curriculum vitae

ADAM M. WICKENHEISER
Assistant Professor
801 22nd St. NW
Academic Center, Phillips Hall 729
Department of Mechanical and Aerospace Engineering
George Washington University
Washington, DC 20052
(202) 994-8392
amwick@gwu.edu

EDUCATION

2008	Ph.D.	Cornell University	Aerospace Engineering Dissertation title: "Dynamics and Trajectory Optimization of Morphing Aircraft in Perching Maneuvers"
2006	M.S.	Cornell University	Aerospace Engineering
2002	B.S.	Cornell University	Mechanical Engineering (w/ minor in Applied Mathematics) Summa Cum Laude

PROFESSIONAL EXPERIENCE

2010– **GEORGE WASHINGTON UNIVERSITY**: Assistant Professor of Mechanical & Aerospace Engineering; conducts research in reconfigurable aircraft aerodynamics and vehicle dynamics, power harvesting systems, and smart material transduction; teaches undergraduate and graduate courses; advises undergraduate and graduate students

2012, 13, 16 **US AIR FORCE RESEARCH LABORATORY**: Summer faculty fellow in the Munitions Directorate at Eglin AFB, Weapons Dynamics and Controls Branch; conducted research on decentralized flow sensing and control for gust alleviation

2008–2009 **CORNELL UNIVERSITY**: Postdoctoral Associate in the Laboratory for Intelligent Machine Systems and Visiting Lecturer in the Sibley School of Mechanical & Aerospace Engineering; conducted research in morphing and perching aircraft aerodynamics and vehicle dynamics, power harvesting systems, and microwave-powered aircraft; advised M.Eng. and undergraduate researchers; taught a course in mechatronics

2003–2007 **CORNELL UNIVERSITY**: Graduate Research Assistant in the Laboratory for Intelligent Machine Systems; conducted research in morphing and perching aircraft aerodynamics and vehicle dynamics; advised M.Eng. and undergraduate researchers; teaching assistant for courses in mechanical design, mechatronics, and vibrations

2006 **US AIR FORCE RESEARCH LABORATORY**: Summer graduate researcher in the Air Vehicles Directorate at Wright-Patterson AFB, Advanced Structural Concepts Branch; conducted research on and tested an interconnected structural/aerodynamic model for morphing aircraft

2003–2005 **NASA LANGLEY RESEARCH CENTER**: Conducted research as a NASA Fellow at Langley's Dynamics & Controls Branch on morphing aircraft dynamics and flight simulation

2001–2002 **CORNELL UNIVERSITY**: Conducted experiments on vortex-induced vibrations on oscillating structures in the water channel facility at the Fluid Dynamics Research Laboratory

PUBLICATIONS:

BOOK CHAPTERS

3. Wickenheiser, A. M. 2012 "Analysis of Energy Harvesting Using Frequency Up-Conversion by Analytic Approximations", *Small-Scale Energy Harvesting*, ed. Lallart, M., InTech, Croatia, pp. 211-234.

2. Wickenheiser, A. M. and Garcia, E. 2012 "Optimal Trajectory Control of Morphing Aircraft in Perching Maneuvers", *Morphing Aerospace Vehicles and Structures*, ed. Valasek, J., Wiley, New York, pp. 177-204.

1. Wickenheiser, A. M. 2011 "Distributed-Parameter Modeling of Energy Harvesting Structures with Discontinuities", *Advances in Piezoelectric Transducers*, ed. Ebrahimi, F., InTech, Croatia, pp. 53-74.

JOURNAL ARTICLES

17. Blower, C. J., Dhruv, A., and Wickenheiser, A. M. "A Viscous-Inviscid Solver for Bio-Inspired Morphing Aircraft Wings with Integrated Feather-like Flaps" (in preparation).

16. Cole, K. and Wickenheiser, A. M. "Formation control with goals represented by distributions" (in preparation).

15. Schur, R., Lyman, C., and Wickenheiser, A. "Dynamic Programming Method for Energy-Aware Path Planning," *IEEE Transactions on Robotics* (in review).

14. Reissman, T., Wickenheiser, A., and Garcia, E. 2016 "Generalized Solutions of Piezoelectric Vibration-Based Energy Harvesting Structures Using an Electromechanical Transfer Matrix Method," *Journal of Vibration and Acoustics*, Vol. 138, 041001.

