall 2008	SSE 2100	6	4.4	4.0

B.S. Honors Thesis Advisees – Major Advisor

- Mary Elizabeth (Mary Beth) Vanlue, IE (OSU), December 2010, “A Method to Effectively Measure Sustainability in Non-Profit Organizations”
- Olivia Girod, IE (OSU, Co-Advisor: J. Calvo-Amodio), June 2014, “A Hybrid-Dynamic Transition Phase for High Mix Low Volume Manufacturers”

B.S. Honors Thesis Committee Service

- Mishal Albassam, IE (OSU, Advisor: J. Calvo-Amodio), March 2014, “The Steps Taken to Design, Select, and Manufacture A Shoe Press for a Small Shoe Manufacturing Company”

Senior Project Advising

- Brent Hughes, Derek Sugiyama, and Mary Beth Vanlue, Furniture Recycling Process and Measures, **Sponsor:** Benton Furniture Share, 2009-2010.
Resulting Paper: Hughes, B., D. Sugiyama, and M.B. Vanlue, 2010, “Process Improvement in a Non-Profit Organization,” *Proceedings 2010 Capstone Design Conference*, July 7-9, Boulder, CO.
- Sam Brannon, Brandon Johnsen, and Michael Visser, Wireless Tool Monitoring System, **Sponsor:** School of Mech/Ind/Mfg Engineering (OSU), 2009-2010.
- Jonathan Glazner, Arthur Muñoz, Bryan Williams, Development of a Process for Testing the Machining Performance of Nanofluids, **Sponsor:** OSU Industrial Sustainability Laboratory, **Partners:** OSU Nanotoxicology Laboratory, Microproducts Breakthrough Institute, Master Chemical, Boeing, 2010-2011.
- Bryan Hudspeth, Simon Manso, Alexander Skrydlak, Development of a Knife Testing Device, **Sponsor:** Benchmade Knife Company, 2010-2011.
- Co-advised two teams with J. Calvo (Ph.D. advisee Hao Zhang served as mentor): Team 1: Matt Munson, Dat Ho, Chris Thompson; Team 2: Jake Ralston, Mudhyan AlMudhyan, Mohammed Alqahtani, Design of a Production Scheduling System, **Sponsor:** Sheldon Manufacturing Inc., 2013-2014.
- Co-advised two teams with J. Calvo (Ph.D. advisee Hao Zhang served as mentor): Team 1: Joel Duhn, Cameron Cruz, Ashleigh Brinkman; Team 2: Adam Strength, James Amrhein, Olivia Girod, Design of Express Line of High Running Products, **Sponsor:** Sheldon Manufacturing Inc., 2013-2014.

Undergraduate Student Supervision and Mentoring

- Kyle Franks, ME (MTU), 2007, web page designer for J.W. Sutherland
- Brandon Quig, ME (MTU), 2008, web page designer for J.W. Sutherland
- Garrett Hoofman, CS (MTU), 2008, web page designer for J.W. Sutherland
- Misha Sahakian, IE (OSU), Summer 2009, undergraduate researcher, nano-metalworking fluids
- Claire Oshatz, IE (OSU), Summer 2011, undergraduate researcher, manufacturing cost modeling
- Nathan Klammer, ME (California Polytechnic State University, San Luis Obispo), Summer 2011, undergraduate researcher, alternative energy analysis and nano-assisted metal cutting
- Steven Hattrup, MfgE (OSU), Summer 2011, undergraduate assistant, product disassembly
- Tim Heneveld, MfgE (OSU), Winter 2012, undergraduate assistant, product disassembly, URISC:Start Recipient (\$1000 award)

- Daniela Rodriguez Casallas, IE (UNAL, Colombia), Fall 2012, life cycle assessment of alternative energy systems
- Ian Garretson, IE (OSU), Spring 2013, undergraduate research assistant, sustainable manufacturing assessment method and model development
- Jackson Santee, IE (OSU), Spring 2013, URSA:ENGAGE undergraduate research assistant, sustainable manufacturing systems engineering
- Christopher Eastwood, Comp. Engr. (OSU), Spring-Fall 2013, URSA:ENGAGE undergraduate research assistant, sustainable manufacturing assessment tool development
- Scott Lindbloom, MfgE (OSU), Fall 2013-Winter 2014, URISC undergraduate research assistant, electrically-assisted machining
- Anthony Farr, ME (OSU), Winter-Spring 2014, URSA:ENGAGE undergraduate research assistant, sustainable manufacturing systems engineering

