PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 9431

, "Front Matter: Volume 9431," Proc. SPIE 9431, Active and Passive Smart Structures and Integrated Systems 2015, 943101 (11 May 2015); doi: 10.1117/12.2196353

SPIE.

Event: SPIE Smart Structures and Materials + Nondestructive Evaluation and Health Monitoring, 2015, San Diego, California, United States

PROCEEDINGS OF SPIE

Active and Passive Smart Structures and Integrated Systems 2015

Wei-Hsin Liao
Gyuhae Park
Alper Erturk
Editors

9–12 March 2015
San Diego, California, United States

Sponsored by
SPIE

Cosponsored by
American Society of Mechanical Engineers (United States)

Cooperating Organizations
Intelligent Materials Forum (Japan)
Jet Propulsion Laboratory (United States)
National Science Foundation (United States)

Published by
SPIE

Volume 9431
Part One of Two Parts

Proceedings of SPIE 0277-786X, V. 9431

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

Active and Passive Smart Structures and Integrated Systems 2015, edited by Wei-Hsin Liao,
Gyuhae Park, Alper Erturk, Proc. of SPIE Vol. 9431, 943101 · © 2015 SPIE
CCC code: 0277-786X/15/\$18 · doi: 10.1117/12.2196353

Proc. of SPIE Vol. 9431 943101-1

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *Active and Passive Smart Structures and Integrated Systems 2015*, edited by Wei-Hsin Liao, Gyuhae Park, Alper Erturk, Proceedings of SPIE Vol. 9431 (SPIE, Bellingham, WA, 2015) Article CID Number.

ISSN: 0277-786X

ISBN: 9781628415346

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

SPIE.org

Copyright © 2015, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/15/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIEDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print. Papers are published as they are submitted and meet publication criteria. A unique citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID Number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages.

Contents

xi	Authors
xv	Conference Committee

Part One

SESSION 1	ENERGY HARVESTING AND SCAVENGING: WAVES/ACOUSTICS
9431 02	Broadband performance of a patterned piezoelectric energy harvester integrated with a continuous elastoacoustic mirror [9431-1]
9431 03	On the use of nonlinear solitary waves for energy harvesting [9431-2]
9431 04	Hydraulic pressure energy harvester enhanced by Helmholtz resonator [9431-3]
9431 05	An experimentally validated contactless acoustic energy transfer model with resistive-reactive electrical loading [9431-4]
9431 06	Energy scavenging from acousto-elastic metamaterial using local resonance phenomenon [9431-5]
SESSION 2	MAGNETO RHEOLOGICAL SYSTEMS I
9431 08	A prosthetic knee using magnetorheological fluid damper for above-knee amputees [9431-7]
9431 09	Behavior of a flexible controllable micropump [9431-8]
9431 0A	Design of energy-efficient MRF-based clutches with defined fail-safe behavior for integration in hybrid powertrains [9431-9]
SESSION 3	ENERGY HARVESTING AND SCAVENGING: FLUID-STRUCTURE INTERACTION
9431 0B	Underwater energy harvesting from vibrations of annular ionic polymer metal composites [9431-10]
9431 0C	Unified electrohydroelastic investigation of underwater energy harvesting and dynamic actuation by incorporating Morison's equation [9431-11]
9431 0D	Transfer matrix modeling of a tensioned piezo-solar hybrid energy harvesting ribbon [9431-12]

- 9431 OE **Enhancement of galloping-based wind energy harvesting by synchronized switching interface circuits** [9431-13]
- 9431 OF **A hydrostatic pressure-cycle energy harvester** [9431-14]
- 9431 OG **A new energy harvester for fluids in motion** [9431-15]

SESSION 4 BIOLOGICAL-INSPIRED SYSTEMS AND BIO-MEMS

- 9431 OH **Fluidic origami cellular structure: combining the plant nastic movements with paper folding art** [9431-16]
- 9431 OI **Nylon-muscle-actuated robotic finger** [9431-18]

SESSION 5 ENERGY HARVESTING AND SCAVENGING: BROADBAND/NONLINEAR I

- 9431 OL **An investigation on vibration energy harvesting using nonlinear dynamic principles inspired by trees** [9431-19]
- 9431 OM **Piezoelectric cantilever-pendulum for multi-directional energy harvesting with internal resonance** [9431-20]
- 9431 OO **Chaotic control of a piezomagnetoelastic beam for improved energy harvesting** [9431-22]

