

# Cassandra L. Thiel, PhD

@CassandraLThiel

## EDUCATION

- PhD Civil Engineering**, University of Pittsburgh (PITT) Pittsburgh, PA  
Area of Specialization: Sustainable Healthcare & Green Buildings 2009 – 2013  
Dissertation: *Understanding and Improving Healthcare Using Environmental Life Cycle Assessment and Evidence-Based Design*
- B.S. Civil Engineering**, cum laude, Michigan Technological University (MTU) Houghton, MI  
Minor: International German, Zertifikat Deutsch Exam, Level B1 2004 - 2009

## AWARDS AND HONORS

- University of Pittsburgh 'Best Poster' Award at Postdoctoral Data & Dine Symposium 2016
- The American Ophthalmological Society (AOS) Charitable, Educational and Scientific Trust Fund, Travel Grant Recipient 2016
- Fulbright-Nehru Academic and Professional Excellence Award (Research) 2014-2015  
Fulbright Scholar Program, Council for International Exchange of Scholars (CIES)
- National Science Foundation (NSF) Integrative Graduate Education and Research Traineeship (IGERT No. 0504345) Fellowship, PITT 2010-2013
- Alumni of the Year, Summer Institute for Sustainability and Energy (UI-Chicago) 2014
- Sustainability Scholar Award, PITT (NSF 1432890) 2014
- Provost Development Fund Award, PITT 2013
- University of Pittsburgh Medical Center (UPMC) 2011  
Sustainable Health Care Innovation Competition Winner, Student Division
- NSF CMMI Student Conference Fellowship Recipient 2011
- Hugh and Martha Winn Endowed Scholarship Recipient, MTU 2009
- Tau Beta Pi Engineering Honor Society, Michigan Beta Member 2009
- Chi Epsilon National Civil Engineering Honor Society Member 2007

## RESEARCH EXPERIENCE

### Post-Doctoral Research:

**Sustainable Healthcare Initiative and EFRI-SEED** 2015-2016

*Advisors:* Dr. Joel Schuman, MD, The Eye Institute, University of Pittsburgh  
Dr. Mark Baratz, MD, University of Pittsburgh Medical Center  
Dr. Melissa Bilec, PhD, University of Pittsburgh

*Summary:* assess and compare cost and environmental impacts of ophthalmic surgical methods in the US and UK; lead and manage clinical trial testing sustainable interventions to hand surgery (orthopedics); develop a sustainable healthcare network in Pittsburgh; finalize a dynamic life cycle assessment of decentralized water treatment

**Fulbright: Environmental Life Cycle Impacts of Cataract Surgery in India** 2014-2015

*Collaborators:* Dr. R. Venkatesh, Aravind Eye Hospital & Institute of Ophthalmology  
Dr. Alan Robin, University of Maryland and Johns Hopkins University  
Dr. Joel Schuman, University of Pittsburgh

*Summary:* assessed life cycle impacts associated with materials, energy, and patient pathways of high-volume cataract surgery in India; compared with standard cataract surgical methods and patient pathways in the US and UK

**NSF EFRI: Barriers, Understanding, Integration - Life Cycle Development** 2013-2014

*Advisor:* Dr. Melissa Bilec, University of Pittsburgh

*Summary:* investigated barriers to wider use of life cycle assessments; developed a dynamic, real-time framework for determining life cycle impacts of green buildings; quantified and compared environmental impacts of decentralized water distribution and treatment systems

*Doctoral Research: Advisor:* Dr. Melissa Bilec. *Committee:* Drs. Kim Needy, Amy Landis, Vikas Khanna, Leonard Casson, and Noe Copley-Woods (MD)

**Effects of Green Hospital Design on Quality and Performance** 2011-2013

*Summary:* Conducted a comparative longitudinal analysis of an older hospital facility with a new, LEED (Leadership in Energy and Environmental Design) certified hospital; statistically assessed the success of building design in improving environmental performance, staff performance, and patient outcomes.

**Life Cycle Assessment (LCA) of Hospital Surgical Procedures** 2010-2013

*Summary:* Established data collection methods; led and mentored data collection and analysis team composed of 5 undergraduate and 3 graduate students; defined and aggregated the environmental impacts associated with the materials and energy used in medical procedures. Specific LCAs conducted on vaginal and Cesarean birth deliveries as well as laparoscopic, robotic, vaginal, and abdominal hysterectomies.

**LCA of a Net-Zero Energy, Living Building** 2009-2010

*Summary:* Defined and aggregated the environmental impacts associated with the primary building materials of Phipps Conservatory and Botanical Garden's 20,000sf administrative and educational facility in Pittsburgh, PA. The structure is compliant with Living Building Challenge v 1.3, LEED Platinum certification, and Sustainable Sites Initiative (SITES) criteria.

*Undergraduate Research:*

**Research Assistant, German Aerospace Institute - Berlin, Germany** 2008  
**Deutsches Zentrum für Luft- und Raumfahrt (DLR)**

*Supervisors:* Nauka Melnik, Dr. Ulrich R.M.E. Geppert, Dr. Bernd Biering

*Summary:* 6-week research internship conducted in German, tested light-weight foil in space conditions, assembled test set-ups in vacuum chambers, conducted basic measurements, and built 3D model of source-light intensity using IDL software.

