

Karl R. Haapala, Ph.D.

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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 Ph.D. Exchange, Public Policy, Southern University-Baton Rouge, LA
- 2001 Certificate in International Business, Michigan Technological University
- 1996-1997 International Studies, University of Oulu (Finland) Open Campus Program

EXPERIENCE

- 07/19-07/20 *Fulbright-Tampere University Scholar*, Automation Technology and Mechanical Engineering, Tampere University, Tampere, Finland
Improving the sustainability performance of metal-based additive manufacturing processes through integrated machine learning and process modeling.
- 07/19-06/22 *Tom and Carmen West Faculty Scholar*, School of Mechanical, Industrial, and Manufacturing Engineering, Oregon State University
Advancing the mission of leading research and educational efforts in the design, evaluation, and optimization of manufacturing systems.
- 06/19-present *Director*, Northwest Satellite Office of the DOE Clean Energy Smart Manufacturing Innovation Institute (CESMII), Oregon State University
Coordinating activities of university faculty and regional industry. Assisting in organizing industry outreach and education in smart manufacturing.
- 05/15-present *Associate Professor*, School of Mechanical, Industrial, and Manufacturing Engineering, Oregon State University
Leading the Industrial Sustainability Lab. Performing research, teaching, and service activities in the Industrial and Manufacturing Engineering program.
- 09/13-present *Assistant Director*, DOE 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.
- 08/18-09/18 *Visiting Professor*, Mechanical Engineering and Industrial Systems, Tampere University of Technology, Tampere, Finland
Collaborated on application of machine learning methods for improving sustainability performance of manufacturing; international co-advising of doctoral students.
- 12/08-05/15 *Assistant Professor*, School of Mechanical, Industrial, and Manufacturing Engineering, Oregon State University

- Performed research, teaching, and service activities in the Industrial and Manufacturing Engineering program, focused on sustainable manufacturing.
- 09/11-09/13 *Faculty Mentor*, DOE 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*, Department 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*, Department 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, Department 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*, Department 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*, Department 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)*, Department 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)*, Department 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, novel sustainability approaches, e.g., micro-/nano-manufacturing processes and sustainable manufacturing systems, and engineering education.

RECOGNITION

Honors from the Profession

- Best Undergraduate Poster (2018), “Aggregating Unit Manufacturing Process Models to Enable Environmental Impact Characterization of Polymer-Based Hybrid Manufacturing,” Workshop on Reusable Abstractions of Manufacturing Processes, 2018 ASME Manufacturing Science and Engineering Conference (with B.S. student D. Harper and M.S. student S. Manoharan)
- Second Place, Doctoral Symposium - Engineering and Technology Track (2017), “Promoting Sustainable Product Design using Unit Manufacturing Process Analysis,” Society of Design and Process Science Conference (with Ph.D. student K. Raoufi)
- Anatol Rapoport Memorial Award for Best Student Paper (2017), “Integration of Sustainability Indicators and the Viable System Model toward a Systemic Sustainability Assessment Methodology,” 61st Annual Meeting of the International Society for the Systems Sciences, (with Ph.D. student A. Tong and OSU collaborator J. Calvo-Amodio)
- DFMLC Best Paper Award (2016), “Using Industry Focus Groups and Literature Review to Identify Challenges in Sustainable Assessment Theory and Practice,” 21st ASME Design for Manufacturing and the Lifecycle Conference, (with M.S. student M.M. Smullin, NIST collaborators M. Mani, K.C. Morris)
- DFMLC Best Paper Award (2015), “Unit Manufacturing Process Models for Ferromagnetic and Non-Ferromagnetic Alloy Surface Inspection Methods,” 20th ASME Design for Manufacturing and the Lifecycle Conference, (with M.S. student I.C. Garretson, NIST collaborators M. Mani, S. Leong, and Boeing collaborators M.D. Carter and A.E. Simmons)
- 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)

Recent Awards from the Profession

- Fulbright-Tampere University U.S. Scholar Award (2019)
- Italian Machine Tool Technology Award Program, Invited Professor (2018)
- SME Distinguished Faculty Advisor Award (2012, 2016)
- NAE US Frontiers of Engineering Symposium, Invited Participant (2015)
- SME/IAC Partnership Participation Award (2013, 2014, 2015)
- SME Warren DeVries Outstanding Young Manufacturing Engineer Award (2014)
- NSF Travel Grant for the 4th International Forum on Sustainable Manufacturing (2014)
- SME Faculty Advisor Professional Development Award (2012)

Recent University Honors and Awards

- Tom and Carmen West Faculty Scholar (2019-22)
- OnPoint Faculty of the Game Award (2016)
- OSU Industry Partnering Award (2016)
- OSU International Programs Faculty Grant (2012)
- Swigert Faculty Fellow (2011-12)
- NSF IGERT Traineeship (2004-08)

MEMBERSHIPS AND HONORARY SOCIETIES

Professional and Honorary Societies

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

GRADUATE STUDENT ADVISING AND MENTORING

Ph.D. Student Advisees – Major Advisor

Graduated (4)

- Hao Zhang, IE (OSU, co-advisor J. Calvo), December 2014, “A Framework for Integrating Systems Thinking into Sustainable Manufacturing” **(2014 IE Outstanding GRA Award)**
- Babak Lajevardi, IE (OSU, co-advisor B. Paul), June 2015, “Energy Analysis of Novel Data Center Cooling Technology: Evaporative Cooling System Operation and Microchannel Heat Exchanger Manufacturing”
- Amin Mirkouei, IE (OSU), June 2016, “Techno-Economic Optimization and Environmental Impact Analysis for a Mixed-Mode Upstream and Midstream Forest Biomass to Bio-Products Supply Chain” **(2015 IE Outstanding GTA Award)**
- Anh Tong, IE (OSU, co-advisor J. Calvo), December 2017, “Integration of Systems Thinking, Viable System Model, and System Dynamics toward Systemic Sustainability Assessment Methodology”

Current (5)

- Venkata Rajesh Saranam, IE (OSU, co-advisor B. Paul), exp. 2019, Nanomanufacturing
- Kamyar Raoufi, IE (OSU), exp. 2019, Sustainable Design and Manufacturing
- Hari P.N. Nagarajan, MEI (TAU, co-advisor E. Coatanea), exp. 2021, Additive Manufacturing
- Arvind Shankar Raman, ME (OSU), exp. 2021, Sustainable Design and Manufacturing
- Suraj Panicker, MEI (TAU, co-advisor E. Coatanea), exp. 2021, Sustainable Manufacturing

M.S. Thesis Student Advisees – Major Advisor

Graduated (22)

- Malcolm O. Brown, IE (OSU), June 2011, “A Process Based Modeling Approach for Economic and Environmental Assessment of Nano-Assisted Manufacturing” **(2011 IE Outstanding GRA Award)**
- Misha V. Sahakian, IE (OSU), September 2011, “Machining and Toxicological Performance of a Zinc Oxide Metalworking Nanofluid” **(2011 IE Outstanding GTA Award)**
- 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”
- Qi Gao, IE (OSU), December 2013, “An Economic and Environmental Assessment Model for Microchannel Device Manufacturing” **(2013 IE Outstanding GTA Award and 2013 College of Engineering GTA Award)**
- Zachary Southworth, IE (OSU), December 2013, “Bottom-up Cost Modeling for Vanadium Redox Flow Battery Component Manufacturing”
- Faraz Niyaghi, IE (OSU), May 2014, “Evaluation of Zinc Oxide Metalworking Nanofluid Stability and Related Biological Response”
- 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”
- Ian Garretson, IE (OSU), September 2015, “A Unit Manufacturing Process Characterization Methodology and Supporting Terminology for Sustainable Manufacturing Assessment” **(2015 IE Outstanding GRA Award)**

- Harsha Malshe, IE (OSU), September 2016, “A Techno-Economic Assessment Methodology for Advanced Additive and Joining Processes”
- Michael Doran, ME (OSU), September 2016, “Characterization of Two Novel Machining Processes for Difficult to Machine Materials”
- Matteo Smullin, IE (OSU), December 2016, “An Information Modeling Framework and Desktop Application to Compose Unit Manufacturing Process Models for Sustainable Manufacturing Assessment”
- Hari P.N. Nagarajan, IE (OSU), June 2017, “Enabling Design for Energy Efficient Additive Manufacturing”
- Javad (Kiarash) Sadeghi, IE (OSU), June 2018, “Assisting Sustainability Analysis of Forest Bioenergy Supply Chains using Mathematical Optimization”
- Saroj Karki, IE (OSU, co-advisor B. Fronk), July 2018, “Enabling Feasibility Assessment of Solar Thermal Energy Systems for Industrial Process Heating Applications”
- Rothanak Chan, ME (OSU, co-advisor M. Campbell), August 2018, “Automated Rapid Manufacturing Feedback for Design Considering Advanced Joining Processes”
- Sriram Manoharam, IE (OSU), May 2019, “Process Information Modeling for Characterizing Sustainability Performance of Cyclic Manufacturing Processes”
- Sai Srinivas Desabathina, IE (OSU, co-advisor Z. Fan), June 2019, “Multi-Sensor Data Fusion for Specific Energy Estimation in a Surface Grinding Process”

Diploma Thesis (Master Degree) Advisee

Graduated (1)

- 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.S. Project Student Advisees – Major Advisor

Graduated (5)

- Tasha Larson, IE (OSU, co-advisor C. Eseonu), September 2014, “Defining and Comparing Risks and Success Measures of the Reference Design Process and Traditional New Product Development Processes”
- Alex Cimino-Hurt, IE (OSU), May 2015, “Assessing Operational and Environmental Performance of Electric Hot Milling via In-Depth and Screening Unit Process Life Cycle Inventory Approaches” **(2015 SME 30 Under 30 Award)**
- Scott Campbell, ME (OSU), June 2016, “Application of Design Scorecards and Sustainability Assessment Tools in the Iterative Development of a Novel Wooden Bicycle Frame”
- Alberto Pezzani, IE (OSU), September 2016, “Defining the Structure and Functionality of a Software-Based Industrial Energy Audit Tool”
- Suraj Panicker, IE (OSU), December 2017, “A Triple Bottom Line Methodology for Assessing the Sustainability Performance of Continuous Web-Manufacturing Processes”

M.Eng. Student Advisees – Major Advisor

Graduated (2)

- Nima Dolatnia, IE (OSU), April 2013
- Walter (Clint) C. Clow, IE (OSU), March 2016

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

Graduated (28)

- 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”
- Woraruthai (Aom) Choothian, IE (OSU, Advisor: T.L. Doolen and C. Eseonu), December 2014, “A Study of the Application of Lean Practices to New Product Development Processes”
- Justin Pommerenck*, ChemE (OSU, Advisor: A. Yokochi), November 2015, “Nonthermal Plasma Microreaction Engineering at Gas and Liquid Interfaces”
- Saeed Ghanbarteherani, IE (OSU, Advisor: J.D. Porter), December 2015, “Efficient Algorithms for Solving the Median Problem on Real Road Networks”
- Benjamin Buford*, EE (OSU, replaced as GCR due to final oral exam scheduling), July 2016, “Modeling, Fabrication, and Characterization of Magnetic Thin Films for Integrated Inductor and MRAM Applications”
- Omid Shahvari, IE (OSU, Advisor: L. Logendran), August 2017, “Bi-Criteria Batching and Scheduling in Hybrid Flow Shops”
- Syed Mohammad Hossein Tabatabaie*, BEE (OSU, Advisor: G. Murthy), August 2017, “Integrated Spatio-temporal Sustainability Analysis of Biofuels Using Biogeochemistry, Economic and Life Cycle Analysis”
- Masoud Ghodrat Abadi*, CivE (OSU, Advisor: D. Hurwitz), May 2018, “Transportation Infrastructure to Support Bicycling: Design and Operational Considerations”
- Brandon Massoni, ME (OSU, Advisor: M. Campbell), September 2018, “AI Decomposition of Complex Parts for Manufacturing with Advanced Joining Processes”
- Mohammad Ali Davar Panah, ME (OSU, Chair: B. Paul), December 2018, “Incremental Forming of Polymers at Room Temperature”

