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Academic Employment

Professor:

Department of Mechanical Engineering.
Joint Appointment—Department of Theoretical and Applied Mathematics,
Division of Applied Mathematics.
The University of Akron, Akron, Ohio.
Fall 2009–present.

Associate Professor:

Department of Mechanical Engineering.
The University of Akron, Akron, Ohio.
Fall 2001–Fall 2009.

Assistant Professor:

Department of Mechanical Engineering.
The University of Akron, Akron, Ohio.
Fall 1995–Fall 2001.

Interim Assistant Dean of Research:

College of Engineering.
The University of Akron, Akron, Ohio.
Summer 2007–Fall 2009.

Education

Ph.D. Cornell University, Ithaca, New York; August 1995.

Major: Theoretical and Applied Mechanics.

Minor: Applied Math.

Dissertation Title: Resonance Capture in Dynamical Systems (under the advisement of Prof. Richard Rand).

B.M.E. *with highest honor*; Georgia Institute of Technology, Atlanta, Georgia; June 1991.

Major: Mechanical Engineering.

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Research Interests

My research interests lie in the area of applied dynamical systems and mechanics. Specifically, I have considered the effects of resonances in nonlinear systems with applications to rotordynamics, spacecraft dynamics, and the mechanisms by which energy is transferred through mechanical systems. This work has recently been extended into the area of vibration-based energy harvesting. Since joining the University of Akron, I have initiated studies of adaptive optical systems, differential collision models, research into structural health monitoring, and the mechanics of nano-scale structures such as graphene sheets and nanotubes. I am currently collaborating with researchers at Sandia National Laboratories in the area of structural dynamics, modeling the dynamic response and structural dissipation induced by mechanical interfaces such as lap joints and bolted connections. In addition, I have worked in several related areas, including the modeling, simulation, and control of thermo-acoustic instabilities in aeropropulsion systems, celestial mechanics, nonlinear thermoelastodynamics, nonlinear control systems, and the evolution of virulence in age-dependent populations.

Research Publications and Presentations

Archival Publications

38. D. Dane Quinn, Angela L. Triplett, Alexander F. Vakakis, and Lawrence A. Bergman. "Energy Harvesting From Impulsive Loads Using Intentional Essential Nonlinearities." *ASME Journal of Vibration and Acoustics*, in press, 2010.
37. D. Dane Quinn, Angela L. Triplett, Lawrence A. Bergman, and Alexander F. Vakakis. "Comparing Linear and Essentially Nonlinear Vibration-based Energy Harvesting." *ASME Journal of Vibration and Acoustics*, in press, 2010.

36. M. W. Roberts, C. B. Clemons, J. P. Wilber, G. W. Young, A. Buldum, and D. D. Quinn. "Continuum Plate Theory and Atomistic Modeling to Find the Flexural Rigidity of a Graphene Sheet Interacting with a Substrate." *Journal of Nanotechnology*, 2010: 868492, 2010.
35. Aaron Stebner, Santo Padula II, Ronald Noebe, Bradley Lerch, and D. Dane Quinn. "Development, Characterization, and Design Considerations of $\text{Ni}_{19.5}\text{Ti}_{50.5}\text{Pd}_{25}\text{Pt}_5$ High-Temperature Shape Memory Alloy Helical Actuators." *Journal of Intelligent Material Systems and Structures*, 20:2107–2126, 2009.
34. Angela Triplett and D. Dane Quinn. "The Effect of Nonlinear Piezoelectric Coupling on Vibration-based Energy Harvesting." *Journal of Intelligent Material Systems and Structures*, 20:1959–1967, 2009.
33. Themistoklis P. Sapsis, Alexander F. Vakakis, Oleg Gendelman, Lawrence A. Bergman, Gaetan Kerschen, D. Dane Quinn. "Efficiency of Targeted Energy Transfers in Coupled Nonlinear Oscillators Associated with 1 : 1 Resonance Captures: Part II, Analytical Study." *Journal of Sound and Vibration*, 325:297–320, 2009.
32. D. Dane Quinn. "Resonant Dynamics in a Rotordynamic System with Nonlinear Inertial Coupling and Shaft Anisotropy." *Nonlinear Dynamics*, 57(4): 623–633, 2009.
31. Jason D. Miller and D. Dane Quinn. "A Two-sided Interface Model for Dissipation in Structural Systems with Frictional Joints." *Journal of Sound and Vibration*, 321(1–2):201–219, 2009.
30. D. Dane Quinn, Oleg Gendelman, Gaetan Kerschen, Themistoklis P. Sapsis, Lawrence A. Bergman, Alexander F. Vakakis. "Efficiency of Targeted Energy Transfers in Coupled Nonlinear Oscillators Associated with 1:1 Resonance Captures: Part I." *Journal of Sound and Vibration*, 311(3–5):1228–1248, 2008.
29. J. Patrick Wilber, Curtis B. Clemons, Gerald W. Young, Alper Buldum and D. Dane Quinn. "Continuum and Atomistic Modeling of Interacting Graphene Layers." *Physical Review B*, 75, 045418, 2007.
28. D. Dane Quinn, Richard H. Rand, and Steven H. Strogatz. "Singular Unlocking Transition in the Winfree Model of Coupled Oscillators." *Physical Review E*, 75, 036218, 2007.
27. D. Dane Quinn. "Resonant Dynamics in Strongly Nonlinear Systems." *Nonlinear Dynamics*, 49:361–373, 2007.
26. D. Dane Quinn, J. Patrick Wilber, Curtis B. Clemons, Gerald W. Young and Alper Buldum. "Buckling Instabilities in Coupled Nano-Layers." *International Journal of Non-Linear Mechanics*, 42:681–689, 2007.
25. Jason D. Miller and D. Dane Quinn. "Nonlinear Stability of Thermoelastic Sliding Contact." *ASME Journal of Applied Mechanics*, 74:595–598, 2007.
24. Abdelghani Zniber and D. Dane Quinn. "Resonance Capture in a Damped Three-Degree-of-Freedom System: Experimental and Analytical Comparison." *International Journal of Non-Linear Mechanics*, 41(10):1128–1142, 2006.
23. D. Dane Quinn and Kalyan Bairavarasu. "Near-simultaneous Impacts." *International Journal of Impact Engineering*, 32:889–904, 2006.