**Biology Lab Research Assistant, Michigan Tech** 2005 – 2006

*Supervisors:* Dr. Donald R. Lueking, Mark Griep, Christopher Anton

*Summary:* Prepared solutions and monitored the growth of *H. Salinarium* Bacteria.

**RESEARCH INTERESTS**

Sustainable healthcare, industrial ecology, healthcare systems efficiency, green buildings, built environment, evidence-based design, sustainability metrics and analysis, ecosystem services, science communication, sustainability and engineering education.

**REFEREED JOURNAL PUBLICATIONS**

13. **Thiel, C.**, Duncan, P., Woods, N. (2016) "Surgical Waste and Global Warming: A Survey of US Obstetrics and Gynecology Physicians' Attitudes and Opinions" *International Journal of Environmental Research and Public Health (IJERPH)*. **Submitted.**
12. Bilec, M., Campion, N., Hottle, T., Landis, A., **Thiel, C.**, Unger, S. (2016) "Investigating Innovative and Traditional Materials Shifts in Medical Products to Reduce Environmental Impacts: Focus on Biopolymers and Cotton Reuse." *Journal of Health Services Research & Policy*. **Submitted.**

11. Grabowski, Z.J., Matsler, A.M., **Thiel, C.**, Hum, R., Bradshaw, A., McPhillips, L., Miller, T., Redman, C. (2016) "Confronting Complexity: Concepts for Integrating Infrastructure, Ecosystems, and People." *Journal of Infrastructure Systems*. **Submitted.**
10. Champion, N., **Thiel C.**, Bilec, M. (2016) "Advancing the US Building Industry: A Framework Aligning Life Cycle Assessment and Integrated Project Delivery" *Sustainable Cities and Society*. **Submitted.**
9. Champion, N., **Thiel C.**, Focareta, J., Bilec M. (2016) "Understanding Green Building Design & Healthcare Outcomes: An Evidence Based Design Analysis of an Oncology Unit" *Journal of Architectural Engineering*, 04016009.doi:10.1061/(ASCE)AE.1943-5568.0000217.
8. Venkatesh, R., van Landingham, S. W., Khodifad, A. M., Haripriya, A., **Thiel, C. L.**, Ramulu, P., & Robin, A. L. (2016). Carbon footprint and cost-effectiveness of cataract surgery. *Current Opinion in Ophthalmology*, 27(1), 82-88.
7. Focareta, J., Champion, N., **Thiel, C.**, & Bilec, M. (2015). The Power of Nurses. *Pennsylvania Nurse*, 70(3), 11-12.
6. Champion, N., **Thiel, C.**, Woods, N., Swanzy, L., Landis, A., Bilec, M. (2015). "Environmental Life-Cycle Impacts of Surgical Material Supply: A Comparative LCA of Disposable Custom Packs." *Journal of Cleaner Production*. 94: 46-55.
5. **Thiel, C.\***, Eckelman, M., Guido, R., Huddleston, M., Landis, A., Sherman, J., Shrake O., Woods, N., Bilec, M. (2014) "Environmental Impacts of Surgical Procedures: Life Cycle Assessment of Hysterectomy in the US." *Environmental Science and Technology*. 49 (3), 1779-1786. \*corresponding author
4. **Thiel C.**, Needy, K., Ries, R., Hupp, D., Bilec M. (2014) "Building Design and Performance: A Comparative Longitudinal Assessment of a Green Children's Hospital." *Building and Environment*. 78(0), 130-6.
3. **Thiel C.**, Champion N, Landis A, Jones A, Schaefer L, Bilec M. (2013) "A Materials Life Cycle Assessment of a Net-Zero Energy Building." *Energies*. 6(2):1125-1141.
2. Champion, N., **Thiel, C.\***, DeBlois, J., Woods, N., Landis, A., Bilec, M. (2012). "Life cycle assessment perspectives on delivering an infant in the US." *Science of the Total Environment*. 425(0): 191-198. \*corresponding author
1. Shrake, S., **Thiel, C.**, Landis, A., Bilec, M. (2012). "Life Cycle Assessment as a Tool for Improving Service Industry Sustainability." *IEEE, Potentials*. 30:1, 10-15.

#### **REFEREED CONFERENCE PROCEEDINGS**

7. Collinge, W., **Thiel, C.**, Champion, N., Al-Ghamdi, S.G., Woloschin, C. L., Soratana, K., Landis, A. Bilec, M. (2015). "Integrating Life Cycle Assessment with Green Building and Product Rating Systems: North American Perspective." *International Conference on Sustainable Design, Engineering and Construction*. Chicago, IL.
6. Collinge, W., **Thiel, C.**, Champion, N., Al-Ghamdi, S.G., Soratana, K., Landis, A. Bilec, M. (2014). "Incorporating Big Data into Life Cycle Assessment of Buildings and Green Building Rating Systems." *North America-East Asia Workshop on Big Data Analytics for Infrastructure and Building Sustainability and Resilience (IBSR) Research*. Beijing, China.
5. Collinge, W., **Thiel, C.**, Champion, N., Landis, A. Bilec, M.. (2014). "Evaluation of a Living Building using Dynamic LCA." *International Symposium on Sustainable Systems and Technology (ISSST)*. Oakland, CA.