SESSION 6 ENERGY HARVESTING AND SCAVENGING: BROADBAND/NONLINEAR II

- 9431 OP **Vibration energy harvesting from a nonlinear standing beam-mass system using a two-mode approximation** [9431-23]
- 9431 OQ **A diamagnetically stabilized horizontally levitated electromagnetic vibration energy harvester** [9431-24]
- 9431 OR **Piezoelectric energy harvesting with a nonlinear energy sink** [9431-25]
- 9431 OS **Tunable bistable devices for harvesting energy from spinning wheels** [9431-26]

SESSION 7 AIRCRAFT, MAV/UAV, AND MORPHING SYSTEMS

- 9431 OT **Spanwise morphing trailing edge on a finite wing** [9431-27]
- 9431 OU **Modeling and development of a twisting wing using inductively heated shape memory alloy actuators** [9431-28]
- 9431 OV **Multimodal sensing strategies for detecting transparent barriers indoors from a mobile platform** [9431-29]

- 9431 0X **A robust two-way switching control system for remote piloting and stabilization of low-cost quadrotor UAVs** [9431-31]
- 9431 0Y **Planform, aero-structural, and flight control optimization for tailless morphing aircraft** [9431-32]

SESSION 8A ENERGY HARVESTING AND SCAVENGING: PIEZOELECTRICS/ELECTRETS

- 9431 10 **Bimorph disk piezoelectric energy harvester under base excitation: electroelastic modeling and experimental validation** [9431-34]
- 9431 11 **Evaluation of piezoelectret foam in a multilayer stack configuration for low-level vibration energy harvesting applications** [9431-35]

SESSION 8B MICRO- AND NANO-INTEGRATED SYSTEMS

- 9431 12 **Force-compensated hydrogel-based pH sensor** [9431-36]
- 9431 13 **Integration of fluidic jet actuators in composite structures** [9431-37]

SESSION 9A SMA-BASED MATERIALS AND SYSTEMS I

- 9431 15 **Experimental investigation of bond in concrete members reinforced with shape memory alloy bars** [9431-39]
- 9431 16 **Adaptive and energy efficient SMA-based handling systems** [9431-40]
- 9431 17 **Shape-retainment control using an antagonistic shape memory alloy system** [9431-41]

SESSION 9B PASSIVE AND ACTIVE VIBRATION ISOLATION SYSTEMS I

- 9431 19 **Magnetoelastic metastructures for passive broadband vibration suppression** [9431-43]
- 9431 1A **Multimodal vibration damping through a periodic array of piezoelectric patches connected to a passive network** [9431-44]
- 9431 1B **Static and quasi-static behavior of an adaptive system to compensate path errors for smart fiber placement** [9431-45]
- 9431 1C **Adaptive-passive control of noise radiation of gear-box systems using a pair of shunted piezo-based rotating inertial actuators** [9431-46]

SESSION 10A ENERGY HARVESTING AND SCAVENGING: GENERAL PIEZOELECTRICS

- 9431 1E **Embedded piezoelectrics for sensing and energy harvesting in total knee replacement units** [9431-48]

- 9431 1G **A mechanical solution of self-powered SSHI interface for piezoelectric energy harvesting systems [9431-50]**

SESSION 10B MODELING, OPTIMIZATION, SIGNAL PROCESSING, SENSING, CONTROL, AND DESIGN OF INTEGRATED SYSTEMS I

- 9431 1H **Damage identification in nonlinear periodic structures utilizing the dynamics of intrinsic localized modes [9431-51]**
- 9431 1I **Modeling and identification of nonlinear electroelastic and dissipative parameters for PZT-5A and PZT-5H bimorphs: a dynamical systems approach [9431-52]**
- 9431 1J **Design optimization of a magnetorheological brake in powered knee orthosis [9431-53]**

Part Two

SESSION 11A MAGNETO RHEOLOGICAL SYSTEMS II

- 9431 1L **Tactile device utilizing a single magnetorheological sponge: experimental investigation [9431-55]**
- 9431 1N **Force modeling for incision surgery into tissue with haptic application [9431-57]**
- 9431 1O **Optimization of new magnetorheological fluid mount for vibration control of start/stop engine mode [9431-58]**
- 9431 1P **Haptic cue control of an MR gear shifting assistance device via Preisach hysteresis linearization [9431-59]**