High School Student Supervision and Mentoring

- Albert Cai, Crescent Valley High School (Corvallis, OR), Summer 2012, Saturday Academy: Apprenticeships in Science & Engineering Program, product disassembly and documentation

SERVICE

University Service

Oregon State University

College of Engineering

- Saturday Academy Apprenticeships in Science and Engineering, High School Intern Mentor, Summer 2012
- Bioenergy Minor Curriculum Committee member, Fall 2011

School of Mechanical, Industrial and Manufacturing Engineering (MIME)

- Industrial & Manufacturing Engineering Undergraduate Program Committee member, Winter 2009-present
- Manufacturing Engineering Curriculum coordinator, Winter 2009-present
- Manufacturing Engineering Educational Laboratory leader, Summer 2009-present
- Society of Manufacturing Engineering faculty advisor (Chapter S019), Fall 2009-present
- MIME Safety Committee, Fall 2009-present
- MIME Graduate Faculty member, Industrial Engineering, Winter 2009-present; Mechanical Engineering, Winter 2009-present; Materials Science, Summer 2014-present
- Industrial and Manufacturing Engineering Graduate Program Committee liaison, Nano/Micromanufacturing, 2012-2013; Advanced Manufacturing, 2013-2014
- MIME Faculty Search Committee member, Advanced Manufacturing Subcommittee chair, Fall 2013-Winter 2014
- Aerospace Option Ad Hoc Curriculum Committee member, Spring 2012-Fall 2013
- Surface Mount Technology Association faculty advisor (OSU Student Chapter), 2012-2013
- MECOP Student Interview and Placement faculty assistant, Winter 2011, Spring 2011, Spring 2013
- MIME Manufacturing Faculty Search Committee member, Fall 2012-Winter 2013
- Beaver Open House, IME Faculty Representative, Fall 2009, Fall 2010, Fall 2011
- Energy & Sustainability Research Cluster co-coordinator, Spring 2009-Spring 2011
- Search Committee member for Machining/Product Realization Lab Manager, Spring 2011
- Composites Laboratory co-leader, Fall 2009-Spring 2011

Michigan Technological University

Sustainable Futures Institute

- Restructuring of Graduate Certificate in Sustainability (2007-08)
- Co-organizer of Orientation/Professional Development Week (August 2004)
- Co-organizer of Sustainable Futures Day (April 2004)

Department of Mechanical Eng.-Eng. Mechanics

- Graduate Student Council (Voting Representative, 2002-03, 2007-08; At-large 2003-07)
- Student Advisory Committee (2002-03) – Co-organizer for ME-EM Open House & Lab Tour

Graduate Student Council

- Secretary (2007-08), Vice President (2002-03), University Senate Liaison (2002-03)
- Graduate Student Mentor Award Committee (2002-03)

Project Teams

- Michigan Tech FutureTruck (2000-01) – Treasurer, Enterprise Design Team
- Michigan Tech FutureCar (1997-2000) – Treasurer (1999-2000), Body Team

Service to the Profession

Journals Reviewed for

Chemical Engineering Journal (2013)

Energy Efficiency (2011)

International Journal of Life Cycle Assessment (2014)

International Journal of Product Life Cycle Management (2009)

International Journal of Production Research (2008, 2013, 2014)

International Journal of Strategic Engineering Asset Management (2013)

Journal of Cleaner Production (2012-2013)

Journal of Intelligent Materials Systems and Structures (2004)

Journal of Manufacturing Science and Engineering, ASME (2004, 2011, 2013)

Journal of Manufacturing Science and Technology, CIRP (2014)

Journal of Manufacturing Systems, SME (2006, 2012)

Journal of Mechanical Design, ASME (2009, 2013)

Journal of Renewable and Sustainable Energy (2011)

Journal of STEM Education: Innovations and Research (2010)

Polish Journal of Environmental Studies (2011)

Resources, Conservation & Recycling (2010)

Sustainability (2010)

Proceedings/Abstracts Reviewed for

[avniR] LCA Conference (2012-2014)