4. **Thiel, C.**, Campion, N., DeBlois, J., Bilec, M., (2012). "Life Cycle Assessment of Medical Procedures: Vaginal and Cesarean Section Births." *International Symposium on Sustainable Systems and Technology (ISSST)*, IEEE. Boston, MA.
3. **Thiel, C.**, Bilec, M., Needy, K. (2012). "Impacts of Green Design on Hospital Performance in the United States." *4<sup>th</sup> CIB International Conference on Smart and Sustainable Built Environments (SASBE)*. São Paulo, Brazil.
2. **Thiel, C. L.**, N. Campion, et al. (2011). "Use of Life Cycle Assessment in healthcare: A preliminary Cesarean section case study." *International Symposium on Sustainable Systems and Technology (ISSST)*, IEEE. Chicago, IL.
1. **Thiel, C.**, Shrake, S., Campion, N., Bilec, M., Landis, A., Woods, N. (2011). "Applications of Life Cycle Assessment: Sustainable Healthcare." *LCA XI*. Chicago, IL.

### **REFEREED JOURNAL PUBLICATIONS IN PROGRESS**

1. N. Anderson, V. Hasik, W. Collinge, **C. Thiel**, V. Khanna, J. Wirick, M. Bilec. (2016) "Evaluating the life cycle environmental benefits and tradeoffs of water reuse systems for net-zero buildings" *Environmental Science and Technology (ES&T)*. **In Progress.**
2. **Thiel, C.**, Ravindran, R. D., Venkatesh, R., Robin, A., Schuman, J. (2016) "Cost, Waste, and Environmental Impact of Cataract Surgery at Aravind Eye Hospitals in Southern India." *Ophthalmology*. **In Progress.**
3. **Thiel, C.**, Schehlein, E., Saeedi, O., Robin, A., Newman-Casey, P.A., Schuman, J. (2016) "Eyes on the Environment: Life Cycle Environmental Impacts and Costs of Cataract Surgery in the United States." *Ophthalmology*. **In Progress.**
4. Bilec, M., **Thiel, C.**, Woods, N. (2016) "Reducing Greenhouse Gas Emissions in the Operating Room: Interventions to Current Approaches to Hysterectomy." *Journal of the American Medical Association (JAMA)*. **In Progress.**

### **CONFERENCE and POSTER PRESENTATIONS**

- **Thiel, C.**, Cassels-Brown, A. (2016). Sustainability Strategies to Reduce Costs, Waste and Environmental Impact. *International Association for the Prevention of Blindness's 10<sup>th</sup> General Assembly (IAPB 10GA)*. Durban, South Africa. **Accepted.**
- **Thiel, C.**, Schehlein, E., Ravilla, T., Ravindran, RD., Robin, A., Saeedi, O., Schuman, J., Venkatesh, R. (2016). Carbon Footprint of Cataract Care: Addressing Sustainable Development Goals 12 and 13. *International Association for the Prevention of Blindness's 10<sup>th</sup> General Assembly (IAPB 10GA)*. Durban, South Africa. Poster. **Accepted.**
- **Thiel, C.**, Schehlein, E., Saeedi, O., Venkatesh, R., Ravindran, RD., Ravilla, T., Robin, A., Schuman, J. (2016). Green Cataract Surgery: Waste Generation and Carbon Footprint of Phacoemulsification at Aravind Eye Hospital in Pondicherry, India. *American Ophthalmology Society (AOS) Annual Meeting*. Colorado Springs, CO. Poster.
- **Thiel, C.**, Schehlein, E., Saeedi, O., Venkatesh, R., Ravindran, RD., Ravilla, T., Robin, A., Schuman, J. (2016). Environmental Life Cycle Assessment and Costs of Phacoemulsification at Aravind Eye Hospital in Pondicherry, India. *University of Pittsburgh Postdoctoral Association's Data and Dine Event*. Pittsburgh, PA. Poster.
- **Thiel, C.**, Venkatesh, R., Ravindran, RD., Ravilla, T., Robin, A., Schuman, J. (2016). Environmental Life Cycle Assessment and Costs of Phacoemulsification at Aravind Eye Hospital in Pondicherry, India. *Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting*. Seattle, WA. Poster.

