

## Melody L. Baglione, Ph.D.

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### EDUCATION:

University of Michigan, Ann Arbor, MI

Ph.D. Mechanical Engineering, 2007, Dissertation: “*Development of system analysis methodologies and tools for modeling and optimizing vehicle system efficiency*,” Co-advisors: Dr. D.N. Assanis and Dr. Jun Ni

University of Michigan, Ann Arbor, MI

M.S. Mechanical Engineering, 2003

Michigan Technological University, Houghton, MI

B.S. Mechanical Engineering, 2000

Swiss Federal Institute of Technology (ETH-Zürich), Switzerland, March – July 1999

Fachhochschule Wilhelmshaven, Germany, October 1996 – January 1997

### APPOINTMENTS:

#### Academic

*George Clark Chair of Mechanical Engineering*, Cooper Union, New York, NY, September 2016 –present, *elected*.

*Associate Professor with Tenure*, Cooper Union, New York, NY, September 2013 – present

*Assistant Professor*, Cooper Union, New York, NY, January 2008 – September 2013

*Visiting Professor*, University of Michigan-Shanghai Jiao Tong University (UM-SJTU), China, May 2013 – Aug.2013

*Visiting Faculty Researcher*, Technical University of Dresden, Germany, June 2014 – July 2014

#### Administrative

*Facilities Energy Efficiency Advisor*, Cooper Union, New York, NY, May 2014 – present

- Advise Buildings & Grounds and work with external vendors regarding improving efficiency of our building systems, improving cogeneration operation, reducing energy costs, retro-commissioning, facilities upgrades, and other building related issues
- Represent Cooper Union in [NYC Carbon Challenge](#) and [NYSERDA REV Campus Challenge](#) working to achieve our commitment to reduce our carbon footprint by 40% from 2014 peak levels by 2030
- Submit required annual Carbon Emissions Inventory to NYC Mayor’s Office of Sustainability
- Submit annual campus energy use in EPA Portfolio Manager to comply with NYC Benchmarking Local Law 84 saving Cooper annual reporting expenses
- Achieved 10% reduction in energy usage since 2014 saving Cooper substantial annual energy costs
- Identified and coordinated reimbursement of \$34,096 in utility overcharges
- Coordinated Con Edison Commercial & Industrial Energy Efficiency Program Incentives totaling \$12,410
- Saved Cooper ~\$12,000 in costs by coordinating multiple bids from NYSERDA Flex-Tech approved contractors for Testing & Rebalancing work for Local Law 87 Retro-Commissioning compliance
- Awarded two NYSERDA grants totaling \$321,671 for energy auditing required by LL87, developing an energy master plan, identifying energy conservation measures, training facilities staff, and developing a new energy efficient building systems course

### COURSES TAUGHT:

Systems Engineering ([ESC251](#))

Mechanical Vibrations ([ME301](#))

Feedback Control Systems ([ME351](#))

Process Control Laboratory ([ME352](#))  
Engineering Mechanics (ESC100)  
Advanced Mechanical Vibrations ([ME401](#))  
Acoustics, Noise and Vibration Control ([EID260](#))  
Senior Capstone Design ([ME393/ME394](#))  
Modeling, Analysis, and Control of Dynamic Systems (VM360) at UM-SJTU

## **PUBLICATIONS:**

Peer-Reviewed Journal Articles and Proceedings (18) \*Cooper Union student co-authors

- \*Sterman, M., Baglione, M., "Simulating the use of CO<sub>2</sub> concentration inputs for controlling temperature in a hydronic radiant system," *Accepted to 2017 ASME International Mechanical Engineering Congress and Exposition*, November 3-9, 2017, Tampa, FL.
- Fava, G., Oliveira, G., Baglione, M., \*Pimpinella, M., "[Mobile Digital Recording: Adequacy of the iRig and iOS device for Acoustic and Perceptual Analysis of Normal Voice](#)," *Journal of Voice*, March 2017, Vol. 31 (2), 236-242.
- Fava, G., Oliveira, G., Baglione, M., \*Pimpinella, M., Spitzer, J., "[The Use of Sound Level Meter Apps in the Clinical Setting](#)," *American Journal of Speech-Language Pathology*, February 2016, Vol. 25, 14-28.
- Baglione, M., "[Building Sustainability into Control Systems: A New Facilities-Based and Hands-On Teaching Approach](#)," *122<sup>nd</sup> ASEE Annual Conference Paper #13199*, June 14-17, 2015, Seattle, WA. [Poster link](#).
- Baglione, M., del Cerro, G., "[Building Sustainability into Control Systems: Preliminary Assessment of a New Facilities-Based and Hands-On Teaching Approach](#)," *Proc. of the 2014 ASEE Zone 1 Conference*, Apr. 3-5, Bridgeport, CT. *Nominated for Best Professional Paper Award*.
- \*Zielkowski, A., Baglione, M., Wootton, D., "[Determining System Time Constant Through Experimental and Analytical Techniques](#)," *Proc. of the 2014 ASEE Zone 1 Conference*, Apr. 3-5, 2014, Bridgeport, CT. *Nominated for Best Student Paper Award*.
- \*Sterman, M., Baglione, M., "[Design of Artificial Neural Network Using Solar Inputs for Assessing Energy Consumption in a High Performance Academic Building](#)," *Proc. of 2012 ASME International Mechanical Engineering Congress and Exposition*, November 9-12, 2012, Houston, TX.
- Baglione, M., \*Short, D., \*Correll, C., \*Tan, D., "[Developing Installations and Activities for an Interactive Light Studio at the American Sign Language and English Lower School](#)," *Proc. of 2012 ASME International Mechanical Engineering Congress and Exposition*, November 9-12, 2012, Houston, TX.
- Baglione, M., \*Caubel, J., "[Developing Undergraduate Engineering Curriculum Material using the Heating, Ventilation, and Air Conditioning and Building Management Systems of a High Performance Academic Building](#)," *Proc. of 2012 ASME International Mechanical Engineering Congress and Exposition*, November 9-12, 2012, Houston, TX.
- Baglione, M., \*Wong, N., \*Clevenson, H., \*O'Meara, B., \*Baker, J., "[Creating an Interactive Light Studio for the American Sign Language and English Lower School](#)," *Proc. of the 2011 ASME International Mechanical Engineering Congress and Exposition*, November 11-17, 2011, Denver, CO.
- \*Kanber, B., Baglione, M., "[Developing an Extensible and Concise Simulink Toolset for Hybrid Vehicle Modeling and Simulation](#)," *SAE Technical Paper 2011-01-0755*. Presented at the 2011 SAE World Congress, April 12-14, 2011, Detroit, MI.
- Baglione, M., "[Incorporating Practical Laboratory Experiments to Reinforce Dynamic Systems and Control Concepts](#)," *Proc. of the 2009 ASME International Mechanical Engineering Congress and Exposition*, November 13-19, 2009, Lake Buena Vista, FL, Vol. 7, pp. 391-395.

