# Jeffrey L. Kauffman

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## EDUCATION

**Ph.D., The Pennsylvania State University, 2012**
Aerospace Engineering
Dissertation: Vibration Reduction of Integrally Bladed Rotors using Piezoelectric Materials
Advisor: George A. Lesieutre

**M.S., The Pennsylvania State University, 2007**
Aerospace Engineering
Thesis: Low-Order Modeling of a Piezoelectric Energy Harvesting Device
Advisor: George A. Lesieutre

**B.S., California Institute of Technology, 2005**
Engineering & Applied Science, Aeronautics Concentration

## PROFESSIONAL EXPERIENCE

**Assistant Professor, 2012 – present**
Department of Mechanical & Aerospace Engineering, University of Central Florida

## TEACHING EXPERIENCE

("Overall effectiveness of instructor" recorded from Student Perception of Instruction responses)

Modal Analysis (EML 5228C)

| | | |
|---|---|---|
| Spring 2014: | in progress | 14 students |

Mechanical Systems Experimental Techniques (EML 4221C, laboratory)

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|---|---|---|
| Spring 2014: | in progress | 98 students (3 TAs) |
| Fall 2013: | 4.66/5 (44 responses) | 82 students (3 TAs) |
| Spring 2013: | 4.71/5 (58 responses) | 83 students (2.5 TAs) |

Effort included significant curriculum and laboratory exercise revision, both to strengthen connection to theoretical Vibrations course (EML 4220) and to accommodate approximately doubled student enrollment

Advanced Vibrational Systems (EML 6223)

| | | |
|---|---|---|
| Fall 2012: | 4.33/5 (3 responses) | 7 students |

## GRADUATE FELLOWSHIPS

NASA Graduate Student Researchers Program Fellowship, 2008-2011
The Pennsylvania State University Graduate Fellowship (declined), 2008
Pennsylvania Space Grant Fellowship (declined), 2008
James E. Marley Graduate Fellowship, The Pennsylvania State University, 2007-2008

**JOURNAL PUBLICATIONS**

4. Kauffman JL, Lesieutre GA, Babuška V (2014) "Damping Models for Shear Beams with Applications to Spacecraft Wiring Harnesses," *Journal of Spacecraft and Rockets* 51 (1): 16-22. doi: 10.2514/1.A32440

3. Lesieutre GA, Kauffman JL (2013) "'Geometric' Viscous Damping Model for Nearly Constant Beam Modal Damping," *AIAA Journal* 51 (7): 1688-1694. doi: 10.2514/1.J052174

2. Kauffman JL, Lesieutre GA (2012) "Piezoelectric-based Vibration Reduction of Turbomachinery Bladed Disks via Resonance Frequency Detuning," *AIAA Journal* 50 (5): 1137-1144. doi: 10.2514/1.J051344

1. Kauffman JL, Lesieutre GA (2009) "A Low-Order Model for the Design of Piezoelectric Energy Harvesting Devices," *Journal of Intelligent Material Systems and Structures* 20 (5): 495-504. doi: 10.1177/1045389X08101559

**CONFERENCE PUBLICATIONS** (students underlined)

16. Lopp GK, Kauffman JL (2014) "Switch Triggers for Optimal Vibration Reduction via Resonance Frequency Detuning," *Proc. ASME Turbo Expo 2014*, GT2014-27263, June 16-20, Düsseldorf, Germany (to be presented).

15. Kauffman JL, Lesieutre GA (2013) "Damping Models for Timoshenko Beams with Applications to Spacecraft Wiring Harnesses," *Proc. 54th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, April 8-11, Boston, MA. doi: 10.2514/6.2013-1890

14. Kauffman JL, Lesieutre GA, Babuška V (2012) "Damping Models for Shear Beams with Applications to Spacecraft Wiring Harnesses," *Proc. 53rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, AIAA-2012-1641, April 23-26, Honolulu, HI. doi: 10.2514/6.2012-1641

13. Choi BB, Duffy K, Kauffman JL, Kray N (2012) "Optimal Topology and Experimental Evaluation of PE Materials for Actively Shunted GE Polymer Matrix Fiber Composite Blades," *Proc. SPIE Smart Structures / NDE 2012*, SPIE 8345-84, March 11-15, San Diego, CA. doi: 10.1117/12.917224

12. Kauffman JL, Lesieutre GA (2011) "Optimal Switching for Piezoelectric-based Resonance Frequency Detuning for Turbomachinery Blade Vibration Reduction," *Proc. 22nd International Conference on Adaptive Structures and Technologies*, October 10-12, Corfu, Greece.

11. Lesieutre GA, Kauffman JL (2011) "Vibration Reduction For Turbomachinery Bladed Disks Under Changing Excitation Using Piezoelectric Materials," *Proc. International Forum of Aeroelasticity and Structural Dynamics 2011*, IFASD-2011-81, June 26-30, Paris, France.

