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Curriculum Vitae last updated: Feb. 21, 2016

EDUCATION

Ph.D. Mechanical Engineering **University of Alabama in Huntsville** **2003**

Concentration: Turbulent Combustion – Spark Ignition

1st Minor: Fluid Mechanics

2nd Minor: Thermodynamics

Dissertation: “Monte-Carlo Computation of Turbulent Premixed Methane/Air Ignition”

Advisors: Dr. Gerald Karr (UAH)

Dr. Douglas Feikema (NASA Glenn Research Center)

M.S. Aerospace Engineering **Georgia Institute of Technology** **1989**

Research: “Fractal Dimension of the Ammonium Perchlorate Solid Rocket Propellant”

Advisor: Dr. Warren Strahle

Bachelor of Aerospace Engineering **Georgia Institute of Technology** **1988**

PROFESSIONAL EXPERIENCE

2015-Present University of Alabama in Huntsville
Mechanical and Aerospace Engineering Dept.
Clinical Associate Professor

2006-2015 University of Alabama in Huntsville
Mechanical and Aerospace Engineering Dept.
Lecturer

2002-2006 University of Alabama in Huntsville
Mechanical and Aerospace Engineering Dept.
Capstone Design Class Instructor

1992-2000 University of Alabama in Huntsville
Mechanical and Aerospace Engineering Dept.
Graduate Teaching Assistant

1990-1991 Aerotherm, Inc., Huntsville, AL
 Aerospace Engineer. Analyzed flow properties of the High Endo-Atmospheric Defense Interceptor (HEDI) for SDI. Utilized various flow analysis codes (KIVA) and grid generation codes (EAGLE). Top Secret government clearance issued Dec. 1990.

RESEARCH INTERESTS

- Engineering Design Methodology
- Product Realization
- Design Education
- STEM Outreach and Education
- Design Optimization
- System Safety and Risk Analysis
- Biomechanical Product Design
- Multidisciplinary Design Team Education
- International Design Collaboration
- Experimental Stress Analysis
- Photoelastic Stress Determination
- Turbulent Combustion
- Monte-Carlo Computations

TEACHING

Courses Taught:

MAE 200 – Principles of Aeronautics and Astronautics
Spring 2007

MAE/CEE 271 – Statics
Fall 2010, Summer 2010, Spring 2010, Fall 2009, Summer 2009, Spring 2009, Fall 2008, Summer 2008, Spring 2008, Fall 2007, Spring 2007, Fall 2006

MAE 396 – Numerical Methods and Computations
Summer 2004, Spring 2004, Fall 2003, Summer 2003

MAE 490 – Introduction to Engineering Design – Product Realization
Fall 2002-present

MAE 490 – Introduction to Design, Build, Fly
Fall 2012, Fall 2011

MAE 491 – Product Realization
Fall 2010-present

MAE 492 – Aerospace Design – Product Realization
Spring 2013, Fall 2012, Spring 2012, Fall 2011, Spring 2011, Fall 2010

MAE 495 – Design For Manufacturing and Assembly
Spring 2012

MAE 495 – Design Optimization and Verification
Summer 2011

MAE 495 – Photoelastic Stress Determination
Fall 2009

MAE 495 – Moonbuggy Design Methodologies
Spring 2010

Average Student Instructor Evaluation (SIE) Score: 93.44

Course Development:

MAE 490/491 Engineering Design – Product Realization

- Design, fabrication, analysis and testing of a patentable product
- Investigate and facilitate biomechanical product design for United Cerebral Palsy
- Require use of NASA's Systems Engineering Design Methods
- Implemented design optimization using X-TOOLSS
- Incorporated engineering ethics discussions based upon NSPE case studies
- Encourage design team completion and submittal of an Invention Disclosure Form
- Broadened the emphasis upon technical writing and public speaking skills
- Promote interdisciplinary design development
- Promoted design team collaboration with UAH Chemical Engineering students
- Incorporated an introduction to Geometric Dimensioning and Tolerancing
- Emphasize Design for Fatigue and Corrosion Resistance
- Require Hazard/Risk Index assessment
- Promote student presentations at national and international conferences
- Promote STEM outreach activities

Previous Design Projects

Projects funded by UAHuntsville, National Space Grant, Alabama Space Grant Consortium, NASA, DoD, US Army, US Navy, AIO-50, Women in Defense, and numerous engineering firms and industries

- US Special Operations Command Design Projects (Fall 2012-Fall 2015)
- NASA Deep Space Habitat Microgravity Stowage and Rack System (2012-2013)
- STEM displays for Sci-Quest, Huntsville, AL. (Spring 2011-Spring 2015)
- STEM Tools for use in Primary and Secondary Education (Summer 2009 – Present)
- Lunar Wombot – Lunar Regolith Burrowing Device (Fall 2010-Spring 2014)

- 1/3 Scale Gemini Capsule and Landing Gear (Fall 2009-Spring 2011)
 - Fluid Flow Circuit designed for Guntersville High School to promote interest in STEM education and careers (Summer 2009)
 - CH-47D Helicopter Icing Spray System in support of a \$7-10 M proposal effort (Summer and Fall 2008)
 - Mobile Solid Rocket Motor Test Stand (Spring 2009)
 - Morgan Press Plastic Injection Machine Mobilization (Spring 2009)
 - Motor Cross Bike Stand (Fall 2008)
 - Mars Rover radio controlled, sample collecting vehicle (Spring 2009)
 - Robotic Window Washer (Spring 2008)
 - Automatic Light Sensing Chicken Coop Door (Summer 2007)
 - Portable Fire Hose Reeling Stand (Fall 2008)
 - Target Detection and Tracking Device
 - Humane Animal Trap
 - Rocket Payload Ejector
 - Press Break Safety Lock
- examples from over 350 design projects*

New Course Development:

MAE 495 Design For Manufacturing and Assembly – Spring 2012

A special topics class structured to study the following: 1) Principles, procedures, and methodology of DFMA techniques, 2) Use and implementation of DFMA processes and procedures during design, fabrication and assembly of a product, 3) Management and oversight of the fabrication and assembly of a product, 3) Testing of the product and the impact of DFMA guidelines upon the verification results, 4) Assessment of the overall impact of DFMA upon the product quality.