- **Thiel, C.**, Schehlein, E., Saeedi, O., Robin, A., Schuman, J. (2016). Costs and Life Cycle Carbon Footprint of Materials Used in Cataract Surgery in the United States. *American Society of Cataract and Refractive Surgery (ASCRS) Symposium & Congress*. New Orleans, LA.
- **Thiel, C.**, Venkatesh, R., Ravindran, R.D., Ravilla, T., Robin, A., Schuman, J. (2016). *Special Interest Scientific Film*. Eye on Emissions: Carbon Footprint of Cataract Surgery in Aravind Eye Hospital. *American Society of Cataract and Refractive Surgery (ASCRS) Symposium & Congress*. New Orleans, LA. Video.
- Namburur, S., **Thiel, C.**, Robin, A. (2016). Medical Waste from Glaucoma Surgeries at Indian and American Eye Hospitals: A Pilot Study. *American Glaucoma Society (AGS) 26<sup>th</sup> Annual Meeting*. Ft. Lauderdale, FL. Poster.
- **Thiel, C.**, Schehlein, E., Saeedi, O., Schuman, J., Robin, A., Venkatesh, R., Ravindran, R.D. (2015). Comparative Material Flow of Medical Supplies and Waste from Cataract Surgery in Southern India and the United States. *International Society for Industrial Ecology (ISIE) 2015 Conference*. Surrey, United Kingdom.
- Hasik, V., Collinge, W., **Thiel, C.**, Landis, A. Bilec, M. (2015). Dynamic LCA of a Zero Energy and Water Building and Implications at the Community Scale. *International Society for Industrial Ecology (ISIE) 2015 Conference*. Surrey, United Kingdom.
- **Thiel, C.**, Venkatesh, R., Ravindran, R.D. (2015). Environmental Impacts and End-of-Life Scenarios for Medical Supplies Used in High-Volume Cataract Surgery in Southern India. *International Symposium on Sustainable Systems and Technology (ISSST)*. Dearborn, MI.
- Collinge, W., **Thiel, C.**, Campion, N., Al-Ghamdi, S.G., Woloschin, C. L., Soratana, K., Landis, A. Bilec, M. (2015). Integrating Life Cycle Assessment with Green Building and Product Rating Systems: North American Perspective. *International Conference on Sustainable Design, Engineering and Construction (ICSDEC)*. Chicago, IL.
- **Thiel, C.** (2015). Material Use and the Environmental Impact of High-Volume Cataract Surgery at Aravind Eye Hospitals. *South and Central Asia Fulbright Conference*. Hyderabad, India.
- **Thiel, C.**, Eckelman, M., Guido, R., Landis, E., Sherman, J., Copley-Woods, N., Bilec, M. (2015). Life Cycle Assessment in Hospital Operating Rooms: Environmental Impacts from Four Types of Hysterectomy. *Engineering Sustainability*. Pittsburgh, PA. Poster.
- **Thiel, C.**, Woods, N., Landis, A., Eckelman, M., Guido, R., Sherman, J., Bilec, M. (2014) "Quantifying environmental impacts of surgeries in US operating rooms using life cycle assessment." *Gordon Research Conference (GRC), Industrial Ecology*. Lucca, Italy. Poster.
- Campion, N., **Thiel, C.**, Landis, A., Sherman, J., Eckelman, M., Woods, N. Bilec, M., (2014). Integrating Environmentally Preferred Solutions into the Healthcare Industry: A Closer Look at Supply Chain and Anesthetic Gases. *LCA XIV*. San Francisco, CA.
- **Thiel, C.**, Campion, N., Bilec, M., Focareta, J., Landis, A., Woods, N. (2014). Does Green Design Affect Patient Outcomes and Staff Productivity? A Look at Evidence-Based Design. *CleanMed*. Cleveland, OH.
- Collinge, W., **Thiel, C.**, Campion, N., Landis, A. Bilec, M.. (2014). Evaluation of a Living Building using Dynamic LCA. *International Symposium on Sustainable Systems and Technology (ISSST)*. Oakland, CA.