- Dan Huang*, ChemE (OSU, Advisor: G. Jovanovic), March 2019, “An Investigation on Modeling the Effect of Catalyst Support on Bio-Hydrogenated Diesel Production Using Density Functional Theory”
- Patrick McNeff, IE (OSU, Advisor: B. Paul), July 2019, “Manufacturing Process Design and Electrically-Assisted Embossing of a Microchannel Solar Receiver”

Current (6)

- Abhishek Agrawal*, EE (OSU, Advisor: A. Natarajan), exp. 2019
- Nan Zhang*, CivE (OSU, Advisor: M. Evans), exp. 2019
- Wei Xu*, Chem (OSU, Advisor: V. Remcho), exp. 2019
- Steven Hattrup, IE (OSU, Advisor: K. Funk), exp. 2019
- Paween Kriangkasem, IE (OSU, Advisor: J.D. Porter), exp. 2019
- Lucas Freiberg*, ChemE (OSU, Advisors: N. AuYeung, G. Jovanovic), exp. 2021

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

Graduated (32)

- 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”
- Erin Collins, ME (OSU, Advisors: R. Paasch, B. Batten), March 2014, “Alternative Design Considerations for a Wave Energy Converter: A Sustainability Approach”

- Kiumars Zolfaghari, IE (OSU, Advisor: K. Funk), November 2014, “Medical Diagnosis: A Functional Model and Diagnostic Aid”
- Lei Jin*, EE, (OSU, Advisors: J. Zhang, T. Brekken), exp. Mar. 2015, “DC Bus Capacitor Discharge of Permanent Magnet Synchronous Machine Drive Systems for Hybrid/Electric Vehicles”
- Tanida Chongviwailan, IE (OSU, Advisor: J. Calvo), May 2015, “A Theoretical Framework to Capture Stakeholders’ Perspectives for the Design of Collaborative Communication Structures for Specialized Organizations”
- Guoheng Ma*, ChemE (OSU, Advisor: C. Chang), exp. March 2016, “Synthesis of Plasmonic-Enhanced Metal-Organic Framework Thin Films and Infrared Sensing Applications”
- Brandon Massoni, ME (OSU, Advisor: M. Campbell), May 2016, “Dividing Complex Parts into Multiple Pieces for Advanced Joining and Additive Manufacturing”
- Addison Wistoff, ME (OSU, Advisor: B. DuPont), May 2016, “Using Automation to Understand Sustainable Design Trade-Offs and to Promote Environmental Sustainability in the Early Design Phase”
- Derrick Risner, Food Sci/Tech (OSU, Advisor: L. Goddick), March 2018, “A Guide to the Fermentation and Distillation of Whey for Potable Spirit Production”
- Dheeraporn Nippaya, IE (OSU, Advisor: J.D. Porter), March 2018, “A Metaheuristic Approach for Facilities Location with Balanced Allocation of Customers”
- Philip Kness*, EE, (OSU), June 2018, “Hardware-Based Security Enhancement for Near Field Communication and Other Close Proximity Inductive-Based Communication Systems”
- Vincenzo Ferrero, ME (OSU, Advisor: B. DuPont), May 2018, “Environmentally Sustainable Product Design: Understanding the Environmental Impact of Product Function and Product Labeling”
- Steven Kawula, ME (OSU, Advisor: B. Paul), September 2018, “A Manufacturing Process Design for Producing an Adhesive-Bonded Membrane based Energy Recovery Ventilator with High Aspect Ratio Support Ribs”
- Alan Grier, ME (OSU, Advisor: M. Campbell), May 2019, “Automated Tradeoff Analysis of Cost Versus Machinability for Design Feedback”
- Donovan Ross, ME (OSU, Advisor: B. DuPont), June 2019, “Exploring the Effectiveness of Providing Structured Design for the Environment Knowledge during the Conceptual Design Phase”
- Raphael Arbelaez, WSE (OSU, Advisor: L. Schimleck), November 2019, “Exploratory Study of Salvaged Lumber as Feedstock for Cross-Laminated Timber (CLT)”

Current (1)

- Tianshu Zhang, ME (OSU, Advisor: R. Albertani), exp. 2019

M.S. Project Committee Service

Graduated (3)

- Adam Rahrer, ME (OSU, Advisor: R.B. Stone), September 2013, “Designing and Creating the Oregon State Age and Disability Simulation Suit”
- Bradley Moore, IE (OSU, Advisor: J. Calvo), September 2015, “Framework and Method for Designing Complementarist Interventions to Address Management Challenges Systemically in Small Organizations”
- Haomiao Zhang, IE (OSU, Advisor: K.L. Funk), May 2016, “West Africa Infectious Disease Diagnosis Aid (WAIDDA) Development”

M.Eng. Committee Service

Current (1)

- Mishal Albassam, IE (OSU, Advisor: J. Calvo), exp. 2020

Graduate Teaching Assistant Supervision

- Srikar Vallury, IE (OSU), Spring 2009, ME 413 lab development
- Misha Sahakian, IE (OSU), Fall 2009-Spr 2010, ME 413, IE 336; **2011 IE Outstanding GTA Awardee**
- 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; **2013 IE Outstanding GTA Awardee** and **2013 College of Engineering GTA Awardee**
- Kunal Kate, IE (OSU), Winter 2012, IE 336
- Joseph Piacenza, ME (OSU), Fall 2012, ME 413; **2014 ME Outstanding GTA Awardee**
- Yasaman Mehravaran, IE (OSU), Winter 2013, MFGE 336
- Ian Garretson, IE (OSU), Fall 2013, ME 413
- Kijoon Lee, IE (OSU), Fall 2013, ME 413
- Seyedhamed Seyedmahmoudi, IE (OSU), Winter 2014, MFGE 336
- Tylee Cairns, IE (OSU), Winter 2014, MFGE 336
- Katarina Morowsky, IE (OSU), Winter 2014, MFGE 336; **2014 IE Outstanding GTA Awardee**
- Samuel Brannon, IE (OSU), Fall 2014, ME 413
- Harish Irrinki, IE (OSU), Fall 2014, ME 413
- Amin Mirkouei, IE (OSU), Fall 2013/Fall 2014, ME 413; Winter 2015/Spring 2016, MFGE 336; Spring 2014, MFGE lab development; **2015 IE Outstanding GTA Awardee**
- Steven Hattrup, IE (OSU), Spring 2016, ME 413 lab development
- Hari Nagarajan, IE (OSU), Winter 2015, MFGE 336; Spring 2015, ME 413 lab dev.; Fall 2016, ME 413
- Michael Dexter, ME (OSU), Fall 2016, ME 413
- Mukhtar Maulimov, ME (OSU), Fall 2016, ME 413
- Suraj Panicker, IE (OSU), Spring 2016/Winter 2017, MFGE 336
- Elham Mirkoohi, ME (OSU), Winter 2017, MFGE 336
- Sai Desabathina, IE (OSU), Fall 2017/Fall 2018, MFGE 535; Winter 2019, MFGE 336
- Sriram Manoharan, IE (OSU), Winter 2018, MFGE 336
- Alec Temes, ME (OSU), Winter 2018, MFGE 336
- Taewan Lee, ME (OSU), Winter 2019, MFGE 336
- Gregory Nigon, MATS (OSU), Winter 2019, MFGE 336

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
- Gorka Rodrigo Asensio, IE (Universidad Politécnic de Valencia, Spain), 2010-2011, research intern
- Mohsen Ebrahimi, IE (OSU), Fall 2013, graduate researcher

SELECTED GIFT, GRANT, AND CONTRACT SUPPORT (\$3.2M OF \$10.6M)

Funded Projects (50 total): Oregon State University (\$3.1M of \$10.5M)

1. *As PI*: “ECR: PEER: Modular Educational Certification for Advancing Training Online through Industry Collaborations (MECHATRONIC),” National Science Foundation, (OSU co-PIs: Z. Fan, D. Kim, C. Sanchez; CCC co-PI: M. Mattson), \$1,844,172, 1/1/2020-12/31/2022.
2. *As PI*: “CESMII WRMC Northern US Satellite Activities: Industry Workshop,” University of California-Los Angeles (DOE/CESMII), \$34,000 (plus \$34,000 cost share), (several co-PIs), 01/01-12/31/2019.
3. *As co-PI*: “Modeling the Total Cost of Ownership for Scaling-Up via Modular Chemical Process Intensification,” American Institute of Chemical Engineers (DOE RAPID), \$225,000 (plus \$117,000 cost share), (PI: B. Paul), 01/01/2019-03/31/2021.

4. *As PI*: “Cost and Environmental Impact Analysis for 3D Printing of Complex Metal Parts,” OSU/HP Inc. Seed Grant, \$20,000 (co-PI: B. Paul; HP PI: T. Etheridge), 01/01-06/30/2019.
5. *As PI*: “NIST-ASTM-NSF-ASME Workshop on Challenges in Representing Manufacturing Processes for Systemic Sustainability Assessments,” National Science Foundation, \$39,056, 4/1/2018-12/31/2019.
6. *As PI*: NSF INTERN Supplement to “Collaborative Research: Constructionism in Learning: Sustainable Life Cycle Engineering (CooL:SLiCE),” National Science Foundation, \$44,018, 4/1/2018-8/31/2019.
7. *As co-PI*: “Oregon State University Industrial Assessment Center,” (PI: J. Junker, co-PI: B. Fronk), U.S. Department of Energy, \$1,968,750, 10/1/2016-9/30/2021.
8. *As PI*: “Collaborative Research: Constructionism in Learning: Sustainable Life Cycle Engineering (CooL:SLiCE),” National Science Foundation (Lead PI: K.Y. Kim, Wayne State; Collaborating PI: K. Jackson, Penn State), \$736,579 (OSU: \$245,690), 9/1/2014-8/31/2019.
9. *As PI*: “Information Model Composability and Extendibility to Support Automated Sustainable Manufacturing System Assessment,” National Institute of Standards and Technology, \$160,070, 9/1/2016-6/30/2019.
10. *As PI*: “OMI Project: A Rapid Design and Manufacturing Analysis Tool for Production using the Blank Factory Concept (Phase 4),” (co-PIs: M. Campbell, D. Kim), \$195,071 (Boeing, \$97,536; Oregon Metals Initiative, \$97,536), 9/16/2017-12/31/2018.
11. *As co-PI*: “Thermal Performance Evaluation of a Solar/Gas Hybrid Water Heating System,” (with co-PI: B. Fronk and M.S. student S. Karki), U.S. Department of Energy, \$25,000 (Special Project under the Industrial Assessment Center program), 9/16/2017-6/30/2018.
12. *As co-PI*: “Construction of Efficient, Cost-Effective and Sustainable Maintenance Facilities,” Oregon Department of Transportation, (PI: J. Ideker), \$145,000, 10/26/2015-3/31/2018.
13. *As co-PI*: “Acquisition of FORMLABS FORM2 Stereolithography 3D Printer,” (PI: S. Pasebani, co-PIs: B. Jensen, B. Bay), OSU School of MIME Strategic Excellence Initiative, \$7,000, Fall 2017.
14. *As PI*: “OMI Project: A Rapid Design and Manufacturing Analysis Tool for Production using the Blank Factory Concept (Phase 3),” (co-PIs: M. Campbell, D. Kim), \$196,356 (Boeing, \$98,178; Oregon Metals Initiative, \$98,178), 8/1/2016-8/11/2017.
15. *As PI*: “A Standard Framework for Composable Information Flow Modeling to Characterize the Sustainability of Product Manufacturing,” National Institute of Standards and Technology (NIST), \$174,995, 1/1/2015-6/30/2017.
16. *As co-PI*: “Smart Grinding Testbed for Clean Energy Manufacturing,” (PI: Z. Fan, co-PIs: J.D. Porter, B. Sencer), OSU School of MIME Strategic Excellence Initiative, \$5,000, Winter 2017.
17. *As co-PI*: “SolarBag® Plus: High Performance Photocatalyst for Purifying Drinking Water,” Oregon Nanoscience and Microtechnologies Institute, (PI: T. Radnieki, co-PI: H. McKenna, Puralytics), \$238,104, 01/01/2016-12/31/2016.
18. *As co-PI*: “Metal 3D Printer,” (PI: S. Pasebani, co-PIs: Z. Fan, R. Malhotra), OSU School of MIME Strategic Excellence Initiative, \$10,000, Fall 2016.
19. *As PI*: “Assessing the Learning Gains of Manufacturing Students in an Integrated Hands-On Curriculum,” Wayne State University (National Science Foundation subawardee), \$16,388 (2 yrs.), 09/01/2014-06/31/2016.
20. *As co-PI*: “Transforming Engineering Culture to Advance Inclusion and Diversity (TECAID) Program for U.S. Mechanical Engineering Departments,” Purdue University (NSF subaward), (PI: K. Sharp, co-PIs: B. Gibbons, E. Momsen, R. Stone), \$16,000, 3/1/2015-8/31/2016.