MAE 495 Design Optimization and Verification – Summer 2011

A special topics class structured to study the following: 1) Principles, procedures, and methodology of design optimization and hardware verification techniques, 2) Use and implementation of NASA's X-TOOLSS design optimization software, 3) Design, set-up and specification of experimental testing process, 3) Stress distribution determination using strain gage measurements, 4) Modeling and simulation validation, 5) Implementation of the principles by design optimization and testing of a specific product.

MAE 495 Moonbuggy Design Methodologies – Spring 2010

A special topics class structured to study and provide the following: 1) Principles, procedures, and methodology of moonbuggy vehicle design, 2) Historical perspective of moonbuggy designs, 3) Detailed description of major systems and sub-systems applicable to moonbuggy designs, 4) Theoretical and analytical calculations, 5) Proper material selection, 6) Manufacturing requirements, complexity and techniques, 7) Testing methods and techniques, 8) Safety and risk analysis associated with vehicle systems, sub-systems, parts, components, fabrication, testing, maintenance, storage, etc., 9) Development of a detailed and practical moonbuggy design manual.

MAE 495 Photoelastic Stress Determination – Fall 2009

A special topics class structured to study the following: 1) Principles, procedures, and methodology of hardware stress distribution determination via photoelastic visualization and strain gage measurements, 2) Design, set-up and specification of experimental testing process, 3) Modeling and simulation validation (FEA), 4) Fatigue failure prediction, 5) Implementation of the principles by designing and demonstrating stress distribution visualization experiments through use of a polariscope and traditional strain gage application procedures.

TECHNICAL PAPERS AND PUBLICATIONS

Carmen, C.L. and Groenewald, B. “Implementation and Impact of STEM Focused International Design Projects within Engineering Capstone Design Classes,” *Advances in Engineering Education*. ASEE Journal. *In preparation*

Patterson, A., Messimer, S., Farrington, P., **Carmen, C.**, and Kendrick, J. “Effect of SLM Parameters on In-Process Stress and Deformation in Overhanging Features,” *Additive Manufacturing Journal*, *Submitted*

Carmen, C.L., Groenewald, B, Setshedi, R. and Abrahams, A. “Promoting K-12 Aerospace Education via Wind Tunnels Developed through an International Capstone Design Partnership,” *2016 ASEE Annual Conference and Exposition*, New Orleans, LA, June 2016.

Setshedi, R., **Carmen, C.L.** and Groenewald, B., “Promotion of Satellite Technology and Aerospace Engineering through an Internationally Designed Tabletop Wind Tunnel,” *66th International Astronautical Congress Proceedings*, Jerusalem, ISR, Oct. 2015.

Carmen, C.L. and Groenewald, B, “Utilization of STEM Tools and Workshops to Promote STEM Education in the United States and South Africa,” *2015 ASEE Annual Conference and Exposition-International Forum*, Seattle, WA, June 2015.

Machemer, A. and **Carmen, C.L.**, “Undergraduate Student Design Team STEM Outreach Efforts Via the Design and Development of a Wind Tunnel,” *65th International Astronautical Congress Proceedings*, Toronto, CAN, Sept. 2014.

Ardis, M., **Carmen, C.L.**, DeLorme, M. and Hole, E., “Using a Marketplace to Form Multidisciplinary Systems Engineering Capstone Project Teams,” *2014 ASEE Annual Conference and Exposition*, Indianapolis, IN, June 2014.

Carmen, C.L. and Fraley, D, “Fostering the Future STEM Workforce Via Industry and Capstone Design Class Partnerships,” *Proceedings of the ASME 2013 International Mechanical Engineering Congress & Exposition (IMECE 2013)*, San Diego, CA, Nov. 2013.

Groenewald, B. and **Carmen, C.L.**, “Establishment of a Multi-National University Effort to Promote International Cooperation and Develop the Future Space Workforce,” *64th International Astronautical Congress Proceedings*, Beijing, CN, Sept. 2013.

Stokes, T. and **Carmen, C.L.**, “Design and Development of a Microgravity Stowage System Specific for Deep Space Exploration,” *64th International Astronautical Congress Proceedings*, Beijing, CN, Sept. 2013.

Barnett, C. and **Carmen, C.L.**, “Random Access Microgravity Stowage - Design Team Outreach to Secondary Education Schools Promoting STEM Education and Careers,” *64th International Astronautical Congress Proceedings*, Beijing, CN, Sept. 2013.

Carmen, C.L. and Groenewald, B., “Initiation and Development of International Collaboration Among the Future Space Workforce Via the Design and Development of a STEM Tool,” *63rd International Astronautical Congress Proceedings*, Naples, IT, Oct. 1-5, 2012.