13. Wickenheiser, A. M. 2013 "Model Reduction in Stochastic Vibration Energy Harvesting Using Compressive Sampling," *Smart Materials and Structures*, Vol. 22, 094029.

12. Wickenheiser, A. M. 2013 "Eigensolution of Piezoelectric Energy Harvesters with Geometric Discontinuities: Analytical Modeling and Validation," *Journal of Intelligent Material Systems and Structures*, Vol. 24, No. 6, pp. 729–744.

11. Wickenheiser, A. M. and Garcia, E. 2011 "Extended, Nonlinear Lifting-Line Method for Aerodynamic Modeling of Reconfigurable Aircraft," *Journal of Aircraft*, Vol. 48, No. 5, pp. 1812–1817.

10. Wickenheiser, A. M. 2011 "Design Optimization of Linear and Nonlinear Cantilevered Energy Harvesters for Broadband Vibrations," *Journal of Intelligent Material Systems and Structures*, Vol. 22, No. 11, pp. 1213–1225.

9. Wickenheiser, A. M. and Garcia, E. 2010 "Power Optimization of Vibration Energy Harvesters Utilizing Passive and Active Circuits," *Journal of Intelligent Material Systems and Structures*, Vol. 21, No. 13, pp. 1343–1361.

8. Wickenheiser, A. M. and Garcia, E. 2010 "Broadband vibration-based energy harvesting improvement through frequency up-conversion by magnetic excitation," *Smart Materials and Structures*, Vol. 19, No. 6, 065020. **(top 20 most cited articles of 2010)**

7. Dietl, J. M., Wickenheiser, A. M. and Garcia, E. 2010 "A Timoshenko Beam Model for Cantilevered Piezoelectric Energy Harvesters," *Smart Materials and Structures*, Vol. 19, No. 5, 055018.

6. Wickenheiser, A. M., Reissman, T., Wu, W. J., and Garcia, E. 2010 "Modeling the effects of electromechanical coupling on energy storage through piezoelectric energy harvesting", *IEEE/ASME Transactions on Mechatronics*, Vol. 15, No. 3, pp. 400–411.

5. Wu, W., Wickenheiser, A., Reissman, T. and Garcia, E. 2009 "Modeling and Experimental Verification of Synchronized Discharging Techniques for Boosting Power Harvesting from Piezoelectric Transducers", *Smart Materials and Structures*, Vol. 18, No. 5, 055012.

4. Wickenheiser, A. and Garcia, E. 2009 "Conceptual Design Considerations for Microwave- and Solar-Powered Fuel-less Aircraft", *Journal of Aircraft*, Vol. 46, No. 2, pp. 510–519.

3. Wickenheiser, A. and Garcia, E. 2008 "Optimization of Perching Maneuvers Through Vehicle Morphing", *Journal of Guidance, Control, and Dynamics*, Vol. 31, No. 4, pp. 815–823.

2. Wickenheiser, A. and Garcia, E. 2007 "Aerodynamic Modeling of Morphing Wings Using an Extended Lifting-Line Analysis", *Journal of Aircraft*, Vol. 44, No. 1, pp. 10–16.

1. Wickenheiser, A. and Garcia, E. 2006 "Longitudinal Dynamics of a Perching Aircraft", *Journal of Aircraft*, Vol. 43, No. 5, pp. 1386–1392.

CONFERENCE PAPERS

37. Crandall, K. L., Whitehead, C., Dong, S., and Wickenheiser, A. 2016 "Using Abstraction for Swarm Control of a Parent System," *IEEE International Conference on Robotics and Automation (ICRA)*, Stockholm, Sweden, pp. 5344–5349.

36. Dhruv, A., Blower, C. J., and Wickenheiser, A. M. 2015 "A three dimensional unsteady iterative panel method with vortex particle wakes and boundary layer model for bioinspired multi-body wings," *Proc. SPIE*, Vol. 9429, 942916.

35. Olympio, R. B., Donahue, J. and Wickenheiser, A. M. 2014 "Theoretical and Experimental Analysis of Frequency Up-Conversion Energy Harvesters Under Human-Generated Vibrations," *Proc. SMASIS2014*.