- Champion, N., Copley-Woods, N., Landis, A., Swanzy, L., **Thiel, C.**, Bilec, M.. (2014). The Life Cycle Environmental Impacts of Disposable Custom Packs. *International Symposium on Sustainable Systems and Technology (ISSST)*. Oakland, CA. Poster.
- Grabowski, Z., Matsler, A., **Thiel, C.**, Hum, R., Bradshaw, A., McPhillips, L., Miller, T., Redman, C. (2014). Weaving the Seamless Web: Conceptualizing Integrated Infrastructures for the 21<sup>st</sup> Century. *Association of American Geographers (AAG) Annual Meeting*. Tampa, FL.
- **Thiel, C.**. (2013). University of Pittsburgh's Sustainability Initiative in Engineering IGERT Program. *Third Conference for Sustainability IGERTs (C4SI3)*. Portland, OR. Poster.
- **Thiel, C.**, Huddleston, M., Shrake, S., Landis, A., Copley-Woods, N., Bilec, M. (2013). Life Cycle Assessments of Surgery. *Third Conference for Sustainability IGERTs (C4SI3)*. Portland, OR. Poster.
- **Thiel, C.**, Shrake, S., Woods, N., Landis, A., Bilec, M. (2013). Analyzing surgical techniques using LCA to inform environmentally sustainable changes in hospital operating rooms. *International Congress on Sustainability Science and Engineering (ICOSSE)*. Cincinnati, OH.
- **Thiel, C.**, Bilec, M., Needy, K., Reis, R. (2013). Quantifying the Impacts of Green Hospital Design through a Comparative Longitudinal Assessment. *International Symposium on Sustainable Systems and Technology (ISSST)*. Cincinnati, OH.
- **Thiel, C.**, Huddleston, M., Shrake, S., Landis, A., Copley-Woods, N., Bilec, M. (2013). Environmental Impacts of Minimally Invasive Surgery. *International Symposium on Sustainable Systems and Technology (ISSST)*. Cincinnati, OH. Poster.
- **Thiel, C.**, Champion, N., Bilec, M., Landis, A., Woods, N. (2013). Improving Environmental Performance of the Operating Room. *CleanMed*. Boston, MA.
- **Thiel, C.**, Bilec, M., Needy, K., Ries, R. (2013). Benefits of Green Hospital Design: A comparative longitudinal assessment. *Engineering Sustainability*. Pittsburgh, PA.
- Champion, N., **Thiel, C.**, Landis, A., Bilec, M., (2013). Net-Zero Energy Building Material Perspective: A Life Cycle Assessment. *Engineering Sustainability*. Pittsburgh, PA. Poster.
- Wood, C., LaScola Needy, K., Shrake, S., **Thiel, C.**, Huddleston, M., Bilec, M. (2013). Emerging Technologies in Healthcare and the Associated Environmental Impacts. *2013 Industrial and Systems Engineering Research Conference (ISERC)*. San Juan, Puerto Rico. Poster.
- **Thiel, C.**, (2012). Meet the Region & Personal Leadership in EWB-USA Chapters. *Engineers Without Borders-USA North East Regional Conference*. Philadelphia, PA.
- **Thiel, C.**, Bilec, M., LaScola-Needy, K. (2012). Impacts of Green Design on Hospital Performance in the United States. *4<sup>th</sup> CIB International Conference on Smart and Sustainable Built Environments (SASBE)*. São Paulo, Brazil. Poster.
- **Thiel, C.**, (2012). Sustainability Research at University of Pittsburgh & Tools of the Road to Sustainable Healthcare. *3<sup>rd</sup> Annual PUC-Rio and University of Pittsburgh Workshop: Research on Nonconventional Materials and Technologies*. Pontifical Catholic University of Rio de Janeiro, Brazil.
- Bilec, M., Landis, A., Shrake, O., **Thiel, C.**, Woods, N. (2012). Using LCA in Healthcare: Focus on Hysterectomy Surgeries. *LCA XII*. Tacoma, WA.

- **Thiel, C.**, Campion, N., DeBlois, J., Landis, A., Woods, N., Bilec, M. (2012). Life Cycle Assessment of Medical Procedures: Vaginal and Cesarean Section Births. *International Symposium on Sustainable Systems and Technology (ISSST)*, IEEE. Boston, MA.
- **Thiel, C.**, Shrake, S., Campion, N., Bilec, M., Landis, A., Woods, N. (2011). Applications of Life Cycle Assessment: Sustainable Healthcare. *LCA XI*. Chicago, IL.
- **Thiel, C.**, Campion, N., Bilec, M., Landis, A., Copley-Woods, N. (2011). Use of Life Cycle Assessment in Healthcare: A Preliminary Cesarean Section Case Study. *IEEE: International Symposium on Sustainable Systems and Technology (ISSST)*. Chicago, IL Poster.
- Woods, N., Goodman, L., **Thiel, C.** (2011). Creating Sustainable Surgery: A Trashy Operation. *CleanMed*. Phoenix, AZ.
- **Thiel, C.**, Campion, N., Bilec, M., Landis, A., Copley-Woods, N. (2011). Sustainable Healthcare: Environmental Improvements for the Operating Room through Life Cycle Assessment of Birthing Kits. *Engineering Sustainability*. Pittsburgh, PA. Poster.
- **Thiel, C.**, (2011). Education and outreach programs at MCSI. *Mascaro Center for Sustainable Innovation (MCSI) Advisory Board Committee*. Pittsburgh, PA.
- **Thiel, C.**, Bilec, M., Landis, A. (2011). Net-Zero Energy Building: A Materials Life Cycle Assessment. *NSF CMMI Research and Innovation Conference*. Atlanta, GA. Poster.
- **Thiel, C.**, (2010). Development of personal research goals. *ASCE 6<sup>th</sup> Annual National Civil Engineering Department Heads Conference*. Pittsburgh, PA.
- **Thiel, C.**, Bilec, M., Landis, A. (2010). Life Cycle Assessment of Net-Zero Energy Building: Focus on Materials. *LCA X*. Portland, OR. Poster.

### **INVITED LECTURES and PRESENTATIONS**

- *University of Pittsburgh* Postdoctoral Association. Postdoc to Postdoc. Improving Efficiency in Medicine: Quantifying Environmental Emissions and Resource-Use of Surgery. 6/15/2016
- *Royal College of Ophthalmologists* Annual Congress. ICC Birmingham, UK. A Sustainable Future in Ophthalmology. Aravind vs Pittsburgh: The carbon footprint of cataract surgery. 05/25/2016
- Wagner School of Public Administration & Tandon School of Engineering, *New York University*. New York, NY. Sustainability in Medicine: Metrics for Change. 04/26-7/2016
- Center for Healthcare Innovation and Delivery Science, *New York University*. New York, NY. Sustainability in Medicine: Metrics for Change. 02/17/2016
- Surgical Team Workgroup Meeting, *University of Pittsburgh Medical Center*. Pittsburgh, PA. Efficiency and Material Optimization Research with UPMC Surgeons. 01/19/2016
- School of Environment, Enterprise, and Design, *University of Waterloo*. Waterloo, ON Canada. Sustainable Healthcare: Applying Industrial Ecology to Medicine. 12/14/2015
- School of Environment, Enterprise, and Design, *University of Waterloo*. Waterloo, ON Canada. A Healthy Place to Heal: the Rise of Environmental Sustainability in Healthcare. 11/18/2015
- *University of Arkansas*. Fayetteville, AR. Sustainability Engineering: From Green Buildings to Green Surgeries. 11/12/2015
- Seven Steps to Sustainable Eye Care Services, *The Royal College of Ophthalmologists*. London, UK. Higher Volume, Lower Carbon Cataract Surgery in the UK, USA, and India. (with Dan Morris.) 10/15/2015