Burks, R.S. and **Carmen, C.L.**, “Critical Legal Issues Associated with Current and Future Spacefaring Endeavors,” *63rd International Astronautical Congress Proceedings*, Naples, IT, Oct. 1-5, 2012.

Traum, J., **Carmen, C.L.**, and Fahimi, F., “Design and Development of a Lunar Rover in Association with the Google™ Lunar X-Prize Competition,” *63rd International Astronautical Congress Proceedings*, Naples, IT, Oct. 1-5, 2012.

Brown, M.K., **Carmen, C.L.**, and Sanders, B., “Development of a Novel Peristaltic Motion Robot Designed to Burrow Within Lunar and Martian Regolith,” *63rd International Astronautical Congress Poster Proceedings*, Naples, IT, Oct. 1-5, 2012.

Carmen, C.L., “Integration of a NASA ESMD Faculty Fellowship Project within an Undergraduate Engineering Capstone Design Class,” *Acta Astronautica*, pp. 141-153. Final version published online: 6-JUL-2012, DOI information: 10.1016/j.actaastro.2012.05.031.

Carmen, C.L., “Integration of a NASA ESMD Faculty Fellowship Project within an Undergraduate Engineering Capstone Design Class,” *62nd International Astronautical Congress Proceedings*, Cape Town, ZA, Oct. 3-7, 2011.

Johnson, J.A., Sanders, B.D. and **Carmen, C.L.**, “Design and Development of a Ground Based Robotic Tunneling Worm for Operation in Harsh Environments,” *62nd International Astronautical Congress Proceedings*, Cape Town, ZA, Oct. 3-7, 2011.

Setayesh, B.R. and **Carmen, C.L.**, “Collaboration Between Academia and Industry to Promote STEM Education Via the Design and Development of Learning Tools,” *62nd International Astronautical Congress Proceedings*, Cape Town, ZA, Oct. 3-7, 2011.

Gilbert, J.A. and **Carmen, C.L.**, MAE/CE 370 Mechanics of Materials Laboratory Manual, Dept. of Mechanical and Aerospace Engineering, University of Alabama in Huntsville, July 2011.

Schmidt, P., Zalewski, J., Murphy, G., **Carmen, C.**, Morris, T. and van Susante, P., “Case Studies in Application of System Engineering Practices to Capstone Projects,” *2011 ASEE Conference Proceedings*, Vancouver, BC, June 2011.

Casagrande, H. and **Carmen, C.L.**, "Promoting STEM Education Via the Design, Analysis, Fabrication and Testing of a Simulated Lunar Roving Vehicle," *61st International Astronautical Congress Proceedings*, Prague, CZ, Oct. 2010.

Pitts, H. and **Carmen, C.L.**, "Descent Systems for an Improved and Reusable Gemini Capsule," *61st International Astronautical Congress Proceedings*, Prague, CZ, Oct. 2010.

Tunstill, L.K. and **Carmen, C.L.**, "Design and Fabrication of Hardware to Promote STEM Education and Careers Among Secondary Education Students," *61st International Astronautical Congress Proceedings*, Prague, CZ, Oct. 2010.

Walker, T. and **Carmen, C.L.**, "Landing Gear Design for a 1/3 Scale Gemini-Style Capsule," *61st International Astronautical Congress Proceedings*, Prague, CZ, Oct. 2010.

Carmen, C. L., Morris, T., Schmidt, P., van Susante P., Zakewski, J., "2010 ESMD Space Grant Faculty Project Consolidated Interim Report," 2010 NASA Exploration Systems Mission Directorate Faculty Fellowship Meeting, Kennedy Space Center, July 26-30, 2010.

Carmen, C. L. and Sautter, F. C., "Modeling and Simulation of Helicopter Icing Spray System Designs," *Huntsville Simulation Conference Proceedings*, Oct. 2009.

Carmen, C. L. and Sautter, F. C., "Modeling and Simulation of Helicopter Icing Spray System Designs," 2009 Huntsville Simulation Conference, Oct. 27-29, 2009

Colebeck, J. A. and **Carmen, C. L.**, "Design of a Motorized Mobile Cooler Utilizing Virtual Visualization," *Huntsville Simulation Conference Proceedings*, Oct. 2009.

Olbricht, N. M. and **Carmen, C. L.**, "Application of Modeling and Simulation in the Design of Experimental Aircraft Flight Control Fixtures," *Huntsville Simulation Conference Proceedings*, Oct. 2009.

Carmen, C.L. and Sautter, F.C., "A Novel Helicopter Icing Spray System Design," *ASME Early Career Technical Journal*, Oct. 2009.

Carmen, C.L. and Sautter, F.C., "A Novel Helicopter Icing Spray System Design," 2009 ASME Early Career Technical Conference, Oct. 2-3, 2009.

Carmen C.L., Introduction to Engineering Design, June 2009.

Carmen, C.L. and Feikema, D.A., "Presumed PDF Modeling of Early Flame Propagation in Moderate to Intense Turbulence Environments," *NASA Technical Report*, E-14446, Glen Research Center, Nov. 2005.

Carmen, C.L., MAE/CE Mechanics of Materials Laboratory Instructor Manual, Dept. of Mechanical and Aerospace Engineering, University of Alabama in Huntsville, June 2000.

Gilbert, J.A. and **Carmen, C.L.**, MAE/CE 370 Mechanics of Materials Laboratory Manual, Dept. of Mechanical and Aerospace Engineering, University of Alabama in Huntsville, June 2000.

