

TECHNICAL PROGRAM

Overview

Update: 2011-08-24

Monday, September 12 th									
14:00 ~ 17:00	Early Registration							Location: Crowne Plaza Hotel Cabana, Palo Alto	
17:00 ~ 19:00	Reception							Location: Crowne Plaza Hotel Cabana, Palo Alto	

Tuesday, September 13 th									
	Room: HC 200-002	Room: HC 200-030	Room: HC 200-034	Room: HC 200-203	Room: HC 200-205	Room: HC 200-303	Room: HC 200-305	Room: ART 2	Room: ART 4
07:00 ~ 08:00	Registration							Location: Dohrmann Grove	
07:00 ~ 08:00	Light Continental Breakfast							Location: Dohrmann Grove	
08:00 ~ 08:10	Opening Remarks							Location: Memorial Auditorium	
08:10 ~ 08:40	Keynote 1							Location: Memorial Auditorium	
08:40 ~ 09:10	Keynote 2							Location: Memorial Auditorium	
09:10 ~ 09:40	Keynote 3							Location: Memorial Auditorium	
09:40 ~ 10:00	Coffee Break							Location: Dohrmann Grove	
10:00 ~ 12:00	Aerospace Structures: Field Evaluation and Validation - I	Sensors and Actuators Development - I	SPECIAL SESSION Bio-inspired Sensing and Actuation Technology - I Chairs: J. Lynch, K. Loh	Prognostics and Data Mining for Health Management - I	Advanced Diagnostics for Damage Assessment - I	SPECIAL SESSION Wind Turbines Monitoring - I Chair: W. Staszewski	Operational Effects Consideration in SHM - I	Civil Infrastructures: Laboratory Demonstration - I	SPECIAL SESSION Monitoring of Civil Engineering Structures with MEMS - I Chairs: C. Grosse, J. Lynch
11:00 ~ 14:05	Poster Sessions							Location: Dohrmann Grove	
12:00 ~ 13:00	Lunch at the Oval							Location: The Oval	
13:00 ~ 14:05	Poster Sessions: Q & A							Location: Dohrmann Grove	
14:05 ~ 15:45	Aerospace Structures: Field Evaluation and Validation - II	Sensors and Actuators Development - II	SPECIAL SESSION Bio-inspired Sensing and Actuation Technology - II Chairs: J. Lynch, K. Loh	SPECIAL SESSION Hot Spot Monitoring - I Chairs: H. Sohn, J.-B. Ihn, M. Leonard	Advanced Diagnostics for Damage Assessment - II	SPECIAL SESSION Wind Turbines Monitoring - II Chair: W. Staszewski	Operational Effects Consideration in SHM - II	Civil Infrastructures: Laboratory Demonstration - II	SPECIAL SESSION Monitoring of Civil Engineering Structures with MEMS - II Chairs: C. Grosse, J. Lynch
15:45 ~ 16:00	Coffee Break							Location: Dohrmann Grove	
16:00 ~ 17:15	Panel Discussion: Aerospace							Location: Memorial Auditorium	
18:30 ~ 22:00	SHM Networking Welcome Night							Location: Frost Amphitheater	