22. G. Mani, D. D. Quinn, and M. Kasarda. “Active Health Monitoring in a Rotating Cracked Shaft Using Active Magnetic Bearings as Force Actuators.” *Journal of Sound and Vibration*, 294(3):454–465, 2006.
21. D. D. Quinn, G. Mani, M. Kasarda, T. Bash, D. J. Inman, and R. G. Kirk. “Damage Detection of a Rotating Cracked Shaft Using an Active Magnetic Bearing as a Force Actuator—Analysis and Experimental Verification.” *IEEE/ASME Transactions on Mechatronics*, 10(6):640–647, 2005.
20. D. Dane Quinn. “The Dynamics of Two Parametrically Excited Pendula With Impacts.” *International Journal of Bifurcation and Chaos*, 15(6):1975–1988, 2005.
19. D. Dane Quinn. “Finite Duration Impacts With External Forces.” *ASME Journal of Applied Mechanics*, 72:778–784, 2005.
18. D. Dane Quinn and Daniel J. Segalman. “Using Series-Series Iwan-Type Models for the Understanding of Joint Dynamics.” *ASME Journal of Applied Mechanics*, 72:666–673, 2005.
17. G. Song and D. D. Quinn. “Experimental Study of the Robust Tracking Control of a Shape Memory Alloy Wire Actuator.” *ASME Journal of Dynamic Systems, Measurement, and Control*, 126:674–677, 2004.
16. Giridhar Sabnavis, R. Gordon Kirk, Mary Kasarda, and Dane Quinn. “Cracked Shaft Detection and Diagnostics: A Literature Review.” *The Shock and Vibration Digest*, 36(4):287–296, 2004.
15. D. Dane Quinn. “A New Regularization for Coulomb Friction.” *ASME Journal of Vibration and Acoustics*, 126:391–397, 2004.
14. S. I. Hariharan, S. D. Sawyer, and D. D. Quinn. “A Laplace Transform/Potential-Theoretic Method for Acoustic Propagation in Subsonic Flows.” *Journal of Computational Physics*, 185:252–270, 2003.
13. R. M. Ralich, R. D. Ramsier, D. D. Quinn, C. B. Clemons, and G. W. Young. “Measuring and Modeling Thermal Fluctuations at Nanometer Length Scales.” *Physical Review E*, 65:057601-1/4, 2002;
also, *Virtual Journal of Nanoscale Science & Technology*, May 20, 2002.
12. D. Dane Quinn and John A. Pelesko. “Generic Unfolding of the Thermoelastic Contact Instability.” *International Journal of Solids and Structures*, 39:145–157, 2002.
11. Curtis B. Clemons, S. I. Hariharan, and D. Dane Quinn. “Amplitude Equations for Time-dependent Solution of the McKendrick Equations.” *SIAM Journal on Applied Mathematics*, 62(2):684–705, 2001.
10. P. Ruby Mawasha, Richard J. Gross, and D. Dane Quinn. “Pressure-Drop Oscillations in a Horizontal Single Boiling Channel.” *Heat Transfer Engineering*, 22:26–34, 2001.
9. D. Dane Quinn and Fang Wang. “Synchronization of Coupled Oscillators Through Controlled Energy Transfer.” *International Journal of Bifurcation and Chaos*, 10(6):1521–1535, 2000.
8. D. Dane Quinn, Curtis B. Clemons, and Kevin M. Dempsey. “On The $SO(2)$ Symmetric Deformation of Rotating Rings with Shear Deformation.” *International Journal of Non-linear Mechanics*, 35:79–93, 2000.

7. D. Dane Quinn. "Resonance Capture in a Three-degree-of-freedom Mechanical System." *Nonlinear Dynamics*, 14:309–333, 1997.
6. D. Dane Quinn. "Transition to Escape in a System of Coupled Oscillators." *International Journal of Non-linear Mechanics*, 32(6):1193–1206, 1997.
5. D. Dane Quinn, Brett Gladman, Phil Nicholson, and Richard Rand. "Relaxation Oscillations in Tidally Evolving Satellites." *Celestial Mechanics and Dynamical Astronomy*, 67:111–130, 1997.
4. Brett Gladman, D. Dane Quinn, Philip Nicholson, and Richard Rand. "Synchronous Locking of Tidally Evolving Satellites." *Icarus*, 122:166–192, 1996.
3. D. Dane Quinn, Richard H. Rand, and Jacqueline Bridge. "The Dynamics of Resonant Capture." *Nonlinear Dynamics*, 8:1–20, 1995.
2. D. Dane Quinn and Richard H. Rand. "A Perturbation Approach to Resonant Capture." In Ardéshir Guran and Daniel J. Inman, editors, *Smart Structures, Nonlinear Dynamics, and Control, Vol.I*, chapter 6, pages 226–246. Prentice Hall, New Jersey, 1995.
1. Richard H. Rand and D. Dane Quinn. "Resonant Capture in a System of Two Coupled Homoclinic Oscillators." *Journal of Vibration and Control*, 1:41–56, 1995.