21. *As PI*: “OMI Project: Achieving Rapid Configuration Generation and Cost-Competitive Production using the Blank Factory Concept,” (co-PI: M. Campbell, co-PI: D. Kim), \$185,370 (The Boeing Company, \$92,685, Oregon Metals Initiative, \$92,685), 8/1/2015-7/31/2016.
22. *As PI*: “Analysis Tool and Guide for Energy Modeling of Additive Manufacturing,” U.S. Department of Energy (IAC Funding to Support Research for Junior Faculty), \$60,000, 7/1/2015-6/30/2016, May 2015.
23. *As PI*: “An Educational Module for Sustainable Additive Manufacturing,” CACHE Corp. (via NSF-funded Sustainable Manufacturing Advances in Research and Technology (SMART) Coordination Network), (with A. Mirkouei and H. Nagarajan), \$4,000, 01/01/2016-6/30/2016.
24. *As co-PI*: “OMI Project: Experimental Investigation of Sustainable Electric-Hot-Grinding,” (PI: R. Malhotra), \$194,200 (Benchmark Knife Co., \$23,205; Blount International, \$73,894; Oregon Metals Initiative, \$97,100), 10/1/2014-1/15/2016.
25. *As PI*: “Development and Delivery of Training for Sustainable Engineering in the Energy Sector,” Portland General Electric, (co-PI: J. Calvo), \$12,789 (gift), 01/01-12/31/2015.
26. *As PI*: “OMI Project: Defining a Path toward the Blank Factory Concept,” (co-PI: M. Campbell, co-PI: D. Kim), \$126,316 (The Boeing Company, \$63,158, Oregon Metals Initiative, \$63,158), 10/1/2014-6/30/2015.
27. *As co-PI*: “OMI Project: Development and Implementation of a Level Pull System,” (PI: J. Calvo), \$12,379 (Sheldon Manufacturing Inc., \$7,463, Oregon Metals Initiative, \$7,463), 10/1/2014-3/31/2015.
28. *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.
29. *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.
30. *As PI*: “Standard Methods for Sustainable Assembly in Aerospace Manufacturing,” National Institute of Standards and Technology, \$50,000, submitted February 26 2013, awarded September 2013, 2/1/2013-12/31/2013.
31. *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, 10/01/2013-06/31/2014.
32. *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, 10/01/2013-06/31/2014.
33. *As PI*: “Toxicological Performance of Metalworking Nanofluids,” \$4,000 (gift), Master Chemical Corp., received April 2013.
34. *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.
35. *As PI*: “Redox Flow Battery Cost Model Development (Phase 1),” (co-PI, B.K. Paul), Pacific Northwest National Laboratory, \$59,871 (8 mo.), awarded February 2013, 2/5/2013-09/30/2013.
36. *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.

37. *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, 1/2013-8/2013, awarded September 2012.
38. *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, 07/2012-06/2013, awarded July 2012.
39. *As PI*: “Non-Destructive Testing of Wood Products,” \$400 (gift), Coyle Treepieces, October 2012.
40. *As PI*: “Sustainable Product Development Collaboratory,” Oregon State University International Programs Faculty Grant, \$2,018, submitted December, 2011, awarded January 25, 2012.
41. *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.
42. *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.
43. *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), 5/2011-12/2013.
44. *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), 10/2010-9/2012.
45. *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), 10/2010-3/2012.
46. *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, 10/2010-9/2011.
47. *As PI*: “Manufacturing Engineering Educational Laboratory: Automated Manufacturing System Upgrade,” OSU Technology Resource Fee (TRF), \$3,800, 9/2010-8/2011.
48. *As PI*: “Development of a Unit Process Life Cycle Inventory,” Wichita State University, \$8,031, 12/2010-6/2011.
49. *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), 10/2010-6/2011.
50. *As PI*: “OMI Project: Development of a Knife Testing Device,” Benchmade Knife Company and Oregon Metals Initiative, \$20,000, 10/2010-6/2011.

Funded Projects (1): 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, awarded November 2005.

SCHOLARSHIP

Book Chapters and Contributions to Other Volumes (3)

(* 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*, 2018, “Materials Processing,” Chapter 3 in *Energy Efficient Manufacturing with Applications*, J. Sutherland ed., Wiley-Scrivener; 1 Ed., Salem, MA, ISBN: 978-1-118-42384-4, (Invited).

Refereed Journal Publications (45)

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

1. 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.
2. 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.
3. **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.
4. 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.
5. 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.
6. 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.).
7. **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.).
8. 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.
9. 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.

10. **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.).
11. 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.
12. Niyaghi, F.* , **K.R. Haapala**†, S.L. Harper, and M.C. Weismiller, 2014, “Stability and Biological Responses of Zinc Oxide Metalworking Nanofluids (ZnO MWnF™),” *Tribology Transactions*, Vol. 57, No. 4, pp. 730-739.
13. **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.
14. **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.
15. Seyedmahmoudi, S.H.* , S.L. Harper, M.C. Weismiller, and **K.R. Haapala**†, 2015, “Evaluating the Use of Zinc Oxide and Titanium Dioxide Nanoparticles in a Metalworking Fluid from a Toxicological Perspective,” *Journal of Nanoparticle Research*, Vol. 17, No. 2, February, Paper 104, 12 p., doi: 10.1007/s11051-015-2915-7.
16. Eastwood, M.D.* and **K.R. Haapala**†, 2015, “An Induction Hardening Process Model to Assist Sustainability Assessment of a Steel Bevel Gear,” *International Journal of Advanced Manufacturing Technology*, Vol. 80, No. 5, September, pp. 1113-1125, doi: 10.1007/s00170-015-7053-y.
17. Zhang, H.* and **K.R. Haapala**†, 2015, “Integrating Sustainable Manufacturing Assessment into Decision Making for a Production Work Cell,” *Journal of Cleaner Production*, Vol. 105, October, pp. 52-63, doi: 10.1016/j.jclepro.2014.01.038.
18. Zhang, H.* , **K.R. Haapala**†, and J. Calvo-Amodio, 2015, “Establishing Foundational Concepts for Sustainable Manufacturing Systems Assessment,” *International Journal of Strategic Engineering Asset Management*, Vol. 2, No. 3, pp. 249-269, doi: 10.1504/IJSEAM.2015.072124.
19. Lajevardi, B.*†, **K. R. Haapala**, and J. Junker, 2015, “Real-time Monitoring and Evaluation of Energy Efficiency and Thermal Management of Data Centers,” *SME Journal of Manufacturing Systems*, Vol. 37, Part 2, pp. 511-516, doi: 10.1016/j.jmsy.2014.06.008.
20. Eastwood, M.D.* and **K.R. Haapala**†, 2015, “Unit Process Model Based Methodology to Assist Product Sustainability Assessment during Design for Manufacturing,” *Journal of Cleaner Production*, Vol. 108, Part A, pp. 54-64, doi: 10.1016/j.jclepro.2015.08.105.
21. Kremer, G., **K. Haapala**, A. Murat, R.B. Chinnam†, K.-Y. Kim, L. Monplaisir, and T. Lei*, 2016, “Directions for Instilling Economic and Environmental Sustainability across Product Supply Chains,” *Journal of Cleaner Production*, Vol. 112, Part 3, pp. 2066-2078, doi: 10.1016/j.jclepro.2015.07.076.
22. Mirkouei, A.*†, P.* Mirzaie, **K.R. Haapala**, J. Sessions, and G.S. Murthy, 2016, “Reducing the Cost and Environmental Impact of Integrated Fixed and Mobile Bio-Oil Refinery Supply Chains,” *Journal of Cleaner Production*, Vol. 113, pp. 495-507, doi: 10.1016/j.jclepro.2015.11.023.
23. Gao, Q.* , J. Lizarazo-Adarme, B.K. Paul, and **K.R. Haapala**†, 2016, “An Economic and Environmental Assessment Model for Microchannel Device Manufacturing: Part 1 – Methodology,” Vol. 120, pp. 135-145, *Journal of Cleaner Production*, doi: 10.1016/j.jclepro.2015.04.142.

24. Gao, Q.*, J. Lizarazo-Adarme, B.K. Paul, and **K.R. Haapala**†, 2016, “An Economic and Environmental Assessment Model for Microchannel Device Manufacturing: Part 2 – Application,” Vol. 120, pp. 146-156, *Journal of Cleaner Production*, doi: 10.1016/j.jclepro.2015.04.141.
25. Nagarajan, H.P.N.*, H.A. Malshe*, **K.R. Haapala**†, and Y. Pan, 2016 “Environmental Performance Evaluation of a Fast Mask Image Projection Stereolithography Process through Time and Energy Modeling,” *ASME Journal of Manufacturing Science and Engineering*, Vol. 138, No. 10, 101004 (10 pages), doi: 10.1115/1.4033756.
26. Alsaffar, A.J.*, K. Raoufi*, K.Y. Kim, G.E.O. Kremer, **K.R. Haapala**†, 2016, “Simultaneous Consideration of Unit Manufacturing Processes and Supply Chain Activities for Reduction of Product Environmental and Social Impacts,” *ASME Journal of Manufacturing Science and Engineering*, Vol. 138, No. 10, 101009 (18 pages), doi: 10.1115/1.4034481.
27. Garretson, I.C.*, M. Mani, S. Leong, K.W. Lyons, **K.R. Haapala**†, 2016, “Terminology to Support Manufacturing Process Characterization and Assessment for Sustainable Production,” *Journal of Cleaner Production*, Vol. 139, pp. 986–1000, doi: 10.1016/j.jclepro.2016.08.103.
28. Mirkouei, A.*†, **K.R. Haapala**, J. Sessions, and G.S. Murthy, 2017, “A Review and Future Directions in Techno-Economic Modeling and Optimization of Upstream Forest Biomass to Bio-oil Supply Chains,” *Renewable and Sustainable Energy Reviews*, Vol. 67, pp. 15-35, doi: 10.1016/j.rser.2016.08.053.
29. Mirkouei, A.*†, **K.R. Haapala**, J. Sessions, and G.S. Murthy, 2017, “An Evolutionary Multi-criteria Decision Making Framework for Enhancing Sustainability Performance across Mixed Biomass-based Energy Supply Chains,” *Applied Energy*, Vol. 206, pp. 1088-1101, doi: 10.1016/j.apenergy.2017.09.001.
30. Psenka, C.E.†, K.-Y. Kim, G.E. Okudan Kremer, **K.R. Haapala**, and K.L. Jackson, 2017, “Translating Constructionist Learning to Engineering Design Education,” *Journal of Integrated Design and Process Science*, Vol. 21, No. 2, pp. 3-20, doi: 10.3233/jid-2017-0004.
31. Bernstein, W.Z.†, A. Bala Subramaniyan*, A. Brodsky, I.C. Garretson*, **K.R. Haapala**, D. Libes, K.C. Morris, R. Pan, V. Prabhu, A. Sarkar*, A. Shankar Raman*, and Zhenhua Wu, 2018, “Research Directions for an Open Unit Manufacturing Process Repository: A Collaborative Vision,” *Manufacturing Letters*, Vol. 15, Part B, pp. 71-75, doi: 10.1016/j.mfglet.2017.12.007.
32. Risner, D.*, A. Shayevitz*, **K. Haapala**, L. Meunier-Goddik, P. Hughes†, 2018, “Fermentation and Distillation of Cheese Whey: Carbon-Dioxide Equivalent Emissions and Water Use in the Production of Whey Spirits and White Whiskey,” *Journal of Dairy Science*, Vol. 101, Issue 4, pp. 2963-2973, doi: 10.3168/jds.2017-13774.
33. Seyedmahmoudi, S.H.*, **K.R. Haapala**†, K.-Y. Kim, and G.E. Kremer, 2018, “Energy and Carbon Footprint Reduction during Textile-based Product Design and Manufacturing,” *International Journal of Strategic Engineering Asset Management*, Vol. 3, No. 2, pp. 109-133 doi: 10.1504/IJSEAM.2018.092231.
34. Nagarajan, H.P.N.†* and **K.R. Haapala**, 2018, “Characterizing the Influence of Resource-Energy-Exergy Factors on the Environmental Performance of Additive Manufacturing Systems,” *Journal of Manufacturing Systems*, Vol. 48, Part A, pp. 87-96, doi: 10.1016/j.jmsy.2018.06.005.
35. Tong, A.†*, J. Calvo-Amodio, J., and **K.R. Haapala**, 2018, “Integration of Sustainability Indicators and the Viable System Model toward a Systemic Sustainability Assessment Methodology,” *Systems Research and Behavioral Science*, Vol. 35, Issue 5, pp. 564-587, doi: 10.1002/sres.2553.
36. Nagarajan, H.P.N. †*, Mokhtarian, H.*, Jafarian, H.*, Dimassi, S.*, Bakrani-Balani, S.*, Hamed, A.*, Coatanéa, E., Wang, G.G., and **Haapala, K.R.**, 2018, “Knowledge-Based Design of Artificial Neural Network Topology for Additive Manufacturing Process Modeling: A New Approach and Case Study for

