



The Department of MECHANICAL ENGINEERING



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Baz, Amr



Minta Martin Professor
Keystone Professor
Director, Smart Materials and Structures Research Center
Department of Mechanical Engineering
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[GMDH Forecasting and Planning Software](#)

Research Interests

Active and passive control of vibration and noise
Active constrained layer damping
Magnetic composites
Active acoustic metamaterials

Education

Ph.D., University of Wisconsin, Madison, 1973

Honors and Awards

Fellow, American Society of Mechanical Engineers (1996)
Who's Who of American Inventors (1996)
Engineering Alumni Association Outstanding Faculty Research Achievement Award (1997)
ASME Adaptive Structures and Material Systems Award (2009)
Pi Tau Sigma Purple Camshaft Teaching Award (2009)
SPIE Smart Structures and Materials Lifetime Achievement Award (2011).

Professional Memberships and Service

Associate Editor, *Vibration and Control Journal*, *Intl. Journal of Smart Structures & Systems*, and *Journal of Mechanics of Advanced Materials and Structures*.

Selected Publications

2013

A. Aladwani, O. Aldraihem, and A. Baz, "Single Degree of Freedom Shear-Mode Piezoelectric Energy Harvester", In Press, *ASME Journal of Vibration and Acoustics*, 2013.
M. Nouh, O. Aldraihem, and A. Baz, "Optimum Design of Thermoacoustic-Piezoelectric Systems with Dynamic Magnifiers", In Press, *Journal of Engineering Optimization*, 2013.
A. Aladwani, O. Aldraihem, and A. Baz, "A Distributed Parameter Cantilevered Piezoelectric Energy Harvester with a Dynamic Magnifier", In press, *Journal of Mechanics of Advanced Materials and Structures*, 2013.

2012

- M. Nouh, O. Aldraihem, and A. Baz, "Energy Harvesting of Thermoacoustic-piezo Systems with a Dynamic Magnifier", *ASME Journal of Vibration & Acoustics*, Vol. 134, No. 4, 061015, Dec. 2012.
- Y Al-Saffar, O Aldraihem and A Baz, "Smart paint sensor for monitoring structural vibrations", *Journal of Smart Materials and Structures*, Vol. 21, No. 4, 045004, April 2012.
- A. Aladwani*, M. Arafa*, O. Aldraihem and A. Baz, "Cantilevered Piezoelectric Energy Harvester with a Dynamic Magnifier", *ASME Journal of Vibration & Acoustics*, Vol.34, No. 3, pp. 031004, 2012.
- O. Aldraihem and A. Baz, "Onset of Self-Excited Oscillations of Traveling Wave Thermo-Acoustic-Piezoelectric Energy Harvester using Root-Locus Analysis", *ASME Journal of Vibration & Acoustics*, Vol.134, No. 1, 011003, Jan. 2012.
- Wael Akl and Amr Baz, "Analysis and experimental demonstration of an active acoustic metamaterial cell", *J. Appl. Phys.* Vol. 111, No. 4, 044505, 2012.
- Wael Akl and Amr Baz, "A technique for physical realization of anisotropic density matrices with application to acoustic beam shifters", *J. Appl. Phys.*, Vol. 111, No. 2, 024907, 2012.
- Wael Akl and Amr Baz, "Active Acoustic Metamaterial with Simultaneous Programmable Density and Bulk Modulus", accepted for publication in *ASME Journal of Vibration & Acoustics*, 2012.
- Smoker J., Nouh M., Aldraihem O, and Baz A., "Energy harvesting from a standing wave thermoacoustic-piezoelectric resonator", *Journal of Applied Physics*, Vol.111, No. 10, 16 May 2012
- Wael Akl and Amr Baz, "Multi-cell Active Acoustic Metamaterial with Programmable Effective Densities", *ASME Journal of Dynamic Systems, Measurement, and Control*, Vol. 134 , No. 6, pp. 061001–(1–11), 2012.
- Wael Akl and Amr Baz, "Experimental characterization of active acoustic metamaterial cell with controllable dynamic density", *J. Appl. Phys.*, Vol. 112, 084912, 2012.
- W. Akl, A. Elsabbagh, and A. Baz, Acoustic metamaterials with circular sector cavities and programmable densities", *Journal of the Acoustical Society of America*, Vol. 132, No. 4, Pt. 2, pp. 2857–2865, October 2012.

2010

- W. J. Jung, Z. Gu, and A. Baz, "**Mechanical Filtering Characteristics of Passive Periodic Engine Mount**", *Finite Elements in Analysis and Design*, Vol. 46, No. 9, pp. 685–697, 2010.
- W. Akl, and A. Baz, "**Multi-cell Active Acoustic Metamaterial with Programmable Bulk's Modulus**", *Journal of Intelligent Material Systems and Structures*, Vol. 21, pp. 541–556, March 2010.
- A. Baz, "**An Active Acoustic Metamaterial with Tunable Effective Density**", *ASME Journal of Vibration & Acoustics*, Vol. 132, No. 4, 2010.
- A. El-Sabbagh and A. Baz, "Nonlinear Dynamics of Acoustic Compressors", accepted for publication in *ASME Journal of Computational and Nonlinear Dynamics*, 2010.