SESSION 11B PIEZO-BASED MATERIALS AND SYSTEMS

- 9431 1S **Nonlinear vibration analysis of the high-efficiency compressive-mode piezoelectric energy harvester [9431-117]**
- 9431 1T **Removing surface accretions with piezo-excited high-frequency structural waves [9431-63]**
- 9431 1V **Multiobjective optimization of piezoelectric bimorph actuator with rigid extension [9431-65]**
- 9431 1W **Effect of material uncertainties on dynamic analysis of piezoelectric fans [9431-66]**

SESSION 12A	MODELING, OPTIMIZATION, SIGNAL PROCESSING, SENSING, CONTROL, AND DESIGN OF INTEGRATED SYSTEMS II
9431 1X	Multifunctional magneto-plasmonic nanotransducers for advanced theranostics: synthesis, modeling and experiment [9431-122]
9431 1Z	A smart model of a long-span suspended bridge for wind tunnel tests [9431-69]
SESSION 12B	PASSIVE AND ACTIVE VIBRATION ISOLATION SYSTEMS II
9431 20	Electromagnetic damper design using a multiphysics approach [9431-70]
9431 22	Vibration of cantilever piezolaminated beams with extension and shear mode piezo actuators [9431-72]
SESSION 13A	ENERGY HARVESTING AND SCAVENGING: APPLICATIONS
9431 23	Magnetoelastic energy harvester for structural health monitoring applications [9431-73]
9431 26	Implementation of a robust hybrid rotary-translational vibration energy harvester for autonomous self-powered acceleration measurement [9431-76]
SESSION 13B	PASSIVE AND ACTIVE VIBRATION ISOLATION SYSTEMS III
9431 27	Earthquake response reduction of mid-story isolated system due to semi-active control using magnetorheological rotary inertia mass damper [9431-77]
9431 2A	Research on seismic performance of slotted RC walls with replaceable damper [9431-80]
SESSION 14A	ENERGY HARVESTING AND SCAVENGING: GENERAL
9431 2B	Harvesting under transient conditions: harvested energy as a proxy for optimal resonance frequency detuning [9431-81]
9431 2C	Electromagnetic energy harvester using coupled oscillating system with 2-degree of freedom [9431-82]
9431 2D	A single-DOF vibration energy harvester for integrating into the parallel mechanism [9431-83]
9431 2E	A six-DOF vibration energy harvester based on the six-DOF parallel mechanism [9431-84]

SESSION 14B MODELING, OPTIMIZATION, SIGNAL PROCESSING, SENSING, CONTROL, AND DESIGN OF INTEGRATED SYSTEMS III

- 9431 2F **Simulating coupled thermal-mechanical interactions in morphing radiators (SPIE/ASME Best Student Paper Award) [9431-85]**
- 9431 2G **A passive control methodology for seismic safety enhancement of monumental structures [9431-86]**
- 9431 2I **Investigation on seismic resistance of high-rising building installed with viscoelastic-wall dampers [9431-88]**

SESSION 15A SMA-BASED MATERIALS AND SYSTEMS II

- 9431 2J **Simulation and experimental studies of the SMA-activated needle behavior inside the tissue [9431-89]**
- 9431 2K **Optimization and testing of a continuous rotary motor based on shape memory wires and overrunning clutches [9431-90]**
- 9431 2M **Modeling framework for materials capable of solid-solid phase transformation: application to the analytical solution of the semi-infinite mode III crack problem in an idealized shape memory alloy [9431-92]**
- 9431 2N **Experimental investigation on a novel 3D isolator made of shape memory alloy pseudo-rubber [9431-93]**
- 9431 2O **Improvement in performance of reinforced concrete structures using shape memory alloys [9431-94]**

SESSION 15B PASSIVE AND ACTIVE VIBRATION ISOLATION SYSTEMS IV

- 9431 2P **Adaptive active vibration control to improve the fatigue life of a carbon-epoxy smart structure [9431-95]**
- 9431 2Q **Non-linear control logics for vibrations suppression: a comparison between model-based and non-model-based techniques [9431-96]**
- 9431 2S **Potential of viscous dampers for vibration mitigation of transmission overhead lines [9431-98]**
- 9431 2T **Design and investigation of a linear smart actuator [9431-99]**

POSTER SESSION

- 9431 2V **Use of spring-roll EAP actuator as end-effector of a hyper-redundant robot [9431-101]**