- Fused Deposition Modeling,” *ASME Journal of Mechanical Design*, Vol. 141, No. 2, pp. 021705 (12 pages). doi: 10.1115/1.4042084.
37. Raoufi, K.†*, S. Manoharan*, and **K.R. Haapala**, 2018, “Synergizing Product Design Information and Unit Manufacturing Process Analysis to Support Sustainable Engineering Education,” *ASME Journal of Manufacturing Science and Engineering*, Vol. 141, No. 2, pp. 021018 (13 pages). doi:10.1115/1.4042077.
 38. Raoufi, K.†*, K. Park, M.T. Hasan Khan*, **K.R. Haapala**, C.E. Psenka, K.L. Jackson, G.E. Okudan Kremer, and K.-Y. Kim, 2019, “A Cyberlearning Platform for Enhancing Undergraduate Engineering Education in Sustainable Product Design,” *Journal of Cleaner Production*, Vol. 211, pp. 730-741, doi: 10.1016/j.jclepro.2018.11.085.
 39. Karki, S.*, B.M. Fronk†, and **K.R. Haapala**, 2019, “Investigation of the Combined Efficiency of a Solar/Gas Hybrid Water Heating System,” *Applied Thermal Engineering*, Vol. 149, pp. 1035-1043, doi: 10.1016/j.applthermaleng.2018.12.086
 40. Sadeghi, J.†* and **K.R. Haapala**, 2019, “Optimizing a Sustainable Logistics Problem in a Renewable Energy Network Using Genetic Algorithm,” *OPSEARCH*, pp. 1-18, doi: 10.1007/s12597-019-00356-5.
 41. Raoufi, K.†*, A.K. Wisthoff**, B.L. DuPont, and **K.R. Haapala**, 2019, “A Questionnaire-based Methodology to Assist Non-Experts in Selecting Sustainable Engineering Analysis Methods and Software Tools,” *Journal of Cleaner Production*, Vol. 229, pp. 528-541, doi: 10.1016/j.jclepro.2019.05.016.
 42. Karki, S.*, **K.R. Haapala**†, and B.M. Fronk, 2019, “Technical and Economic Feasibility of Solar Thermal Energy Systems for Small and Medium Manufacturers,” *Applied Energy*, Vol. 254, pp. 113649 (16 pages), doi: 10.1016/j.apenergy.2019.113649.
 43. Ferrero, V.*, A. Shankar Raman*, **K.R. Haapala**, B. DuPont†, “Validating the Sustainability of Eco-Labeled Products Using a Triple-Bottom-Line Analysis,” *Smart and Sustainable Manufacturing Systems*, SSMS-2019-0022, in press.
 44. Manoharan, S.* † and **K.R. Haapala**, “Characterizing the Sustainability Performance of Cyclic Manufacturing Processes: A Hybrid Manufacturing Case,” *International Journal of Sustainable Manufacturing*, in press.
 45. Nagarajan, H.P.N.†*, Panicker, S.*, Mokhtarian, H., Remy-Lorit, T., Coatanéa, E., Chakraborti, A., Prod'hon, R., Jafarian, H., Haapala, K.R., “Graph-based Meta-modeling for Characterizing Cold Metal Transfer (CMT) Process Performance,” *Smart and Sustainable Manufacturing Systems*, SSMS-2019-0026, in press.
 46. Shankar Raman, A. †*, Haapala, K.R., Raoufi, K.*, Linke, B.S., Bernstein, W.Z., and Morris, K.C., Defining Near-term to Long-term Research Opportunities to Advance Metrics, Models, and Methods for Smart and Sustainable Manufacturing,” *Smart and Sustainable Manufacturing Systems*, accepted.

Peer-Reviewed Conference Publications (84)

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

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82. Mokhtarian, H.[†]*, A. Hamedi*, H.P.N. Nagarajan*, S. Panicker*, E. Coatanea, and **K.R. Haapala**, 2019, “Probabilistic Modelling of Defects in Additive Manufacturing: A Case Study in Powder Bed Fusion,” *Procedia CIRP (52nd CIRP Conference on Manufacturing Systems)*, Vol. 81, pp. 956-961, doi: 10.1016/j.procir.2019.03.234
83. Panicker, S.[†]*, H.P.N. Nagarajan*, H. Mokhtarian*, A. Hamedi*, A. Chakraborti*, E. Coatanea, **K.R. Haapala**, and K. Koskinen, 2019, “Tracing the Interrelationship between Key Performance Indicators and Production Cost using Bayesian Networks,” *Procedia CIRP (52nd CIRP Conference on Manufacturing Systems)*, Vol. 81, pp. 500-505, doi: 10.1016/j.procir.2019.03.136
84. Shankar Raman, A.[†]*, D.S. Harper**[†], **K.R. Haapala**, B.S. Linke, W.Z. Bernstein, and K.C. Morris, 2019, “Challenges in Representing Manufacturing Processes for Systematic Sustainability Assessments – Workshop on June 21, 2018,” *Proceedings of the ASME 2019 14th International Manufacturing Science and Engineering Conference (MSEC)*, Paper No. MSEC2019-3032, June 10-14, 2019, Erie, PA, USA.

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.
11. Poster: Mirkouei, A.†* and **K.R. Haapala**, 2014, “Integration of Machine Learning and Mathematical Programming Methods into the Biomass Feedstock Supplier Selection Process,” Oregon BEST FEST, September 15-16, Portland, OR.
12. Poster: Mirkouei, A.†* and **K.R. Haapala**, 2015, “A Network Model to Optimize Upstream and Midstream Biomass-to-Bioenergy Supply Chain Costs,” OSU Engineering Research Expo, March 4, Portland, OR.
13. Poster: Tong, A.†*, J. Calvo, and **K. Haapala**, 2015, “A Dynamic Model of Job Satisfaction,” OSU Engineering Research Expo, March 4, Portland, OR.
14. Poster: Jackson, K. †, C. Psenka, K.-Y. Kim, and **K.R. Haapala**, 2015, “New Constructionism: An Approach to Support Deep Understanding of Sustainable Life Cycle Engineering,” 2015 IIE/ISERC, May 30-June 2, Nashville, TN.
15. Poster: Raoufi, K.†*, K.-Y. Kim, C. Psenka, K. Jackson, and **K. Haapala**, 2015, “Manufacturing and Supply Chain Analysis to Support Sustainable Design,” 2015 ASME Manufacturing Science and Engineering Conference, June 8-12, Charlotte, NC.

16. Poster: Jackson, K.†, C. Psenka, K.-Y. Kim, and **K.R. Haapala**, 2015, “Constructionist Learning for Environmentally Responsible Product Design,” 2015 ASEE Annual Conference and Exposition, June 14-17, Seattle, WA.
17. Poster: Malshe, H.†*, B. Massoni*, M. Campbell, D. Kim, and **K. Haapala**, 2015, “Inside the Blank Factory: A Knowledge-Based Manufacturing Plan Generator for Advanced Additive and Joining Processes,” 2015 California Forum on Energy Efficient Manufacturing (CaFEEM), October 1, University of California-Davis, Davis, CA.
18. Poster: Garretson, I.C.*†, M.M. Smullin*, and **K.R. Haapala**, 2015, “Composing Unit Manufacturing Process Model for Manufacturing Energy Analysis,” 2015 California Forum on Energy Efficient Manufacturing (CaFEEM), October 1, University of California-Davis, Davis, CA.
19. Poster: Mirkouei, A.†*, **K. Haapala**, G. Murthy, and J. Sessions, 2016, “Multi-criteria Decision Making for Sustainable Bio-Oil Production using a Mixed Supply Chain,” OSU Engineering Research Expo, March 1, Portland, OR. (**2nd Place, Industrial Engineering Category**)
20. Poster: Doran, M.†*, W. Pratte, R. Malhotra, and **K. Haapala**, 2016, “Characterization of an Electrically Assisted Grinding Process,” OSU Engineering Research Expo, March 1, Portland, OR.
21. Poster: Raoufi, K. *, **K.R. Haapala**†, K.-Y. Kim, C. Psenka, and K. Jackson, 2016, “A Constructionist Learning Approach for Educating Undergraduate Engineers on Sustainable Design and Manufacturing,” Envisioning the Future of Undergraduate STEM Education: Research and Practice, April 27-29, 2016, Washington, D.C.
22. Poster: Raoufi, K.†*, K.-Y. Kim, C. Psenka, K. Jackson, and **K. Haapala**, 2016, “A Questionnaire-based Methodology to Assist Manufacturing Processes Selection for Sustainable Product Design,” 2016 ASME Manufacturing Science and Engineering Conference, June 27-July 1, Blacksburg, VA.
23. Poster: B. Wang†**, C. Psenka, K.Y. Kim, **K.R. Haapala**, K.L. Jackson, and G.E. Kremer, 2016, “Cyberlearning and Constructionism in Learning for Sustainable Life-Cycle Engineering,” 5th International Congress on Sustainability Science & Engineering (ICOSSE 2016), October 24-27, Suzhou, China.
24. Poster: Jackson, K.L. †, C.E. Psenka, K.-Y. Kim, **K.R. Haapala**, and G.E. Okudan Kremer, 2017, “Deepening the Understanding of Sustainable Life Cycle Engineering with Constructionism,” Cyberlearning 2017, April 18-19, Washington, D.C.
25. Poster: Raoufi, K.†*, K.-Y. Kim, C. Psenka, K. Jackson, G.E. Okudan Kremer, and **K. Haapala**, 2017, “Enabling Cyber-Based Learning of Product Sustainability Assessment using Unit Manufacturing Process Analysis,” 2017 ASME Design for Manufacturing and the Life Cycle Conference, August 6-9, Cleveland, OH (**Honorable Mention in Data-Driven X for the Life Cycle Poster Competition**).
26. Poster: Chan, R.†*, S. Manoharan, and **K. Haapala**, 2017, “Comparing the Sustainability Performance of Metal-Based Additive Manufacturing Processes,” 2017 ASME Design for Manufacturing and the Life Cycle Conference, August 6-9, Cleveland, OH (**2nd Place in Data-Driven X for the Life Cycle Poster Competition**).
27. Extended Abstract: Raoufi, K.†* and **K.R. Haapala**, 2017, “Promoting Sustainable Product Design using Unit Manufacturing Process Analysis,” Society of Design and Process Science Conference (SDPS 2017), November 5-9, Birmingham, AL (**2nd Place, Doctoral Symposium, Engineering and Technology Track**).
28. Abstract: Massoni, B.*†, **K.R. Haapala**, M.I. Campbell, 2018, “Katana: Geometry Based Cost Modeling and Optimization for Traditional and Advanced Manufacturing,” *Proceedings of the ASME 2018 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*, Paper No. IDETC2018-85481, August 26-29, Quebec City, Quebec, Canada.