- Baglione, M., Duty, M., "[Development of a Powertrain Matching Analysis Tool](#)," *SAE Technical Paper 2010-01-0490*, Presented at 2010 SAE World Congress, April 13-15, 2010, Detroit, MI. *Awarded SAE Engineering Meetings Board Outstanding Oral Presentation Award.*
- Baglione, M., Duty, M., "[Reverse Dynamic Optimization of Variable Displacement Engine Operation and System Integration](#)," *Proc. of the 2008 ASME Dynamic Systems and Control Conference*, October 20-22, 2008, Ann Arbor, MI.
- Baglione, M., Duty, M., "[Development of Reverse Dynamic Optimization Methodology for Optimal Powertrain Integration and Control Design](#)," *Proc. of the ASME 2008 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*, August 3-6, 2008, Brooklyn, NY.
- Baglione, M., Duty, M., Pannone, G. "[Vehicle System Energy Analysis Methodology and Tool for Determining Vehicle Subsystem Energy Supply and Demand](#)," *SAE Transactions Journal of Passenger Cars: Electronic and Electrical Systems*, Vol. 116, No. 7, 2008.
- Baglione, M., Duty, M., Ni J., Assanis, D., "[Reverse Dynamic Optimization Methodology for Maximizing Powertrain System Efficiency](#)," *Proc. of the 2007 Fifth IFAC Symposium on Advances in Automotive Control*, August 20-22, 2007, Aptos, CA. *Invited as Plenary Speaker.*
- Dahm, W. A., Ni, J., Mijit, K., Qiao, G., Benjamin, A., Gu, Y., Lei, Y., and Baglione f/k/a Papke, M., "[Micro internal combustion swing engine \(MICSE\) for portable power generation systems](#)." *Proc. of the 40th AIAA Aerospace Sciences Meeting*, January 14-17, 2002, Reno, NV.

Published Proceedings and Presentations (13) \*Cooper Union student co-authors

- Zalles, G., \*Kamel, Y., Anderson, I., \*Lee, M.Y., Neil, C., Henry, M., Cappiello, S., Mydlarz, C., Baglione, M., and Roginska, A., "[A low-cost, high-quality MEMS ambisonic microphone](#)," *Accepted to 143<sup>rd</sup> Audio Engineering Society Conference*, October 18-21, 2017, New York, NY.
- \*Lawless, M., Baglione, M., Sidebotham, G., "[An interdisciplinary musical instrument design course at the Cooper Union](#)," 171st Meeting of the Acoustical Society of America, *The Journal of the Acoustical Society of America*, Vol. 139, 2096, 2016.
- Mydlarz, C., Shamoan, C., Baglione, M., \*Pimpinella, M., "[The design and calibration of low cost urban acoustic sensing devices](#)," *10th European Congress and Exposition on Noise Control*, Maastricht, Netherlands, May 31-June 3, 2015, *Best Paper and Presentation Award.*
- Baglione, M., Duty, M.J., "[A Dynamic Programming Based Simulation Tool for Optimizing Vehicle System Efficiency](#)," *3rd International Conference on Energy Efficient Vehicles (ICEEV 2014)*, June 24-25, 2014 Dresden, Germany. *Invited as Keynote Speaker.*
- Fava, G., Oliveira, G., Baglione, M., \*Pimpinella, M., & Spitzer, J. B., "The use of sound level meter apps in the clinical setting," XXIII Annual Pacific Voice Conference & VI World Voice Consortium Congress, Santa Clara, CA, 2015.
- Fava, G., Oliveira, G., Baglione, M., \*Pimpinella, M., "The use of the iPad and iPhone for digital recording of the human voice in the clinical and research settings," XXIII Annual Pacific Voice Conference & VI World Voice Consortium Congress, Santa Clara, CA, 2015
- \*DiStefano, T., Advised by M.Baglione, "[Reforming Engineering Education: An Experiential Approach to Control Systems Design and Building Sustainability](#)," 2015 ASEE Northeast Section Conference, Apr. 30-May 2, 2015, Boston, MA. [Poster link.](#)
- Oliveira, G., Fava, G., Baglione, M., \*Pimpinella, M., "MoVa—Mobile Voice Applications," ASHA Convention, Nov. 2014, Orlando, FL.