- 9431 2W **Design of an innovative magnetostrictive patch actuator [9431-102]**
- 9431 2X **Low frequency inertial control strategy for seismic attenuation with multi-stage mechanical suspensions [9431-103]**
- 9431 2Z **Passive vibration control in a building-like structure using a tuned-mass-damper and an autoparametric cantilever beam absorber [9431-105]**
- 9431 30 **Design and analysis of an innovative combined magneto-rheological damper-mount [9431-106]**
- 9431 32 **Hysteresis modeling and experimental validation of a magnetorheological damper [9431-108]**
- 9431 33 **Design of MR brake featuring tapered inner magnetic core [9431-109]**
- 9431 36 **Trajectory tracking and vibration control in a space frame flexible structure with a PZT stack actuator [9431-112]**
- 9431 37 **Wideband piezoelectric energy harvester for low-frequency application with plucking mechanism [9431-113]**
- 9431 38 **Sensor-less parameter estimation of electromagnetic transducer and experimental verification [9431-114]**
- 9431 39 **Enhanced piezoelectric energy harvesting of a bistable oscillator with an elastic magnifier [9431-115]**
- 9431 3B **Off-road motorbike performance analysis using a rear semi-active suspension [9431-119]**
- 9431 3C **Comparisons of the dynamic characteristics of magnetorheological and hydraulic dampers [9431-120]**
- 9431 3D **Aerosol deposited PZT actuated 2D scanner system [9431-121]**

Authors

Numbers in the index correspond to the last two digits of the six-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first four digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Abdolhamidi, Shervin, 0B	Enriquez-Zarate, J., 2Z
Abundis-Fong, H. F., 2Z	Erbis, Vadim, 0A
Acernese, F., 2X	Ermanni, Paolo, 0Y
Acevedo, Isaiah, 0V	Errico, Gianmarco, 2V
Adiba, Afifa, 06	Erturk, Alper, 02, 04, 05, 0C, 10, 11
Aglietti, Guglielmo S., 20	Essink, Brittany C., 23
Ahmed, Riaz U., 06	Fava, Victor, 2V
Alujevic, N., 1C	Ferri, Brian, 1I
Anton, Steven R., 11, 1E	Fossati, L., 1Z
Arafa, Mustafa, 0S	Friswell, M. I., 0P
Arrieta, Andres F., 0Y	Fujitani, Hideo, 27
Aucejo, Mathieu, 1A	Ganguli, Ranjan, 1V
Bai, Xian-Xu, 32	Garcia-Pérez, O. A., 36
Bajoria, Kamal M., 22, 2O	Ge, Cong, 1G
Banerjee, Sourav, 06	Geiyer, Daniel, 0O
Barone, F., 2X	Gerlach, Gerald, 12
Bassam, A., 2S	Geßner, Thomas, 13
Baughman, Ray H., 0I	Giberti, H., 2W
Behrooz, Majid, 09	Giordano, G., 2X
Bertagne, Christopher L., 2F	Gordaninejad, Faramarz, 09
Boccalero, Gregorio, 0G	Gray, M., 05
Boragno, Corrado, 0G	Guenther, Margarita, 12
Boyd, James G., 0U	Guo, An-xin, 2N
Bryant, Matthew, 0D	Güth, Dirk, 0A
Carrara, Matteo, 02	Hahn, Gregory, 0F
Cazzulani, Gabriele, 2P	Haines, Carter, 0I
Cervantes-Muñoz, Damián, 3B	Han, Young-Min, 1P
Cha, Youngsu, 0B	Harne, R. L., 0L, 1H
Chattaraj, Nilanjan, 1V	Hartl, Darren J., 0U, 2F
Chatterjee, Punnap, 0D	Hegger, Christian, 0A
Chen, Chao-Ting, 3D	Helal, Mohammed, 0S
Chen, Peng, 32	Hiraki, Yasuhiro, 37
Chiu, Wing K., 2C	Hobeck, Jared D., 19, 23
Choi, Seung-Bok, 08, 1L, 1N, 1O, 1P, 30, 33	Holz, B., 16
Choi, Seung-Hyun, 1L, 1N	Honarvar, Mohammad, 2J
Chu, Kang-Yu, 3D	Huo, Lianfeng, 2A
Chung, Jye Ung, 1O, 1P, 30	Hutapea, Parsaoran, 2J
Cinquemani, Simone, 1Z, 2P, 2W	Hynds, Taylor D., 2B
Cunefare, Kenneth, 04	Ikeda, Naoto, 37
Daghash, S. M., 15	Ikeda, T., 17
Darabi, A., 10	Ikegame, Toru, 38
Deng, Kangfa, 12	Inman, Daniel J., 0T, 19, 23
Depaetere, B., 1C	Inoue, Tsuyoshi, 38
De Rosa, R., 2X	Ito, Mai, 27
Deü, Jean-François, 1A	Jikuya, Ichiro, 38
Dhanalakshmi, K., 2T	Jung de Andrade, Monica, 0I
Diana, G., 1Z	Kaduskar, Shreya S., 2O
Dragoni, Eugenio, 2K	Kagata, Hiroshi, 37
Elhadidi, Mohamed, 0S	Kalkowski, Michał K., 1T