CIRP International Conference on Life Cycle Engineering (2010-2012, 2014-2015)

ASME International Design Engineering Technical Conferences (2010-2014)

ASME Manufacturing Science and Engineering Conference (2009-2014)

ASME International Symposium on Flexible Automation (2006)

IIE Industrial Engineering Research Conference (2011-2012)

INEER International Conference on Engineering Education (2007)

International Conference on Agile Manufacturing (2007)

SME North American Research Conference (2005-2014)

Reports Reviewed for

Structural Engineering Institute, Sustainability Committee, Carbon Working Group (2012)

National Science Foundation Panelist

NSF/CMMI Manufacturing and Construction Machines and Equipment Program (2009, 2014)

NSF SBIR/STTR Program (2013)

NSF/EPA Networks for Characterizing Chemical Life Cycle (2013)

American Society of Mechanical Engineers

Program Chair (2013-2014), Design for Manufacturing and the Life Cycle Engineering Technical Committee, ASME Design Engineering Division (DED).

Special Session Chair, Program Co-Chair (2012-2013), Design for Manufacturing and the Life Cycle Engineering Technical Committee, ASME Design Engineering Division (DED).

Chair (2011-2013), Life Cycle Engineering Technical Committee, ASME Manufacturing Engineering Division (MED). Led MED State of the Art journal paper.

Vice Chair (2010-2011), Life Cycle Engineering Technical Committee, 2010-2011, ASME Manufacturing Engineering Division (MED). Led MED State of the Art conference paper.

Session Co-Chair, Japan-USA Symposium on Flexible Automation, July 19-21, 2004, Denver, CO.

Session Chair, "Sustainable Manufacturing Processes – II," 2009 ASME Manufacturing Science & Engineering Conference (MSEC), October 4-7, 2009, West Lafayette, IN.

Topic Organizer and Review Coordinator, "DFMLC-5: Environmental Analysis of Emerging Technologies," 15th Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2010 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 15-18, Montreal, Quebec.

Review Coordinator, "Manufacturing Cost Estimation and Total Cost of Ownership," 15th Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2010 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 15-18, Montreal, Quebec.

Symposium Organizer, "Sustainable Nanomanufacturing," 2010 ASME Manufacturing Science & Engineering Conference (MSEC), October 12-15, Erie, PA (with B.K. Paul, and W. Zhang).

Session Chair, "Sustainable Nanomanufacturing," 2010 ASME Manufacturing Science & Engineering Conference (MSEC), October 12-15, Erie, PA.

Symposium Organizer, "Sustainable Nanomanufacturing," 2011 ASME Manufacturing Science & Engineering Conference (MSEC), June 13-17, 2011, Corvallis, OR (with W. Zhang).

Conference Host Committee Co-Chair, 2011 ASME Manufacturing Science & Engineering Conference (MSEC), June 13-17, 2011, Corvallis, OR.

Review Co-Coordinator, "Sustainable Design," 16th Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2011 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 28-31, Washington, D.C.

Session Co-Chair, "Life Cycle Decision Making II," 16th Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2011 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 28-31, Washington, D.C.

Session Co-Organizer, “System-wide Impacts of the Energy-Water Nexus,” 2011 ASME International Mechanical Engineering Congress and Exposition (IMECE), November 11-17, Denver, CO.

Track Co-Chair, “Track 4: Sustainable Manufacturing,” 2012 ASME Manufacturing Science & Engineering Conference (MSEC), June 4-8, South Bend, IN (with J.A. Camelio).

Symposium Organizer, “Sustainable Manufacturing Processes and Systems,” 2012 ASME Manufacturing Science & Engineering Conference (MSEC), June 4-8, South Bend, IN (with Y. Yuan, W. Zhang, and H.C. Zhang).

Track Co-Organizer, “Sustainable Design and Manufacturing,” 2012 ASME/ISCIE International Symposium on Flexible Automation (ISFA), June 18-20, St. Louis, MO (with F. Zhao and J.W. Sutherland).

Session Chair, “Design for Supply Chain,” 17th Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2012 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 15-18, Chicago, IL.

Track Chair, “Track 4: Sustainable Manufacturing,” 2013 ASME Manufacturing Science & Engineering Conference (MSEC), June 10-13, University of Wisconsin, Madison, WI.