Wednesday, September 14 th									
	Room: HC 200-002	Room: HC 200-030	Room: HC 200-034	Room: HC 200-203	Room: HC 200-205	Room: HC 200-303	Room: HC 200-305	Room: ART 2	Room: ART 4
08:00 ~ 08:30	Light Continental Breakfast							Location: Dohrmann Grove	
08:30 ~ 09:00	Keynote 4							Location: Memorial Auditorium	
09:00 ~ 09:30	Keynote 5							Location: Memorial Auditorium	
09:30 ~ 10:00	Keynote 6							Location: Memorial Auditorium	
10:00 ~ 10:20	Coffee Break							Location: Dohrmann Grove	
10:20 ~ 12:00	Aerospace Structures: Field Evaluation and Validation - III & AISC-Guidebook Development Panel Session (30 min)	Sensors and Actuators Development - III	SPECIAL SESSION Hot Spot Monitoring - II Chairs: H. Sohn, J.-B. Ihn, M. Leonard	SPECIAL SESSION Verification and Validation of Damage Sensing - I Chair: E. Medina	Advanced Diagnostics for Damage Assessment - III	Prognostics and Data Mining for Health Management - II	Novel Signal Processing Techniques - I	Civil Infrastructures: Field Evaluation and Validation - I	SPECIAL SESSION Advanced SHM for Ship Structures Chair: L. Salvino
12:00 ~ 13:00	Lunch at the Oval							Location: The Oval	
13:00 ~ 14:20	Aerospace Structures: Laboratory Demonstration - I	Sensors and Actuators Development - IV	SPECIAL SESSION Hot Spot Monitoring - III Chairs: H. Sohn, J.-B. Ihn, M. Leonard	SPECIAL SESSION Verification and Validation of Damage Sensing - II Chair: E. Medina	SPECIAL SESSION Intelligent Sensor Networks for SHM - I Chairs: J. Lynch, A. Swartz	Prognostics and Data Mining for Health Management - III	Novel Signal Processing Techniques - II	Civil Infrastructures: Field Evaluation and Validation - II	Advanced Monitoring for Load / Environments
14:20 ~ 14:40	Coffee Break							Location: Dohrmann Grove	
14:40 ~ 17:00	SHM in Action							Location: Memorial Auditorium	
18:30 ~ 22:00	Banquet and Award Night							Location: Crowne Plaza Hotel Cabana, Palo Alto	

Thursday, September 15 th									
	Room: HC 200-002	Room: HC 200-030	Room: HC 200-034	Room: HC 200-203	Room: HC 200-205	Room: HC 200-303	Room: HC 200-305	Room: ART 2	Room: ART 4
08:00 ~ 08:30	Light Continental Breakfast							Location: Dohrmann Grove	
08:30 ~ 09:00	Keynote 7							Location: Memorial Auditorium	
09:00 ~ 09:30	Keynote 8							Location: Memorial Auditorium	
09:30 ~ 10:00	Coffee Break							Location: Dohrmann Grove	
10:00 ~ 12:00	Aerospace Structures: Laboratory Demonstration - II	SPECIAL SESSION Structural Health Monitoring of Wind Turbines Chair: J. R. White	SPECIAL SESSION Intelligent Sensor Networks for SHM - II Chairs: J. Lynch, A. Swartz	SPECIAL SESSION Wave Propagation Simulation - I Chairs: W. Staszewski, W. Ostachowicz	Advanced Diagnostics for Damage Assessment - IV	SPECIAL SESSION Decision Making in Structural Health Monitoring - I Chairs: D. Zonta, M. Todd	Novel Signal Processing Techniques - III	SPECIAL SESSION SHM Benchmark for High-rise Structures - I Chair: Y.Q. Ni	SPECIAL SESSION Non-contact Sensing Technologies - I Chair: H. Sohn
12:00 ~ 13:20	Lunch at the Oval							Location: The Oval	
12:00 ~ 13:20	Faculty / Student Panel							Location: TBA	
13:20 ~ 15:20	Aerospace Structures: Laboratory Demonstration - III	Quantification / Validation / Certification	SPECIAL SESSION Intelligent Sensor Networks for SHM - III Chairs: J. Lynch, A. Swartz	SPECIAL SESSION Wave Propagation Simulation - II Chairs: W. Staszewski, W. Ostachowicz	Advanced Diagnostics for Damage Assessment - V	SPECIAL SESSION Decision Making in Structural Health Monitoring - II Chairs: D. Zonta, M. Todd	Modeling / Simulation	SPECIAL SESSION SHM Benchmark for High-rise Structures - II Chair: Y.Q. Ni	SPECIAL SESSION Non-contact Sensing Technologies - II Chair: H. Sohn
15:20 ~ 15:35	Coffee Break							Location: Dohrmann Grove	
15:35 ~ 17:00	Panel Discussion: Civil & Mech. Systems							Location: TBA	

TECHNICAL PROGRAM

Tuesday, September 13th

07:00 ~ 08:00	Registration <i>Location: Dohrmann Grove</i>	
---------------	--	--