34. Dhruv, A., Blower, C. J. and Wickenheiser, A. 2014 "A Three Dimensional Iterative Panel Method for Bio-Inspired Multi-Body Wings," *Proc. SMASIS2014*.

33. Paxson, B. and Wickenheiser, A. M. 2014 "Design considerations for small-scale wind energy harvesters driven by broadband vortex-induced vibrations," *Proc. SPIE*, Vol. 9057, 90571K.

32. Blower, C. J., Dhruv, A., and Wickenheiser, A. M. 2014 "A two-dimensional iterative panel method and boundary layer model for bio-inspired multi-body wings," *Proc. SPIE*, Vol. 9055, 90550V.

31. Wickenheiser, A. 2013 "Modeling Impact-Based Vibration Energy Harvesting with Application to Frequency Up-Conversion," 24th International Conference on Adaptive Structures and Technologies (on CD).

30. Patel, A. P. and Wickenheiser, A. 2013 "Towards Frequency-Independent Vibration-Based Energy Harvesting using Frequency Up-Conversion and Power Analysis," *Proc. SMASIS2013*.

29. Blower, C. and Wickenheiser, A. 2013 "The Validation of a Generalized Aerodynamic Model for a Multi-Body Bio-Inspired Wing," *Proc. SMASIS2013* (**best paper in the Bioinspired Smart Materials and Systems Symposium**).

28. Cole, K. and Wickenheiser, A. 2013 "Impact of Wind Disturbances on Vehicle Station Keeping and Trajectory Following," *AIAA Guidance, Navigation, and Control (GNC) Conference*.

27. Wickenheiser, A. M. 2012 "Model Reduction of Piezoelectric Energy Harvesters Subject to Band-Limited, Stochastic Base Excitation," *Proc. SMASIS2012*.

26. Blower, C. J. and Wickenheiser, A. M. 2012 “The Variations in Active Panel Location and Number for a Bio-Inspired Aircraft Gust Alleviation System,” *Proc. SMASIS2012*.

25. Blower, C. J., Lee, W. and Wickenheiser, A. M. 2012 “The development of a closed-loop flight controller with panel method integration for gust alleviation using biomimetic feathers on aircraft wings,” *Proc. SPIE*, Vol. 8339, 83390I.

24. Anderson, B. and Wickenheiser, A. M. 2012 “Performance analysis of frequency up-converting energy harvesters for human locomotion,” *Proc. SPIE*, Vol. 8341, 834102.

23. Blower, C. and Wickenheiser, A. M. 2011 “The Development of a Closed-Loop Flight Controller for Localized Flow Control and Gust Alleviation Using Biomimetic Feathers on Aircraft Wings,” *Proc. SMASIS2011*.

22. Sivadas, V. and Wickenheiser, A. M. 2011 “Small-Scale Wind Energy Harvesters from Flow-Induced Vibrations,” *Proc. SMASIS2011*.

21. Wickenheiser, A. M. and Reissman, T. 2011 “Generalized Eigensolution to Piecewise Continuous Distributed-Parameter Models of Piezoelectric Energy Harvesters Using the Transfer Matrix Method,” *Proc. SMASIS2011*.

20. Sivadas, V. and Wickenheiser, A. M. 2011 “A Study of Several Vortex-Induced Vibration Techniques for Piezoelectric Wind Energy Harvesting,” *Proc. SPIE*, Vol. 7977, 79770F.

19. Blower, C. J. and Wickenheiser, A. M. 2011 “Two-Dimensional Localized Flow Control Using Distributed, Biomimetic Feather Structures: A Comparative Study,” *Proc. SPIE*, Vol. 7975, 79750L.

18. Blower, C. J. and Wickenheiser, A. M. 2010 “Biomimetic Feather Structures for Localized Flow Control and Gust Alleviation on Aircraft Wings,” 21st International Conference on Adaptive Structures and Technologies (on CD).

17. Wickenheiser, A. M. 2010 “Broadband and Low Frequency Vibration-Based Energy Harvesting Improvement Through Magnetically Induced Frequency Up-Conversion,” *Proc. SMASIS2010*.

16. Wickenheiser, A. and Garcia, E. 2010 “Design of Energy Harvesting Systems for Harnessing Vibrational Motion from Human and Vehicular Motion,” *Proc. SPIE*, Vol. 7643, 76431B.