- *Google Waterloo*, Kitchener, Ontario. Sustainability Engineering and Healthcare: Efficiency and Waste in the Operating Room. 05/5/2015
- The Systems Institute, *Johns Hopkins University*. Baltimore, MD. Healthcare and the Environment: Emissions and Effects of Surgical Models and their Material Use. 04/20/2015
- *Engineers for Sustainable World* and *Engineers for Sustainable Medical Devices* (ESW & ESMD) Workshop Speaker. PITT. Material flow and sustainability assessments. 10/23/2014
- *Gundersen Health System*. LaCrosse, WI. Sustainability and Healthcare: A Surgical Case Study Quantifying the Environmental Impacts of Hysterectomies. 08/29/2014
- University of Illinois-Chicago, *SISE 2014*. Chicago, IL. Sustainability within Healthcare: Using Environmental LCA in the OR. 08/19/2014
- Undergraduate Research Program, *MCSI PITT*. Environmental Footprint of Hospital Operating Rooms. 04/26/2014
- University of Illinois-Chicago, *SISE Alumni Event*. Chicago, IL. Sustainability within Healthcare: Using Environmental LCA in the OR 04/26/2014
- Golisano Institute for Sustainability, *Rochester Institute of Technology*. Rochester, NY. Sustainability Engineering Tools and Techniques to Improve Environmental Footprint of Healthcare Systems 04/25/2014
- *University of Wisconsin - La Crosse*, BioMath Seminar. Sustainability and Healthcare: A Case Study Quantifying the Environmental Impacts of Surgical Hysterectomies. 11/12/2013
- *Engineers for a Sustainable World* (ESW) Regional Conference. PITT. Beyond Environmental Sustainability: the US Healthcare System. 11/02/2013
- *UPMC Shadyside Hospital*, Grand Rounds. PITT. Science-Based Sustainability in the Operating Room 10/30/2013
- *American Association of University Women* (AAUW) Tomah Branch. Tomah, WI. Creating Sustainability in Healthcare and Our Community. 08/2013
- *University of Colorado – Boulder*. Civil, Enviro, & Architectural Eng. Seminar. Boulder, CO. Life Cycle Assessment and Implications for Green Building Design 04/2013

### **OTHER PUBLICATIONS and MEDIA REPORTS**

- Signed a letter of recommendations for the National Science Foundation's Research Traineeship program (NRT) from the Third Conference for Sustainability IGERTs (2013).
- Featured in: Vian, J. (2013). "Thiel to speak on sustainability in healthcare" *The Tomah Journal*. August 26, 2013.
- **Thiel, C.** (2012). "Smart and Sustainable Built Environments (SASBE)." *ISIE (International Society for Industrial Engineering) Student Newsletter*. Winter 2012.
- Niblick, B., **Thiel, C.**, Collinge, W., Sorantana, K. . (2011). "LCA XI Conference: Instruments for Green Futures Markets." *ISIE (International Society for Industrial Engineering) Newsletter*. Vol 11, Issue 4.
- Arbor Day Foundation Tree Campus USA Photo Contest: 2nd place. (2011) <http://www.arborday.org/media/pressreleases/pressrelease.cfm?id=229>
- Photography featured in: *A Chronology of Boating on the Navesink River*. Hendrik F. van Hemmen, 2010.
- Interviewed in: Gagnon, J. (Spring, 2009). "Learning to Lead". *Michigan Tech Magazine*. Vol 46, No 1.



**GRANTS AWARDED****Total Awarded: \$55,000**

2014	Fulbright-Nehru Academic and Professional Excellence Award (Research); Fulbright Scholar Program, Council for International Exchange of Scholars (CIES)	\$20,000
2013	Provost Development Fund Award, PITT	\$5,000
2011	National Institutes of Health (NIH) Grant Numbers UL1 RR024153 and UL1TR000005; awarded through PITT's Clinical and Translational Science Institute (CTSI) and Engineering to Clinical Collaborative Research Pilot Program (EnCCoR)	\$25,000
2010	Mascaro Center for Sustainable Innovation (MCSI) Student Community Grant	\$5,000