- \*Rodriguez, J., Co-advised by M. Baglione and G. Sidebotham, "[Cogeneration at 41 Cooper Square](#)," GE Global Research Summit Student Research Poster Session, Aug. 9, 2014, Niskayuna, NY. *Nominated for and awarded travel grant by GE.*
- NYC Dept. of Design and Construction's (NYCDDC) Town+Gown Engineering Design Projects Poster Session, May 15, 2014, NY, NY and Wanted Design Industry City Poster Exhibit, May 9-20, 2014, Brooklyn, NY. *Showcased four student projects related to the built environment.*
- \*Leong, E., \*Tayco, G.J., Advised by M. Baglione, "[A Method for Analyzing and Reducing Building Energy Consumption](#)," 2014 ASEE Zone 1 Conference Student Poster Session, Apr. 3-5, 2014, Bridgeport, CT. [Poster link](#).
- Baglione, M., 2013 NSF TUES/CCLI PI Conference, Jan. 23-25, 2013, Washington, DC, [Abstract and poster link](#). *Applied for and awarded NSF travel grant.*
- \*Sinha, A., Co-advised by M. Baglione and D. Wootton, Design and Fabrication of a Myoelectric Hand, 37th Annual Northeast Bioengineering Conference Poster Session, April 1-2, 2011, Troy, NY.

#### ARTICLES AND MEDIA:

- "Silence, Please, I'm Healing," by Margaret Wappler, *The California Sunday Magazine*, Available [online](#) and distributed in print in magazine supplement in the *Los Angeles Times*, September 29, 2016.
- "SOUND: The anechoic chamber at the Cooper Union," Sense & the City: A monthly [blog](#) about the sensory experience of New York City, by Caitlin Van Dusen, May 8, 2017.
- "Noise Is a Drug and New York Is Full of Addicts," by Susie Neilson, *Nautilus*, Available [online](#), July 28, 2016.
- "Industry experience as a platform for academic careers," *Science Magazine*, by Alaina G. Levine, In print and [online](#), Oct. 2015.
- "Science Made This Chamber Silent, Your Mind Is What Makes It Terrifying," by Clinton Nguyen, *Motherboard*, [Online](#), Oct. 20, 2015.
- "How Visuals Can Help Deaf Children 'Hear'", [The Huffington Post](#) and [Live Science](#), by John Varrasi, July 2014.
- "New Interactive Studio Allows Deaf Children to 'Hear'", *Design & Trend*, July 25, 2014.
- "Interactive Light Studio Stimulates Learning: Designed for Special Hearing Impaired Children" by Alaina G. Levine, [ASME ME Today Article](#), Aug. 2014.
- "Some Students At NYC School Study Music Despite Being Unable To Hear," Aired nationally on [Time Warner Cable News](#) and on Connect a Millions Minds segment, Nov. 2013.
- "Interactive light studio makes sound visible," WABCEyewitness News Segment with 480,400 viewership and [online](#), June 24, 2011.
- "A Bike That Uses Its Brakes for a Speed Boost (and Other Student Engineer Inventions)," [Scientific American](#), June 24, 2011.
- "Cooper Union students use modal shakers to evaluate theory versus real vibration," *Test Engineering & Management Magazine*, In print and online, December/January, 2010-2011.
- "The Modal Shop Collaborates with Universities," *Sound and Vibration Magazine*, July 2010.
- "Cooper Union Students Use LabVIEW and NI CompactDAQ to Study Mechanical Vibrations," *National Instruments (NI) Academic News*, February 2010.

## INVITED PANELS AND TALKS:

### Invited Panels

NYSERDA REV Campus Challenge, Clean energy ideas and challenges panelist, May 2, 2017. *Hosted by Cooper Union.*

The Dynamic Trio: How Government, Academic and Industry are Building the Foundation for a Sustainable Future, Sustainable Energy and Design Conference Panelist, Bronx Community College, Nov. 20, 2015

### Invited Talks

NYC Carbon Challenge for University and Hospital Partner Meeting, Oct. 27, 2016

ASME Metropolitan Section Technical Dinner Meeting, Cooper Union's New LEED Platinum Academic Building: Student Projects and Cogeneration Case Study, Apr. 23, 2015. *Hosted by Cooper Union.*

Institute of Automobile Engineering Colloquium, A Dynamic Programming Based Simulation Tool for Optimizing Vehicle System Efficiency and Current Vehicle System Efficiency Trends, Technical University of Dresden, July 9, 2014.

## PATENT:

"Methods and Systems for Powertrain Optimization and Improved Fuel Economy." [USPTO#8,050,856](#). Co-inventor: Mark J. Duty. Granted: Nov. 1, 2011. *In 2012, this patent was selected by Chrysler senior management out of 244 U.S. patents approved between 2007 and 2012 for the [Walter P. Chrysler Technology Award](#).*

## FUNDED PROJECTS (\$443,105 in total):

[Workforce Training: Cooper Union Facilities Training and Curriculum Development](#). This project engages an energy consultant in developing and delivering facilities training curriculum, engages student interns in developing new building systems primers and knowledge repositories, and supports faculty and an energy consultant in developing a new Energy Efficient Building Systems course. New York State Energy Research and Development Authority (NYSERDA) PON 3442, PI, 10/1/2017, \$167,671.

[REV Campus Challenge Technical Assistance for Roadmaps](#). This project engages student interns and an energy consultant in creating a building data historian and automated reporting tools, energy auditing and identifying energy conservation measures, and developing an energy master plan and carbon action plan. New York State Energy Research and Development Authority (NYSERDA) PON 3438, PI, 8/29/2017, \$154,000.

[Building Sustainability into Control Systems Courses](#). This project developed new building tours, [online learning materials](#), a real-time [power dashboard](#), and hands-on process control laboratories that introduce students to HVAC and sustainable building systems. NSF Transforming Undergraduate Engineering Education (TUES), [Award DUE #1044830](#), PI, 8/1/2011-7/31/2015, \$107,884.

[Interactive Light Studio](#). Created an interactive play and learning studio at The American Sign Language and English Lower School (PS 347) and developed STEM outreach programs to inspire local school children, including the Deaf and hearing impaired, to explore STEM. Project featured on [WABC-Eyewitness News](#) segment and on [Time Warner cable news](#) and "Connect a Millions Minds" nationally, and online. Funded by five ASME Diversity Action Grants & Met Section Funding, 2011-2016, \$13,550 in total.