15. Wickenheiser, A. and Garcia, E. 2009 “Combined Power Harvesting from AC and DC Sources”, *Proc. SPIE*, Vol. 7288, 728816.

14. Wickenheiser, A. M. and Garcia E. 2008 “The Effects of Shape Reconfiguration on Morphing Aircraft in Perching Maneuvers”, *Proc. SMASIS08*, SMASIS2008–650.

13. Hurst, A. C., Wickenheiser, A. and Garcia E. 2008 “Estimation and Control of a Bio-Inspired Morphing Aircraft”, *Proc. SMASIS08*, SMASIS2008–522.

12. Wickenheiser, A., Reissman, T., Garcia, E. and Wu, W. 2008 “The Effects of Electromechanical Coupling on Transient Charging Behavior in Piezoelectric Power Harvesting”, CanSmart International Workshop on Smart Materials and Smart Structures (on CD).

11. Wickenheiser, A. M., Reissman, T., Garcia, E. and Wu, W. J. 2008 “A Study of the Transient Charging Behavior of Several Approaches to Piezoelectric Energy Harvesting”, 19th International Conference on Adaptive Structures and Technologies (on CD).

10. Hurst, A., Wickenheiser, A. and Garcia, E. 2008 “Localization and Perching Maneuver Tracking for a Morphing UAV”, *IEEE/ION PLANS*, pp. 1238–1245.

9. Wickenheiser, A. M. and Garcia, E. 2008 “Mission Performance of a Solar- and Microwave-Powered Aircraft”, *Proc. SPIE* Vol. 6928, 692802.

8. Wickenheiser, A. and Garcia, E**.** 2007 “Dynamic Wind Tunnel Testing of Perching Maneuvers”, 18th International Conference on Adaptive Structures and Technologies (on CD).

7. Wickenheiser, A., Garcia, E. 2007 “Perching Aerodynamics and Trajectory Optimization”, *Proc. SPIE*, Vol. 6525, 65250O.

6. Wickenheiser, A. and Garcia, E., 2006 “Perching Trajectory Optimization Through Aircraft Morphing”, CanSmart International Workshop on Smart Materials and Smart Structures (on CD).

5. Wickenheiser, A., Garcia, E., and Waszak, M. 2005 “Longitudinal dynamics of a perching aircraft concept”, *Proc. SPIE*, Vol. 5764, pp. 192–202.

4. Manzo, J., Garcia, E., Wickenheiser, A., and Horner, G. 2005 “Design of a shape-memory alloy actuated macro-scale morphing aircraft mechanism”, *Proc. SPIE*, Vol. 5764, pp. 232–240.

3. Wickenheiser, A. and Garcia, E. 2004 “Modeling and Control of Morphing Air Vehicles”, 15th International Conference on Adaptive Structures and Technologies (on CD).

2. Manzo, J., Garcia, E., Wickenheiser, A., and Horner, G. 2004 “Adaptive Structural Systems and Compliant Skin Technology of Morphing Aircraft Structures”, *Proc. SPIE*, Vol. 5390, pp. 225–234.

1. Wickenheiser, A., Garcia, E., and Waszak, M. 2004 “Evaluation of bio-inspired morphing concepts with regard to aircraft dynamics and performance”, *Proc. SPIE*, Vol. 5390, pp. 202–211.

PRESENTATIONS

“Predicting Long-Term Energy Harvesting Performance of Piezoelectric Transducers Subject to Degradation and Failure,” SPIE Smart Structures and Materials 2016: Active and Passive Smart Structures and Integrated Systems, March 20–24, Las Vegas, NV, 2016.

“Bio-inspired Flight Control Using a Distributed Array of Multifunctional Flaps,” Gordon Research Conference on Multifunctional Materials & Structures, January 31–February 5, Ventura, CA, 2016.

“Theoretical and Experimental Analysis of Frequency Up-Conversion Energy Harvesters Under Human-Generated Vibrations,” ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems, September 8–10, Newport, RI, 2014.