Refereed Proceedings

33. Angela Triplett, D. Dane Quinn, Alexander F. Vakakis, and Lawrence A. Bergman. "Energy Harvesting from an Impulsive Load with Essential Nonlinearities." *DETC2009-86669*, Proceedings of IDETC/CIE 2009, ASME International Design Engineering Technical Conferences, 2009.
32. D. Dane Quinn, Angela L. Triplett, Lawrence A. Bergman, and Alexander F. Vakakis. "Comparing Linear and Essentially Nonlinear Vibration-based Energy Harvesting." *SMASIS08-463*, Proceedings of the first ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), 2008.
31. Angela Triplett and D. Dane Quinn. "The Effect of Nonlinear Piezoelectric Coupling on Vibration-based Energy Harvesting." *IMECE2008-66393*, Proceedings of IMECE 2008, ASME International Mechanical Engineering Congress & Exposition, 2008.
30. Themistoklis P. Sapsis, D. Dane Quinn, Oleg Gendelman, Alexander F. Vakakis, Lawrence A. Bergman, Gaetan Kerschen. "Efficient Targeted Energy Transfer in Coupled Nonlinear Oscillators through 1 : 1 Resonance Captures." Proceedings of ENOC-2008, the Sixth EUROMECH Nonlinear Dynamics Conference, 2008.
29. M. Kasarda, D. Inman, D. Quinn, T. Bash, and R. G. Kirk. "Facilitating Smart Rotating Machinery through the Application of Active Magnetic Bearing Technology." IMECHE 9th International Conference on Vibrations in Rotating Machinery, University of Exeter, Exeter, UK, Sept 8–10, 2008.
28. D. Dane Quinn, Alexander F. Vakakis, and Lawrence A. Bergman. "Vibration-based Energy Harvesting with Essential Nonlinearities." *DETC2007-35457*, Proceedings of IDETC/CIE 2007, ASME Design Engineering Technical Conferences, 2007.

27. Jason Miller and D. Dane Quinn. "Reduced-order Modeling of Two-sided Frictional Interfaces." *DETC2007-35448*, Proceedings of IDETC/CIE 2007, ASME Design Engineering Technical Conferences, 2007.
26. M. Kasarda, T. Bash, G. Mani D. Quinn, D. Inman, and R. G. Kirk. "A New Approach for Health Monitoring and Detection of a Shaft Crack Using an Active Magnetic Actuator During Steady-State Rotor Operation." *GT2007-27589*, Proceedings of the ASME/IGTI Turbo Expo, 2007.
25. Vineel Mallela, John Zhe, and D. Dane Quinn. "In-Plane Stretching in MEMS Actuated Deformable Mirrors." *IMECE2006-15482*, Proceedings of IMECE 2006, ASME International Mechanical Engineering Congress & Exposition, 2006.
24. Girindra Mani, D. Dane Quinn, and Mary E. F. Kasarda. "Structural Health Monitoring of Rotordynamic Systems by Wavelet Analysis." *IMECE2006-15930*, Proceedings of IMECE 2006, ASME International Mechanical Engineering Congress & Exposition, 2006.
23. Mary E. F. Kasarda, Daniel Inman, R. Gordon Kirk, D. Dane Quinn, Girindra Mani, Travis Bash, and L. Scott Stephens. "A Magnetic Bearing Actuator for Detection of Shaft Cracks in Rotating Machinery Supported in Conventional Bearings." Proceedings of the Tenth International Symposium on Magnetic Bearings (ISMB10), 2006.
22. D. Dane Quinn. "Resonant Dynamics in a Rotordynamic System with Nonlinear Inertial Coupling and Shaft Anisotropy." *IMECE2005-81946*, Proceedings of IMECE 2005, ASME International Mechanical Engineering Congress & Exposition, 2005.
21. J. Patrick Wilber, Curtis B. Clemons, Amy E. Pudloski, Gerald W. Young, Alper Buldum and D. Dane Quinn. "Buckling Instabilities in Coupled Nanoscale Structures." *IMECE2005-81922*, Proceedings of IMECE 2005, ASME International Mechanical Engineering Congress & Exposition, 2005.
20. Jason D. Miller and D. Dane Quinn. "An Iwan Model for Dissipation in Structural Systems with Frictional Joints." *DETC2005-84985*, Proceedings of IDETC/CIE 2005, ASME Design Engineering Technical Conferences, 2005.
19. D. Dane Quinn. "Resonant Dynamics in a Rotordynamic System with Nonlinear Inertial Coupling." Proceedings of the International Symposium on Stability Control of Rotating Machinery (ISCORMA-3), 2005.
18. Girindra Mani, D. Dane Quinn, Mary E. F. Kasarda, Daniel J. Inman, and R. Gordon Kirk. "Health Monitoring of Rotating Machinery Through External Forcing." Proceedings of the International Symposium on Stability Control of Rotating Machinery (ISCORMA-3), 2005.
17. D. Dane Quinn, Richard. H. Rand, and Steven Strogatz. "Synchronization in the Winfree Model of Coupled Nonlinear Oscillators." Proceedings of ENOC-2005, the Fifth EUROMECH Nonlinear Dynamics Conference, 2005.
16. D. Dane Quinn, Amy E. Pudloski, Curtis B. Clemons, J. Patrick Wilber, Gerald W. Young, and Alper Buldum. "Buckling Instabilities in Coupled Nanotubes." Proceedings of ENOC-2005, the Fifth EUROMECH Nonlinear Dynamics Conference, 2005.