07:00 ~ 08:00	Light Continental Breakfast <i>Location: Dohrmann Grove</i>	
---------------	---	--

Opening Remarks

TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
08:00 ~ 08:10	Brad G. Osgood Senior Associate Dean for Student Affairs in the School of Engineering at Stanford University <i>Location: Memorial Auditorium</i>	

Keynotes

Chair: A. Srivastava (NASA Ames, USA) **Location:** Memorial Auditorium

TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
08:10 ~ 08:40	Integration of Structural Health Monitoring Systems into Unmanned Aerial Systems - Challenges and Opportunities Matthias Buderath [Cassidian, Germany]	
08:40 ~ 09:10	The Journey to Incorporate Health Monitoring and Condition Based Maintenance Jim Cycon [Sikorsky, USA]	
09:10 ~ 09:40	The Challenges of Structural Health Monitoring Technologies in Civil Infrastructure H. Felix Wu [NIST, USA]	

09:40 ~ 10:00	Coffee Break <i>Location: Dohrmann Grove</i>	
---------------	--	--

Poster Sessions

TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
09:40 ~ 14:05	Poster Session & Special Poster Session: NIST Technology Innovation Program (TIP) <i>Location: Dohrmann Grove</i>	

Aerospace Structures: Field Evaluation and Validation - I

Chair: C. Stolz (Cassidian, Germany), J. Miller (NASA Marshall, USA) **Location:** HC 200-002

TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
10:00 ~ 10:20	Real-Time Micro-Explosive Damage Detection in an Unmanned Rotorcraft Vehicle Using Embedded Sensing H. Edge ¹ , H. Chung ² , M. Coatney ¹ , B. Mary ¹ , P. Tibbits ¹ , M. Murugan ¹ , A. Ghoshal ¹ , D. Le ¹ , M. Pappakostas ² [1] Army Research Laboratory, USA; 2) Acellent Technologies, Inc., USA]	
10:20 ~ 10:40	Comparisons of SHM Sensor Models with Test Data for Sandwich Composite Structures V. Hafiychuk ¹ , D. G. Luchinsky ¹ , V. N. Smelyanskiy ¹ , R. Tyson ² , J. Miller ³ , C. Banks ³ [1] NASA Ames Research Center, USA; 2) University of Alabama, USA; 3) NASA Marshall Space Flight Center, USA]	

10:40 ~ 11:00	Large Sensor Network Architectures for Monitoring Large-Scale Structures D. Zhang, B. Zheng, H. Chung, S. Banerjee, S. Beard, I. Li [Acellent Technologies Inc., USA]	
11:00 ~ 11:20	Overview of CVM Technology Tests Performed by Embraer R. P. Rulli, P. A. da Silva [Embraer S.A. Lima, Brazil]	
11:20 ~ 11:40	Advanced System-Level Reliability Analysis and Prediction with Field Data Integration T. Meyer ¹ , J. Berg ¹ , A. Palladino ¹ , Avinash Sarlashkar ¹ , S. Hussain ² , D. Lamb ² [1) Impact Technologies, USA; 2) US Army RDECOM-TARDEC, USA]	
11:40 ~ 12:00	Development and Testing of an Ultrasonic Phased Array System Based on Piezo Actuators and Fiber Optic Sensors M. Scheerer ¹ , C. Bockenheimer ² , A. Dante ³ , Z. Djino ⁴ , F. Graf ⁵ , T. Natschlager ⁶ , A. Peldszus ⁷ , M. Reiterer ⁸ , T. Sauter ⁹ , R. Stössel ¹⁰ [1) Aerospace & Advanced Composites GmbH, Austria; 2) Airbus, USA; 3) Profactor, Austria; 4) Integrated Microsystems Austria GmbH, Austria; 5) Joanneum research, Austria; 6) Software Competence Center Hagenberg, Austria; 7) FACC, Austria; 8) RED Bernard, Austria; 9) ÖAW, Austria; 10) EADS Innovation Works, Germany]	