## OTHER RESEARCH AND SCHOLARLY WORK:

[Engineering Education Innovation Research](#). Developed new experiential teaching methods by integrating new hands-on laboratories and real-world projects into mechanical engineering curriculum; Implemented collaborative learning and new design and professional development workshops in senior design; Developed new advanced vibration/modal analysis (ME401) and acoustics, noise, and vibration control

courses(EID260), in which students solve realistic engineering problems and acquire hands-on experience with vibration and acoustic measurement, impact hammer and shaker data acquisition and analysis.

[Vehicle System Optimization](#). Developed dynamic optimization powertrain matching analysis tool (PMAT) for optimizing automotive control and configuration. Characterized vehicle efficiency experimentally and computationally. My research helped Oak Ridge National Laboratory populate the EPA's [FuelEconomy.gov](#) [Where the Energy Goes](#) website and the International Energy Agency (iea) [Technology Roadmap: Fuel Economy of Road Vehicles](#) report.

#### **PROPOSALS AND GRANTS:**

DAAD Faculty Research Grant Proposal, "Hands-On and Project-Based Learning: Benchmarking and Best Practices in Mechanical Engineering Programs," Submitted Oct. 2017

Contributed to IDC Proposal: Art, Architecture, Construction and Engineering (AACE) Lab, 7/25/2017.

NYSERDA PON 3442, "[Workforce Training: Cooper Union Facilities Training and Curriculum Development](#)," PI, Awarded 10/1/2017, \$167,671.

NYSERDA PON 3438, "[REV Campus Challenge Technical Assistance for Roadmaps](#)," PI, Awarded, PO Issued on 8/29/17 for \$154,000.

NSF Improving Undergraduate STEM Education (IUSE) proposal #1725958, "Collaborative Research: System Dynamics Experimentation and Exploration at Home," Co-PI, \$66,044, 1/11/17, Declined.

Residence Hall Chiller Replacement Project, Con Edison Commercial & Industrial Energy Efficiency Program Incentive, 2016, \$4,380.90. Awarded.

DAAD Faculty Research Grant Proposal, "Vehicle Systems Simulation and Optimization," Awarded 5/2/2014, €2,150.

ASME Diversity Action Grant, "Creating an Interactive Light Studio for Integrated Deaf and Hearing Children and STEM Outreach," 2011-2013, 2014, 2016, \$13,000 in total.

NSF IUSE proposal #1625874, "Collaborative Research: System Dynamics Experimentation and Learning at Home," Co-PI, \$63,689, 1/13/16, Declined.

NSF IUSE proposal #1525020, "Collaborative Research: System Dynamics Experimentation and Learning at Home," Co-PI, \$54,318, 1/13/15, Declined.

NSF Discovery Research K-12 (DRK-12) proposal #1222935, "[Interactive Light Studio: Interactive Technology for Promoting STEM Learning in PreK-2 Students and Encouraging Inclusivity for the Deaf and Hearing-Impaired](#)", PI, \$373,216, 1/10/2012, Received "competitive" rating but declined.

NSF Transforming Undergraduate Engineering Education (TUES) Type II proposal #1225766, "Collaborative Research: Extending System Dynamics Measurements and Experimentation at Home," PI, \$51,867, 1/13/2012, Received "competitive" rating but declined.

Society of Women Engineering Program Development Grant proposal, "Interactive Light Studio," 12/1/2011, \$2400, Declined.

NSF TUES proposal, "[Building Sustainability into Control Systems Courses](#)," Award DUE #1044830, PI, Submitted: 5/27/2010, Awarded: Aug. 2011, \$107,884.

Contributed to City of New York Capital Funding proposal, Equipment Request for Biomedical Engineering Research, Awarded \$350,000, FY 2010.

Brooks Family Capital Equipment grant used to expand Mechatronics and Vibration & Acoustics laboratories with various equipment, including state-of-the-art 16-channel LMS SCADAS data acquisition system, 2010.

NSF Transforming Undergraduate Engineering Education (TUES) Type II proposal #1122328, "Collaborative Research: Extending System Dynamics Measurements and Experimentation at Home," PI, \$45,870, 1/4/2011, Declined.

National Society of Collegiate Scholars Service Initiative Proposal, "Interactive Light and Sound Studio," \$6,000, 4/21/2011, Program suspended without any awards given.

NSF Course, Curriculum, and Laboratory Improvement (CCLI) proposal, "[A Sequence of Unified, Collaborative Learning Platforms in Mechanical Engineering: The Cooper-active Experience](#)," \$196,780, 5/22/2009, Declined.

Contributed to Sherman Fairchild Foundation grant proposal for support of biology and engineering research and curriculum development, 2008.

Submitted a Challenge Grant proposal in the amount of \$102,805 to Chrysler LLC for the development of a Powertrain Noise, Vibration, and Harshness (NVH) Systems Analysis tool, 4/22/2008, Program suspended due to Chrysler financial difficulties.

#### **HONORS AND AWARDS:**

- Technical University of Dresden Junior Faculty Fellowship, 2014
- Deutscher Akademischer Austausch Dienst/German Academic Exchange Service (DAAD) Faculty Research Visit Grant, 2014
- Society of Automotive Engineering (SAE) International Ralph R. Teetor Educational Award, 2013
- ASME District A Student Section Advisor Award and Honorarium, 2012. *Nominated by Metropolitan Section and awarded by ASME General Awards Committee; District A encompasses 13 U.S. States, Washington DC, Puerto Rico, and 6 Canadian provinces.*
- SAE Longtime Member Service Award, 2011
- ASME Metropolitan Section Service Award, ASME President's Night Dinner, March 17, 2011.
- SAE Engineering Meetings Board Outstanding Oral Presentation Award, 2010
- Cooper Union Student's List for Exemplary Teaching Award, December 2009. *Awarded by Engineering Student Council and Cooper Union Student Body.*
- National Science Foundation (NSF) Graduate Research Fellow, 2002-2007
- NSF East Asia Pacific Fellowship to Shanghai Jiao Tong University, 2002
- University of Michigan Rackham Engineering Award, 2001
- Michigan Tech Scholar Award, 1995-2000
- Michigan Tech Campus Campaign Leadership Award, 1999
- Swiss Federal Institute of Technology (ETH) Exchange Student Fellowship, 1999
- Congress-Bundestag Youth Exchange Program Scholarship to Germany (Fulbright-Hays), 1996-1997

#### **STUDENT ADVISING:**

##### Graduate Students (14)

Joe Viola, Development of cogeneration performance analysis and modeling tools, M.Eng., Expected 2018.