15. Mary Kasarda, D. Dane Quinn, Travis Bash, Girindra Mani, Daniel J. Inman, R. Gordon Kirk, and Jerzy T. Sawicki. “Magnetic Bearings for Non-Destructive Health Monitoring of Rotating Machinery Supported in Conventional Bearings.” Proceedings of the 6th International Conference on Damage Assessment of Structures, 2005.
14. D. Dane Quinn and Kalyan Bairavarasu. “Sequential and Near-simultaneous Multi-body Collisions.” *IMECE2004-61605*, Proceedings of IMECE 2004, ASME International Mechanical Engineering Congress & Exposition, 2004.
13. Reddy Mankala and D. Dane Quinn. “Resonant Dynamics and Saturation in a Coupled System with Quadratic Nonlinearities.” *IMECE2004-61623*, Proceedings of IMECE 2004, ASME International Mechanical Engineering Congress & Exposition, 2004.
12. Girindra Mani, D. Dane Quinn, Travis Bash, Mary E. F. Kasarda, Daniel J. Inman, and R. Gordon Kirk. “Damage Detection of a Rotating Cracked Shaft Using an Active Magnetic Bearing as a Force Actuator.” Proceedings of the Ninth International Symposium on Magnetic Bearings (ISMB9), 2004.
11. Abdelghani Zniber and D. Dane Quinn. “Frequency Shifting in Nonlinear Resonant Systems with Damping.” *DETC2003/VIB-48444*, Proceedings of DETC ’03, ASME Design Engineering Technical Conferences, 2003.
10. D. Dane Quinn. “A New Regularization of Coulomb Friction.” *IMECE2002-32402*, Proceedings of IMECE 2002, ASME International Mechanical Engineering Congress & Exposition, 2002.
9. D. Dane Quinn. “Distributed Friction and Microslip in Mechanical Joints.” *DETC2001/VIB-21514*, Proceedings of DETC ’01, ASME Design Engineering Technical Conferences, 2001.
8. D. Dane Quinn. “Resonances in Slowly Varying Dynamical Systems.” In A. R. Sahu, R. R. Bhargava, and A. P. Gupta, editors, *Advances in Elastic Vibrations, Smart Structures, and Their Solution Technologies*, pages 1–10, 2001.
7. Gangbing Song and D. Dane Quinn. “Robust Tracking Control of a Shape Memory Alloy Wire Actuator.” In H.-S. Tzou, M. F. Golnaraghi, and C. J. Radcliffe, editors, *AD-Vol. 61: Control of Vibration and Noise: New Millennium*, pages 9–16. The American Society of Mechanical Engineers, 2000.
6. D. Dane Quinn and Anindya Chatterjee. “Collisions of Force-response Rigid Bodies with Infinite Friction and Zero Internal Dissipation.” In A. Guran, editor, Proceedings of the *Second International Symposium on Impact and Friction of Solids, Structures, and Intelligent Machines*, 2000.
5. D. Dane Quinn. “An Impact Oscillator With Finite Time Collisions.” *DETC99/VIB-8173*, Proceedings of DETC ’99, ASME Design Engineering Technical Conferences, 1999.
4. D. Dane Quinn, Curtis Clemons, and Kevin Dempsey. “The Singular Nature of Rotating Circular Rings with Symmetry.” In Anil K. Bajaj and Michael P. Païdoussis, editors, *DE-Vol. 53-1: 4th International Symposium on Fluid-structure Interactions, Aeroelasticity, Flow-induced Vibrations and Noise—Nonlinear Dynamics*, pages 299–306. The American Society of Mechanical Engineers, 1997.

3. D. Dane Quinn. "Control of Two Coupled Pendula With Zero Energy Change." In Anil K. Bajaj, N. Sri Namachchivaya, and Matthew A. Franchek, editors, *DE-Vol. 91: Nonlinear Dynamics and Controls*, pages 13-18. The American Society of Mechanical Engineers, 1996.
2. D. Dane Quinn. "Slow Escapes From Resonance." In R. A. Ibrahim and A. K. Bajaj, editors, *DE-Vol. 84-1: 1995 Design Engineering Technical Conferences Vol. 3, Part A*, pages 737-746. The American Society of Mechanical Engineers, 1995.
1. Richard H. Rand and D. Dane Quinn. "Resonant Capture in a System of Coupled Oscillators." In Anil K. Bajaj, N. Sri Namachchivaya, and Raouf A. Ibrahim, editors, *AMD-Vol. 192, DE-Vol. 78: Nonlinear and Stochastic Dynamics*, pages 249-268. The American Society of Mechanical Engineers, 1994.