Carmen, C.L. and Feikema, D.A., “Monte Carlo Computation of Turbulent Premixed Methane-Air Ignition,” *Combustion, Explosion, and Shock Waves*, Vol. 34, Num. 3, pp.253-259, May 1998.

Carmen, C.L. and Feikema, D.A., “Monte Carlo Simulation of Turbulent Premixed Methane-Air Ignition,” Proceedings of the Central States Section of the Combustion Institute, Combustion Fundamentals and Applications, St. Louis, MO., May 1996.

Carmen, C.L., University of Alabama in Huntsville Propulsion Research Center Annual Review, 1995.

Carmen, C.L. and Feikema, D.A., “Monte Carlo Simulation of Turbulent Premixed Methane-Air Ignition,” AIAA 33rd Annual Aerospace Sciences Meeting, Reno, NV, Jan. 1995.

INVITED PRESENTATIONS

ASME North Alabama Section, “Design and Production of a Mobile Arm Support System for Cerebral Palsy Patients,” MAE Capstone Design Team, UAH Von Braun Research Hall, Huntsville, AL, April 29, 2015.

ASME North Alabama Section, “Design and Development of a Sailboat Disablement System for the US Special Operations Command,” MAE Capstone Design Team, UAH Von Braun Research Hall, Huntsville, AL, May 7, 2014.

NASA Engineering Design Process Seminar/Workshop, “What is Systems Engineering?” Cape Peninsula University of Technology, Cape Town, South Africa, May 14, 2013.

STEM Seminar/Workshop, “Promoting STEM Education and Careers,” Cape Peninsula University of Technology, Cape Town, South Africa, May 16, 2013.

ASME North Alabama Section, “Design and Development of a NASA Deep Space Habitat Microgravity Stowage and Rack System,” MAE Capstone Design Team, UAH Von Braun Research Hall, Huntsville, AL, May 1, 2013.

FIRST Robotics, “Implementation of the NASA SE Design Process,” Heritage Elementary School, Madison, AL, Oct. 23, 2012.

ASME North Alabama Section, UAH Moonbuggy Team 1: “The 2012 NASA Great Moonbuggy Race,” Von Braun Research Hall, Huntsville, AL, May 2, 2012.

ASME North Alabama Section, UAH Moonbuggy Team: “Design and Development of the 2011 UAHuntsville Moonbuggy,” Von Braun Research Hall, Huntsville, AL, May 18, 2011.

NASA Minority Innovations Challenges Institute (MICI) online presentation, “Establishing and Supporting a Successful Moonbuggy Team,” <http://www.nasamiciconference.com/index1.php>, Oct. 20, 2010.

Great Midwestern Space Grant Meeting, “2010 NASA ESMD Faculty Fellowship – Exploration Toolset for the Optimization of Launch and Space Systems,” University of Minnesota, Minneapolis, MN, Sept. 16, 2010.

NASA Exploration Systems Mission Directorate Faculty Fellowship Meeting, “2010 NASA ESMD Faculty Fellowship – Exploration Toolset for the Optimization of Launch and Space Systems,” Kennedy Space Center Headquarters, FL, July 29, 2010.

NASA MSFC ES-22 Branch Meeting, “NASA ESMD 2010 Faculty Fellowship,” Marshall Space Flight Center, Huntsville, AL, July 20, 2010.

ASME North Alabama Section, UAH Moonbuggy Team: “Design of the 2010 UAHuntsville Moonbuggy,” Von Braun Research Hall, Huntsville, AL, April 7, 2010.

Americans in Orbit Annual Banquet, “MAE 490 and AIO-50 Collaborative Efforts,” Sci-Quest, Huntsville, AL, Feb. 20, 2010.

Women in Defense Leadership Panel, “Fostering Positive Team Dynamics,” Raytheon Inc., Huntsville, AL, July 23, 2009.

ASME North Alabama Section, UAH Moonbuggy Team: “Design of the 2009 UAHuntsville Moonbuggy,” Von Braun Research Hall, Huntsville, AL, April 1, 2009.

STEM OUTREACH PRESENTATIONS

MAE 490 WID/Greengate School Design Team, “Design and Development of a Dyslexic Brain Models,” Greengate School, Ms. White’s classes, Huntsville, AL, Mar. 17, 2015.

MAE 491 Northrup Grumman/ALLIES Design Team, “Design of a Table Top Wind Tunnel with Flow Visualization,” St. John the Baptist Catholic School, Mr. Shepard’s 8th Grade Science classes, Madison, AL, Dec. 1, 2014.

MAE 491 WID Design Team, “Design and Development of a Water Distillery,” Discovery Middle School, Mr. Archer’s 8th Grade Science classes, Madison, AL, Nov. 24, 2014.

MAE 491 Lunar Wormbot/SERPENTS Team, “Design Project: NASA Lunar Lander,” Morris Elementary School, Huntsville, AL, April 2014.

MAE 491 Lunar Wormbot/SERPENTS Team, “Design Project: Balloon Rockets,” Williams Middle School, Huntsville, AL, April 2014.

MAE 491 Design Team, "Design and Development of a Table Top Pulley System," Williams Middle School, Huntsville, AL, Nov. 2013.

UAH MAE NSGF X-Hab Design team, "Design of a Microgravity Stowage and Rack System for a NASA Deep Space Habitat," Williams Middle School, Huntsville, AL, March, 2013.

