Preface

Significant recent advancements in SHM technologies have motivated considerable work in the literature that is focused on providing information on the material state in terms of health and integrity on a real-time basis, and on assuring the safety of structures with high reliability through "big data" analytics and machining learning techniques. Therefore, the theme of the 11th International Workshop on Structural Health Monitoring (IWSHM) is "**Real-Time State Awareness and Data-Driven Safety Assurance**."

These proceedings include a collection of papers from the most recent SHM-related work presented at the 11th biennial International Workshop on Structural Health Monitoring on September 12-14, 2017. We have witnessed a considerable increase in the number of submitted abstracts compared to IWSHM 2015. However, due to space limitation, 401 papers were selected and included in the Workshop proceedings. The general topics span the areas of diagnostics and prognostics, environmental and operational effects, modeling and simulation, sensors and sensor networks, SHM-based structural design, signal processing, system identification and machine learning. The main applications include aerospace and civil structures, wind energy and oil/gas infrastructure, high-speed railway transportation, and autonomous vehicles.

Special topics were also organized to address novel concepts and emerging technologies in SHM. The committee would like to extend its appreciation to the Special Session organizers whose contributions are listed below:

Acoustic Emission and Hybrid SHM	V. Giurgiutiu (U South Carolina)
Assessment of the Value of SHM Information	S. Thöns (DTU), M. Todd (UCSD), M.P. Limongelli (Poli di Milano)
Diagnostics and Prognostics of Composite Structures Towards a Condition-based Maintenance Framework	D. Zarouchas (DELFT), T. Loutas (U Patras)
Distributed and Quasi-distributed Fiber-optic and Electrical Sensors, and Associated Data Analysis and Management	D. Zonta (U Strathclyde), B. Glisic (Princeton)
Dynamic Data Driven Applications Systems (DDDAS)	E. Blasch (AFOSR), F.-K. Chang (Stanford)
Guided Waves in Structures for SHM	W. Ostachowicz (PAS)

Multifunctional Materials and Structures	K. Loh (UCSD), D. Ryu (New Mexico Tech)
Probabilistic SHM	D. Zonta (U Strathclyde), B. Glisic (Princeton)
Recent Advances in Ultrasonics and Acoustic Emission Techniques for SHM/NDE	S. Salamone (U Texas at Austin)
Seismic Structural Health Monitoring for Civil Structures	M.P. Limongelli (Poli di Milano), M. Celebi (USGS)
SHM Applications to Medical Devices and Biological Systems	N. Salowitz (U Wisconsin), L. Salvino (ONR)
SHM Technology in Wind Turbines	W. Ostachowicz (PAS)
SHM within Harsh Extreme Environments	D. Senesky (Stanford), H. Huang (U Texas at Arlington)
Signal Processing for Health Monitoring of Structural and Biological Systems	Y. Zhang (Georgia Tech), J. Zhu (U Nebraska)
Structural Health Monitoring of High-speed and Intercity Railways	Y.-Q. Ni (HK Poly. U), C.-Y. Wang (National Central University)
Tomographic Methods for Spatial Sensing	K. Loh (UCSD), T. Tallman (Purdue)
Integration and Certification of SHM Technologies for Aircraft Applications	M. Buderath (Airbus)
Vision-based Studies for Structural Health Monitoring	M. Jahanshahi (Purdue)

This workshop is co-sponsored by the Air Force Office of Scientific Research (Les Lee and Jaimie Tiley) and Office of Naval Research (Ignacio Perez). Corporate sponsors are: Boeing, Airbus/Testia, and Embraer. The Workshop could not have been successfully organized without the support of the International Organizing Committee, which includes the following members:

International Organizing Committee

T. Kundu, University of Arizona, USA
F. Lanza di Scalea, UC San Diego, USA
H.Li, Harbin Institute of Technology, China
M.P. Limongelli, Politecnico di Milano, Italy
C. Lopes, UNESP, Brazil
J. Lynch, University of Michigan, Ann Arbor, USA
Y.Q. Ni, Hong Kong Polytechnic University, Hong Kong
W. Ostachowicz, Polish Academy of Sciences, Poland
P. Rizzo, University of Pittsburgh, PA, USA
M. Ruzzene, Georgia Tech, USA
S. Salamone, University of Texas, Austin, USA
N. Salowitz, University of Wisconsin, Milwaukee, USA
W. Staszewski, AHG University of Science and Technology, Poland
H. Sohn, KAIST, Korea
N. Takeda, University of Tokyo, Japan
K. Worden, University of Sheffield, UK
X. Qing, Xiamen University, China
D. Zonta, University of Strathclyde, UK

Industry
P. Anchieta da Silva, Embraer, Brazil
M. Buderath, Airbus Defense, Germany
C. Bockenheimer, Airbus, Germany
M. Davis, Sikorsky, USA
J.B. Ihn, Boeing Company, USA
A. Kumar, Acellent Technologies, USA
J. Pinsonnault, Bombardier, Canada
F. Rodriguez-Lence, Airbus, Spain
H. Speckmann, Testia GmbH (an Airbus Company), Germany
A.N. Srivastava, Verizon, USA
H. Voges, Honeywell, USA
H. Wenzel, VCE Holding GmbH, Austria

Government
H. Azari, Federal Highway Administration, USA
C. Boller, IZFP, Germany
K. Ding, China Special Equipment Inspection and Research Institute, China
C. Farrar, Los Alamos National Laboratory, USA
S. Galea, DSTO Australia, Australia
M. Haile, US Army Research Laboratory, USA
S. Huang, US Army, USA
B.L. Lee, Air Force Office of Scientific Research, USA
I. Perez, Office of Naval Research, USA
W. Prosser, NASA-Langley, USA
L. Salvino, Office of Naval Research, USA
P. Swindell, FAA, USA

The committee would also like to express its sincere appreciation for the dedication and support of the Workshop coordinators: Purim Ladpli (Workshop Manager), David Wang, Colleen Rosania, Yitao Zhuang, Cheng Liu, Xiyuan Chen, Tanay Topac, Anthony Bombik, Elliot Ransom, Chen Liu, Wyatt Smith, Molly Zhang, Srikar Srivatsa, Chirag Sachdeva, David Cooper, Kellan Chao, Sang Youl, Gyu Dong, Aaron Babia, Dr. Xi Chen,

Dr. Hailin Cao, and many volunteers. The committee would also like to express its gratitude to Barbara Briscoe and other staff members from the Department of Aeronautics and Astronautics at Stanford University for making this Workshop possible.

Fu-Kuo Chang
Organizing Chairman
Department of Aeronautics and Astronautics
Stanford University
Stanford, CA 94305, USA

Alfredo Güemes
Organizing Co-Chairman
E.T.S.I. Aeronauticos
Universidad Politecnica de Madrid
Madrid, Spain

September 12, 2017