“Gust Alleviation at Low Reynolds Number Through an Array of Semi-Active Wing Flaps,” AFOSR Workshop on Muscular-Skeletal System Inspired Morphing Air Vehicles Using Active Materials, March 19, Arlington, VA, 2014 (**invited**)

“Gust Alleviation at Low Reynolds Number Through Controlling Semi-Active Wing Deformation,” Embry-Riddle Aeronautical University, November 7, Daytona Beach, FL, 2013 (**invited**).

“Modeling Impact-Based Vibration Energy Harvesting with Application to Frequency Up-Conversion,” 24th International Conference on Adaptive Structures and Technologies, October 7–9, Aruba, 2013.

“Towards Frequency-Independent Vibration-Based Energy Harvesting using Frequency Up-Conversion and Power Analysis,” ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems, September 16–18, Snowbird, UT, 2013.

“Gust Alleviation at Low Reynolds Number Through Controlling Semi-Active Wing Deformation,” University of Florida Research and Education Engineering Center, July 10, Shalimar, FL, 2013.

"Broadband Vibration-Based Energy Harvesting: Model Reduction and Frequency Up-Conversion," 11th International Conference on Recent Advances in Structural Dynamics, July 3, Pisa, Italy, 2013 (**plenary**).

"Bio-inspired Engineering and Robotics at the George Washington University," Joint Research Symposium: The George Washington University and Korea University, March 8, Seoul, Korea, 2013.

"Powering Long-Term Wireless Devices from Human Locomotion by Broadband Vibration Energy Harvesting," 12th Annual Intelligence Community Postdoctoral Research Fellowship Colloquium, September 25, Washington, DC, 2012 (**keynote**).

"Model Reduction of Piezoelectric Energy Harvesters Subject to Band-Limited, Stochastic Base Excitation," ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems, September 19–21, Stone Mountain, GA, 2012.

"Synthesis and Analysis of De-Centralized Control Laws for Wing Sections Using Biomimetic "Feathers" for Gust Alleviation and Maneuverability," University of Florida Research and Education Engineering Center, August 7, Shalimar, FL, 2012.

"Performance Analysis of Frequency Up-Converting Energy Harvesters for Human Locomotion," SPIE Smart Structures and Materials 2012: Active and Passive Smart Structures and Integrated Systems VI, March 12–15, San Diego, CA, 2012.

"Vibration Energy Harvesting Using Piezoelectricity: Single Segment, Multi-Segment, and Circuit Modeling," Pan-American Advanced Studies Institute Workshop on Computational Material Science for Energy Generation and Conversion, January 9–20, Santiago, Chile, 2012 (**invited**).

"Small-Scale Wind Energy Harvesters from Flow-Induced Vibrations," ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems, September 18–21, Scottsdale, AZ, 2011.

"Generalized Eigensolution to Piecewise Continuous Distributed-Parameter Models of Piezoelectric Energy Harvesters Using the Transfer Matrix Method," ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems, September 18–21, Scottsdale, AZ, 2011.

"Analytical Solutions for Piezoelectric Energy Harvesters with lumped Masses and Bends Using the Transfer Matrix Method," 6th Annual Energy Harvesting Workshop, August 8–10, Roanoke, VA, 2011.

"Broadband and Low Frequency Vibration-Based Energy Harvesting Improvement Through Magnetically Induced Frequency Up-Conversion," ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems, September 28–October 1, Philadelphia, PA, 2010.

"Design of Energy Harvesting Systems for Harnessing Vibrational Motion from Human and Vehicular Motion," SPIE Smart Structures and Materials 2010: Active and Passive Smart Structures and Integrated Systems IV, March 7–11, San Diego, CA, 2010.

"Transient Charging Behavior of Combined Energy Harvesting from Piezoelectric and Thermoelectric Sources," 5th Annual Energy Harvesting Workshop, March 3–4, Roanoke, VA, 2010.

"Holistic Power Harvesting Systems", Intelligence Community Postdoctoral Research Fellowship Program Colloquium, April 28, Chantilly, VA, 2009.

"Aeroelastic and Multi-source Power Generation", AFOSR Special Workshop on Energy Harvesting from Aerospace Environments, April 16, Arlington, VA, 2009 (**invited**).

"Combined Power Harvesting from AC and DC Sources", SPIE Smart Structures and Materials 2009: Active and Passive Smart Structures and Integrated Systems III, March 8–12, San Diego, CA, 2009.

