

## Mark Horner Holdhusen

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### EDUCATION

Ph.D. in Mechanical Engineering, Georgia Institute of Technology, May 2005.

M.S. in Mechanical Engineering, Georgia Institute of Technology, August 2002.

B.M.E. with high distinction, University of Minnesota, August 1999.

### ACADEMIC WORK EXPERIENCE

*Professor of Engineering (Spring 2005 – present)*

*University of Wisconsin – Marathon County*

Taught freshman and sophomore level courses including Engineering Fundamentals, Engineering Graphics, Statics, Dynamics, Strength of Materials, and Thermodynamics.

*Course Coordinator (Fall 2002 – Spring 2004)*

*Georgia Institute of Technology*

Experimental Engineering – Oversaw global activities of capstone experimental laboratory course including giving introductory lecture, organizing students into groups, grading project proposals, supervising oral presentations, and collections and issuance of grades.

*Laboratory Teaching Assistant (Summer 2003 and Spring 2004)*

*Georgia Institute of Technology*

Experimental Engineering – Assisted groups of 4 or 5 students in capstone experimental laboratory related to acoustics including instructing students in basic acoustics, familiarizing students with laboratory equipment, guiding students through an open-ended laboratory investigation, and aiding students in analyzing and reporting data.

*Course Grader*

*Georgia Institute of Technology (Summer 2001, Fall 2001, and Fall 2002)*

Structural Vibrations and Acoustics & Noise Control – Graded homework assignments.

### INDUSTRIAL WORK EXPERIENCE

*Engineering Assistant (September 1998 – August 1999)*

*Johnson Controls, Minneapolis, MN*

Drafted and revised HVAC controls systems CAD drawings, created OEM manuals for facilities managers, updated equipment databases for specific systems, and aided engineers in other various tasks as needed.

### ACADEMIC EXPERIENCE

*New Course Development*

Helped to create new or updated courses in the engineering curriculum. These courses include Engineering Fundamentals, Engineering Graphics with Computer Aided Drafting, and Engineering Thermodynamics.

Also, created a laboratory for Strength of Materials from nothing. Also helped to develop Engineering Graphics, Dynamics, Engineering Fundamentals, Mechanics of Materials, and Thermodynamics for online delivery. Also, developed Engineering Graphics for a flexible degree option.

### *Department and Campus Committees*

Served on several committees for both the Department of Computer Science, Engineering, Physics, and Astronomy and the UW-Marathon County campus. These committees include faculty curriculum, appointments, Student Life & Interest Committee, childcare, Advising Assessment, Evaluations, Sexual Harassment Mediation, Steering, Research and Professional Development, Information and Instructional Technology, Admission and Institutional Research, Promotion and Tenure, Integrated Campus Budget Management, Executive, Assessment, Diversity, and Academic Actions.

### *Department Assessment Coordinator*

Includes advising instructors of assessment procedures, compiling, analyzing, and presenting assessment data to the department, writing final report of department's assessment activities and results.

### *Student Club Advisor*

Served as advisor to both the gaming club and engineering club.

### *Departmental Service*

Active member of department by serving as secretary for three academic years, webmaster, department representative for position searches, mentor to instructional academic staff, and doing class visitations.

## JOURNAL ARTICLES

Holdhusen, Mark Horner; Cunefare, Kenneth A., "Damping effects on the state-switched absorber used for vibration suppression," *Journal of Intelligent Material Systems and Structures*, v 14, p 551-561, 2003.

Kenneth A. Cunefare, Van B. Biesel, John Tran, Ryan Rye, Aaron Graf, Mark Holdhusen, and Anne-Marie Albanese, "Anechoic chamber qualification: Traverse method, inverse square law analysis method, and nature of test signal," *Journal of the Acoustical Society of America*, Volume 113, pp. 881-892, 2003.

Holdhusen, Mark and Cunefare, Kenneth, "A State-Switched Absorber Used for Vibration Control of Continuous Systems," *Journal of Vibration and Acoustics*, Volume 129, Issue 5, page 577, October 2007.

Holdhusen, Mark and Cunefare, Kenneth, "Investigation of the Two-state, Maximum Work Extraction Switching Rule of a State-switched Absorber for Vibration Control," *Journal of Intelligent Material Systems and Structures*, Volume 19, page 1245, November 2008.