29. Abstract: Paul, B.K. †, J. O'Connor, **K. Haapala**, A. Shankar Raman*, and K. Alhamouri*, 2019, "A Case Study for The Use of Conventional and Modular Construction Methods in Building an Intensified Chemical Plant," 2019 AIChE Annual Meeting, November 10-15, Orlando, FL.
30. Poster: Paul, B.K. †, J. O'Connor, **K. Haapala**, A. Shankar Raman*, and K. Alhamouri*, 2019, "Modeling the Total Cost of Ownership for Scaling-Up via Modular Chemical Process Intensification," RAPID Institute Poster Session, 2019 AIChE Annual Meeting, November 10-15, Orlando, FL.

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., C.J. Eastwood, I.C. Garretson, 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., C.J. Eastwood, I.C. Garretson, 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., K.R. Haapala, and J.F. Junker, 2014, "Data Center Cooling System Evaluation," Initial White Paper for IT Aire, July 20.
17. Lajevardi, B., K.R. Haapala, and J.F. Junker, 2015, "Data Center Cooling System Evaluation," Final White Paper for IT Aire, July 31.
18. Malshe, H., B. Massoni, K. Haapala, M. Campbell, and D. Kim, 2015, "Defining a Path towards the Blank Factory Project," Phase 1 Final Report for The Boeing Company, June 30.
19. Malshe, H., B. Massoni, S. Lindberg, R. Chan, K. Haapala, M. Campbell, and D. Kim, 2016, "Achieving Rapid Configuration Generation and Cost-Competitive Production using the Blank Factory Concept," Phase 2 Final Report for The Boeing Company, July 31.
20. Massoni, B., R. Chan, Z. DeVita, E. Severson, J. Goodman, K. Haapala, M. Campbell, and D. Kim, 2017, "A Rapid Design and Manufacturing Analysis Tool for Production using the Blank Factory Concept," Phase 3 Final Report for The Boeing Company, August 31.
21. Massoni, B., R. Chan, A. Grier, I. Sargent, K. Haapala, M. Campbell, and D. Kim, 2018, "A Rapid Design and Manufacturing Analysis Tool for Production using the Blank Factory Concept," Phase 4 Final Report for The Boeing Company, December 31.

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 (*Presented by M.-C. Chiu, Penn State*). See paper above.
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 (*Presented by M.R. Bohm, University of Louisville*). See paper above.
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 (*Presented by M.O. Brown, M.S. advisee*). See paper above.
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, abstract with Kim, K.-Y., G. E. Okudan Kremer, E. A. Murat, and R. B. Chinnam. (*Presented by K.-Y. Kim, Wayne State University*).

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*). See paper above.
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), June 4-8, 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 M.S. 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 (ISERC 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, Oregon State University M.S. student*). 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, Oregon State University Ph.D. student*). See paper above.
44. "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 International Mechanical Engineering Conference and Exposition (MSEC), 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 Annual Conference and Expo 2014 (ISERC 2014), May 31-June 3, Montreal, Quebec, Canada (*Presented by B. Lajevardi, Ph.D. advisee*). See paper above.
49. "A Framework for Assessing Environmental and Operational Performance of New Manufacturing Process Technology," IIE Annual Conference and Expo 2014 (ISERC 2014), May 31-June 3, Montreal, Quebec, Canada (*Presented by A. Cimino-Hurt, M.S. advisee*). See paper above.
50. "A Proposed Hybrid-Dynamic Transition Phase for High Mix Low Volume Manufacturers," IIE Annual Conference and Expo 2014 (ISERC 2014), May 31-June 3, Montreal, Quebec, Canada (*Presented by O. Girod, B.S. Honors thesis advisee*). See paper above.

51. "Real-time Monitoring and Evaluation of Energy Efficiency and Thermal Management of Data Centers," SME/NAMRC 42 (2014), June 9-12, Detroit, MI (*Presented by B. Lajevardi, Ph.D. 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.
54. "Manufacturing Energy Analysis of a Microchannel Heat Exchanger for High-Density Servers," SME/NAMRC 43 (2015), June 8-12, Charlotte, NC (*Presented by I. Garretson, M.S. advisee*). See paper above.
55. "Profile of Sustainability in Additive Manufacturing and Environmental Assessment of a Novel Stereolithography Process," 2015 ASME International Manufacturing Science and Engineering Conference (MSEC), June 8-12, Charlotte, NC (*Presented by H. Malshe, M.S. advisee*). See paper above.
56. "A Network Model to Optimize Upstream and Midstream Biomass-to-Bioenergy Supply Chain Costs," 2015 ASME International Manufacturing Science and Engineering Conference (MSEC), June 8-12, Charlotte, NC (*Presented by A. Mirkouei, Ph.D. advisee*). See paper above.
57. "Unit Manufacturing Process Models for Ferromagnetic and Non-Ferromagnetic Alloy Surface Inspection Methods," 2015 ASME IDETC/CIE: 20th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 2-5, Boston, MA (*Presented by I. Garretson, M.S. advisee*). See paper above.
58. "Application of Sustainability Assessment to a Novel Plastic Recycling Process," 2015 ASME IDETC/CIE: 20th Design for Manufacturing and the Lifecycle Conference (DFMLC), August 2-5, Boston, MA. See paper above.
59. "Safety: Let's Start at the Beginning," 2015 ASEM International Annual Conference, October 7-10, Indianapolis, IN (*Presented by A. Tong, Ph.D. advisee*). See paper above.
60. "A Dynamic Model of Job Satisfaction and Turnover: Framework for Model Development and Simulation," 2015 ASEM International Annual Conference, October 7-10, Indianapolis, IN (*Presented by A. Tong, Ph.D. advisee*). See paper above.
61. "Evolutionary Optimization of Bioenergy Supply Chain Cost with Uncertain Forest Biomass Quality and Availability," IIE Annual Conference and Expo 2016 (ISERC 2016), May 21-24, Anaheim, California, USA. (*Presented by A. Mirkouei, Ph.D. advisee*). See paper above.
62. "Environmental Analysis of a Mixed-Mode Forest Biomass-to-Bio-oil Supply Chain," IIE Annual Conference and Expo 2016 (ISERC 2016), May 21-24, Anaheim, California, USA. Abstract only; ID #136. (*Presented by A. Mirkouei, Ph.D. advisee; Co-authors: K. Haapala, J. Sessions, G. Murthy*)
63. "Discussion on Constructionism and Sustainable Lifecycle Engineering," IIE Annual Conference and Expo 2016 (ISERC 2016), May 21-24, Anaheim, California, USA. Abstract only; ID #689. (*Presented by K.Y. Kim, Co-authors: K. Haapala, C. Psenka, K. Jackson*).
64. "A Pedagogical Module Framework to Improve Scaffolded Active Learning in Manufacturing Engineering Education," SME/NAMRC 44 (2016), June 27-July 1, Blacksburg, Virginia, USA. (*Presented by A. Mirkouei, Ph.D. advisee*). See paper above.

65. "Composability of Unit Manufacturing Process Models for Manufacturing Systems Analysis," 2016 ASME International Manufacturing Science and Engineering Conference (MSEC), June 27-July 1, Blacksburg, Virginia, USA. (*Presented by M. Smullin, M.S. advisee*). See paper above.
66. "An Approach to Compare Sustainability Performance of Additive and Subtractive Manufacturing during Process Planning," 2016 ASME IDETC/CIE: 21st Design for Manufacturing and the Lifecycle Conference (DFMLC), August 21-24, Charlotte, North Carolina, USA. (*Presented by M. Doran, M.S. advisee*). See paper above.
67. "Using Industry Focus Groups and Literature Review to Identify Challenges in Sustainable Assessment Theory and Practice," 2016 ASME IDETC/CIE: 21st Design for Manufacturing and the Lifecycle Conference (DFMLC), August 21-24, Charlotte, North Carolina, USA. (*Presented by M. Smullin, M.S. advisee*). See paper above.
68. "Reducing Greenhouse Gas Emissions for Sustainable Bio-Oil Production Using A Mixed Supply Chain," 2016 ASME IDETC/CIE: 21st Design for Manufacturing and the Life Cycle Conference (DFMLC), August 21-25, Charlotte, North Carolina, USA. (*Presented by A. Mirkouei, Ph.D. advisee*). See paper above.
69. "A Full Cost Model for Sustainable Manufacturing Systems" American Society for Engineering Management 2016 International Annual Conference, October 26-29, Concord, NC. (*Presented by H. Zhang, Ph.D. advisee, Collaborators: K. Haapala, J. Calvo-Amodio*). Presentation only.
70. "Development of Learning Modules for Sustainable Life Cycle Product Design: A Constructionist Approach," 2017 ASEE Annual Conference & Exposition, June 25-28, Columbus, OH. (*Presented by T. Khan, collaborating Ph.D. student*). See paper above.
71. "Environmental Performance Evaluation of Direct Metal Laser Sintering through Exergy Analysis," NAMRI/SME 45 (2017), June 4-8, Los Angeles, California, USA. (*Presented by H.P.N. Nagarajan, M.S. advisee*). See paper above.
72. "A Desktop Application for Sustainability Performance Assessment of Composed Unit-Based Manufacturing Systems," ASME 2017 International Manufacturing Science and Engineering Conference (MSEC), June 4-8, Los Angeles, California, USA. (*Presented by A. Shankar Raman, Ph.D. advisee*). See paper above.
73. "Enabling Non-Expert Sustainable Manufacturing Process and Supply Chain Analysis during the Early Product Design Phase," NAMRI/SME 45 (2017), June 4-8, Los Angeles, California, USA. (*Presented by K. Raoufi, Ph.D. advisee*). See paper above.
74. "Integration of Sustainability Indicators and the Viable System Model toward a Systemic Sustainability Assessment Methodology," 61st Annual Meeting of the ISSS - 2017, July 9-14, Vienna, Austria. (*Presented by A. Tong, Ph.D. advisee*). See paper above.
75. "Understanding the Sustainability of Eco-Labeled Products when Compared to Conventional Alternatives," 2017 ASME IDETC/CIE: 22nd Design for Manufacturing and the Life Cycle Conference (DFMLC), August 6-9, Cleveland, Ohio, USA. (*Presented by V. Ferrero, collaborating M.S. student*). See paper above.
76. "Enabling Cyber-Based Learning of Product Sustainability Assessment using Unit Manufacturing Process Analysis," 2017 ASME IDETC/CIE: 22nd Design for Manufacturing and the Life Cycle Conference (DFMLC), August 6-9, Cleveland, Ohio, USA. (*Presented by K. Raoufi, Ph.D. advisee*). See paper above.
77. "Comparing the Sustainability Performance of Metal-Based Additive Manufacturing Processes," 2017 ASME IDETC/CIE: 22nd Design for Manufacturing and the Life Cycle Conference (DFMLC), August 6-9, Cleveland, Ohio, USA. (*Presented by R. Chan and S. Manoharan, M.S. advisees*). See paper above.