UAH MAE NSGF X-Hab Design team, "Design of a Microgravity Stowage and Rack System for a NASA Deep Space Habitat," Whitesburg Middle School, Huntsville, AL, Feb. 2013.

UAH MAE NSGF X-Hab Design team, "Design of a Microgravity Stowage and Rack System for a NASA Deep Space Habitat," Challenger Middle School, Huntsville, AL, Feb. 2013.

2012 UAH MAE Moonbuggy Team I, "History of the NASA Lunar Rover and the Great Moonbuggy Race," Madison Elementary School, Madison, AL, Feb. 22, 2012.

MAE 491/492: 1/3 Scale Gemini Capsule Design Team, "The History of NASA and Manned Spaceflight," Madison Elementary School, Madison, AL, Feb. 2011.

MAE 491/492: 1/3 Scale Gemini Capsule Design Team, "The History of NASA and Manned Spaceflight," Athens Elementary School, Athens, AL, Dec. 2010.

2009-2010 UAH Moonbuggy Team, "How Mathematics Impacts Engineering," Discovery Middle School, Madison, AL, May, 2010

AWARDS, GRANTS AND CONTRACTS

Awarded/Current

North Alabama Section ASME award for UAH ASME Student Section member attendance at the 2016 ASME SPDC and Old Guard Competition, Atlanta, GA. (3/11/2016-3/12/2016).

North Alabama Section ASME award for MAE 490/491. Full Arm Support for Cerebral Palsy Patients. Design, fabrication and delivery to United Cerebral Palsy Center, Huntsville, AL. (9/1/2015-5/1/2016).

WID award for MAE 490/491 STEM Tool (Model Car Wind Tunnel) design, fabrication, and delivery to Mill Creek Elementary School, Huntsville, AL. (9/1/2015-5/1/2016).

North Alabama Section ASME award for UAH ASME Student Section Operations. (9/1/2015-5/1/2016).

Completed

WID award for MAE 490/491 STEM Tool (STEM Station-Phase II) design, fabrication, and delivery to Mt Carmel Elementary School, Huntsville, AL. (6/1/2015-12/1/2015).

WID award for MAE 490/491 STEM Tool (Dyslexic Brain and Dyslexic Brain Post Academic Intervention Models) design, fabrication, and delivery to Greengate School, Huntsville, AL. (1/1/2015-12/1/2015).

UAH/SIT, #2014-876. “Design and Development of Armored Vehicle Window Improvements for the US Special Operations Forces.” (10/27/2014-12/31/2015).

UAH/SIT, #2014-875. “Design and Development of a Sailboat Disablement System for the US Special Operations Forces.” (10/27/2014-10/25/2015).

WID award for MAE 491 STEM Tool (Potential and Kinetic Energy Roller Coaster-Phase II) design, fabrication, and delivery to Mt. Carmel Elementary School, Huntsville, AL. (1/1/2015-5/1/2015).

WID award for MAE 490/491 STEM Tool (Mobile Experimentation/Demonstration Cart) design, fabrication and delivery to Sci-Quest Hands-On Science Center, Huntsville, AL. (8/1/2014-5/1/2015).

North Alabama Section ASME award for MAE 490/491. Mobile Arm Support for Cerebral Palsy Patients. Design, fabrication and delivery to United Cerebral Palsy Center, Huntsville, AL. (8/1/2014-5/1/2015).

Northrup Grumman award for MAE 490/491 STEM tool (Table Top Wind Tunnel) design, fabrication, and delivery to St. John the Baptist Catholic Middle School, Madison, AL. (6/1/2014-12/1/2014).

WID award for MAE 490/491 STEM Tool (Potential and Kinetic Energy Roller Coaster) design, fabrication, and delivery to Mt. Carmel Elementary School, Huntsville, AL. (1/1/2014-12/1/2014).

WID award for MAE 490/491 STEM Tool (Mobile Water Distillation System) design, fabrication, and delivery to Discovery Middle School, Madison, AL. (1/1/2014-12/1/2014).

UAH/SIT, #2014-035. “SIT Sailboat Disablement Project.” (11/1/2013-6/30/2014).

F/NASA/GSFC/ASGC, #2011-127. “New Course Development: Collaboration Between NASA and MAE 490/491/492 to Design, Fabricate and Test a Lunar Wormbot.” (1/1/2011-12/31/2011, no-cost extension to 6/30/2014).

WID award for MAE 490/491 “Solar Racers” solar and mechanical energy museum display. Design, fabrication, and delivery to Sci-Quest Children’s Learning Center, Madison, AL. (6/1/2013-12/1/2013).

WID award for MAE 490/491 STEM tool (Children’s Learning Stations) design, fabrication and delivery to Mt. Carmel Elementary School, Huntsville, AL. (6/1/2013-12/1/2013).

Northrup Grumman award for MAE 490/491 STEM tool (Table Top Wind Tunnel) design, fabrication, and delivery to Huntsville High School, Huntsville, AL. (6/1/2013-12/1/2013).

Northrup Grumman award for MAE 490/491 STEM Tool (Pulley System) design, fabrication and delivery to Williams Middle School, Huntsville, AL. (1/1/2013-12/1/2013).

WID award for MAE 490/491 STEM tool (Table-Top Wind Tunnel) design, fabrication and delivery to Discovery Middle School, Madison, AL. (1/1/2013-12/1/2013).

NASA, #2012-552. "X-Hab 2013: Design and Development of a Microgravity Random Access Stowage and Rack System." (8/1/2012-9/30/2013, no-cost extension to 11/30/2013).