Holdhusen, Mark and Cunefare, Kenneth, "Experimental Vibration Control of a Single-Degree of Freedom System Using a State-Switched Absorber," *Journal of Intelligent Material Systems and Structures*, Volume 19, page 1435, December 2008.

## CONFERENCE PRESENTATIONS AND PROCEEDINGS

### *Presentations with Refereed Proceedings*

Holdhusen, Mark H.; Cunefare, Kenneth A., "Experimental vibration control of a two-degree of freedom, state-switched absorber system," *American Society of Mechanical Engineers, Dynamic Systems and Control Division*, v 71, p 421-427, 2002.

Holdhusen, Mark and Cunefare, Kenneth, "Experimental Validation of a State-Switched Absorber Used to Control Vibrating Continuous Systems", *Proceedings of the American Society of Mechanical Engineers International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*, Long Beach, California, DETC2005-85021, 2005.

Holdhusen, Mark, "Design of an engineering graphics course for a pre-engineering program", Proceedings of the American Society for Engineering Education Annual Conference & Exposition, Chicago, Illinois, 2006-1051, 2006.

Holdhusen, Mark, "The efficacy of an engineering graphics course for both students with and without prior engineering graphics experience," Proceedings of the American Society for Engineering Education Annual Conference, Honolulu, Hawaii, 2007.

Holdhusen, Mark; James-Byrnes, Christa; and Rodriguez, Luis, "Lesson study for a distance education statics course," Proceedings of the American Society for Engineering Education Annual Conference & Exposition, Pittsburgh, PA, June 22 - 25, 2008.

Holdhusen, Mark, "Assessment of delivery modes of an engineering graphics course," Proceedings of the American Society for Engineering Education Annual Conference & Exposition, Austin, TX, June 14 – 17, 2009.

Byrnes, Christa and Holdhusen, Mark, "Development and Delivery of a Project-Based Introductory Engineering Course for Online Delivery," Proceedings of the American Society for Engineering Education Annual Conference & Exposition, San Antonio, TX, June, 2012. (Won First-year Programs Division Best Paper Award – 3rd Place.)

Douglas, Jamie and Holdhusen, Mark, "Development of Low-Cost, Hands-On Lab Experiments for an Online Mechanics of Materials Course," Proceedings of the American Society for Engineering Education Annual Conference & Exposition, Atlanta, GA, June, 2013.

Holdhusen, Mark, "A 'flipped' statics classroom," Proceedings of the American Society for Engineering Education Annual Conference & Exposition, Seattle, WA, June, 2015.

#### *Presentations with Proceedings*

Holdhusen, M.; Cunefare, K.A.; Larson, G., "The role of damping in the state-switched absorber for vibration control," Proceedings of SPIE - The International Society for Optical Engineering, v 4326, p 232-242, 2001.

Holdhusen, M.; Cunefare, K.A., "Optimization of location and tuning of the state-switched absorber for controlling the vibration of a beam," Proceedings of the SPIE - The International Society for Optical Engineering, v 5049, p 404-13, 2003.

Holdhusen, M. H.; Cunefare, K.A., "Optimization of a state-switched absorber applied to a continuous vibrating system," Proceedings of the SPIE - The International Society for Optical Engineering, 5386-38, 2004.

Holdhusen, M. H.; Cunefare, K.A., "Investigation of the two-state, maximum work extraction switching rule of the state-switched absorber for vibration control," The 2004 International Symposium on Active Control of Sound and Vibration, 2004.

Byrnes, Christa and Holdhusen, Mark, "Development and Delivery of a Project-Based Introductory Engineering Course for Online Delivery," ASEE North Midwest Section Meeting, Duluth, MN, 2011

Douglas, Jamie and Holdhusen, Mark, "Development of Low-Cost, Hands-On Lab Experiments for an Online Mechanics of Materials Course," ASEE North Midwest Section Meeting, St. Cloud, MN, 2012.

### *Presentations with Abstracts*

Mark Holdhusen, Kenneth A. Cunefare, and Gregg Larson, "Experimental validation of the state-switched absorber for two-component harmonic forcing," *Journal of the Acoustical Society of America*, v 109, p 2351, 2001.

Kenneth A. Cunefare, Van Biesel, Anne-Marie Albanese, Lisa Chang, and Mark Holdhusen, "Source dependency on anechoic chamber validation," *Journal of the Acoustical Society of America*, v 109, p 2453, 2001.