**TEACHING EXPERIENCE**

<b>Guest Lecture:</b> ECE: Sustainable Computing, PITT	01/2016
• Lecture: Life Cycle Assessment Basics	
<b>Instructor:</b> ENGR 1610/2610: Eng. and Sustainable Development, PITT	Fall 2012-2015
• Designed curriculum, created assignments, and taught lectures on critical materials and systems thinking (1 unit), formerly ENGR1210/2210.	
<b>Guest Lecture:</b> CEE 1503: Intro to Environmental Engineering, PITT	10/2015
• Lecture: Life Cycle Assessment and Waste Management	
<b>Instructor:</b> ENGR 715: Engineering Applications for Society, PITT	Spring 2014
• Negotiated variety of engineering projects with local community partners, designed lectures, taught course, managed student progress on projects	
<b>Guest Lecture:</b> Green Building Design, PITT	01/2013
• Lecture: Ecological Design Practices and Principles	
<b>Guest Lecture:</b> Engineering and Sustainable Development, PITT	11/2012
• Lecture: Critical Materials	
<b>Pedagogical Training:</b> Two Day Teaching Workshop through <i>Teaching Teachers</i>	09/2012
• Learned teaching methods and classroom management techniques	
• Gave example lecture and was critiqued by peers	
<b>Instructor:</b> Mini-course in LCA and the Use of SimaPro Software, Universidade Federal do Espírito Santo (UFES), Vitória, Brazil	05-06/2012
• Designed lessons, created assignments, taught lectures [14 hours in Portuguese]	
<b>Guest Lecture:</b> Analise do Ciclo da Vida (Life Cycle Assessment), Universidade Federal do Espírito Santo (UFES), Vitória, Brazil	04/2012
• Lecture: "Construido um ACV" (Building an LCA) [in Portuguese]	
<b>Teaching Assistant:</b> Introduction to Life Cycle Assessment, PITT	2011
• Designed and taught a course module and homework on types of LCA	
• Fielded student questions on assignments and lecture materials	
<b>Guest Lecture:</b> Analise do Ciclo da Vida (Life Cycle Assessment), Universidade Federal do Espírito Santo (UFES), Vitória, Brazil	06/2011
• Lecture: "Construido um ACV" (Building an LCA) [in Portuguese]	
<b>Guest Lecture:</b> Design for the Environment (DfE), PITT	04/2011
• Lecture: Children's Hospital case study of DfE principles	
<b>Pedagogical Training:</b> Pitt's Center for Instructional Development and Distance Education (CIDDE) workshop <i>Creating a Teaching Portfolio</i>	2011
<b>Pedagogical Training:</b> Pitt's Center for Instructional Development and Distance Education (CIDDE) workshop <i>Developing Instruction</i>	2011
<b>Teaching Assistant:</b> Design for the Environment, PITT	2011
• Set up and assisted in laboratory experiments	

<b>Instructor:</b> Junior Urban Leadership Institute (JuLI), Kingsley Association	2011
<ul style="list-style-type: none"> <li>• Created six week lesson plan for Introduction to Sustainability</li> <li>• Lectured and hosted activities on general topics in sustainability</li> </ul>	
<b>Teaching Assistant:</b> Nondestructive Evaluation and Structural Health Monitoring	2010
<ul style="list-style-type: none"> <li>• Created lab set-ups by filming home assessment example and pouring concrete forms with defects detectable via infra-red thermography</li> <li>• Assisted in the use of infra-red camera</li> </ul>	
<b>Guest Lecture:</b> Introduction to Life Cycle Assessment, PITT	09/2010
<ul style="list-style-type: none"> <li>• Lecture: Setup for LCA of buildings and appropriate data sources.</li> </ul>	
<b>Guest Lecture:</b> Research Methods, Virginia Tech University	09/2010
<ul style="list-style-type: none"> <li>• Lecture: Establishing personal research goals</li> </ul>	
<b>Course Coordinator:</b> Calculus I Labs, Michigan Tech	2006-07
<ul style="list-style-type: none"> <li>• Directed Calculus I lab sections with over 300 students and 20 TAs</li> </ul>	
<b>Teaching Assistant:</b> Calculus I, II, and III Labs, Michigan Tech	2005-06
<ul style="list-style-type: none"> <li>• Taught students software <i>Mathematica</i></li> </ul>	

## PROFESSIONAL SERVICE EXPERIENCE

### Peer Review Service

<ul style="list-style-type: none"> <li>• <i>Health Affairs</i> – 1 article reviewed</li> <li>• <i>International Journal of Life Cycle Assessment (JLCA)</i> – 4 articles reviewed</li> <li>• <i>Resources, Conservation &amp; Recycling</i> – 1 article reviewed</li> <li>• <i>Environmental Science and Technology (ES&amp;T)</i> – 1 article reviewed</li> <li>• <i>Journal of Industrial Ecology (JIE)</i> – 1 article reviewed</li> <li>• ASEE National Conference - Student Division - 3 proceedings reviewed</li> <li>• Simonen, K. (2014). <i>Life Cycle Assessment</i>, Routledge. – 2 chapters reviewed</li> </ul>	2016 2015-16 2016 2015 2014 2014 2013
<b>Expert Contributor, Global Green and Healthy Hospitals (GGHH) Connect</b>	2014-16
<i>Role:</i> Answer member-hospital questions and contribute to discussions on hospital procurement and green building design	