78. "Promoting Sustainable Product Design using Unit Manufacturing Process Analysis," *Society of Design and Process Science Conference (SDPS 2017)*, November 5-9, Birmingham, AL. (Presented by K. Raoufi, Ph.D. advisee). See extended abstract above.
79. Organizer/Facilitator: Workshop on Using Cyberlearning to Enable Sustainable Engineering Education, SDPS 2017: 22nd International Conference: Emerging Trends and Technologies in Convergence Solutions, November 5-9, 2017, Birmingham, AL, (co-organizers: K.-Y. Kim of Wayne State University and G. Okudan Kremer of Iowa State University).
80. "A Sustainability Assessment Framework for Dynamic Cloud-based Distributed Manufacturing," 25th CIRP Life Cycle Engineering Conference, April 30-May 2, 2018 Copenhagen, Denmark. (Presented by H. Nagarajan, Ph.D. advisee). See paper above.
81. Organizer/Facilitator: Reusable Abstractions of Manufacturing Processes (RAMP) Workshop, 2018 ASME Manufacturing Science & Engineering Conference (MSEC), June 18-22, College Station, TX, (co-organizers: B. Linke of University of California, Davis; F. Zhao, Purdue University; KC Morris/W. Bernstein of the National Institute of Standards and Technology).
82. "Benchmarking Undergraduate Manufacturing Engineering Curricula in the United States," 46th SME NAMRC, June 18-22, 2018, College Station, Texas. (Presented by K. Raoufi, Ph.D. advisee). See paper above.
83. "Demonstrating a Standard Methodology for Sustainable Manufacturing Process Characterization," ASME 2018 International Manufacturing Science and Engineering Conference (MSEC), June 18-22, 2018, College Station, Texas, USA. (Presented by A. Shankar Raman, Ph.D. advisee). See paper above.
84. "Thermal Performance Evaluation of a Residential Solar/Gas Hybrid Water Heating System," 5th International High Performance Buildings Conference at Purdue, July 9-12, 2018, West Lafayette, IN. (Presented by S. Karki, M.S. advisee). See paper above.
85. "Multi-Sensor Data Fusion for Specific Energy Estimation in the Grinding Process," International Symposium on Flexible Automation (ISFA 2018), July 15-19, 2018, Kanazawa, Japan. (Presented by S. Desabathina, M.S. advisee). See paper above.
86. "Comparison between Artificial Neural Network and Random Forest Based Multi-Sensor Fusion for Predicting CBN Wheel Condition," International Symposium on Flexible Automation (ISFA 2018), July 15-19, 2018, Kanazawa, Japan. (Presented by D. Porter, collaborator). See paper above.
87. "Assessing Component Machinability using Voxelized Solid Models," ASME 2018 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, August 26-29, 2018, Quebec City, Quebec, Canada. (Presented by R. Chan, M.S. advisee). See paper above.
88. "Aggregating Unit Process Models to Enable Environmental Impact Characterization of Polymer-Based Hybrid Manufacturing," 16th Global Conference on Sustainable Manufacturing (GCSM), October 2-4, 2018, Lexington, Kentucky. (Presented by S. Manoharan, M.S. advisee). See paper above.
89. "Towards Sustainable Manufacturing by Extending Manufacturing Execution System Functions," 20th International Conference on Industrial Technology (IEEE-ICIT 2019), February 13-15, 2019, Melbourne, Australia. (Presented by A. Lobov, collaborator). See paper above.
90. "A Grey Box Software Framework for Sustainability Assessment of Composed Manufacturing Processes: A Hybrid Manufacturing Example," 26th CIRP Life Cycle Engineering Conference, May 7-9, 2019, West Lafayette, IN, USA. (Presented by S. Manoharan, M.S. advisee). See paper above.
91. "Enabling Sustainability Performance Assessment by Non-Experts through Improved Visual Communication Methods and Tools," 26th CIRP Life Cycle Engineering Conference, May 7-9, 2019, West Lafayette, IN, USA. (Presented by K. Raoufi, Ph.D. advisee). See paper above.

92. “Challenges in Representing Manufacturing Processes for Systematic Sustainability Assessments – Workshop on June 21, 2018,” *ASME 2019 14th International Manufacturing Science and Engineering Conference (MSEC)*, June 10-14, 2019, Erie, PA, USA. (Presented by A. Shankar Raman, Ph.D. advisee). See paper above.
93. “Industrial Sustainability: Reviewing the Past, Envisioning Our Future,” *ASME 2019 14th International Manufacturing Science and Engineering Conference (MSEC)*, June 10-14, 2019, Erie, PA, USA. Presented update on the ASME MED 100-Year Paper for publication in 2020.
94. “Probabilistic Modelling of Defects in Additive Manufacturing: A Case Study in Powder Bed Fusion,” *52nd CIRP Conference on Manufacturing Systems*, June 12-14, 2019, Ljubljana, Slovenia, (Presented by S. Panicker, Ph.D. advisee). See paper above.
95. “Tracing the Interrelationship between Key Performance Indicators and Production Cost using Bayesian Networks,” *52nd CIRP Conference on Manufacturing Systems*, June 12-14, 2019, Ljubljana, Slovenia, (Presented by S. Panicker, Ph.D. advisee). See paper above.
96. “A Case Study for the Use of Conventional and Modular Construction Methods in Building an Intensified Chemical Plant,” 2019 AIChE Annual Meeting, November 10-15 2018, Orlando, FL, (Presented by B.K. Paul, collaborator). See abstract 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 Speaker: "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 Speaker: "Advanced Manufacturing and Sustainability," Smartmap Expo, September 29, 2011, TRAC Center, Pasco, WA.
22. Invited Speaker: "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 Speaker: "Sustainability in Engineering Design and Manufacturing Engineering," Lundquist College of Business, University of Oregon, October 12, 2012, Eugene, OR.
29. Invited Speaker: "Sustainability Assessment of Titanium and Aluminum Product Manufacturing," Materials Science Seminar, Oregon State University, May 2, 2013, Corvallis, OR.
30. Invited Advisor: 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. “Enabling Sustainable and Resilient Supply Chains During Early Product Design,” NSF I/UCRC Center for e-Design Strategic Planning Meeting, July 31-August 1, 2013, Corvallis, OR.
34. Invited Speaker: “Improving Environmental Performance of Cast Metal Products,” Oregon Chapter of the American Foundry Society, January 15, 2014, Portland, OR.
35. Invited Participant and Panelist: Smart Manufacturing Workshop, National Institute of Standards and Technology (NIST), June 16-17, 2014, Gaithersburg, MD.
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.
37. Invited Panelist: “Session 2: Standards for data and reporting,” Workshop on Standards-based Cloud Services for Manufacturing Sustainability Assessment, National Institute of Standards and Technology, May 5, 2015, Gaithersburg, MD.
38. Organizer/Facilitator: “Defining Industry Needs in Manufacturing Process Characterization,” Industry Roundtable sponsored National Institute of Standards and Technology (NIST), June 18, 2015, Boston, MA (*co-organizer: J. Isaacs of Northeastern University*).
39. Organizer/Facilitator: “Defining Industry Needs in Manufacturing Process Characterization,” Industry Roundtable sponsored National Institute of Standards and Technology (NIST), December 8, 2015, Seattle, WA.
40. Organizer/Facilitator: “Defining Industry Needs in Manufacturing Process Characterization,” Industry Roundtable sponsored National Institute of Standards and Technology (NIST), March 12, 2016, Chicago, IL (*co-organizers: S. Shade, J. Sutherland, F. Zhao of Purdue University*).
41. Presenter: Clean Energy Smart Manufacturing Innovation Institute (CESMII) Northwest Regional Manufacturing Center, DOE Site Visit, August 31, 2016, Seattle, WA.
42. Presenter: “B.S. Manufacturing Engineering Curriculum Changes at Oregon State University,” Manufacturing Committee of MECOP Inc., January 12, 2018, Wilsonville, OR (*with B. Paul*).
43. Invited Speaker: “Overview of Oregon State University and Research in the Industrial Sustainability Lab,” for the Faculty of Engineering Sciences, May 4, 2018, Tampere University of Technology, Tampere, Finland.
44. Visiting Faculty Seminar: “Formalizing Sustainable Manufacturing Assessment through Unit Manufacturing Process Modeling,” September 10, 2018, Tampere University of Technology, Tampere, Finland.
45. Invited Exhibitor: “Smart Manufacturing,” Symposium on The Promise and the Peril of Artificial Intelligence and Robotics, October 23, 2018, Oregon State University, Corvallis, OR (*with Z. Fan and students S. Desabathina and T. Lee*).
46. Presenter: “Melting Pots: A Cacophony of Cultures, A Fusion of Flavors,” American Voices Seminar, October 11-12, 2019, University of Turku, Finland (*with fellow Fulbrighters D. Carranza, C. Confortini, B. Lear, and L. Presser*).
47. Organizer/Panel Moderator: CESMII Smart Manufacturing Industry Workshop, November 13, 2019, Oregon State University, Corvallis, OR (*co-organizer D. Porter*).

TEACHING

Tampere University (2019-2020)

- Spring 2020 *Co-instructor*, Advanced Project Work, MEI-19006
Co-instructor, Changing Subject Course (TBD), MEI-19106
Co-instructor, Systems Engineering, MEI-41207
- Fall 2019 *Guest Lecturer*, Digital Manufacturing, MEI-51026

Oregon State University (2009-present)

- Winter 2019 *Instructor*, Production Engineering, MFGE 336
Curriculum Innovation: Revised timing of topics to improve course flow.
- Fall 2018 *Instructor*, Industrial Sustainability Analysis, MFGE 535
- Winter 2018 *Instructor*, Production Engineering, MFGE 336
Curriculum Innovation: Revised timing of topics to improve lecture and lab alignment, and reduce conflicts with ME 250 and Capstone later in the term.
Guest Lecturer, Computer Control of Manufacturing Processes, MFGE 437, Presented a lecture on logic control.
- Fall 2017 *Instructor*, Industrial Sustainability Analysis, MFGE 535
- Summer 2017 *Guest Lecturer*, Computer Aided Design and Manufacturing, ME 413, Two-lecture case study on product data management for airplane door manufacturing.
- Spring 2017 *Guest Lecturer*, Computer Control of Manufacturing Processes, MFGE 437, Presented a lecture on logic control.
- Winter 2017 *Instructor*, Production Engineering, MFGE 336
Instructor, Advanced Manufacturing Seminar, IE 507
- Fall 2016 *Instructor*, Industrial Sustainability Analysis, MFGE 535
Instructor, Computer Aided Design and Manufacturing, ME 413
Curriculum Innovation: Revised course to include expanded topics in CNC machining and sustainable additive manufacturing.
Guest Speaker, Introduction to MIME, MIME 101, Lecture on diversity with other members of the DIV/MIME (diversity by MIME) project team.
- Spring 2016 *Instructor*, Production Engineering, MFGE 336
- Fall 2015 *Instructor*, Industrial Sustainability Analysis, MFGE 535
Guest Speaker, Introduction to MIME, MIME 101, Lecture on diversity with other members of the DIV/MIME (diversity by MIME) project team.
- Spring 2015 *Guest Lecturer*, Production Engineering, MFGE 336
- Winter 2015 *Instructor*, Production Engineering, MFGE 336
- Fall 2014 *Instructor*, Industrial Sustainability Analysis, MFGE 535
Instructor, Computer Aided Design and Manufacturing, ME 413
Guest Speaker, Introduction to Industrial and Manufacturing Engineering, IE/MFGE 285, Lecture on manufacturing engineering as a discipline.
- Spring 2014 *Organizer*, Cutting Tools and Related Machining Fundamentals, MFGE 808,
Curriculum Innovation: Led the organization of two-day, eight-hour course taught by a cutting tool engineer (Boeing), with 18 undergrad/grad students and faculty/staff.