Sensors and Actuators Development - I		
Chair: I. Oppenheim (Carnegie Mellon University, USA), P. Qing (Acellent Technologies Inc., USA)		Location: HC 200-030
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
10:00 ~ 10:20	Flexible Integration Techniques for Wireless Sensors Network Deployment: Application to Aircraft Structure Health Monitoring D. Dragomirescu, M. M. Jatlaoui, S. Charlot, T. Beluch, P. Pons, H. Aubert, R. Plana [University of Toulouse, France]	
10:20 ~ 10:40	On-Board Structural Health Monitoring (OBSHM) Smart Tag N. Agianniotis ¹ , C. Papadas ¹ , P. Anagnostopoulos ¹ , V. Rouet ² , B. Foucher ² [1) Integrated Systems Development ISD S.A., Maroussi, Greece; 2) EADS France]	
10:40 ~ 11:00	Highly Nonlinear Granular Crystal Sensor and Actuator for Delamination Detection in Composite Structures J. Yang ¹ , F. Restuccia ² , C. Daraio ³ [1) University of South Carolina, USA; 2) University of Edinburgh, UK; 3) California Institute of Technology, USA]	
11:00 ~ 11:20	The Implementation of Piezoelectric Wafer Sensors for Acoustic Emission Sensing in Aluminum D. Ozevin ¹ , Z. Li ² [1) University of Illinois at Chicago, USA; 2) Xi'an Aircraft Strength Institute, China]	
11:20 ~ 11:40	Diagnosis of Internal Defect of a Pipe by Mechanoluminescent Sensor S. Guo ¹ , C.-N. Xu ^{1,2} , D. Ono ¹ [1) National Institute of Advanced Industrial Science and Technology, Japan; 2) Japan Science and Technology Agency, Japan]	
11:40 ~ 12:00	Development of an Integrated Fiber Bragg Grating Contact Pressure and Temperature Sensor for Composite Smart Manufacturing L. Maurin ¹ , P. Ferdinand ¹ , L. Robert ² , J.-J. Orteu ² [1) CEA, LIST, France; 2) Université de Toulouse, France]	

SPECIAL SESSION		
Bio-inspired Sensing and Actuation Technology - I		
Chairs: J. Lynch (Univ. of Michigan, USA), K. Loh (UC Davis, USA)		
Chair: J. Lynch (University of Michigan, USA), K. Loh (UC Davis, USA)		Location: HC 200-034
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
10:00 ~ 10:20	Cochlea-Based Spectral Decomposition of Sensor Signals for Resource-Constrained Sensor Networks C. A. Peckens, J. P. Lynch [University of Michigan, USA]	
10:20 ~ 10:40	Bio-inspired Smart Skin based on Expandable Network Z. Guo, K. Kim, G. Lanzara, N. Salowitz, P. Peumans, and F.-K. Chang [Stanford University, USA]	
10:40 ~ 11:00	Integrated Piezo-Element Drive Electronics for Structural Health Monitoring Y. Guo, B. Murmann [Stanford University]	
11:00 ~ 11:20	Micropillar Sensing Element for Bio-Inspired Flow Sensors J. Tao, X. Yu, J. Berilla [Case Western Reserve University, USA]	
11:20 ~ 11:40	A Bio-Inspired Nanocomposite for Photocurrent-based Strain Sensing D. Ryu, K. J. Loh [University of California, Davis, USA]	
11:40 ~ 12:00	Improving the Reliability of Sensor Skins for Structural Health Monitoring I. Mohammad, H. Huang [University of Texas at Arlington, USA]	

Prognostics and Data Mining for Health Management - I

Chair:

C. Farrar (Los Alamos National Laboratory, USA)

Location:

HC 200-203

TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
10:00 ~ 10:20	Prognostic Modeling and Experimental Techniques for Electrolytic Capacitor Health Monitoring C. Kulkarni ¹ , J. Celaya ² , G. Biswas ¹ , K. Goebel ² [1] Vanderbilt University, USA; 2) NASA Ames, USA]	
10:20 ~ 10:40	Improving the Accuracy of Structural Fatigue Life Tracking Through Dynamic Strain Sensor Calibration H. Lee ¹ , J. Sheldon ¹ , M. Watson ¹ , C. Palmer ¹ , T. Fallon ² [1] Impact Technologies, LLC., USA; 2) Naval Air Systems Command, USA]	
10:40 ~ 11:00	A 9-Step Process for Developing a Structural Health Monitoring System S. Graves ¹ , K. Rens ² , F. Rutz ² [1] Structure Inspection and Monitoring, Inc., USA; 2) University of Colorado Denver, USA]	
11:00 ~ 11:20	Combined and I Indices Based on Principal Component Analysis for Damage Detection and Localization D. A. Tibaduiza, L. E. Mujica, M. Anaya, J. Rodellar [Universitat Politècnica de Catalunya, Spain]	
11:20 ~ 11:40	An Experimental and Numerical Investigation of Damage Detection in a Mistuned Bladed Disc A. U. Rehman, K. Worden, J. A. Rongong [University of Sheffield, UK]	
11:40 ~ 12:00	Fatigue Evaluation and Prognosis for Steel Bridges with Remote Acoustic Emission Monitoring J. Yu, P. Ziehl [University of South Carolina, USA]	

Advanced Diagnostics for Damage Assessment - I

Chair:

M. Bach (EADS Innovation Works, Germany), T. Stepinski (Uppsala University, Sweden)

Location:

HC 200-205

TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
10:00 ~ 10:20	Damage Diagnosis Algorithm for Civil Structures Using a Sequential Change Point Detection Method and Time-Series Analysis H. Y. Noh, R. Rajagopal, A. S. Kiremidjian [Stanford University, USA]	
10:20 ~ 10:40	Cointegration and SHM of Bridges E. J. Cross, K. Worden, K.-Y. Koo, J. M. W. Brownjohn [University of Sheffield, UK]	
10:40 ~ 11:00	Piezoceramic-Based 2-D Spiral Phased Array for Damage Detection of Thin Orthotropic Composite Laminates B. Yoo, D. J. Pines [University of Maryland, USA]	
11:00 ~ 11:20	Guided Wave and Probability Based Diagnostic Imaging for Detection of Multiple Welding Damages in Welded Tubular Steel Structures X. Lu ¹ , M. Lu ² , L. Zhou ² , Z. Su ² , L. Cheng ² , L. Ye ³ , G. Meng ¹ [1] Shanghai Jiao Tong University, China; 2) Hong Kong Polytechnic University, Hong Kong SAR; 3) University of Sydney, Australia]	
11:20 ~ 11:40	Nonlinear Cointegration as a Combinatorial Optimisation Problem E. J. Cross, K. Worden [University of Sheffield, UK]	
11:40 ~ 12:00	Characterizing Damage Based on Locally Perturbed Dynamic Equilibrium H. Xu, L. Cheng and Z. Su [The Hong Kong Polytechnic University, Hong Kong]	

SPECIAL SESSION

Wind Turbines Monitoring - I

Chair: W. Staszewski (Sheffield University, UK)

Chair:

W. Staszewski (Sheffield University, UK), M. Wang (Northeastern University, USA)

Location:

HC 200-303

TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
10:00 ~ 10:20	Coupling Sensor-Based Structural Health Monitoring with Finite Element Model Updating for Probabilistic Lifetime Estimation of Wind Energy Converter Structures D. Hartmann ¹ , K. Smarsly ² , K. H. Law ² [1] Ruhr-University Bochum, Germany; 2) Stanford University, USA]	
10:20 ~ 10:40	Aspects of Automatization of Wind Farm Monitoring on the Example of a Diagnostic Center T. Barszcz, A. Jablonski [AGH University of Science and Technology, Poland]	
10:40 ~ 11:00	In-Operation Identification of a Wind Turbine Structure via Non-Stationary Parametric Models L. D. Avendaño-Valencia, M. D. Spiridonakos, S. D. Fassois [University of Patras, Greece]	