"Energy Harvesting from Ambient Vibrations Using Cantilevered Piezoelectric Transducers," Dynamics, Systems, and Controls Seminar, Sibley School of Mechanical and Aerospace Engineering, Cornell University, Ithaca, NY, February 27, 2009 (**invited**).

"Bio-Inspired Maneuvers for Morphing and Flapping-Wing Aircraft", HAWK Seminar Series, Massachusetts Institute of Technology, Cambridge, MA, November 20, 2008 (**invited**).

"The Effects of Shape Reconfiguration on Morphing Aircraft in Perching Maneuvers", ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems, October 28–30, Ellicott City, MD, 2008.

"The Effects of Electromechanical Coupling on Transient Charging Behavior in Piezoelectric Power Harvesting", CanSmart International Workshop on Smart Materials and Smart Structures, October 23–24, Montreal, Quebec, Canada, 2008.

"A Study of the Transient Charging Behavior of Several Approaches to Piezoelectric Energy Harvesting", 19th International Conference on Adaptive Structures and Technologies, October 6–9, Ascona, Switzerland, 2008.

"Morphing Aircraft in Perching Maneuvers", 3rd International Conference on Smart Materials, Structures, and Systems, June 8–13, Acireale, Sicily, 2008.

"Mission Performance of a Solar- and Microwave-Powered Aircraft", SPIE Smart Structures and Materials 2008: Active and Passive Smart Structures and Integrated Systems II, March 10–13, San Diego, CA.

"Dynamic Wind Tunnel Testing of Perching Maneuvers", 18th International Conference on Adaptive Structures and Technologies, October 3–5, Ottawa, ON, 2007.

"Perching Aerodynamics and Trajectory Optimization", SPIE 14th Annual International Symposium on Smart Structures and Materials, March 18–22, San Diego, CA, 2007.

"Perching Trajectory Optimization Through Aircraft Morphing", CanSmart International Workshop on Smart Materials and Smart Structures, October 12–13, Toronto, OT, Canada, 2006.

"Recent Developments in Perching Aircraft at Cornell", Wright-Patterson Air Force Base, Dayton, OH, August 9, 2006.

"Dynamics and Control of Morphing Aircraft in Perching Maneuvers", Eglin Air Force Base, Ft. Walton Beach, FL, March 7, 2006.

"Longitudinal dynamics of a perching aircraft concept", SPIE 12th Annual International Symposium on Smart Structures and Materials, March 6–10, San Diego, CA, 2005.

"Modeling and Control of Morphing Air Vehicles", 15th International Conference on Adaptive Structures and Technologies, October 25–27, Bar Harbor, ME, 2004.

"Evaluation of bio-inspired morphing concepts with regard to aircraft dynamics and performance", SPIE 11th Annual International Symposium on Smart Structures and Materials, March 14–17, San Diego, CA, 2004.

FUNDING: GRANTS, CONTRACTS AND AWARDS

"Scalable Collaborative Robotics Optimization," GW Undergraduate Research Award (recipient: Scott Barnes), 2016, $6000

"UFF: Multi-Domain Search and Rescue Using Cooperative Robots," GW University Facilitating Fund, 2016, $8,000

"Decentralized, Semi-Active Flow Control over Wings for Gust Alleviation," Air Force Summer Faculty Fellowship Program, Eglin AFB, 2016, $42,500

"Just-in-time Interactive Online Modules for Applied Engineering Computing," GW Office of Teaching & Learning, 2013, $10,000

"Gust Alleviation at Low Reynolds Number Through Controlling Semi-Active Wing Deformation," Air Force Summer Faculty Fellowship Program, Eglin AFB, 2013, $18,050

"Synthesis and Analysis Of De-Centralized Control Laws For Wing Sections Using Biomimetic "Feathers" For Gust Alleviation And Maneuverability," Air Force Summer Faculty Fellowship Program, Eglin AFB, 2012, $13,400

"Powering Long-Term Wireless Devices from Human Locomotion by Broadband Vibration Energy Harvesting", Intelligence Community Young Investigator Program, Central Intelligence Agency, 2011–2013, $228,950

"Holistic Power Harvesting Systems", Intelligence Community Postdoctoral Research Fellowship, Central Intelligence Agency, 2007–2010, $360,000