**Associate Editor, Proceedings of ISSST2014** 2014

**International Symposium on Sustainable Systems and Technologies (ISSST)** 2014

*Role:* Student Committee Events Coordinator; plan, facilitate, and run student educational session on article reviewing at ISSST (May 18-21, 2014 in Oakland, CA)

**Project Judge, Sustainable Solutions Competition (PITT)** 2014

*Role:* Select student team winners for \$25k grant for sustainability-related campus project

**Project Judge, Summer Institute on Sustainability and Energy (SISE) UI-Chicago** 2014

*Role:* 1 of 5 panel judges, select best project from 12 teams participating in SISE 2014

**Program Mentor, NSF International Research Experience for Students (IRES)** 2011-13

*Role:* Mentor 4-6 PITT students conducting sustainability research bamboo structures at PUC-Rio in Rio de Janeiro, Brazil as part of Pitt's Summer IRES program

**Volunteer, NSF Research Experience for Teachers (RET) Competition** 2009-11

*Role:* Time and judge groups of high school students participating in an engineering design competition at yearly science expo; Pittsburgh, PA

## ORGANIZATIONAL LEADERSHIP

**President, Engineers Without Borders (EWB-USA) North East Region (NER)** 2012-14

*Role:* Lead 15 volunteers in 10-state region with 3400 professional and student members in 64 chapters; oversee planning and execution of NER conference for over 400 attendees; build and cultivate the NER's state representative program - issued \$200 per rep for multi-chapter events; leverage member talents to improve EWB-USA national programs and policies

- State Representative, Engineers Without Borders (EWB-USA) Western PA** 2011-12  
*Role:* Relay non-technical information to all Pennsylvania-based EWB chapters, write and distribute monthly EWB-PA newsletter, facilitate the sharing of information and techniques related to international travel, engineering, and fundraising via conference calls and emails
- Facilitator, \$tart\$mart Salary Negotiation Workshop (W&J College)** 4/07/2013  
*Role:* Teach about the gender wage gap to 10 attendees, guide attendees through wage research methods and salary negotiation strategies, and facilitate mock salary negotiations
- Coordinator, \$tart\$mart Salary Negotiation Workshop (PITT)** 9/23/2012, 12/3/2011  
*Role:* Plan and schedule workshop, obtain funding support, create event advertising materials, photograph and supervise event for over 40 attendees per event

### **COMMUNITY OUTREACH and VOLUNTEERING**

#### **Photographer, Events Volunteer**

- Women in Bio (WIB). Trending Industry Jobs in Pittsburgh Event, Pittsburgh 03/30/2016
- Women in Bio (WIB). P.O.W.E.R. Event, Pittsburgh 09/21/2015
- Pitt Health Innovation Case Competition (4River Solutions), PITT 04/11/2014
- \$tart\$mart Salary Negotiation Workshop, PITT 08/22/2013

#### **Instructor, Manchester Academic Charter School (MACS) Green Week** 2011-2015

*Role:* Develop one-day curriculum on problem solving, teach 70 - 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> grade students about combined sewer systems and stakeholder perspectives; Pittsburgh, PA

#### **Volunteer, Sri Aurobindo Society (Pondicherry, India)** 2014-2015

*Role:* Photograph and edit participant interviews for SARVAM community development project; consult for and advise emerging community health program

#### **Volunteer, International Wolf Symposium** 10/11-13/2013

*Role:* Run the International Wolf Center's on-site store, organize immediate attendee feedback for keynote, assist with the volunteer and speaker hospitality suite; Duluth, MN

#### **Instructor, Crossroads Foundation Computer Science School** 07/30/2013

*Role:* Teach 50 high school students about indoor air and environmental quality and lead in IAQ/IEQ monitoring and data assessment

#### **Volunteer, Rebuilding Together Pittsburgh (RTP) Home Weatherization** 10/2012

*Role:* Prepare an elderly woman's home for winter, re-caulk front door, replace thermostat, exchange lighting for energy efficient bulbs; Homewood, PA

#### **Speaker, Am. Assoc. for University Women (AAUW) Sister to Sister Summit** 03/29/2012

*Role:* Share my experiences in high school, college, and Brazil with 40 girls from the Tomah Middle School in Tomah, WI via web-conferencing

#### **Volunteer, American Center for Life Cycle Assessment (ACLCA) LCA XI** 2010-11

### **PROFESSIONAL MEMBERSHIPS and CERTIFICATIONS**

- International Society for Industrial Ecology (ISIE) Member** 2013-2017
- American Association of University Women (AAUW) Member** 2013-2016
- Association for Research in Vision and Ophthalmology (ARVO) Member** 2015-2016
- American Society for Engineering Education (ASEE) Member** 2013-2015
- Engineers Without Borders (EWB-USA) Member** 2009-2014
- \$tart\$mart Salary Negotiation Workshop Trained Facilitator** 2011
- University of Pittsburgh Graduate and Professional Student Assembly (GPSA) Travel Grant Recipient** 2010, 2011
- PADI SCUBA Certification** 2009
- Keweenaw Symphony Orchestra, Violinist** 2004-2009
- Experimental Aircraft Association (EAA) Member** 2002-2007