Katsumura, Hidenori, 37
 Kauffman, Jeffrey L., 0O, 2B
 Kim, Pyunghwa, 1L, 1N
 Kim, Soomin, 1L, 1N, 1P
 Kleine, R. Kaleb, 0V
 Konh, Bardia, 2J
 Koontz, Zachary, 04
 Kraus, Dustan, 0V
 Krishna Chaitanya, S., 2T
 Kroll, Lothar, 13
 Krombholz, C., 1B
 Kruse, F. F., 1B
 Kulpe, Jason A., 02
 Kunze, J., 16
 Kuo, Chun-Liang, 3D
 Lagoudas, Dimitris C., 0U
 Lajimi, S. A. M., 0P
 Leadenham, Stephen M., 02, 1I
 Leamy, Michael J., 02, 10
 Li, Hui, 2N
 Li, Kaiyuan, 03
 Li, Su-chao, 2N
 Li, Suyi, 0H
 Liang, Junrui, 0E, 1G
 Liao, Wei-Hsin, 1J, 39
 Lima, Marcio D., 0I
 Lipowski, Mathias, 13
 Liu, Haili, 0E, 1G
 Liu, Kefu, 0R
 Liu, M., 2I
 Liu, Mingzhao, 1X
 Longtin, Jon, 1X
 Lossouarn, Boris, 1A
 Lozoya-Santos, Jorge de J., 3B
 Ma, Hao, 1J
 Maas, Jürgen, 0A
 Mao, Chen-xi, 2N
 Mascareñas, David, 0V
 Masoumi, Masoud, 1X
 Masuda, Arata, 37
 Meneghini, R. Michael, 1E
 Molinari, Giulio, 0Y
 Monner, H. P., 1B
 Morgan, Eric, 0F
 Moss, Scott D., 26, 2C
 Motzki, P., 16
 Mourni, Ziad, 2M
 Mukherjee, Sujoy, 1W
 Nassar, Omar, 0S
 Oh, Jong-Soek, 1L, 1N, 33
 Okumura, Hidenori, 37
 Orsini, Lorenzo, 2Q
 Otto, Thomas, 13
 Ou, Jinping, 2A
 Owen, Robert B., 23
 Oyadiji, S. Olutunde, 3C
 Ozbulut, O. E., 15
 Palagummi, S., 0Q
 Pankonien, Alexander M., 0T
 Papalou, Angeliki, 2G
 Park, Jinhyuk, 08
 Payne, Owen R., 26
 Perner, M., 1B
 Peza-Solis, J. F., 36
 Phu, Do Xuan, 1O, 30
 Pinte, G., 1C
 Porfiri, Maurizio, 0B
 Qian, Li-Jun, 32
 Ramírez Mendoza, Ricardo, 3B
 Ray, Chase A., 1I
 Ren, J., 2I
 Resta, Ferruccio, 0X, 2P, 2Q, 2V
 Richardson, Guy, 20
 Ripamonti, Francesco, 0X, 1Z, 2P, 2Q, 2V
 Rizzo, Piervincenzo, 03
 Romano, R., 2X
 Rome, Richard S., 0I
 Roubien, Denis, 2G
 Rustighi, Emiliano, 1T
 Sas, P., 1C
 Sato, Yusuke, 27
 Saunders, Robert N., 0U
 Sawamura, K., 17
 Schipf, David R., 3D
 Schirmer, Eckart, 13
 Schueller, Martin, 13
 Scirè Mammano, Giovanni, 2K
 Seelecke, S., 16
 Senba, A., 17
 Shafer, Michael W., 0F
 Shahab, S., 05, 0C, 10
 Sherif, M. M., 15
 Sheth, Rubik B., 2F
 Silva-Navarro, G., 2Z, 36
 Skow, Ellen, 04
 Sohn, Jung Woo, 33
 Soltani, A., 2S
 Srivastava, Swapnil, 1W
 Stabile, Alessandro, 20
 Strepelias, Elias, 2G
 Sun, A., 0L
 Tadesse, Yonas, 0I
 Takagi, Kentaro, 38
 Tamayama, M., 17
 Tang, J., 0M
 Tang, Lihua, 0E, 0R
 Tewolde, Mahder, 1X
 Thota, M., 1H
 Torti, Alessandro, 2P
 Triantafillou, Thanasis, 2G
 Trujillo-Franco, L. G., 36
 Ung, Chandarin, 26, 2C
 Vandewater, Luke A., 26
 Vivani, Andrea, 0X
 Walther, Marco, 13
 Wang, D. H., 2D, 2E
 Wang, Guang Qing, 39
 Wang, Jian, 2A
 Wang, K. W., 0H, 0L, 1H
 Wang, Wei-Chih, 3D