Unrefereed Proceedings and Abstracts

23. D. Dane Quinn, Stephen G. Burrow, and David A. W. Barton. "The inuence of power harvesting circuits on energy harvesting performance." Presented at the *SPIE Conference on Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring* San Diego, CA, March 7-11, 2010.
22. D. Dane Quinn. "Load Tuning in Multi-mode Energy Harvesting." Presented at the *Thirteenth Conference on Nonlinear Vibrations, Dynamics, and Multibody Systems*, Blacksburg, VA, May 23-27, 2010.
21. Angela Triplett, D. Dane Quinn, Lawrence Bergman, and Alexander Vakakis. "Essential Nonlinearities and Vibration-based Energy Harvesting." Presented at the *Society of Engineering Science 45th Annual Technical Meeting*, Urbana, IL, October 12-15, 2008.
20. Angela Triplett and D. Dane Quinn. "The Effect of Nonlinear Piezoelectric Coupling on Vibration-based Energy Harvesting." Presented at the *Twelfth Conference on Nonlinear Vibrations, Dynamics, and Multibody Systems*, Blacksburg, VA, June 01-04, 2008.
19. D. Dane Quinn. "HigherEd 2.0: A New Approach for Engineerng Education." Presented at the *7th Annual Celebration of Excellence in Learning and Teaching*, The University of Akron, Akron, OH, April 7-8, 2008.
18. Aaron Stebner, Santo A. Padula II, Ronald D. Noebe, and D. Dane Quinn. "Characterization of Ni_{19.5} Ti_{50.5} Pd₂₅ Pt₅ High-Temperature Shape Memory Alloy Springs and Their Potential Applications in Aeronautics." Presented at the *SPIE Conference on Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring* San Diego, CA, March 9-13, 2008.
17. D. Dane Quinn, Oleg Gendelman, Gaetan Kerschen, Alex Vakakis, Themis Sapsis, and Lawrence Bergman. "Energy Transition from a Linear Oscillator to an Attached Mass through an Essential Nonlinearity." Presented at the *Eleventh Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures*, Blacksburg, VA, August 13-17, 2006.
16. D. Dane Quinn. "Capture, Nonlinear Normal Modes, and Energy Transfer through Non-Stationary Resonances." Presented at the *Second International Conference on Nonlinear Normal Modes and Localization in Vibrating Systems*, Karlovassi, Samos, Greece, June 19-23, 2006.

15. D. Dane Quinn. “Resonant Dynamics and Saturation in a Coupled System with Quadratic Nonlinearities.” Presented at the *Tenth Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures*, Blacksburg, VA, July 25–28, 2004.
14. D. Dane Quinn. “A Continuum Model of Interfacial Dissipation with Time-varying Tangential and Normal Loads.” Presented at the *2003 U.S. National Congress on Computational Mechanics*, Albuquerque, New Mexico, July 28–30, 2003.
13. Daniel J. Segalman and D. Dane Quinn. “Solving Discrete Models of Interfacial Dissipation: Complementarity vs. Regularization.” Presented at the *2003 U.S. National Congress on Computational Mechanics*, Albuquerque, New Mexico, July 28–30, 2003.
12. D. Dane Quinn. “Synchronization for the Winfree Model of Coupled Nonlinear Oscillators: From Continuum to Discrete.” Presented at the *SIAM Conference on Applications of Dynamical Systems*, Snowbird, UT, May 26–31, 2003.
11. D. Dane Quinn. “Resonant Dynamics in Systems with Period-Amplitude Dependence.” Presented at the *Ninth Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures*, Blacksburg, VA, July 28–31, 2002.
10. R. M. Ralich, D. D. Quinn, R. D. Ramsier, C. B. Clemons, and G. W. Young. “Thermal and Electromagnetic Effects on Cantilevers at Nanometer Length Scales.” Presented at the OSAPS meeting, Youngstown State University, April 11–12, 2002.
9. D. Dane Quinn. “Generic Unfolding of the Thermoelastic Contact Instability.” Presented at the *SIAM Conference on Applications of Dynamical Systems*, Snowbird, UT, May 20–24, 2001.
8. D. Dane Quinn. “Dynamic Resonances in Nonlinear Systems.” Presented at the *SIAM Conference on Applications of Dynamical Systems*, Snowbird, UT, May 20–24, 2001.
7. D. Dane Quinn. “The Influence of Injector Dynamics on Longitudinal Combustion Instabilities.” *AIAA-2000-3125*, American Institute of Aeronautics and Astronautics, presented at the *36th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit*, Huntsville, AL, July 17–19, 2000.
6. Curtis Clemons, S. I. Hariharan, and D. Dane Quinn. “Nonlinear Stability of Age-dependent Population Dynamics.” Presented at the *SIAM Conference on Applications of Dynamical Systems*, Snowbird, UT, May 23–27, 1999.
5. D. Dane Quinn. “Thermo-acoustic Instabilities in Aeropropulsion Systems.” Presented at the *SIAM Conference on Applications of Dynamical Systems*, Snowbird, UT, May 23–27, 1999.
4. D. Dane Quinn and Daniel E. Paxson. “A Simplified Model for the Investigation of Acoustically Driven Combustion Instabilities.” *AIAA-98-3764*, American Institute of Aeronautics and Astronautics, presented at the *34th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit*, Cleveland, OH, July 13–15, 1998.
3. D. Dane Quinn. “Resonance Capture In Weakly Forced Mechanical Systems.” Presented at the *SIAM Conference on Applications of Dynamical Systems*, Snowbird, UT, May 18–22, 1997.

2. D. Dane Quinn. “Resonance Capture in a Three Degree-of-freedom Mechanical System.” Presented at the *Sixth Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures*, Blacksburg, VA, June 9–13, 1996.
1. D. Dane Quinn, Richard H. Rand, and Jacqueline Bridge. “The Dynamics of Resonant Capture.” Presented at the *Fifth Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures*, Blacksburg, VA, June 12–16, 1994.