Mark Holdhusen and Kenneth Cunefare, "Optimization of a state-switched absorber applied to a vibrating continuous system," *Journal of the Acoustical Society of America*, v 113, p 2227, 2003.

Kenneth A. Cunefare, Van Biesel, Mark Holdhusen, Austin Shoemaker, "Design features for free-field qualification of a new semi-anechoic room, and qualification performance," *Journal of the Acoustical Society of America*, v 114, p 2440, 2003.

Holdhusen, Mark, "Space-dependent damping for reducing vibration of continuous systems", *Journal of the Acoustical Society of America*, v 119, p 3298, 2006.

Holdhusen, Mark, "Space-dependent damping for reducing vibration of continuous systems", 151st Meeting of the Acoustical Society of America, Providence, Rhode Island, 2006.

Holdhusen, Mark, "An inexpensive approach to measure one-third octave reverberation times," 158th Meeting of the Acoustical Society of America, San Antonio, Texas, October 2009.

Holdhusen, Mark, "Yeast flocculation using acoustic agglomeration," abstract submitted to the 171st meeting of the Acoustical Society of America, Salt Lake City, UT, May, 2016.

### GRANTS AWARDED

Cunefare, Ken and Holdhusen, Mark, "Reflection of Airborne Noise at Duct Terminations," ASHRAE 1314-TRP, 2004.

Received a Lesson Study Training Grant to focus on engineering classes given via WisLineWeb with UWC engineering faculty.

### CONSULTATIONS

Assessed the acoustic reverberation in the Great Hall in the Grand Theater for the Performing Arts Foundation. Included a student to help with the data acquisition. A report on the findings with recommendations was sent the Performing Arts Foundation. 2008

Gave informal acoustic consultation on noise level in the newly built Red Eye Brewing Company restaurant. 2008

### HONORS

Winner of the 2008 Barrington/Musolf Faculty Research Award

Winner of department-based "star faculty" award in 2009

Winner campus Kaplan Award in 2011

Winner 3<sup>rd</sup> place First-year Programs Division Best Paper Award at ASEE annual conference in 2012.

## PROFESSIONAL ORGANIZATIONS

American Society of Mechanical Engineers

Acoustical Society of America

American Society for Engineering Education

## COMMUNITY SERVICE

### *Program to Recruit Minorities and Women into Science*

Worked with some minority students from DC Everest High School in a program to recruit minorities and women to study science, technology, engineering, and math at UWMC. The students came every Friday afternoon from February until May and viewed demos, participated in experiments, saw our facilities, listened to speakers, and worked with a UWMC student mentor and faculty members.

### *Member of the Project Lead the Way Program Advisory Committee*

Project Lead the Way is a national pre-engineering curriculum designed for high schools to increase the number and quality of engineers. The Wausau School District is implementing this program and I sit on the advisory committee.

### *Elementary/Middle School Programs*

Offered a many after school, evening, and weekend programs for elementary students introducing them to engineering. Developed and implemented projects intended to challenge students to think as engineers to solve problems. Example projects were a balloon powered car, a vinegar/baking soda rocket, and an egg dropper.

### *Girl Scout Engineering Programs*

On several occasions worked with girl scouts introducing them to engineering design. Projects similar to those listed above were developed and facilitated.

### *Discuss UWMC engineering with Wausau High School students*

Facilitated a talk to Wausau West and Wausau East High School students discussing engineering education opportunities. The talk was specifically geared toward informing them of the engineering program at UWMC as well as what to expect as an engineering major in college.

### *Campus contact for Gear Up program*

Organized an all-day visit to campus for local Gear Up high school students. The visit consisted of talking with advisors, learning about campus resources, a tour of campus, visiting a class of their choice, and lunch with current students. Gave after school programs for middle school students where they designed, tested, and fabricated hoop gliders made from straws, paper, and tape.

### *Governance Board of Wausau Engineering Global Leadership Academy*

Member of governance board for the Wausau Engineering Global Leadership Academy (WEGLA) charter school in for the Wausau School District. Also, a member of the curriculum committee for WEGLA.

### *Science Olympiad Judge*

Judge for elevated bridge and compound machines for Science Olympiad held on campus.

### *Middle/High School Underwater Robotics club*

Co-organizer of underwater robotics club for high school and middle school students. The students design an underwater ROV for a regional competition.