10. Kauffman JL, Lesieutre GA (2011) "Vibration Reduction of Turbomachinery Bladed Disks with Changing Dynamics using Piezoelectric Materials," *Proc. 52nd AIAA/ASME/ASCE/ASC Structures, Structural Dynamics, and Materials Conference*, AIAA-2011-2003, April 4-7, Denver, CO. doi: 10.2514/6.2011-2003

9. Kauffman JL, Lesieutre GA (2011) "Performance of Piezoelectric-based Damping Techniques for Structures with Changing Excitation Frequencies," *Proc. SPIE Smart Structures / NDE 2011*, SPIE 7977-12, March 6-10, San Diego, CA. doi: 10.1117/12.880515 (**Best Student Paper Finalist**)

8. Kauffman JL, Lesieutre GA (2010) "Piezoelectric-based Vibration Damping and Control of Turbomachinery Bladed Disks," *Proc. 21st International Conference on Adaptive Structures and Technologies*, October 4-6, State College, PA.

7. Kauffman JL, Lesieutre GA (2010) "How Biaxial Membrane Loads Influence the Modal Damping of Flexural Structures," *Proc. 16th US National Congress of Theoretical and Applied Mechanics*, USNCTAM2010-1396, June 27 - July 2, University Park, PA.

6. Lesieutre GA, Thiel MR, Kauffman JL (2010) "Piezoelectric Devices for Helicopter and Turbomachinery Blade Response Reduction," *Proc. 2010 School and Symposium on Smart Structural Systems Technologies*, 179-182, April 6-9, Porto, Portugal.

5. Choi B, Kauffman J, Duffy K, Provenza A, Morrison C (2010) "Active Vibration Reduction of Titanium Alloy Fan Blades (FAN1) Using Piezoelectric Materials," *2010 Propulsion - Safety and Affordable Readiness Conference*, March 16-18, Jacksonville, FL. (**NASA Technical Memorandum 2010-216335**)

4. Kauffman JL, Lesieutre GA (2009) "Reduction of High-Cycle Fatigue in Integrally Bladed Rotors through Piezoelectric Vibration Damping," *Proc. 20th International Conference on Adaptive Structures and Technologies*, Paper ID#9213, October 20-22, Hong Kong.

3. Kauffman JL, Lesieutre GA (2008) "A Low-Order Model of a Piezoelectric Annulus for Energy Harvesting," *2008 U.S. Navy Workshop on Acoustic Transduction Materials and Devices*, May 13-15, University Park, PA.

2. Kauffman JL, Lesieutre GA (2007) "A Nonlinear Model of a Bimorph-Based Piezoelectric Energy Harvesting Device," *Proc. 18th International Conference on Adaptive Structures and Technologies*, Paper ID#153, October 3-5, Ontario, Canada.

1. Kauffman JL, Lesieutre GA, Frank JE (2007) "A Low-Order Model for the Design of Piezoelectric Energy Harvesting Devices," *Proc. 48th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, AIAA-2007-1704, April 23-26, Honolulu, HI. doi: 10.2514/6.2007-1704

**INVITED LECTURES**

2. "Piezoelectric-based Vibration Reduction of Turbomachinery Bladed Disks via Resonance Frequency Detuning," Sandia National Laboratories, 22 September 2011, Albuquerque, NM.

1. "Low-Order Modeling of Piezoelectric Energy Harvesting Devices," NASA Glenn Research Center, 28 October 2008, Cleveland, OH.

**GRANTS AND CONTRACTS**

"Siemens Faculty Fellowship: Finite Element Modeling Techniques for Friction-based Damping in Turbomachinery," Siemens Energy, Inc., $16,000, 07/13-09/13, PI, 100%.

"Autonomous Self-Powered Vibration Reduction of Turbomachinery Bladed Disks," ONR, $240,543 (of $510,000 for full period), 06/13-05/16, PI, 100%.

**THESES SUPERVISED**

| | | |
|---|---|---|
| Daniel Geiyer | Ph.D. | August 2015 (expected) |
| John Trautwein | M.S. | August 2015 (expected) |
| Taylor Hynds | M.S. | May 2015 (expected) |
| Garrett Lopp | M.S. | May 2015 (expected) |
| Amanda Alexander | B.S. | May 2015 (expected) |
| Stephen Ilardi | B.S. | August 2014 (expected) |

Also serving on four Ph.D. and six M.S. thesis committees.

**SERVICE TO THE PROFESSION**

Member, AIAA Adaptive Structures Technical Committee, 2014; Secretary, 2014

Manuscript Referee, Applied Physics A: Materials Science & Processing, Applied Physics Letters, Journal of Intelligent Material Systems and Structures

Panel Reviewer, National Defense Science & Engineering Graduate Fellowship

**SERVICE TO THE DEPARTMENT AND UNIVERSITY**

Faculty Advisor, Æ (Acoustics and Audio Engineering Club), 2013-2014

Faculty Search Committee, 2013-2014

Engineer Search Committee, 2013-2014

Laboratory Curriculum Committee, 2013-2014

Laboratory Committee, 2012-2014

**OUTREACH**

Speaker and Session Volunteer, Camp Connect 2013, a STEM exhibition designed for under-represented minority high school students

Mentor, UCF EXCEL Undergraduate Research Experience, 2013

Student Liaison and Volunteer Organizer for Penn State's Exploration Day 2009, a STEM exhibition for K-12 students (>2,600 attendees)

Pennsylvania Space Grant Consortium Outreach Award, 2008

**PROFESSIONAL AFFILIATIONS**

American Institute of Aeronautics and Astronautics

SPIE (formerly Society of Photo-optical Instrumentation Engineers)