UAH/SIT, #2013-012. Stevens Institute of Technology/SERC, "Design and Development of a Humanitarian Aid and Disaster Recovery Kit for the US Navy." (1/1/2013-6/30/2013).

Fontaine Industries (Cullman, AL) award for MAE 490/491/492 Fifth Wheel design, fabrication and delivery. (9/1/2012-5/1/2013).

WID award for MAE 490/491/492 Museum Display (Experiment Demonstration Cart) design, fabrication and delivery to Sci-Quest Museum, Huntsville, AL. (Jan. 2013-Dec. 2013).

NSF Travel Grant. GRFP Scholarship Review Panel. Washington, DC. (1/8/2013-1/11/2013).

F/NASA/GSFC/ASGC, #2011-867. "Development of the 2011-2012 UAHuntsville Moonbuggy." (1/1/2012-12/31/2012, no-cost extension to 5/31/2013).

NSF Travel Award. GRFP Scholarship Review Panel. Washington, DC. (1/10/2012-1/14/2012).

WID award for MAE 490/491/492 STEM Tool (Table-top catapult) design, fabrication and delivery to Williams Middle School, Huntsville, AL. (Jan. 2012-Dec 2012).

WID award for MAE 490/491/492 Museum display (Hybrid Energy) design, fabrication and delivery to Sci-Quest Museum, Huntsville, AL. (Jan. 2012-Dec. 2012).

Northrup Grumman award for MAE 490/491/492 Moonbuggy Team. (Nov. 2011).

WID award for MAE 490/491/492 STEM Tool (Wimshurst machine) design, fabrication and delivery to Discovery Middle School, Madison, AL. (Aug. 2011-May 2012).

WID award for MAE 490/491/492 Museum display (Solar Racer) hardware design, fabrication and delivery to Sci-Quest Museum, Huntsville, AL. (Aug. 2011-Aug. 2012).

WID award for MAE 490/491/492 Museum display (Solar Roller) hardware design, fabrication and delivery to Sci-Quest Museum, Huntsville, AL. (Jan. 2011-Dec. 2011).

F/NASA/GSFC/ASGC, #2011-161. “Development of the 2010-2011 UAHuntsville Moonbuggy.” (1/1/2011-12/31/2011).

F/NASA/KSC, #NNK10OD09P. “NASA Exploration Toolset for Optimization of Launch and Space Systems.” NASA Exploration Systems Mission Directorate (ESMD) Faculty Fellowship. (6/1/2010-5/31/2011).

WID award for MAE 490/491/492 STEM Tool (Pulley System and Earthquake Simulation Table) design, fabrication and delivery to Providence School, Huntsville, AL. (Aug. 2010-Aug. 2011).

F/NASA/GSFC/ASGC, #2010-153. “New Course Development: Collaboration Between Americans in Orbit and MAE 490 – Introduction to Engineering Design.” (12/16/2009-2/29/2011).

F/NASA/GSFC/ASGC, #2010-139. “Design, Analysis, Testing and Fabrication of the 2009-2010 UAHuntsville Moonbuggy.” (12/16/2009-2/28/2011).

ASME Travel Grant. 2011 ASME Leadership Training Conference. Dallas, TX. (3/3/2011-3/6/2011)

ASEE Travel Grant. DoD SMART Scholarship Review Panel. Washington, DC. (1/20/2011-1/22/2011).

WID award for MAE 490 STEM hardware design, fabrication and delivery to Williams Middle School, Huntsville, AL. (Jan.-Dec. 2010).

UAHuntsville Research and Creative Experience for Undergraduates (RCEU) Program: Robert Coates, “Development and Application of Inerter Technologies.” (May-August 2010).

National Space Grant Foundation Travel Grant. NASA ESMD Senior Design Workshop. Kennedy Space Center, FL. (5/26/2009-5/28/2009).

UAHuntsville Research and Creative Experience for Undergraduates (REU) Program: Tamara Cottam, “Application of Magnetic Fluids in Microgravity Technologies.” (May-August 2009).

PROFESSIONAL SERVICE AND DEVELOPMENT

Book Review

- Ruina and Pratap. “Introduction to Statics and Dynamics,” Oxford University Press, Nov. 2009.

Competition Judging

- Student Poster Competition, Great Midwestern Regional Space Grant Consortia Meeting, University of Minnesota, Minneapolis, MN, Sept. 16-17, 2010.

- Honeywell Leadership Academy Engineering Design Challenge Judge – Thermal Protection System, US Space and Rocket Center, Huntsville, AL, Mar. 1, 2010.

Conference Paper Reviewer

- ASEE Annual Conference and Exposition, New Orleans, LA, June 2016.
- ASEE Annual Conference and Exposition, Indianapolis, IN, June 2014.

Conference Sessions Chaired

- American Astronautical Society, von Braun Symposium, Student Poster Session, University of Alabama in Huntsville, Huntsville, AL, Oct. 2010.
- Huntsville Simulation Conference session “Methodology, Theory and Philosophy,” Oct. 2009.

Journal Paper Reviewer

- Learning and Individual Differences, Journal of Psychology and Education, June 2015.