Sun Kwon, Development of Cooper Union's Carbon Action Plan and Analysis of Cogeneration Carbon Impact, Expected 2019.

Tony Zhao, Analysis of Laboratory Ventilation and Exhaust Systems, Expected 2019.

[Investigating thermal performance of double-skin perforated-sheet façade using multi-scale approach](#), Woojae Kim, M.Eng., 2016.

[Development of a Calibrated Whole-Building Heat Balance Energy Model for a High-Performance Academic Building](#), Eric Ringold, M.Eng., 2016.

[Laboratory Ventilation Energy Conservation Measures](#), Chong Woo (John) Han, M.Eng., 2016.

[Evaluation of Low-Cost Microphones and Sound Level Meter Applications for Voice Measurement](#), Michael Pimpinella, M.Eng., 2016. *Published in Journal of Voice and AJSLP.*

- [Technical and Economic Assessment of Cogeneration in an Urban Academic Building](#), Jonathan Rodriguez, M.Eng., 2014
- [Air Dispersion Characteristics and Thermal Comparison of Traditional and Fabric Ductwork using Computational Fluid Dynamics](#), Sriya Adhya, M.Eng., 2014
- [Vehicle Simulation Analysis and Hardware-in-the-Loop Framework for Electric Vehicle Design and Optimization](#), David Hahm, M.Eng., 2012
- [The Application of Numerical Methods and Artificial Intelligence to the Building Management System in a LEED Certified Academic Building \(41 Cooper Square\)](#), Michael Sterman, M.Eng., 2012. *Published ASME paper.*
- [Developing an Extensible and Concise Simulink Toolset for Hybrid Vehicle Modeling and Simulation](#), Burak Kanber, M.Eng., 2011. *Published SAE paper.*
- [Pneumatic Process Modeling and Experimentation for Model-Based Control](#), Brian Tovar, M.Eng., 2011
- Development of Vehicle Performance Simulation, Georg Thomann, University of Applied Sciences in Esslingen, Germany, Diplomarbeit, 2007
- Senior Capstone Design Projects (36)
- Building Energy Optimization, Zhichun Sun, Kevin Yao, 2017-2018
- Sound Localization, Mingyang Lee, Yue Yue Li, 2017-2018
- Wheelchair assistance design to enable people with disabilities to participate in running events, *In collaboration with Achilles International*, Liushifeng Chen, Jihu Kim, Pranav Joneja, William Lim, Jason Yao, Co-advised by Nick Wong (ME'14) of Upcycles and Dr. Wei, 2017-2018
- Developing a [Mobile Market Stand](#) for the Social Growth of Developmental Special Needs Students at the [Brooklyn Transition Center](#), Austin Wong, Tom Chan, Co-advised by Nick Wong (ME'14) of Upcycles and Dr. Wootton, 2016-2017
- The Design and Fabrication of an Educational Co-Flow Diffusion Flame Test Stand, Harrison Milne, Ashish Pokharel, Jordan Selig, Co-advised with Dr. Sidebotham, 2016-2017
- The Cooper Brewer, Karan Gill, Co-advised with Dr. Keene, 2016-2017
- [Automated Building Fault Diagnosis](#), Alex Bush, Joe Viola, 2015-2016
- The Development and Implementation of a Formula SAE Chassis Dynamometer, Amy Chambers, Hunter McKane, Co-advised with Dr. Delagrammatikas, 2015-2016
- Deciphering the NYC Noise Code, Jackie Lee, Matthew Palmer, 2015-2016
- Play that Sparks Curiosity: A Projection Experience (PlaySCAPE), Catherine Go, Jenny Jung, Jeffrey Tam, 2015-2016
- [@41CooperSquare: An Energy Dashboard](#), Created [Green Features website](#) and lobby kiosk, Janet Butler and PolinaSmirnova, 2013-2014
- Atomic Force Microscope: Vibration Analysis and Solution, Michael Pimpinella, Atomic 2013-2014
- [A Methodology for Reducing Building Energy Usage](#), Eric Leong, Greg Tayco, 2013-2014, *Presented at 2014 ASEE Zone 1 Conference.*
- Formula SAE Exhaust Manifold Design, Jessica Loo, Co-advised with Dr. Delagrammatikas, 2013-2014
- Formula SAE Intake Manifold Design, William Biesiadecki, Co-advised with Dr. Delagrammatikas, 2013-2014
- [Degree of Comfort: A Thermal Comfort Study of 41 Cooper Square](#), Yudi Guo, Daniel Moreno, 2013-2014
- Simulating Hybrid Electric Vehicles for Fuel Efficiency, Steven Lee, 2013-2014
- Downsizing the Engine in a Formula-style Racecar, Jonathan Zorko, Co-advised with Dr. Delagrammatikas, 2013-2014
- Grenade Cartridge Crimping and Staking Fixture, David Rophael, *Organizing sponsorship by US ARMY-ARDEC*, Picatinny, NJ, 2012-2013.