ASEE Air Force Graduate Student Award, Wright-Patterson AFB, 2006, $33,500

"Dynamics and Control of Morphing Aircraft", NASA Fellowship, Graduate Student Research Program, Langley Research Center, 2003–2006, $72,000

Cornell University Graduate Fellowship, 2002–2003, $52,520

Learning Initiative for Future Engineers (LIFE) research grant, 2001, $3,600

TEACHING EXPERIENCE

THEORY OF VIBRATION: instructor; produced and delivered weekly lectures, wrote and graded weekly homework assignments and two exams during the semester
Years taught: 2014

ADVANCED VIBRATION ANALYSIS AND CONTROL: instructor and creator of brand-new course; produced and delivered weekly lectures, wrote weekly homework assignments and two exams during the semester
Years taught: 2014–2015

LINEAR SYSTEM DYNAMICS: instructor; produced and delivered weekly lectures, wrote weekly homework assignments and two exams during the semester; managed a teaching assistant and grader
Years taught: 2013–2014

ELECTROMECHANICAL CONTROL SYSTEM DESIGN: instructor; produced and delivered weekly lectures, wrote and graded weekly homework assignments and two exams during the semester
Years taught: 2012–2013

AERO-HYDRODYNAMICS: instructor; produced and delivered weekly lectures, wrote and graded weekly homework assignments and two exams during the semester
Years taught: 2010–2012

FLUID MECHANICS: instructor; produced and delivered weekly lectures, wrote weekly homework assignments and three exams during the semester; managed a teaching assistant and grader
Years taught: 2010–2011

INTRODUCTION TO VIBRATION ANALYSIS: instructor; produced and delivered weekly lectures, wrote weekly homework assignments and two exams during the semester; managed a teaching assistant and grader
Years taught: 2005–2007 (guest lecturer), 2011–2012 (instructor)

MECHATRONICS: lecturer; produced and delivered three weekly lectures, developed and revised weekly laboratory experiments, and oversaw a final project robotic competition; wrote weekly homework assignments and three exams during the semester; managed eight teaching assistants and two additional graders and interacted with department laboratory coordinators
Years taught: 2008 (instructor), 2006 (laboratory teaching assistant)

MECHANICAL SYNTHESIS: laboratory teaching assistant; ran a weekly laboratory on mechanical design, prototyping, team building, and product presentation; taught the use of various metalworking tools in the machine shop and the SolidWorks CAD software, culminating in the design and production of a hand-powered rock crusher and a compressed air motor; graded lab reports and group presentations
Years taught: 2005

UNIVERSITY SERVICE

2015	MAE Strategic Planning Committee
2015	Judge, Pelton Senior Design Competition
2015	GW Greek Life Task Force
2015	Judge, SEAS R&D Showcase
2015	Inside GW: SEAS Academic Session
2014–	MAE Undergraduate Curriculum Committee
2014	New Student Getaway Faculty Chaperon
2014	GW Reform and Advancement of STEM-education Practices (GRASP) project member
2014	SEAS Development and Alumni Relations presentation
2014–2015	Judge, GW Business Plan Competition
2013–2014	SEAS 1001 Meet the Faculty presentation
2013–2014	Secretary, M&AE Faculty Meetings
2013–2014	Appointment, Salary, and Promotion Policies (ASPP) Senate Committee
2013–2014	VSTC Science Technology and Engineering Day, Workshop Designer and Leader
2013	Lyterati (Annual Reporting Software) Pilot Participant
2012	New Student Getaway Faculty Chaperon
2011–2013	MAE Undergraduate Curriculum Committee
2011	SEAS Graduation Celebration Floor Marshall
2011	MAE Faculty Search Committee (aerodynamics and propulsion)
2010	New Student Getaway Faculty Chaperon
2010	Judge, SEAS R&D Showcase
2007	Dynamics and Control Faculty Search (Committee of Selected Graduate Students)

PROFESSIONAL SERVICE

Chair (2014–2016), Secretary (2012–2014), and Founding Member, ASME Technical Committee on Energy Harvesting
Member, International Organizing Committee, International Conference on Adaptive Structures and Technologies (ICAST)
Member, ASME Adaptive Structures and Material Systems Branch
Guest Editor, IOP *Smart Materials and Structures Journal*, special issue on select papers from Symposium 7: Energy Harvesting of the ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), 2015