Scholarship Review/Selection

- ASME North Alabama Section, 2015 Outstanding Undergraduate Mechanical Engineering Student, Matthew Calahan, Feb. 2016.
- ASME North Alabama Section, 2015 Outstanding Undergraduate Mechanical Engineering Student, Christine Milton, Feb. 2015.
- National Science Foundation, Panelist, Jan. 2015.
- ASME North Alabama Section, 2014 Outstanding Undergraduate Mechanical Engineering Student, Tanya Snider, Feb. 2014.
- National Science Foundation, Panelist, Feb. 2014.
- ASME North Alabama Section, 2013 Outstanding Undergraduate Mechanical Engineering Student, Jessica Hyscher, Feb., 2013.
- National Science Foundation, Panelist, Jan. 2013.
- ASME North Alabama Section, 2012 Outstanding Undergraduate Mechanical Engineering Student, Michael Patterson, Feb. 2012.
- National Science Foundation, Panelist, Jan. 2012.
- ASEE, U.S. Department of Defense SMART Scholarship Review Panelist, Mechanical Engineering, Washington, D.C., Jan. 20-22, 2011.
- ASME North Alabama Section, 2011 Outstanding Undergraduate Mechanical Engineering Student, Lisa Tunstill, Feb. 2011.
- ASME North Alabama Section, 2010 Outstanding Undergraduate Mechanical Engineering Student, Charles Boyles, Feb. 2010.
- ASME North Alabama Section, 2009 Outstanding Undergraduate Mechanical Engineering Student, Eric Becnel, Feb., 2009.

Workshop/Training/Seminar Participation

- SWE Webinar, “Become a Better Technical Writer,” Sept. 11, 2015.
- SWE Webinar, “What the History of Successful Women in STEM Fields Can Teach us About Finding Success (and Holding our Ground) Today,” Aug. 18, 2015.
- UAH Sponsored Webinar, “Banishing Bullying,” July 21, 2015.

- UAH Export Training (online), Oct. 1, 2014
- SWE Webinar, “Voices from the Field: 45 Minutes, 45 Girls...What do I do?” STEM Outreach Training, Feb. 25, 2015.
- ASME 2011 Leadership Training Conference Delegate, Dallas, TX., March 3-6, 2011.
- NASA Tech Briefs Professional Development Online Seminar, "Modern 3D Scanning Solutions: Applications for the Medical Design Engineer," Feb. 15, 2011.
- NASA, Exploration Systems Mission Directorate (ESMD) Senior Design Workshop, Kennedy Space Center, FL., July 28, 2010.
- NASA, Exploration Systems Mission Directorate (ESMD) Senior Design Workshop, Kennedy Space Center, FL., May 27, 2009.
- ASME Professional Development Online Seminar, Santa Clara University, Brannan Engineering Labs, “Design Optimization,” June 6, 2009.

Aerospace Engineering Advisor – University of Alabama in Huntsville

- Undergraduates students (2007-2011)
- Mentor and provide guidance for academic career, audit degree applications

Honors Student Advisor – University of Alabama in Huntsville

- Sydney Steele, "Design and Development of a Mobile Experimentation Cart for Sci-Quest Hands-On Science Center," (Fall 2014, Spring 2015)
- Austin Avery, "Design and Development of a Mobile Experimentation Cart for Sci-Quest Hands-On Science Center" (Fall 2014, Spring 2015)
- Charles Setterlund, “Design and Fabrication of a Sci-Quest Museum Display Conveying Potential and Kinetic Energy Concepts” (Summer 2012, Spring 2013)
- Andrew Machermer, "Continued and Refined Fluid and Aerodynamic Analyses of a Small-Scale, Low Speed Wind Tunnel” (Spring 2013, Fall 2013)
- Mallory Brown, “Development of a Novel Peristaltic Motion Robot Designed to Burrow Within Lunar and Martian Regolith,” Attended the 63rd *International Astronautical Congress Poster Proceedings*, Naples, IT, Oct. 2012. (Fall 2011, Spring 2012)

Undergraduate Student Research Advisor – University of Alabama in Huntsville

- Jeremy Traum, “Google/X-Prize Lunar Rover Design and Development,” Attended and presented a paper at the 63rd *International Astronautical Congress Poster Proceedings*, Naples, IT, Oct. 2012. (Spring 2012)

REU Student Advisor – University of Alabama in Huntsville

- Robert Coates, “Moonbuggy Design Methodologies,” (Summer 2010)
- Tamara Cottam, “Magnetorheological Damper Analysis,” (Summer 2009)

ASME Student Section Advisor – University of Alabama in Huntsville (2008-present)

- 2016 Old Guard Presentation and Poster Competition (Mar. 2016)
 - Procured funding for 2 MAE students to attend the Student Professional Development Conference and participate in the competition at Georgia Institute of Technology
- 2014 Old Guard Presentation Competition (Mar. 2014)

- Procured funding for 8 MAE students to attend the Student Professional Development Conference and participate in the competition at Clemson University
- Microgravity Team (2009-2012)
- Moon Buggy Team (2009-2012)
- 2009 Design Competition – Mars Rocks!
- 2008 Design Competition – Winrobo
- Maintain UAH ASME Website - www.asme.uah.edu
- Additional responsibilities include fostering and promoting affiliation with the North Alabama ASME Senior Chapter, represent UAH at the monthly ASME North Alabama Senior Chapter meetings, organize industry forums, promote professional networking.