Invited Lectures and Presentations

4. “Nonlinearities and Vibration-based Energy Harvesting.” The University of Bristol, Bristol, UK. June 15, 2009.
3. “Non-stationary Resonances: Energy Transfer and Capture in Nonlinear Systems.” Short Course presented at the 8th *Brazilian Conference on Dynamics, Control, and Applications (DINCON09)*, Bauru, SP, Brazil, May 18–22, 2009.
2. “Nonlinearities and Vibration-based Energy Harvesting.” Keynote Lecture, 8th *Brazilian Conference on Dynamics, Control, and Applications (DINCON09)*, Bauru, SP, Brazil, May 18–22, 2009.
1. “Research in Thermo-acoustic Instabilities.” Insights into Research and Technology, NASA Glenn Research Center. August 10, 1999.

Other

1. D. Dane Quinn. “Book Review: *Topics in Nonlinear Dynamics with Computer Algebra*, by Richard Rand.” *SIGSAM Bulletin: Communications in Computer Algebra*, 31(1):27–28, 1997.

Funding

Awarded Research Funding

16. National Science Foundation, “HigherEd 2.0: Transforming STEM Undergraduate Education,” 09/2007–08/2010, \$75,000 (PI, subcontract from University of Virginia)
15. National Science Foundation, “Collaborative Research: Phase II Development of an Innovative Multi-functional Smart Vibration Platform,” 09/2007–08/2010, \$22,040 (PI)
14. National Aeronautics and Space Administration, Glenn Research Center, “GSRP—Development and Characterization of High Temperature Shape Memory Alloy Actuators,” 07/2006–07/2008, \$54,000 (PI)
13. National Science Foundation, “Modeling, Simulation, and Analysis of Bending Nanotubes,” 06/2004–05/2007, \$274,185 (Sr.I, 20% share)
12. Sandia National Laboratories, “Collaborative Research: Development and Analysis of Reduced-order Models for Mechanical Interfaces,” 10/2003–09/2006, \$130,769 (PI)
11. National Science Foundation, “Magnetic Actuators for Non-Destructive Evaluation (NDE) of Rotating Machinery for Health Diagnostics and Prognostics,” 10/2002–01/2006, \$79,642 (PI, subcontract from Virginia Tech)

10. National Science Foundation, “Dynamic Resonances in Nonlinear Mechanical Systems,” 06/2002–05/2006, \$147,679 (PI)
9. Ohio Board of Regents Research Challenge Grant, 2002, \$20,000 (PI)
8. National Science Foundation, “Differential Collision Models,” 08/2001–12/2005, \$131,773 (PI)
7. Ohio Board of Regents Research Challenge Grant, 2001, \$20,000 (PI)
6. Department of Energy/Ohio State University Research Foundation subcontract, “Local Measurement of Fuel Energy Deposition,” 07/2000–06/2001, \$30,000 (PI)
5. Ohio Board of Regents Research Challenge Grant, 2000, \$20,000 (PI)
4. National Science Foundation, “Dynamic Resonances in Mechanical Systems,” 06/2000–05/2001, \$38,259 (PI)
3. Firestone Research Initiative Fellowship, The University of Akron, “Development of a Dynamical Systems Lab,” 10/1999–09/2000, \$5,000 (PI)
2. Ohio Space Grant Consortium, “Physics-based Numerical Methods for Solving Reactive Flow Problems,” 07/1998–09/1999, \$10,000 (PI)
1. University of Akron Faculty Research Grant, “Robust Control of Dynamical Systems,” 01/1996–12/1996, \$3,500 (PI)

Awarded Other Funding

2. The University System of Ohio, “Promoting STEM Undergraduate Engagement, Advancement, and Retention: Increasing the Knowledge and Capabilities of Ohio’s Workforce.” 06/2008–05/2013, \$6,500,000 (co-PI)
1. National Science Foundation, “US-India Workshop: Elastic Vibrations, Smart Structures and their Solution Technologies, Roorkee, India, January 2001,” 07/2000–06/2001, \$24,000 (co-PI)

Graduate Students

Ph. D.

Christopher D. Morgan. “Effect of Fractional Based Damping on Dynamic System Response.” Ph.D. thesis, The University of Akron, Akron, Ohio, 1998. (co-advised with J. Padovan)

Girindra Mani. “Structural Health Monitoring of Rotordynamic Systems.” Ph.D. thesis, The University of Akron, Akron, Ohio, 2006.

Jason Miller, in progress.

Angie Triplett, in progress.

M. S.

Angie Triplett, “Vibration-Based Energy Harvesting.” M.S. thesis, The University of Akron, Akron, Ohio, 2008.

Harish Chandra. “Differential Model and Impact Response of a Flexible Beam Attached to a Rigid Supporting Structure.” M.S. thesis, The University of Akron, Akron, Ohio, 2008.

- Aaron Stebner, “Development, Characterization, and Application of $\text{Ni}_{19.5} \text{Ti}_{50.5} \text{Pd}_{25} \text{Pt}_5$ High-temperature Shape Memory Alloy Helical Actuators.” M.S. thesis, The University of Akron, Akron, Ohio, 2007.
- Jason Snow, “Design of a Wheelchair-Walker Device.” M.S. thesis, The University of Akron, Akron, Ohio, 2005.
- Abhishek Dubey, “Tangential Restitution in Three-dimensional Collisions.” M.S. thesis, The University of Akron, Akron, Ohio, 2004.
- Reddy Mankala, “Resonance Capture in the Presence of Internal Resonances.” M.S. thesis, The University of Akron, Akron, Ohio, 2004.
- Kalyan Bairavarasu. “Multiple Impact Collisions Of Rigid Bodies Under The Influence Of External Impulsive Forces.” M.S. thesis, The University of Akron, Akron, Ohio, 2003.
- Abdelghani Zniber. “Resonance Capture in a Multi-Degree-of-Freedom Non-Linear Rotor Dynamic System.” M.S. thesis, The University of Akron, Akron, Ohio, 2002.
- Brian Moore. “Equilibrium Configurations of a Helical Rod.” M.S. thesis, The University of Akron, Akron, Ohio, 2001.
- Fang Wang. “The Dynamics and Control of Two Coupled Pendula Subject to Energy Conservation.” M.S. thesis, The University of Akron, Akron, Ohio, 1998.
- Ratnakumar V. Dhavala. “Analysis of a Truck Trailer Suspension System Using a Five Degree-of-freedom Model.” M.S. thesis, The University of Akron, Akron, Ohio, 1997. (co-advised with P. Lam)
- Vineel Mallela, in progress

Teaching and Engineering Experience

08/1995–present: Department of Mechanical Engineering, The University of Akron, Akron, OH.