Reviewer, AIAA *Journal, Journal of Aircraft, Journal of Guidance, Control, and Dynamics*, Guidance, Navigation, and Control (GNC) Conference
Reviewer, AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference
Reviewer, ASME *Journal of Dynamic Systems, Measurement, and Control, Journal of Vibration and Acoustics,* International Mechanical Engineering Congress & Exposition (IMECE)
Reviewer, Elsevier *Aerospace Science and Technology, Applied Energy, Applied Mathematical Modelling, Experimental Thermal and Fluid Science, Journal of Fluids and Structures, Journal of Sound and Vibration, S&T Books*
Reviewer, Hindawi *Shock and Vibration*
Reviewer, IEEE *Transactions on Mechatronics*, Conference on Decision and Control (CDC), International Conference on Robotics and Automation (ICRA)
Reviewer, IOP *Bioinspiration & Biomechanics, Smart Materials and Structures Journal*
Reviewer, MDPI *Sensors*
Reviewer, SAGE *Advances in Mechanical Engineering, Journal of Intelligent Materials Systems and Structures, Proceedings of the IMECHE, Part 1: Journal of Systems and Control Engineering*
Reviewer, Wiley *Asian Journal of Control, International Journal for Numerical Methods in Fluids*
Panelist, NSF Sensors & Sensing Systems Program
Panelist, NSF Graduate Research Fellowship Program
Panelist, NSF National Robotics Initiative Program
Judge, Fairfax County Regional Science and Engineering Fair, 2013
Session Co-Chair, "Aircraft, MAV/UAV, and Morphing Systems", SPIE Smart Structures/NDE,2010
Session Organizer, "Energy Harvesting IV", ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), 2010
Session Co-Chair, "Sensors and Actuators", International Conference on Adaptive Structures and Technologies (ICAST)
Symposium Co-Chair, Sustainability, 2011 ASME Conference on Smart Materials, Adaptive Structures, and Intelligent Systems
Symposium Co-Chair, Energy Harvesting, 2013 ASME Conference on Smart Materials, Adaptive Structures, and Intelligent Systems
Symposium Chair, Energy Harvesting, 2014 ASME Conference on Smart Materials, Adaptive Structures, and Intelligent Systems

PROFESSIONAL AFFILIATIONS

2011– American Physical Society
2005– American Institute of Aeronautics and Astronautics
2003– The Society of Photo-Optical Instrumentation Engineers
2002– American Society of Mechanical Engineering

AWARDS AND HONORS

2016 Air Force Summer Faculty Fellow, Eglin AFB, FL
2015 SEAS Outstanding Teacher Award for an Assistant Professor
2015 Engineers' Council MAE Professor of the Year
2014 Elected Chair of the ASME Energy Harvesting Technical Committee
2013 Air Force Summer Faculty Fellow, Eglin AFB, FL
2013 Engineers' Council MAE Professor of the Year
2012 Air Force Summer Faculty Fellow, Eglin AFB, FL
2011 Intelligence Community Young Investigator
2010 Elected to International Organizing Committee for the International Conference on Adaptive Structures and Technologies (ICAST)
2007 Intelligence Community Postdoctoral Research Program
2006 ASEE Air Force Summer Graduate Student Award, Wright Patterson AFB, OH
2003 NASA Fellowship, Graduate Student Research Program, NASA Langley, VA

2002	Summa Cum Laude
2002	Pi Tau Sigma, National Mechanical Engineering Honor Society
2002	Frank O. Ellenwood Prize – highest cumulative GPA in Fluid Dynamics and Heat Transfer
2002	Cornell University Graduate Fellowship
2001	Kappa Delta Rho Beta Chapter Scholarship
2001	Kappa Delta Rho Inactive Chapter Scholarship
2000	Kappa Delta Rho Horace E. Shackelton Memorial Scholarship
2000	Kappa Delta Rho Commerford B. Martin Engineering Scholarship
2000	Lockheed Martin Engineering Scholars Award
1998	National Commended Merit Scholar
1998	Alumax Foundation Scholarship
1998	Irving L. Huber Engineering Award
1998	Armstrong Laboratory Association Science and Mathematics Award
1998	US Air Force Mathematics and Science Award