## Matthew D. Williams

Contact

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Profile

Doctorate in mechanical engineering with five years of experience in the modeling, design, packaging, and characterization of MEMS.

**EDUCATION** 

## Doctor of Philosophy in Mechanical Engineering

May 2011

University of Florida, Gainesville, FL

• Overall GPA: 4.0/4.0

• Thesis: "Development of a MEMS Piezoelectric Microphone for Aeroacoustics Applications"

• Advisor: Dr. Mark Sheplak

# Master of Science in Mechanical Engineering

May 2008

University of Florida, Gainesville, FL

• Overall GPA: 4.0/4.0

## Bachelor of Science in Mechanical Engineering

May 2005

Clemson University, Clemson, SC

• Overall GPA: 4.0/4.0

• Summa Cum Laude with Departmental Honors

EXPERIENCE

# Graduate Research Assistant, Interdisciplinary Microsystems Group

Apr 2006 – Present

University of Florida, Gainesville, FL

- Designed MEMS microphones using custom multiphysics models and employed formal design optimization to maximize performance
- Interfaced with fabrication engineers throughout design and build process to ensure manufacturability and successful delivery
- Created robust device package for both in-house and sponsor laboratory testing
- Led teams of up to three research assistants in the characterization of MEMS microphones
- Served as mentor for NSF Graduate Research Fellowship applicants, overseeing three winners and three honorable mention recipients

**Visiting Researcher**, Struct. Optimization & Comput. Mechanics Group

Sep 2008 – Sep 2009

Delft University of Technology, Delft, The Netherlands

- Researched multistable microsystems, including those exhibiting mechanical snap-through and electrostatic pull-in
- Developed modeling and optimization capabilities for multistable microsystems

# Webmaster, Interdisciplinary Microsystems Group

July 2007 - Present

University of Florida, Gainesville, FL

- Supervised website overhaul, satisfying publicity needs of six faculty members on time and on budget
- Revolutionized the sharing and preservation of institutional knowledge via integrated website wiki

## Intern, Combustion Engineering

Summer 2004

GE Energy, Greenville, SC

- Constructed automated tool for tracking of combustion fleet issues and corrective actions
- Supported creation of combustion product scorecards for assessment of product performance
- Coordinated hardware modifications and test plan for 7FA gas turbine igniter lab test

**Supplemental Instruction Leader & Tutor**, Academic Success Center Aug 2003 – May 2005 Clemson University, Clemson, SC

- Led study sessions for chemistry, statics, dynamics, and mechanics of materials courses
- Facilitated student interaction and learning as both teacher and peer

Intern, Ground Machinery

Summer 2002

Union Switch and Signal, Batesburg-Leesville, SC

- Assembled three types of railroad track switch machines and signal transformers
- Provided valuable feedback on employee training programs and engineering documentation

## Intern, Optical Modules Manufacturing

Oct 2000 - Apr 2001

Cisco Systems, West Columbia, SC

- Established proficiency at optical fiber splicing and handling
- Constructed three varieties of multiplexing and demultiplexing units

#### Training

### University of Florida, Gainesville, FL

Sep 2005 – Present

Selected Coursework: Advanced Structural Composites, Data Measurement & Analysis, Finite Element Analysis, Principles & Design of MEMS Transducers, Solid State Electronics, Structural Optimization

**Danish Center for Applied Mathematics and Mechanics**, Lyngby, Denmark Jun 2009 Topology Optimization Short Course

European Comsol Conference, Hannover, Germany

Nov 2008

Comsol Short Courses on MEMS, Structure-Acoustic Interactions, Custom PDEs

Abaqus East, Providence, RI

Mar 2006

Contact in Abaqus/Standard

Abagus Central, West Lafavette, IN

Dec 2005

Introduction to Abaqus

## SKILLS

Abaqus, AutoCAD, COMSOL, Drupal, HTML, Maple, MATLAB (including OOP and Optimization Toolbox), Labview, Photoshop, PHP, B&K PULSE, Ultiboard

## SELECTED PUBLICATIONS

M. D. Williams, M. Sheplak, and F. van Keulen. Modeling of Initially Curved Beam Structures for Design of Multistable MEMS. *Journal of Applied Mechanics*, Accepted with revisions, 2011.

B. A. Griffin, M. D. Williams, C. S. Coffman, and M. Sheplak. A MEMS piezoelectric ultrasonic radiator. *Journal of Microelectromechanical Systems*, In press, 2011.

B. A. Griffin, V. Chandrasekaran, M. D. Williams, B. V. Sankar, and M. Sheplak. Model for thermoelastic actuation of an axisymmetric isotropic circular plate via an internal harmonic heat source. *International Journal of Solids and Structures*, February 2011.

M. D. Williams, B. A. Griffin, J. Meloy, and M. Sheplak. A MEMS-Based Piezoelectric Microphone for Aeroacoustic Measurements. In 2nd ASA Meeting on Acoustics, Cancun, Mexico, November 2010.

M. D. Williams, B. A. Griffin, A. Ecker, J. Meloy, and M. Sheplak. An Aluminum Nitride Piezoelectric Microphone for Aeroacoustics Applications. In *Hilton Head 2010: A Solid-State Sensors, Actuators, and Microsystems Workshop*, Hilton Head, SC, June 2010.

## Honors

## National

• National Science Foundation Graduate Research Fellow	2005 -	2008
Algernon Sydney Sullivan Award		2005
• Barry M. Goldwater Scholarship	2004 -	2005

### University of Florida

• University of Florida Alumni Fellow

2005 - 2010

## Clemson University

Clemson University	
• Mech. Eng. Dept. Award for Outstanding Scholastic Achievement & Excellence in Eng	. 2006
• Calhoun Honors College B.C. Inabet Honors Medallion	2005
• Faculty Scholarship Award	2005
• James H. Sams Award for Top Senior in Mechanical Engineering	2005
• Carl Donner Nelson, Jr. Award for Top Junior in Mechanical Engineering	2004
• Mechanical Engineering Department Award for Highest Academic Average	2003
Dixon Fellow	2002 - 2005