2009

- A. Baz, "**The Structure of an Active Acoustic Metamaterial with Tunable Effective Density**", *New Journal of Physics*, Vol 11, 1230102009, 2009.
- El-Sabbagh, W. Akl, A. Baz, "Topology optimization of periodic Mindlin plates," *Finite Elements in Analysis and Design*, Vol. 44, No. 8, pp. 439– 449, 2008.
- O. Aldraihem, W. Akl, and, A. Baz, "Nanocomposite Functional Paint for Vibration and Noise Monitoring," *Sensors & Actuators: A. Physical*, Vol. 149, pp. 233–240, 2009.
- J. Smoker, A. Baz, and L. Zheng, "Virtual Reality Simulation of a Full Car Active Suspension System with Nonlinear Energy Sink Controller," *J. of Virtual Reality*, Vol. 8, No. 2, pp. 75–82, 2009.
- W. Akl, A. El-Sabbagh, K. Al-Mitani, A. Baz, "Topology optimization of a plate coupled with acoustic cavity," *International Journal of Solids and Structures*, Vol. 46, No. 10, pp. 2060–2074, 2009.
- L. Zheng, Y. N. Li, and A. Baz, "Fuzzy-Sliding Mode Control of a Full Car Semi-Active Suspension Systems with MR Dampers," *Journal of Smart Structures & Systems*, Vol. 5, No. 3, pp. 261–278, 2009.
- M. Arafa, O. Aldraihem, and A. Baz, "Modeling and Characterization of a Linear Piezomotor," *Journal of Intelligent Material Systems and Structures*, Vol. 20, No. 16, pp. 1913–1921, 2009.
- K. M. S. Eldalil and A. Baz, "Dynamic Stability of Cylindrical Shells under Moving Loads Using Periodic Stiffeners – Part 1," *Advances in Acoustics and Vibration*, Vol. 2009, Article ID 317202, 10.1155/2009/317202, 2009..
- K. M. S. Eldalil and A. Baz, "Dynamic Stability of Cylindrical Shells under Moving Loads Using Piezo-Stack Actuator – Part 2," *Advances in Acoustics and Vibration*, Vol. 2009, Article ID 927078, doi:10.1155/2009/927078, 2009.

2008

- W. Akl, A. El-Sabbagh, A. Baz, "Optimization of the static and dynamic characteristics of plates with isogrid stiffeners," *Finite Elements in Analysis and Design*, Vol. 44, No. 8, pp. 513– 523, 2008.

Related News

Bruck Named a UMD Distinguished Scholar–Teacher

Professor **Hugh Bruck** named one of six Distinguished Scholar–Teachers for the 2016–2017 school year. April 4, 2016

Baz Recognized with Two Awards for Teaching Excellence

Minta Martin Professor Amr Baz recognized with both a Distinguished Scholar–Teacher Award and the Poole and Kent Teaching Award for Senior Faculty. May 19, 2015

Four Mechanical Engineering Graduate Students Selected as Future Faculty Fellows

Althamer, Anderson, Greve and Singh Chosen for Clark School's 2014 Future Faculty Program December 12, 2013

New Minta Martin Professors Named

Historic honor recognizes full professors who have made significant scholarly contributions. July 19, 2012

Amr Baz Earns Lifetime Achievement Award

ME professor recognized for his work in the field of smart structures and materials. November 15, 2010

ME Department Welcomes New Grad Students

Students benefit from graduate orientation. September 1, 2009

Department Well–Represented at OTC Invention Awards

Professors Baz & McCluskey earn top recognition. April 26, 2007

ME Faculty Honored at Research Leaders Luncheon

Nine ME Faculty honored on November 14. December 15, 2006

2006 ME Research Review Day Highlights

Research Review Day held on March 20, 2006 at the University Inn and Conference Center. February 15, 2006

Alfred Gessow Rotorcraft Center Honored

The award will consist of a gold medal, a certificate, and an honorarium May 10, 2002

A. James Clark School of Engineering Awards – Call for Nominations

The faculty member receiving the service award will be presented with a plaque and a cash award. March 15, 2002

Professor Amr Baz Named Director of Center for Small Smart Systems

Dr. Amr Baz, Professor of Mechanical Engineering, has been named Director of the Center for Small Smart Systems. November 13, 2001

Eight Mechanical Engineering Faculty Present at ASME Conference

Eight faculty members from the Department of Mechanical Engineering attended, presented, and were divisional chairs at the 2001 ASME Conference. September 15, 2001

Three Teams from the Clark School of Engineering Win MURI Awards

Department of Defense have selected three teams from the A. James Clarke School of Engineering to receive Multidisciplinary University Research Initiative (MURI) Awards. February 7, 2001