- ME 730—Vibration of Continuous Systems: Analysis of continuous vibrating systems, using separation of variables, energy, variational, Rayleigh-Ritz and other approximate techniques. Concepts and solutions of integral equations as applied to continuous systems.
- ME 726—Nonlinear Continuum Mechanics: Finite deformation and strain, stress, constitutive equations, strain energy functions. Solution of finite deformation problems in hypoelasticity, coupled thermo-viscoelasticity and plasticity, electro-elasticity and micro-polar theories.
- ME 630—Vibration of Discrete Systems: vibrations in finite dimensional systems, including single- and multi-degree-of-freedom systems. Analytical mechanics, free and forced vibrations, damped and transient response, normal mode vibrations, nonlinear systems.
- ME 629—Nonlinear Engineering Problems: Study of nonlinear ordinary and partial differential equations governing phenomena of mechanics. Analysis of phase space trajectories, singularities and stability. Development of approximate analytical methods.

ME 441/541—Control Systems Design: Methods of feedback control design such as minimized error, root-locus, frequency domain. Compensation techniques. Multivariable and nonlinear design methods and computer-aided control design.

ME 431/531—Fundamentals of Mechanical Vibrations: Forced and free response of one and two degree-of-freedom systems.

ME 340—System Dynamics and Response: A unified approach to modeling, analysis, response, and stability of engineering systems.

ME 321—Kinematics of Machines: Displacements, velocities, accelerations and introduction to forces in plane motion mechanisms. Introduction to design of gears, gear trains, cams, and the synthesis of mechanisms.

ME 203—Dynamics: Kinematics and kinetics of particles and rigid bodies. Principles of work, energy, momentum and impulse.

07/1995–08/1995: Department of Mechanical Engineering, Cornell University, Ithaca, NY.

M&AE 326—System Dynamics: Dynamic behavior of mechanical systems; modeling, analysis techniques, and applications. Vibrations of single- and multi-degree-of-freedom systems. Feedback control systems, stability analysis.

Professional Associations and Activities

American Society of Mechanical Engineers

American Society for Engineering Education

Society for Industrial and Applied Mathematics

Invited Participant, *Tri-Service Workshop on Mechanical Energy Harvesting*, Virginia Tech, Blacksburg, VA, August 12–13, 2009

Invited Participant, *2nd Workshop on Joints Modelling*, Dartington Hall, Totnes, Devon, UK, April 26–29, 2009

Invited Participant, *Duke University Workshop on Nonlinear Vibration*, Durham, NC, June 06, 2008.

Invited Participant, *NSF/Sandia Workshop on Joint Mechanics*, Washington, D.C., October 16–18, 2006.

Invited Participant, *2nd Contact Mechanics Workshop*, sponsored by AFOSR and Sandia National Labs, West Palm Beach, FL, May 12–13, 2002.

Invited Participant, *Sandia Workshop on the Modeling and Simulation of Jointed Structures*, Albuquerque, NM, April 25–26, 2000.

Invited Participant, *NSF Workshop for the Advancement and Retention of Underrepresented and Minority Engineering Educators—1999*, Washington, D.C., September 26–29, 1999.

Invited Participant, *AFSOF Workshop on Dynamics and Control of Combustion Instabilities in Propulsion and Power Systems*, Pasadena, CA, November 20–22, 1997

Honors and Awards

College of Engineering Tau Beta Pi Outstanding Teacher Award—2005
NASA-OAI Collaborative Aerospace Research Summer Faculty Fellowship—1999
NASA-ASEE Summer Faculty Fellowship—1997,1998
Adviser to Ms. Laura Foster, recipient of the 1997 ASME Arthur Williston Award
National Science Foundation: Minority Graduate Fellowship
Ford Foundation Dissertation Fellowship: Honorable Mention
Graduate Engineering Minority Fellowship
Georgia Tech Presidential Scholar
National Merit Scholar
Cornell University: Harriet Davis Fellowship—teaching excellence in applied mathematics

Academic Service

Professional

Associate Editor, *Mathematical Problems in Engineering*, 2008–present.
Associate Editor, *ASME Journal of Vibration and Acoustics*, 2003–present.
Editorial Board, *Nonlinear Dynamics*, 2005–present.
Research Committee on the Mechanics of Jointed Structures, ASME Board on Research and Technology, Member (2010–present).
Technical Committee on Vibration and Sound, ASME Design Engineering Division, Secretary (2010–present), Member (2004–2009).
Technical Committee on Micro- and Nano-scale Systems, ASME Design Engineering Division, Member (2006–2009).
Dynamics and Control of Structures and Systems Technical Committee, ASME Applied Mechanics Division, Member (1999–2008).
Conference Program Chair, *Special Conference on Mechanical Vibration and Noise (VIB)*, 2010 ASME International Design Engineering Technical Conferences, Montreal, QC Canada, August 15–18, 2010.
General Conference Program Co-Chair, *2009 ASME International Design Engineering Technical Conferences (IDETC)*, San Diego, California USA, August 30–September 2, 2009.
Conference Program Chair, *22nd Biennial Conference on Mechanical Vibration and Noise (VIB)*, 2009 ASME International Design Engineering Technical Conferences, San Diego, California USA, August 30–September 2, 2009.
Organizer, *System Identification and Reduced Order Modeling With Applications to Linear and Nonlinear Systems*, 21th Biennial Conference on Mechanical Vibration and Noise, ASME 2007 Design Engineering Technical Conferences, Las Vegas, Nevada USA, September 4–7, 2007.