- Synthesis of Modal Analysis and Finite Element Methods for Troubleshooting and Optimizing Structures, Sung Wook Park, Woojae Kim, 2012-2013.
- [Energy Modeling of 41 Cooper Square using eQuest](#), Sara Carlson, 2012-2013.
- Musical Instrument Design, Martin Lawless, Co-advised with Dr. Sidebotham, 2012-2013.
- Design of Braking and Pedal System for Cooper Union Formula SAE Car, Kim Meehan, Co-advised with Dr. Delagrammatikas, 2012-2013.
- Formula SAE Chassis and Suspension Design, Spyros Korsanos, Co-advised with Dr. Delagrammatikas, 2012-2013.
- [Optimizing Vehicle Gear Control Strategies](#), Jonathan Yong, Co-advised with Dr. Ben Davis, 2011-2012.
- [Modeling the Upper Airway in Obstructive Sleep Apnea Syndrome](#), Sophie Rand, Co-advised with Dr. Wootton, 2011-2012.
- Interactive Light Studio Digital Projection System and Applications, Dale Short, 2011-2012. *Published ASME paper.*
- Development of Animatronics and Curriculum for Interactive Light Studio, Caitlin Correll, 2011-2012.
- [Modal Analysis of a Flat Plate with Closely Spaced Mode Shapes Using the LMS SCADAS MOBILE and Test.Lab](#), EglindMyftiu, 2010-2011.
- [Design and Fabrication of a Myoelectric Hand](#), Amrisha Sinha, Co-advised with Dr. Wootton, 2010-2011. *Published Senior Capstone project abstract and participated in the 37th Annual Northeast Bioengineering Conference poster session, Troy, NY, April 1-2, 2011.*
- Interactive Light Studio, James Baker, 2010-2011. *Published ASME paper.*
- [Acoustic Characterization of 41 Cooper Square Academic Spaces](#), Jacob Fern, Co-advised with Dr. Wei, 2010-2011. [Poster link.](#)
- Stabilization of Cooper Union Atomic Force Microscope (AFM), Roman Rekhler, Consulted, 2009-2010.
- Magnetic Resonance Elastography (MRE): An analysis of elastic tissue vibration, Jonathan Serman, Consulted, 2008-2009.
- Formula SAE Car Traction Control and Impact Analysis, Burak Kanber, Consulted, 2008-2009.
- The Mechanics of Drum Sounds: Developing a Practical Method of Quantifying the Acoustic Response of Drums, Stephen Antonelli, Consulted, 2008-2009.
- Student Research Projects Advised for Independent Study Course Credit (13)
- Low-Cost NEST+m Auditorium Acoustics Solution, Yigal Kamel (BSE), Raymond Lee, EID260-IS, Spring 2017
- Reverberation Time Experimentation and Analysis of Acoustic Panel Treatments in Rose and NEST+m Auditoriums, Jean Lam (ChemE), Yueyue (Keira) Li, Ben Park (CivE), EID260-IS, Fall 2016
- [Optimizing Cogeneration Heat Recovery](#), Soyoung Moon, ME365, Fall 2016.
- [41 Cooper Square Energy Analytics](#), Created [Cooper Energy Analytics](#) tool (can only be accessed from Cooper network), Zhengqi Xi, ME365, Fall 2016.
- [Analysis of Laboratory Ventilation Rates and Safety Codes](#), Tony Zhao, ME493, Fall 2016.
- [Modal analysis of an acoustic violin and a 3D-printed electric violin](#), Jackie Li, ME401-IS, Spring 2016.
- [Determining the Acoustic Properties of Auditoriums](#), Yueyue (Keira) Li, ME393, Fall 2015.
- [Acoustical Analysis of The Cooper Union Anechoic Chamber and Kanbar Research Laboratory](#), Martin Lawless and Matthew von der Lippe, ME363, Fall 2011.
- Implementing integrated sensor and circuit technology for sound-to-light assistive learning devices for the deaf and hearing impaired, Hannah Clevenson (EE), Bridget O'Meara, ME365, Spring 2011.
- Development of a System for Visualizing Bending Mode Shapes of an Aluminum Cantilever Beam Using NI LabVIEW and LMS Test.Lab, Sam Glauber, ME363, Fall 2009.

Hybrid Electric Vehicle Analysis: Researching Methods for Hybrid Vehicle Simulation, Electric Motor Control and Failure Modes Analysis, Saman Farid, Paige Holland, and Beatriz Ponce, ME363, Fall 2009.

Optimization of Key Suspension Parameters Using CarSim, Dennis Robertson, ME364, Spring 2009.

Myoelectric Hand Prosthesis: Researching and prototyping an affordable prosthetic hand for upper limb amputees, Toby Klein, SeYoon Kim, Qiao Li, and Andy Ye, ME363, Summer 2008 - Summer 2009.

#### Student Researchers Supported with External Funding

Building System Primers and Re-Tuning, Robert Faddoul, William Lim, Zhichun Sun, Will Henderson, NYSERDA PON#3442, Summer 2017 - ongoing

Creation of real-time 41 Cooper Square [Power Dashboard](#), Eric Leong, NSF DUE #1044830, Fall 2013-Spring 2015

[Building Re-Tuning and Diagnosis Tool Development](#), Alex Bush, NSF DUE #1044830, Summer 2015

[Radiant Water System Description](#) and Web Content Development, Daniel Moreno, NSF DUE #1044830, Summer 2014

Development and implementation of School of Engineering faculty content management website ([engfac.cooper.edu](http://engfac.cooper.edu)), Andrew Crudge, Mike Palafox, NSF DUE #1044830, 2011-2012

[Development of Online Building Systems Curriculum Material](#), Julien Caubel, NSF DUE #1044830, Summer 2011-Summer 2012. *Published ASME paper.*

Design of New Process Control Laboratory Experiment Software Interface and Curriculum, Amanda Zielkowski, Tyler DiStefano, Kimberly Meehan, NSF DUE #1044830, Fall 2011-Spring 2015. *Presented at 2015 ASEE Northeast Section and 2014 ASEE Zone 1 conferences.*

Analysis of Process Control Test Rigs and [Rainwater Harvesting System](#) Description, Mike Sanfelice, NSF DUE #1044830, Fall 2011-Spring 2012.