Symposium Organizer, “Sustainable Manufacturing for Emerging Technologies,” 2013 ASME Manufacturing Science & Engineering Conference (MSEC), June 10-13, University of Wisconsin, Madison, WI (with B.S. Linke and W. Zhang).

Session Chair, “Sustainable Manufacturing Processes,” 2013 ASME Manufacturing Science & Engineering Conference (MSEC), June 10-13, University of Wisconsin, Madison, WI.

Session Co-Chair, “Sustainable Manufacturing Technologies,” 2013 ASME Manufacturing Science & Engineering Conference (MSEC), June 10-13, University of Wisconsin, Madison, WI.

Symposium Organizer, “Design for Supply Chain,” 18th Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2013 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 4-7, 2013, Portland, OR.

Symposium Co-Organizer, “Global Trends in Manufacturing (Panel Session),” 18th Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2013 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 4-7, 2013, Portland, OR (with J. Mason).

Session Chair, “Value Chain Management for Sustainability,” 18th Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2013 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 4-7, 2013, Portland, OR.

Symposium Co-Organizer, “Sustainable Manufacturing for Emerging Technologies,” 2014 ASME Manufacturing Science & Engineering Conference (MSEC), June 9-13, Detroit, MI (with C. Yuan, M. Hutchins, and K. Walczak).

Session Chair, “Design for Supply Chain,” 19th Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2014 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 17-20, 2014, Buffalo, NY.

Society of Manufacturing Engineers

Member, SME NAMRI (North American Manufacturing Research Institute), 2002-present.

Faculty Advisor, Oregon State University Student Chapter (S019), F09-present.

SMIS Beta Reviewer, Sustainable Manufacturing Information Service (SMIS) Project, 2010.

Session Co-Chair, “Manufacturing Systems 3,” 37th Annual NAMRC, May 19-22, 2009, Greenville, SC.

Conference Host Committee Co-Chair, 2011 SME North American Manufacturing Research Conference (NAMRC), June 13-17, 2011, Corvallis, OR.

Session Co-Chair, “Sustainable Manufacturing 1,” 39th Annual NAMRC, June 13-17, 2011, Corvallis, OR.

The International Academy for Production Engineering (CIRP)

Session Chair, B1: Energy Saving Product Development, 17th CIRP Conference on Life Cycle Engineering, May 19-21, 2010, Hefei, China.

Scientific Committee, 19th CIRP Conference on Life Cycle Engineering, May 23-25, 2012, University of California at Berkeley, CA, USA.

Scientific Committee, 21th CIRP Conference on Life Cycle Engineering, June 18-20, 2014, Trondheim, Norway.

Scientific Committee, 22nd CIRP Conference on Life Cycle Engineering, April 2015, University of New South Wales, Sydney, Australia.

Session Chair, Methods and Tools for Sustainability in Processes (I), 19th CIRP Conference on Life Cycle Engineering, May 23-25, 2012, University of California at Berkeley, CA, USA.

Workshop Team, Unit Process Life Cycle Inventories CO₂PE!-UPLCI Workshop, 19th CIRP Conference on Life Cycle Engineering, May 23-25, 2012, University of California at Berkeley, CA, USA.

Other Service to the Profession

Scientific Committee, 2nd Intl. [avniR] LCA Conference, November 6-7, 2012, Lille, France.

Scientific Committee, 3rd Intl. [avniR] LCA Conference, November 4-5, 2013, Lille, France.

Scientific Committee, 4th Intl. [avniR] LCA Conference, November 5-6, 2014, Lille, France.

Organizing Committee, U.S. National Science Foundation (NSF) Pan-American Advanced Studies Institute (PASI) on Manufacturing Innovation through Sustainable Design, July 14-27, 2013, Barranquilla, Colombia.

External Reviewer, National Institute for Standards and Technology Editorial and Review Board (NIST ERB), 2013-present.

Task Group Member, ASTM WK35705: Sustainability Characterization of Manufacturing Processes, ASTM Subcommittee E60.13 on Sustainable Manufacturing, 2014-present.

Service to the Public

Judge, Sunnyside School District Middle School Science Fair, February 2010, Sunnyside, WA.

Member, Industrial/Postsecondary Advisory Committee, Career and Technical Education Program, Junction City High School, January 2014-present, Junction City, OR.