Wang, Y., 2I
Wang, Ya, 1X
Wankhade, Rajan L., 22
Waters, Timothy P., 1T
Whitcomb, John D., 2F
Wilson, Brooke E., 1E
Wu, Lianjun, 0I
Wu, Wen-Jong, 3D
Xu, J., 0M
Yadav, Shubham Kumar, 1W
Yang, Yaowen, 0E
Yang, Zhengbao, 1S
York, A., 16
Yoshida, Shohei, 27
Yuan, F. G., 0Q
Yuan, G., 2D, 2E
Zaki, Wael, 2M
Zeyada, Yasser, 0S
Zhang, Yi, 3C
Zhang, Yu, 0R
Zhao, G., 1C
Zhao, Liya, 0E
Zhao, Yagebai, 2N
Zhu, An-Ding, 32
Zou, J., 0Q
Zu, Jean, 1S

Conference Committee

Symposium Chairs

Victor Giurgiutiu, University of South Carolina (United States)
Christopher S. Lynch, University of California, Los Angeles
(United States)

Symposium Co-chairs

Jayanth N. Kudva, NextGen Aeronautics, Inc. (United States)
Theodoros E. Matikas, University of Ioannina (Greece)

Conference Chair

Wei-Hsin Liao, The Chinese University of Hong Kong
(Hong Kong, China)

Conference Co-chairs

Gyuhae Park, Chonnam National University (Korea, Republic of)
Alper Erturk, Georgia Institute of Technology (United States)

Conference Program Committee

Gregory S. Agnes, Jet Propulsion Laboratory (United States)
Mehdi Ahmadian, Virginia Polytechnic Institute and State University
(United States)
Eric H. Anderson, Moog CSA Engineering (United States)
Hiroshi Asanuma, Chiba University (Japan)
Amr M. Baz, University of Maryland, College Park (United States)
Diann E. Brei, University of Michigan (United States)
Gregory P. Carman, University of California, Los Angeles
(United States)
Seung-Bok Choi, Inha University (Korea, Republic of)
William W. Clark, University of Pittsburgh (United States)
Alison B. Flatau, University of Maryland, College Park (United States)
Farhan S. Gandhi, Rensselaer Polytechnic Institute (United States)
Ephraim Garcia, Cornell University (United States)
Mehrdad N. Ghasemi-Nejhad, University of Hawai'i (United States)
Victor Giurgiutiu, University of South Carolina (United States)
Faramarz Gordaninejad, University of Nevada, Reno (United States)
Nakhiah C. Goulbourne, University of Michigan (United States)
Daniel J. Guyomar, Institut National des Sciences Appliquées de Lyon
(France)