Organizer, *Design, Dynamics and Controls of Micro/Nano Systems*, 2006 ASME International Mechanical Engineering Congress and Exposition, Chicago, IL. November 5–10, 2006.

Organizer, *System Identification and Reduced Order Modeling With Applications to Linear and Nonlinear Systems*, 20th Biennial Conference on Mechanical Vibration and Noise, ASME 2005 Design Engineering Technical Conferences, Long Beach, California USA, September 24–30, 2005.

Organizer, *System Identification and Reduced Order Modeling With Applications to Linear and Nonlinear Systems*, 19th Biennial Conference on Mechanical Vibration and Noise, ASME 2003 Design Engineering Technical Conferences, Chicago, Illinois USA, September 2–6, 2003.

Organizer, *Symposium on the Modeling and Simulation of Structures with Jointed Interfaces*, 18th Biennial Conference on Mechanical Vibration and Noise, ASME 2001 Design Engineering Technical Conferences, Pittsburgh, PA. September 9–12, 2001.

Co-organizer and Technical Committee, *U.S.-India International Workshop on the Elastic Vibrations, Smart Structures and Their Solutions Technologies*, Roorkee, India. January 2–5, 2001.

Technical Committee Member, *6th Biennial Symposium on Active Control of Vibration and Noise*, 2000 ASME Mechanical Engineering International Congress and Exposition, Orlando, FL. November 5–10, 2000.

Chair/Co-chair for numerous Conference Technical Sessions.

Panel Review Participant, National Science Foundation, 1998, 1999, 2001, 2004, 2006, 2008, 2009

Reviewer: AIAA Journal, AIAA Journal of Guidance, Dynamics, and Control, AIAA Journal of Propulsion and Power, ASME Journal of Applied Mechanics, ASME Journal of Computational and Nonlinear Dynamics, ASME Journal of Dynamic Systems, Measurement and Control, ASME Journal of Vibration and Acoustics, Cambridge University Press, Finite Elements in Analysis and Design, International Journal of Non-linear Mechanics, International Journal of Rotating Machinery, International Journal of Solids and Structures, ISA Transactions, Israel Science Foundation, Journal of Computational and Theoretical Nanoscience, Journal of Computing in Civil Engineering, Journal of Engineering Mechanics, Journal of Sound and Vibration, Journal of the Franklin Institute, Journal of Vibration and Control, Mechanics Research Communications, Nonlinear Dynamics, Physica D, Qatar National Research Foundation, SIAM Journal on Applied Mathematics, Shock and Vibration Digest.

University of Akron

Choose Ohio First Scholarship Committee, 2008–present;

University Fellowship Network, Committee for Nationally Competitive Scholarships, 2009–present;

Chair, Associate Dean Search Committee, Honors College, 2009;

University Graduate Curriculum Committee, 2006–2009;

University Faculty Rights and Responsibilities Committee, 2005–2008;

University Committee on Electronic Thesis and Dissertations, 1999–2000;

Faculty Search Committee, Department of Mathematics and Computer Science,
Applied Math Division, 1999–2000, 2000–2001.

College of Engineering

Interim Assistant Dean of Research, College of Engineering, 2007–2009
Women in Engineering Advisory Board, 2009–present;
Strategic Planning Committee, 2003–present
Computer Resource Committee, 2004–present
Department of Civil Engineering RTP Committee, external member, 2002
Department of Electrical and Computer Engineering RTP Committee, external
member, 2002
Dean’s Advisory Committee, 1997–2002
Ad hoc Committee on Distance Learning, 2000–2001
Ad hoc Committee for Computer Management, 2000–2001
Ad hoc Committee for Recruitment and Retention Committee, 1996–1997

Department of Mechanical Engineering

ABET Coordinator, Mechanical Engineering, 2006–present
Chair, Department of Mechanical Engineering RTP Committee, 2003
ABET Committee Member, 2002–present
Organizer, Department of Mechanical Engineering Seminars, 1999–2004
Graduate Admissions, Department of Mechanical Engineering, 1998–present
Review Committee for Graduate Teaching Assistships, 1998–2001
Faculty Search Committee, Department of Mechanical Engineering 1999–2000,
2002–2003, 2003–2004, 2006–2007, 2008–2009

Personal

Sex: Male
Nationality: United States of America (born: June 1969, Athens, GA)
Race: Native American (Lumbee)

Married to the beautiful Kristen Layne Quinn, with three wonderful children, Kaelyn
Layne, James Phillip, and Ian Joseph.

Assistant Coach: Cornell Men’s Varsity Soccer (1993–1995).

Georgia Tech Men’s Soccer (1987–1991), Captain (1990–1991).

GFS Soccer Club (semi-professional) (1995–present).

Roxxymoron (vocals, guitar, banjo, trumpet, cowbell).