- Coordinated by OSU Professional and Continuing Education program (13 students awarded 0.8 continuing education units).
- 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 as a discipline.
- 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: (1) New course development (IE 591/491). **(2)** 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 as a discipline.
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 *Course Development*, Production Engineering, IE 336
 & Fall 2009 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 (2004-2008)

- 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, along with a Hispanic Ph.D. engineering student.
- 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 2017-Winter 2018. This led to a dual major with Mechanical Engineering.
2. Coordinated B.S. Manufacturing Engineering Curricular redesign, Oregon State University, Winter-Fall, 2009. This better differentiated the program from Industrial Engineering.

3. Developed Educational Module, “Sustainable Product Manufacturing,” Center for Sustainable Engineering, Carnegie Mellon University, Summer 2010.
4. Developed Educational Module (with advisees Hari Nagarajan and Amin Mirkouei), “Sustainable Additive Manufacturing,” CACHE Corp. (under NSF SMART Research Coordination Network), 2016.

B.S. Honors Thesis Advisees – Major Advisor (2)

- 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” (**2014 SME 30 Under 30 Award**)

B.S. Honors Thesis Committee Service (4)

- 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”
- Jack Bellville, ME (OSU, Advisor: B. DuPont), May 2015, “Exploring Sustainable Design Methods Through the Redesign of a Commuting Bicycle”
- Sadie Boyle, ME (OSU, Advisor: B. DuPont), May 2016, “Exploring Processes that Foster Innovative and Sustainable Product Design”
- Ian Sargent, IE (OSU, Advisor: D. Kim), December 2018, “The Impact of Material Handling on Manufacturing Process Plan Selection”

Senior Project Advising (13 projects, 15 teams of 3 students each)

- Brent Hughes, Derek Sugiyama, and Mary Beth Vanlue, Furniture Recycling Process and Measures, **Sponsor:** Benton Furniture Share, 2009-2010.
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.
- Joel Knapp, Ankit Patel, Yierfan Haimiti, Design of Lean Pull System, **Sponsor:** Sheldon Manufacturing Inc., 2014-2015 (Ph.D. Advisees Hao Zhang and Anh Tong served as mentors).
- Awad Albaqawi, Andrew Dix, Carsten Haase, Shoe Press, **Sponsor:** Soft Star Shoes, Winter-Spring 2015.
- Ryan Johnson, Nick Dodge, Andres Uribe, Metal Detection Process Redesign and Improvement, **Sponsor:** Oregon Freeze Dry, 2015-2016.
- Samuel Aditya, Kyle Eckrich, Amy Masoni, Development of a Model for Sustainable System Assessment, (Ph.D. Advisee Anh Tong serving as mentor). **Sponsor:** Industrial Sustainability Lab,

- Partners:** Dr. Javier Calvo (OSU Reliable Systems Engineering and Change Management Lab), Dr. Jason Ideker (CivE), Oregon Department of Transportation, 2016-2017.
- Abdulrhman Alahmadi, Abdullah Alyahya, Mohammed Alabdullatif, Sustainable Supply Chain Management, (Ph.D. Advisee Kamyar Raoufi serving as mentor). **Sponsor:** OSU Industrial Sustainability Laboratory, **Partners:** Iowa State University, Pennsylvania State University, Wayne State University, Fall 2016.
 - Warren Mead, William Landsiedel, Christopher Lambangsaputra, Sustainable Supply Chain Management, (Ph.D. Advisee Kamyar Raoufi serving as mentor). **Sponsor:** OSU Industrial Sustainability Laboratory, **Partners:** Iowa State University, Pennsylvania State University, Wayne State University, Winter-Spring 2017.
 - Jimi Witt, Bryan Madison, Ulises Morales, Abdullah Bin Howban, Laundromat Heat Recovery, **Sponsor:** local laundromat business, Winter-Spring 2018.

Undergraduate Student Supervision and Mentoring (27)

- 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, URISC:Start, product disassembly
- Daniela Rodriguez Casallas, IE (UNAL, Colombia), Fall 2012, visiting undergraduate researcher, life cycle assessment of alternative energy systems
- Ian Garretson, IE (OSU), Spring 2013, undergraduate research assistant (Boeing), sustainable manufacturing assessment method and model development
- Jackson Santee, IE (OSU), Spring 2013, URSA:Engage undergraduate research assistant, sustainable manufacturing systems
- Christopher Eastwood, CompE (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, Fall 2014, URSA:Engage undergraduate research assistant, sustainable manufacturing systems engineering
- Trent Cayetano, Gen. Engr. (OSU), Winter, Spring, Fall 2015, STEM Leaders Program, undergraduate research assistant, sustainable manufacturing systems engineering
- Supriya Kapur, IE (OSU), Spring/Fall 2015-Winter 2016, undergraduate assistant, NSF Cool:SLiCE Project
- Soe Lyian Toe, ESE (OSU), Fall 2015-Spring 2016, URISC undergraduate research assistant, energy use in additive manufacturing
- Rothanak Chan, IE (OSU), Winter-Summer 2016, undergraduate assistant, Boeing Project
- Keaton Corder-Swanson, IE (OSU), Fall 2016, undergraduate assistant, Boeing Project
- Emily Severson, IE (OSU), Fall 2016-Spring 2017, undergraduate assistant, Boeing Project
- Yiye (Stella) Xu, CivE (OSU), Fall 2016-Spring 2017, undergraduate assistant, ODOT Project
- Tuong Hoang, ME (OSU), Winter 2018, undergraduate assistant, NSF Cool:SLiCE Project
- Emily Liu, CS (OSU), Winter-Spring 2018, undergraduate assistant, MIME Undergraduate Research Experience program, assistance with NSF Cool:SLiCE Project
- Preston Baker, MfgE (OSU), Winter-Spring 2018, undergraduate assistant, MIME Undergraduate Research Experience program, assistance with hybrid manufacturing project
- David Headrick, CS (OSU), Fall 2018-Spring 2019, mentee, Faculty-Student Mentor Pilot Program

- Taylor Westbrook, BioHlth (OSU), Fall 2018-Spring 2019, mentee, Faculty-Student Mentor Pilot Program
- Ella Mudry, ME (OSU), Winter-Spring 2019, undergraduate assistant, URSA Engage, hybrid additive-subtractive machine structure development
- Dustin Harper, ME (OSU), Winter-Spring 2018, undergraduate assistant, URSA Engage; Summer 2018-Winter/Fall 2019, undergrad researcher, NSF RAMP Workshop documentation
- Connor Wilson, CS (OSU), Winter-Spring/Fall 2019, undergraduate assistant, URSA Engage, hybrid additive-subtractive machine control development

High School Student Supervision and Mentoring (4)

- Albert Cai, Crescent Valley High School (Corvallis, OR), Summer 2012, Saturday Academy: Apprenticeships in Science & Engineering Program, product disassembly and documentation
- Brandon Murray, Camas High School (Camas, WA), Summer 2015, Saturday Academy: Apprenticeships in Science & Engineering Program, product disassembly and documentation; Summer 2016, Professional Development Internship Program, software development for sustainable manufacturing tool
- Natalie Dupuy, Crescent Valley High School (Corvallis, OR), Summer 2016, Saturday Academy: Apprenticeships in Science & Engineering Program, sustainable product development; Summer 2017, Volunteer Researcher, sustainable manufacturing research
- Jennifer Yang, Corvallis High School (Corvallis, OR), Summer 2017, Saturday Academy: Apprenticeships in Science & Engineering Program, sustainable product development

SERVICE

University Service

Oregon State University

University

- Mentor, Inaugural Faculty-Student Mentor Program, 2018-2019

Graduate School

- Graduate Council Representative, Service on various M.S. and Ph.D. committees, 2010-present

College of Forestry

- Member, Faculty Search Committee, Advanced Wood Manufacturing, Spring 2018-Fall 2018

College of Engineering

- Member, Search Committee, Associate Dean for Faculty Development, Winter 2018
- Member, COE Office of Faculty Development, Diversity & Inclusion Team, 2016-2019
- Mentor, Saturday Academy Apprenticeships in Science and Engineering, High School Internships, Summers of 2012, 2015, 2016, and 2017
- Member, Bioenergy Minor Curriculum Committee, Fall 2011

School of Mechanical, Industrial and Manufacturing Engineering (MIME)

- Lead, Advanced Manufacturing Area, Fall 2017-Spring 2019
- Member, Graduate Faculty, Industrial Engineering, Winter 2009-present; Mechanical Engineering, Winter 2009-present; Materials Science, Summer 2014-present
- Member, Mechanical Engineering Graduate Program Committee (GPC), Fall 2018
- Member, Industrial & Manufacturing Engineering Undergraduate Program Committee (UPC), Winter 2009-Spring 2019
- Coordinator, B.S. Manufacturing Engineering Curriculum, Winter 2009-present
- Coordinator, Manufacturing Engineering Educational Laboratory, Summer 2009-present
- Faculty Advisor, Society of Manufacturing Engineers (OSU Chapter S019), Fall 2009-Spr 2019
- Member, Promotion & Tenure Subcommittee (Mid-tenure Case), 2018-19
- Member (representing IME and junior faculty), NSF TECAID (Transforming Engineering Culture to Advance Inclusion and Diversity) Project Team, 2015-17

- Organizer, Manufacturing Day Event at OSU ATAMI Building, October 2016, October 2017
- Member, Promotion & Tenure Subcommittee (Mid-tenure Case), 2016-17
- Chair, Faculty Search Committee, Materials Science, 2016-17
- Member, Promotion & Tenure Subcommittee (Tenure Case), 2016-17
- Member, Faculty Search Committee (Assistant Professor-Senior Research), Fall 2016
- Member, Safety Committee, Fall 2009-Summer 2016
- Member, Faculty Search Committee, Advanced Manufacturing, 2015-16
- Member, School Head Search Committee, 2015-16
- Chair, Laboratory Instructor Search Committee, 2015-16
- Mock Interviewer for OSU SME club-organized event, January 2016
- Member, Ad Hoc Committee on Voting, Spring 2015
- Liaison, Industrial & Manufacturing Engineering Graduate Program Committee (GPC), Nano/Micro-manufacturing, 2012-2013; Advanced Manufacturing, 2013-2014
- Member, Faculty Search Committee (Chair, Advanced Manufacturing Subcommittee), 2013-14
- Member, Faculty Search Committee, Advanced Manufacturing, 2012-13
- Faculty Advisor, Surface Mount Technology Association (OSU Student Chapter), 2012-2013
- Faculty Assistant, MECOP Interview and Placement Events, Winter: 2011; Spring: 2011, 2013
- Member, Aerospace Option Ad Hoc Curriculum Committee, Spring 2012-Fall 2013
- IME Faculty Representative, Beaver Open House, Fall 2009, Fall 2010, Fall 2011
- Co-coordinator (with R. Peterson), Energy & Sustainability Research Cluster, Sp 2009, 2010-11
- Member, Search Committee, Machining/Product Realization Lab Manager, Spring 2011
- Co-coordinator (with R. Albertani), Composites Laboratory, 2009-10, 2010-11

Michigan Technological University

Sustainable Futures Institute

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

Department and Project Leadership

- Secretary, OSU Graduate Student Council, 2007-08
- At-large Member, OSU Graduate Student Council, 2003-07
- Vice President/University Senate Liaison, OSU Graduate Student Council, 2002-03
- Member, Graduate Student Mentor Awards Committee, 2002-03
- Member, Student Advisory Committee for the Department of Mechanical Eng.-Eng. Mechanics (Co-organized ME-EM Open House/Lab Tour), 2002-03
- Treasurer (2000-01), Michigan Tech FutureTruck, Enterprise Design Team member, 2000-01
- Treasurer (1999-2000), Michigan Tech FutureCar, Body Team member, 1997-2000