#### Undergraduate Student Research

Developing a low-cost, high-quality MEMS ambisonic microphone and automatic rotating microphone mount in collaboration with NYU Immersive Audio Group, Yigal Kamel (BSE), Raymond Lee, Summer 2017

Developing interactive projection system using C++ based Open Frameworks, David Tan, Summer 2011-Spring 2012.

Advanced modal analysis concepts and testing techniques, Sam Glauber, SeYoon Kim, and Andy Ye, Summer 2009.

Development of a Powertrain Noise, Vibration, and Harshness (NVH) model, Ali Moussawi, Summer 2008.

#### High School Students

[Investigating the Suppression of Mid-Range Harmonics in Violins](#), Stephanie Kwan (Stuyvesant High School), 2014 New York City Science and Engineering Fair and Intel Science Search project, Co-advised by David Tan (ME'14)

#### **PROFESSIONAL EXPERIENCE:**

- 2004– 2007 **DaimlerChrysler / Chrysler LLC**, *Powertrain Systems Engineer*, Auburn Hills, MI
- Developed Powertrain Matching Analysis Tool (PMAT) for optimizing variable displacement, torque converter clutch, and gear shift control and for specifying engine, transmission and driveline technology requirements for all new vehicle programs
  - Co-developed vehicle system energy analysis tool using hybrid empirical and analytical approach with real-time component speed and load data measurements
  - Supported algorithm development and validation for transient fuel, interactive transmission, and flexible fuel control
  - Responsible for engine dynamometer testing and engine controller unit calibration and hardware development for V8 engine program

- 2004 • Developed Design of Experiments (DoE) model to investigate variable valve timing effects on cold start emissions and combustion stability for new I4 engine program  
**Daimler, International Management Associate: Body & Powertrain Research for Passenger Car Engines, Stuttgart, Germany**
- 2003 • Researched cold start control strategies to reduce emissions for direct injection I4 engine  
 • Acquired and analyzed temperature, HC-, and CO-emissions data  
**DaimlerChrysler, International Management Associate: Mack Avenue Engine Plant Resident Engineering, Detroit, Michigan**
- 2000 – 2001 • Developed algorithm to improve in-process engine assembly error-proofing station  
 • Improved process capability of critical crankshaft features and resolved camshaft issues (dimensional issues, product and process concerns, rejects, etc.)  
**Deloitte Consulting, Business Analyst, Metro Detroit, MI**
- 1999 • Consulted various OEMs on order-to-delivery, supply chain management, and e-business strategy projects  
 • Performed statistical forecast variation analysis to support online supplier collaboration  
**Chrysler, Summer Intern, Detroit, MI**
- 1998 • Responsible for coordinating a mock-up prototype vehicle  
**General Motors, Summer Intern, Pontiac, MI**
- 1997 • Evaluated preventative maintenance system and worked with vendor to implement changes  
**BMW AG, 6-month Internship, Munich, Germany**
- 1994 – 1995 • Organized and performed powertrain component resonance, fatigue, and static load tests  
**Detroit Edison, Co-op, Detroit, MI**
- Assisted engineers in design of power plant systems and produced CAD drawings of designs  
 • Supported surveys and inspections of power plants to troubleshoot systems

#### PROFESSIONAL DEVELOPMENT:

- 2017 ABET Symposium, Baltimore (14 PDH), MD, April 20-21, 2017
- An interactive workshop on assessing hands-on teaching, 2015 ASEE Northeast Section Conference, 4/30/2015
- Association of Energy Engineers (AEE) Five-Day Training for Energy Managers, NY, NY, April 13-17, 2015
- Commission on Independent Colleges and Universities (clcu) Energy Grants and Cost-saving Opportunities Conference, Vassar College, 10/21/2015
- Building Re-tuning Training (15 PDH), CUNY Building Performance Lab, NY, NY, June 2-30, 2015
- LMS Test.Lab Rotating Machinery, Aug.4-6,2015, *course tuition extended free of charge*
- Presenting Data and Information, Edward Tufte workshop, March 13, 2013
- NSF Proposal Writing Workshop, Nov. 15, 2011
- ASME Student Leadership Training Seminar, Harvard University, Oct. 16, 2011
- *Adding Sustainability to Engineering Education Workshop*, Center for Sustainable Engineering (CSE), Syracuse University, May 22-24, 2011. *Applied for and awarded NSF travel funding.*
- Flow Metering in Energy Management (1 PDH), ASME Technical Dinner Meeting, 4/21/2011
- Sustainable Design Lecture Series, 3/2/2011, 12/2/2010, 2/19/2010
- NYCT Emergency Tunnel Ventilation and Station Smoke Management Systems (1 PDH), ASME Technical Dinner Meeting, 6/17/2010
- NYSERDA's Solar One NYC: Future Metropolis panel and event, 6/10/2010.
- Siemens Laboratory Energy Savings Full-Day Seminar, 3/11/2010
- American Recovery and Reinvestment Act Grant Writing Workshop, June 1-2, 2009
- LMS Modal Analysis training course, June 9-12, 2008. *\$3400 course tuition extended free of charge*
- LMS Digital Signal Processing training, July 22-25, 2008. *\$3400 course tuition extended free of charge*

**PROFESSIONAL ACTIVITIES:**

**American Society of Mechanical Engineers (ASME)**

Cooper Union Faculty Advisor, 2008 – present

Dynamic Systems and Controls Division Newsletter Associate Editor, 2009 – 2014

Inaugurated and hosted ASME Metropolitan Intercollegiate Design Competition, 2011 and 2012.

Regularly attend ASME Met Section meetings and hosted two ASME Meet and Greets (10/15/2009, 11/19/2009)

**Society of Automotive Engineers (SAE)**

SAE Longtime Member Service Award, 2011

**American Society of Engineering Education (ASEE)**

Ad-hoc Faculty Committee to complete NSF survey for "[Creating a Culture of Systematic Innovation in Engineering Education](#)" ASEE Report, Led writing and submission of final survey, June 2010.