Tristram T. Hyde, NASA Headquarters (United States)
Daniel J. Inman, University of Michigan (United States)
Conor D. Johnson, Moog CSA Engineering (United States)
Hyung-Jo Jung, KAIST (Korea, Republic of)
David L. Mascareñas, Los Alamos National Laboratory (United States)
Roger Ohayon, Conservatoire National des Arts et Métiers (France)
Mohammad Rastgaar Aagaah, Massachusetts Institute of Technology
 (United States)
Norbert Schwesinger, Technische Universität München (Germany)
Yi-Chung Shu, National Taiwan University (Taiwan)
Henry A. Sodano, University of Florida (United States)
Steve Southward, Virginia Polytechnic Institute and State University
 (United States)
Roger Stanway, The University of Sheffield (United Kingdom)
Jiong Tang, University of Connecticut (United States)
Dai-Hua Wang, Chongqing University (China)
Kon-Well Wang, University of Michigan (United States)
Norman M. Wereley, University of Maryland, College Park
 (United States)
Hwan-Sik Yoon, The University of Alabama (United States)
Lei Zuo, Virginia Polytechnic Institute and State University
 (United States)

Session Chairs

- 1 Energy Harvesting and Scavenging: Waves/Acoustics
Wei-Hsin Liao, The Chinese University of Hong Kong
 (Hong Kong, China)
Gyuhae Park, Chonnam National University (Korea, Republic of)
- 2 Magneto Rheological Systems I
Norman M. Wereley, University of Maryland, College Park
 (United States)
- 3 Energy Harvesting and Scavenging: Fluid-Structure Interaction
Alper Erturk, Georgia Institute of Technology (United States)
Henry A. Sodano, University of Florida (United States)
- 4 Biological-inspired Systems and Bio-MEMS
Gregory P. Carman, University of California, Los Angeles
 (United States)
- 5 Energy Harvesting and Scavenging: Broadband/Nonlinear I
Yi-Chung Shu, National Taiwan University (Taiwan)

- 6 Energy Harvesting and Scavenging: Broadband/Nonlinear II
Kon-Well Wang, University of Michigan (United States)
Mustafa H. Arafa, The American University in Cairo (Egypt)
- 7 Aircraft, MAV/UAV, and Morphing Systems
Alison B. Flatau, University of Maryland, College Park (United States)
Nam Seo Goo, Konkuk University (Korea, Republic of)
- 8A Energy Harvesting and Scavenging: Piezoelectrics/Electrects
Lei Zuo, Virginia Polytechnic Institute and State University
(United States)
- 8B Micro- and Nano-Integrated Systems
Matthew Bryant, North Carolina State University (United States)
- 9A SMA-Based Materials and Systems I
Darren Harli, Texas A&M University (United States)
Diann E. Brei, University of Michigan (United States)
- 9B Passive and Active Vibration Isolation Systems I
Andres F. Arrieta, ETH Zürich (Switzerland)
- 10A Energy Harvesting and Scavenging: General Piezoelectrics
Norbert Schwesinger, Technische Universität München (Germany)
Soobum Lee, University of Maryland, Baltimore County (United States)
- 10B Modeling, Optimization, Signal Processing, Sensing, Control, and
Design of Integrated Systems I
Jiong Tang, University of Connecticut (United States)
Mohammad H. Malakooti, University of Florida (United States)
- 11A Magneto Rheological Systems II
Seung-Bok Choi, Inha University (Korea, Republic of)
Majid Behrooz, University of Nevada, Reno (United States)
- 11B Piezo-based Materials and Systems
Alper Erturk, Georgia Institute of Technology (United States)
- 12A Modeling, Optimization, Signal Processing, Sensing, Control, and
Design of Integrated Systems II
Francesco Ripamonti, Politecnico di Milano (Italy)
- 12B Passive and Active Vibration Isolation Systems II
Steven R. Anton, Tennessee Technological University (United States)

- 13A Energy Harvesting and Scavenging: Applications
Ryan L. Harne, University of Michigan (United States)
Lihua Tang, The University of Auckland (New Zealand)
- 13B Passive and Active Vibration Isolation Systems III
Hiroshi Asanuma, Chiba University (Japan)
- 14A Energy Harvesting and Scavenging: General
Jeffrey L. Kauffman, University of Central Florida (United States)
- 14B Modeling, Optimization, Signal Processing, Sensing, Control, and Design of Integrated Systems III
Angeliki Papalou, Technological Educational Institute of Patras (Greece)
Yilan Zhang, University of Michigan (United States)
- 15A SMA-Based Materials and Systems II
Tadashige Ikeda, Nagoya University (Japan)
- 15B Passive and Active Vibration Isolation Systems IV
Dai-Hua Wang, Chongqing University (China)
Yilan Zhang, University of Michigan (United States)