Service to the Profession

Journals Editorships Held

- *Associate Editor*, ASTM Journal of Smart and Sustainable Manufacturing, 2015-present
- *Associate Editor*, ASME Journal of Manufacturing Science and Engineering, 2016-present
- *Editorial Board Member*, AIChE Journal of Advanced Manufacturing and Processing, 2018-present
- *Guest Editor*, ASME Journal of Manufacturing Science and Engineering Special Issue on Sustainable Life Cycle Engineering, Co-editors: S. Behdad and W.Z. Bernstein, 2018
- *Guest Editor*, ASME Journal of Manufacturing Science and Engineering Special Issue on Sustainable Manufacturing, Co-editors: D.A. Dornfeld, M. Helu, and J. Arinez, 2016

Book Publishers Reviewed for

- Elsevier (2018) – book proposal on Advanced Manufacturing (vol. on Sustainable Manufacturing)

Journals Reviewed for

- Chemical Engineering Journal (2013)
- Design Science (2018-2019)
- Ecological Indicators (2015-2016)
- Energy Efficiency (2011)
- Environmental Impact Assessment Review (2014)
- Frontiers in Energy Research (2016)
- International Journal of Advanced Manufacturing Technology (2013-2017)
- International Journal of Computing and Information Science in Engineering (2016)
- International Journal of Life Cycle Assessment (2014, 2017)
- International Journal of Manufacturing Research (2019)
- International Journal of Product Life Cycle Management (2009)
- International Journal of Production Research (2008, 2013, 2014)
- International Journal of Strategic Engineering Asset Management (2013)
- International Journal of Sustainable Engineering (2017)
- International Journal of Sustainable Manufacturing (2015)
- Journal of Cleaner Production (2012-2017, 2019)
- Journal of Industrial Ecology (2019)
- Journal of Intelligent Materials Systems and Structures (2004)
- Journal of Manufacturing Processes, SME (2018-2019)
- Journal of Manufacturing Science and Engineering, ASME (2004, 2011, 2013-2016)
- Journal of Manufacturing Science and Technology, CIRP (2014, 2019)
- Journal of Manufacturing Systems, SME (2006, 2012, 2015)
- Journal of Mechanical Design, ASME (2009, 2013-2016, 2018-2019)
- Journal of Renewable and Sustainable Energy (2011)
- Journal of Smart and Sustainable Manufacturing Systems, ASTM (2019)
- Journal of STEM Education: Innovations and Research (2010)
- Manufacturing Letters, SME (2018)
- Polish Journal of Environmental Studies (2011)
- Resources, Conservation & Recycling (2010, 2017)
- Sustainable Production and Consumption (2017-2018)
- World Journal of Engineering & Physical Sciences (2014)

Proceedings/Abstracts Reviewed for

- ASME International Design Engineering Technical Conferences (2010-2018)
- ASME Manufacturing Science and Engineering Conference (2009-2019)
- ASME International Symposium on Flexible Automation (2006)
- CIRP International Conference on Life Cycle Engineering (2010, 2012, 2014-2019)
- CIRP Global Conference on Sustainable Manufacturing (2018)
- IIE Industrial Engineering Research Conference (2011-2012)
- INEER International Conference on Engineering Education (2007)
- International Conference on Agile Manufacturing (2007)
- International Conference on Industry 4.0 and Advanced Manufacturing (2019)
- SME North American Research Conference (2005-2019)
- [avniR] LCA Conference (2012-2014)

National Science Foundation Proposals Reviewed for

- NSF/CMMI Manufacturing Machines and Equipment Program (2009, 2014-2016)
- NSF/DUE (2014)
- NSF/EPA Networks for Characterizing Chemical Life Cycle (2013)
- NSF SBIR/STTR Program (2013)

American Society of Mechanical Engineers (ASME)

ASME Leadership

- *Technical Program Chair*, 2021 ASME Manufacturing Science & Engineering Conference (MSEC), West Lafayette, IN.
- *Technical Program Co-Chair*, 2020 ASME Manufacturing Science & Engineering Conference (MSEC), June 22-26, 2020, Cincinnati, OH.
- *Past Chair (2018-2020)*, *Design for Manufacturing and the Life Cycle Engineering Technical Committee*, ASME Design Engineering Division (DED)
- *Chair (2017-2018)*, *Design for Manufacturing and the Life Cycle Engineering Technical Committee*, ASME Design Engineering Division (DED)
- *Vice Chair (2016-2017)*, *Design for Manufacturing and the Life Cycle Engineering Technical Committee*, ASME Design Engineering Division (DED)
- *Secretary (2015-2016)*, *Design for Manufacturing and the Life Cycle Engineering Technical Committee*, ASME Design Engineering Division (DED)
- *Conference Chair (2014-2015)*, *Design for Manufacturing and the Life Cycle Engineering Technical Committee*, ASME Design Engineering Division (DED)
- *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)
- *Conference Host Committee Co-Chair*, 2011 ASME Manufacturing Science & Engineering Conference (MSEC), June 13-17, 2011, Corvallis, OR.
- *Chair (2011-2013)*, *Life Cycle Engineering Technical Committee*, ASME Manufacturing Engineering Division (MED). Led MED state of the art journal papers
- *Vice Chair (2010-2011)*, *Life Cycle Engineering Technical Committee*, 2010-2011, ASME Manufacturing Engineering Division (MED). Led MED state of the art conference paper

ASME Conference Organization (17 symposia, 3 tracks)

- *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).
- *Symposium Organizer*, “Sustainable Nanomanufacturing,” 2011 ASME Manufacturing Science & Engineering Conference (MSEC), June 13-17, 2011, Corvallis, OR (with W. Zhang).
- *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.
- *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 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 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).
- *Review Coordinator*, “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.
- *Panel 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).
- *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).
- *Symposium Co-Organizer*, “Sustainable Manufacturing Technologies and Practices,” 2015 ASME Manufacturing Science & Engineering Conference (MSEC), June 8-12, Charlotte, NC (with C. Yuan and C. Schoonenberg).
- *Review Co-Coordinator*, “Design for Manufacturing and Assembly,” 21st Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2016 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 21-24, 2016, Charlotte, NC (with J. Summers).
- *Symposium Co-Organizer*, “Manufacturing Process Characterization for System Level Sustainability Assessment,” 2017 ASME Manufacturing Science & Engineering Conference (MSEC), June 4-8, Los Angeles, CA (with M. Mani, K.C. Morris, K.W. Lyons, and B.S. Linke).
- *Symposium Co-Organizer*, “Reusable Abstractions of Manufacturing Processes (RAMP),” 2018 ASME Manufacturing Science & Engineering Conference (MSEC), June 18-22, College Station, TX (with K.C. Morris, W.Z. Bernstein, F. Zhao, and B.S. Linke).
- *Review Coordinator*, “Design for Manufacturing and Assembly,” 23rd Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2018 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), August 26-29, 2018, Quebec City, Canada.
- *Symposium Co-Organizer*, “Advances in Reusable Abstractions for Manufacturing Process and Unit Process Life Cycle Inventories,” 2019 ASME Manufacturing Science & Engineering Conference (MSEC), June 10-14, Erie, PA (with K.C. Morris, W.Z. Bernstein, and B.S. Linke).

Other Service to ASME

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

- *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.
- *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, Portland, OR.
- *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.
- *Session Chair*, “Industrial Energy Efficiency,” 2015 ASME Manufacturing Science & Engineering Conference (MSEC), June 8-12, Charlotte, NC.
- *Session Chair*, “Dornfeld Symposium 8 - Sustainable Mfg. 3,” 2016 ASME Manufacturing Science & Engineering Conference (MSEC), June 27-July 1, Blacksburg, VA.
- *Session Chair*, “Design for Manufacturing and Assembly,” 21st Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2016 International Design Engineering Technical Conferences (IDETC) & Computers and Information in Engineering Conference (CIE), August 21-24, Charlotte, NC.
- *Session Chair*, “Sustainable Design and Manufacturing II,” 23rd Design for Manufacturing and the Lifecycle Conference (DFMLC), ASME 2018 International Design Engineering Technical Conferences (IDETC) and Computers & Information in Engineering Conf. (CIE), Aug. 26-29, Quebec City, Canada.

Society of Manufacturing Engineers (SME)

SME Leadership

- *Chair (Appointed by SME Member Council Chair)*, Student Relations Committee, 12/2018-12/2020.
- *Member (Appointed by SME President)*, Member Council (Student Relations Committee Liaison), 08/2017-12/2018.
- *Conference Host Committee Co-Chair*, 2011 SME North American Manufacturing Research Conference (NAMRC), June 13-17, 2011, Corvallis, OR.
- *Faculty Advisor*, Oregon State University Student Chapter (S019), Fall 2009-present.
- *Member*, SME NAMRI (North American Manufacturing Research Institute), 2002-present.

Other Service to SME

- *Session Co-Chair*, “Manufacturing Systems 3,” 37th NAMRC, May 19-22, 2009, Greenville, SC.
- *SMIS Beta Reviewer*, Sustainable Manufacturing Information Service (SMIS) Project, 2010.
- *Session Co-Chair*, “Sustainable Manufacturing 1,” 39th NAMRC, June 13-17, 2011, Corvallis, OR.
- *Member*, Distinguished Faculty Advisor Award Selection Committee, 2019.

The International Academy for Production Engineering (CIRP)

- *Scientific Committee*, CIRP Conference on Life Cycle Engineering (2012-2019)
- *Scientific Committee*, Global Conference on Sustainable Manufacturing (2018-2019)
- *Session Chair*, 26th CIRP Conference on Life Cycle Engineering (2019), West Lafayette, IN.
- *Session Chair*, 19th CIRP Conference on Life Cycle Engineering (2012), Berkeley, CA.
- *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.
- *Session Chair*, 17th CIRP Conference on Life Cycle Engineering (2010), Hefei, China.

Other Service to the Profession

- *International Program Committee Member*, 1st International Conference on Industry 4.0 and Advanced Manufacturing (I-4AM 2019), Bengaluru, India, June 28-29, 2019.
- *External Examiner*, Ph.D. Dissertation, University of New South Wales, November 2018.

- *Student Poster Competition Judge*, RAMP (Reusable Abstractions of Manufacturing Processes) Workshop Poster Session, College Station, TX, June 2018.
- *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.
- *Presentation Judge*, National Institute for Standards and Technology (NIST) RAMP (Reusable Abstractions of Manufacturing Processes) Challenge, June 2017.
- *Educational Reviewer*, “Geometric Dimensioning and Tolerancing,” by David A. Madsen and David P. Madsen, Goodheart-Willcox, 2016.
- *Report Reviewer*, “HT 2 Induction Hardening, Unit Process Life Cycle Inventory,” by Eric Vozzola, Michael Overcash, Evan Griffing, 2016.
- *IESP Pre-Doctoral Fellowship Proposal Reviewer*, University of Illinois-Chicago, 2015.
- *Scientific Committee*, Intl. [avniR] LCA Conference, Lille, France (2012-2014)
- *Student Poster Competition Judge*, 4th International Forum on Sustainable Manufacturing at the University of Kentucky, September 12, 2014, Lexington, KY.
- *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.
- *Reviewer*, Structural Engineering Institute, Sustainability Committee, Carbon Working Group, 2012

Service to the Public

- *High School Student Mentor*, Professional Development Internship Program, Camas High School (Camas, WA), Summer 2016.
- *Member*, Industrial/Postsecondary Advisory Committee, Career and Technical Education Program, Junction City High School (Junction City, OR), 2014-2015.
- *Judge*, Sunnyside School District Middle School Science Fair (Sunnyside, WA), February 2010.