**ASHRAE**

Awarded Associate Member Status Level, 2014

**Society of Women Engineers (SWE)**

Invited as speaker to Annual SWE Intercollegiate Mixer, 2010

Participated on 3rd Annual SWE Alumna-Student Panel Discussion for Cooper SWE, 2009

U-M GradSWE Social Co-Chair, 2001 –2002

MTU Chapter Vice-President, Girls + Math + Science Day Volunteer, 1998 –1999

MTU Chapter Fundraising Chairperson, Girls + Math + Science Day Volunteer, 1997 –1998

**American Association of University Women (AAUW)**

Sundaes and Science Outreach Volunteer, 2006 – 2007

**REVIEWS:**

- Society of Automotive Engineers (SAE) Paper Reviewer, 2015 - 2016
- Austrian Science Fund (FWF)Erwin Schroedinger-Fellowship Reviewer, 2016
- Congress-Bundestag Youth Exchange for Young Professionals interview committee, 2007, 2014
- Cooper Union Institute for Sustainable Design's 'Visualizing Climate Change' Fellowship Jury, 2015
- DAAD Faculty Research Grants Reviewer, 2015
- *Live Energy e-textbook* reviewer, funded in part by the NSF, 2014
- NSF Transforming Undergraduate Engineering Education (TUES) review panel, Washington DC, 2013
- ASME International Mechanical Engineering Congress & Exposition (IMECE) Paper Reviewer, 2010-2012
- Center of Sustainable Engineering ([CSE e-Library](#)) educational module reviewer, 2012
- ASME Dynamic Systems and Control Conference (DSCC) Paper Reviewer, 2009, 2011
- NSF Grant #0736603 "System Dynamics Measurements and Experimentation at Home" evaluator

**COMMITTEES:**

- Dean Search Committee, Fall 2016 – Present
- Middle States Commission on Higher Education (MSCHE) Working Group Standard III: Design and Delivery of the Student Learning Experience, May 2016 – Present
- Institutional Review Board Committee Member, Fall 2012– Present
- Planning and Assessment Council (PAC), 2013 – 2015
- Chair of Ad-hoc committee on Curriculum Reinvention, Fall 2012. *Authored [Undergraduate Curriculum Committee Report](#)*
- Advisory Committee on Campus Security, 2008 – 2012
- IDE/BSE Faculty Advising Committee, 2009 – 2012
- ME Transition Committee, 2008 – 2012

- Engineering Representative to Humanities and Social Sciences (HSS) Faculty, 2009 – 2012
- Academic Standards Committee, Summer/Fall 2010, Summer 2011

**OTHER SERVICE:**

- Initiated Study Abroad program with University of Applied Sciences Karlsruhe and Dresden University of Applied Sciences, including travel and tuition scholarships for 2 Cooper students per year to attend a 2-week [HAWtech Summer School](#) program in Karlsruhe, Dresden and Berlin, 2016 - ongoing
- From the Lab Research Event, 41 Cooper Square: A Building for Learning, presented by my student, Tony Zhao, Feb. 28, 2017. *Also showcased four student projects at Fall 2016 and Spring 2016 From the Lab events.*
- Organized tours for Prospective and Admitted Student Days (2008 – ongoing) and Women in Engineering Events (2016 – 2017)
- Led and engaged students in numerous [STEM outreach sessions](#) for local schools, including The American Sign Language and English Lower School (PS 347), The Parkside School (PS 130K) in Brooklyn, Midtown West (PS 212), 43rd Street Kids Preschool, LaSalle Academy, and New Explorations in Science, Technology and Math (NEST+m)
- Advised Cooper Union Engineers as Teachers (East) students working with Prof. Cumberbatch on creating five lessons and hands-on activities and attended [Iridescent Family Science Sessions](#) at the Iridescent studio in the Bronx, Spring 2012
- Served as evaluator for 2<sup>nd</sup> annual Invention Factory, 2014
- Led numerous tours of 41 Cooper Square to universities, professional organizations, international delegations, and other important guests
- Coordinated numerous site visits for students, including Princeton central plant and campus controls room, Columbia LEED Science Building, NY Hilton Cogen site visit, New School building and One Bryant Park central plants, cogen and thermal storage facilities
- Association of Energy Engineers, Building Energy Project Opportunities presentation, Feb. 7, 2017
- NYC Dept. of Design & Construction Town+Gown research partnership representative, 2014 – ongoing
- Developed several industry contacts (Chrysler, TEC Systems, Smith Engineering, AECOM, Gradus Group, Totem Power, etc.) resulting in hiring of many of our students
- Received donations of over \$12,000 in equipment from PCB Piezotronics and National Instruments
- Engineers without Borders New York Professional section presentation with Bridget O'Meara (ME'11), 11/4/2010
- Participate and showcase student projects in annual End of Year Show, 2011 – ongoing
- Contributing to assessment process by developing Student Assessment of Learning Gains (SALG) template and assisting faculty with implementing online student survey and by developing Senior Capstone Design evaluation rubric and ABET outcomes matrix and templates.
- Engineering Advisory Board Meetings, 3/23/2011, 11/10/2008.
- CU Alumni Council presentation, 5/11/2009
- Academic Affairs Meeting, 3/4/2009

**SKILLS:**

Programming/Simulation: MATLAB/Simulink, Mathematica, Fortran

Controls: National Instruments LabVIEW, dSpace Hardware-in-the-Loop (HIL) simulator

Powertrain: Combustion Analysis System (CAS), ETAS INCA Calibration Software and Hardware

Noise and Vibration/Digital Signal Processing/Modal Analysis: LMS Test.Lab, NI DAQ and Sound & Vibration Suite, Larson-Davis Sound Level Meter and Piezotronics measurement equipment

Design/CAE: I-DEAS, AutoCAD

Language: Fluent in conversational and proficient in technical German