ASME North Alabama Section

- UAH ASME Student Section Advisor Representative (2008-present)
- Director (2012-present)
- Chair (2011-2012)
- Vice-Chair (2010-2011)
- Program Chair (2010-2011)
- Annually nominate a ASME North Alabama Section Outstanding Undergraduate Mechanical Engineering Student

MAE Dept. 490/491/492 Capstone Design Class Coordinator – University of Alabama in Huntsville

- 2012 – present
- Coordinate efforts among the various design instructors to ensure consistency and adherence to ABET requirements
- Procure customers and funding for the Product Realization Capstone Design Class

MAE Dept. Statics Course Coordinator – University of Alabama in Huntsville

- Spring 2010 – 2012
- Coordinate efforts among the various Statics instructors to ensure consistency and oversee the development of a common final examination among all sections
- Approved a new textbook for implementation in fall 2010

NASA MUST Mentor

- Motivating Undergraduates in Science and Technology
- Mentor underserved and underrepresented students pursuing an engineering degree

Charger Preview – MAE Representative (July 24, 2015)

Sci-Quest Hands-On Science Center New Exhibit Committee (2015-2016)

MAE Dept. tour -Parker-Hanifin (Apr. 21, 2015)

UAH Admitted Student Phone-a-thon (Jan. 2015)

MAE/Northrup Grumman Open House (April 2015)

MAE Awards Committee (Oct. 2013-present)

MAE Lecturer Search Committee (July 2013)

MAE Newsletter Development (August 2012)

MAE Lecturer Search Committee (July 2012)
 UAH Science Fair – Safety Check (Mar. 7, 2012)
 GSA Space Day 2008, U.S. Space and Rocket Center – Lunar Lander Team Lead (Nov. 8, 2008)
 Aerospace Engineering Undergraduate Program Committee (2009– 2012)
 MAE Mechanical Engineering Undergraduate Program Committee (Sept. 2006 – present)
 MAE Audit Committee – Design Audit Committee Chair (2008)
 MAE Faculty Meeting Minutes (Aug. 2008 – May 2010)
 MAE Dept. New Student Tour (Feb. 4, 2010)
 Moon Buggy Team Open House (Jan. 10, 2009)
 UAH Open House – MAE Faculty Representative (Mar. 8, 2008)
 UAH Open House – MAE Faculty Representative (Oct. 6, 2007)
 UAH Engineering Open House – MAE Faculty Representative (Sept. 28, 2007)
 UAH Open House – MAE Faculty Representative (Apr. 21, 2007)
 UAH Open House – MAE Faculty Representative (Mar. 10, 2007)

HONORS AND AWARDS

International Aluminum Extrusion Design Competition 1st Place Student Entry – Team Faculty Advisor (May 2015)
 UAH COE Outstanding Teacher (April 2015)
 ASME North Alabama Chapter “2013 Outstanding Mechanical Engineer of the Year” (Feb. 2013)
 NASA 2012 Great Moonbuggy Race, 1st Place – Team Faculty Advisor (April 2012)
 NASA 2012 Great Moonbuggy Race, 1st Place Design Report – Team Faculty Advisor (April 2012)
 NASA 2012 Great Moonbuggy Race, 1st Place System Safety Challenge – Team Faculty Advisor (April 2012)
 SAE Ralph R. Teetor Educator Award (Oct. 2011)
 HATS ASME Professional of the Year (June 2011)
 NASA ESMD 2011 Systems Engineering Paper Competition, 1st Place – Lunar Wormbot Team Faculty Advisor (April 2011)
 NASA 2011 Great Moonbuggy Race, 2nd Place – Team Faculty Advisor (April 2011)
 NASA 2011 Great Moonbuggy Race, 1st Place System Safety Competition – Team Faculty Advisor (April 2011)
 ASME 2011 Leadership Training Conference Delegate, Dallas, TX., (March 2011)
 NASA Exploration Systems Mission Directorate Summer Faculty Fellow, Marshall Space Flight Center (Summer 2010)
 NASA 2010 Great Moonbuggy Race, 1st Place Vehicle Design Competition – Team Faculty Advisor (April 2010)
 NASA 2010 Great Moonbuggy Race, 1st Place System Safety Competition – Team Faculty Advisor (April 2010)
 ASME North Alabama Chapter “2010 Outstanding Mechanical Engineer of the Year” (Feb. 2010)
 International Aluminum Extrusion Design Competition Winning Student Entry – Team Faculty Advisor (Feb. 2010)
 ASME Safety Engineering and Risk Analysis Division (SERAD) 2nd Place National Design Competition – Team Faculty Advisor (Aug. 2009)
 Who’s Who Among America’s Educators (2007-2009)

Georgia Institute of Technology AIAA Student Conference Section Chair
Georgia Institute of Technology Student Government Representative

SOCIETY MEMBERSHIPS

Air Force Association - Life Patron (1988-Present)
American Association of University Women (2012-Present)
American Institute of Aeronautics and Astronautics-Senior and Lifetime Member (1987-Present)
American Society for Engineering Education (2013-Present)
 Aerospace Division (2013-Present)
 College Industry Partnerships Division (2013-Present)
 Design in Engineering Education Division (2013-Present)
 Engineering and Public Policy Division (2013-Present)
 Mechanical Division (2013-Present)
 Women In Engineering Division (2013-Present)
American Society of Mechanical Engineers (2008-Present)
 North Alabama ASME Section Director (2012-Present)
 North Alabama ASME Section Chair (2011-2012)
 North Alabama ASME Section Vice-Chair (2010-2011)
 North Alabama ASME Section Vice-Chair (2009-2010)
 UAH ASME Student Section Faculty Advisor (2008-Present)
Society of Automotive Engineers (2011-Present)
Society of Women Engineers (2012-Present)
 Women in Academia Committee (2012-Present)
Women in Aerospace