11:00 ~ 11:20	Structural Integrity Monitoring of the Critical Zones in the Wind Turbine Composite Blades with the use of Integrated Sensors - SESS Project A. Hanc ¹ , K. Dragan ² , M. McGugan ³ , T. Uhl ⁴ [1) EC Electronics, Poland; 2) Air Force Institute of Technology, Poland; 3) Materials Research Division, Risø National Laboratory for Sustainable Energy, Technical University of Denmark, Denmark; 4) AGH University of Science and Technology, Poland]	
11:20 ~ 11:40	Lightning Protected Monitoring System for Wind Turbine Rotor Blades B. Frankenstein ¹ , L. Schubert ¹ , E. Schulze ¹ , D. Fischer ¹ , B. Weihnacht ¹ , R. Rieske ² [1) Fraunhofer IZFP-Dresden, Germany; 2) Technical University Dresden, IAVT, Germany]	
11:40 ~ 12:00	Appropriate Rigid Body Correction for Analyzing the Dynamics of Rotating Structures using 3D Digital Photogrammetry T. Lundstrom, C. Niezrecki, P. Avitabile [The University of Massachusetts, USA]	

Operational Effects Consideration in SHM - I		
Chair: R. Brennan (US Army Research Laboratory, USA), A. del Grosso (University of Genoa, Italy)		Location: HC 200-305
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
10:00 ~ 10:20	A View into Baseline Free Guided Wave Approaches for Structural Health Monitoring U. Lieske, C. Boller [Fraunhofer Institute for Non-Destructive-Testing, Dresden, Germany]	
10:20 ~ 10:40	Physics Based Temperature Compensation Strategy for Structural Health Monitoring S. Roy, K. Lonkar, V. Janapati, F.-K. Chang [Stanford University, USA]	
10:40 ~ 11:00	Load-Enhanced Imaging of Fatigue Cracks via Sparse Guided Wave Arrays J. E. Michaels, S. J. Lee, X. Chen, T. E. Michaels [Georgia Institute of Technology, USA]	
11:00 ~ 11:20	An Efficient Temperature Compensation Technique for Guided Wave Ultrasonic Inspection J.B. Harley, J.M.F. Moura [Carnegie Mellon University, USA]	
11:20 ~ 11:40	Mystery Revealed on Natural Frequency Change of a Structure During Rainstorms M. H. Cheng, V. Heckman, T. Heaton [California Institute of Technology, USA]	
11:40 ~ 12:00	Influence of Environment Condition on the Group Velocity of the Lamb Wave for SHM System K. Takahashi ¹ , H. Soejima ¹ , T. Ogisu ¹ , Y. Okabe ² , N. Takeda ² , Y. Koshioka ³ [1) Fuji Heavy Industries Ltd., Aerospace Company, Japan; 2) University of Tokyo, Japan; 3) RIMCOF Research Center of Advanced Materials and Composites, Japan]	

Civil Infrastructures: Laboratory Demonstration - I		
Chair: F. Casciati (University of Pavia, Italy), A. Holst (TU Braunschweig, Germany)		Location: ART 2
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
10:00 ~ 10:20	Sensing Resolution and Measurement Range of a Passive Wireless Strain Sensor X. Yi, T. Wu, G. Lantz, J. Cooper, C. Cho, Y. Wang, M. M. Tentzeris, R. T. Leon [Georgia Institute of Technology, USA]	
10:20 ~ 10:40	Ultrasonic Wall Thickness Monitoring at High Temperatures (>500 °C) F. Cegla ¹ , P. Cawley ¹ , J. Allin ² , J. Davies ² [1) Imperial College, UK; 2) Permasense Ltd, UK]	
10:40 ~ 11:00	Early Detection of Fatigue Damage in Notched and Welded Steel Structures Using Active Thermography R. Plum, T. Ummenhofer [Karlsruhe Institute of Technology, Germany]	
11:00 ~ 11:20	A Wavelet Based Methodology for Damage Detection and Severity Assessment on the ASCE Benchmark Structure Using Phase II Experimental Data M. Jamal-Ahmad, J. Carter [Imperial College, UK]	
11:20 ~ 11:40	Integrate On-line RSSA and RSSI-COV Algorithms for Operational Modal Analysis of Bridge Structures C.-H. Loh, Y.-C. Liu, F.-M. Wu [National Taiwan University, Taiwan]	
11:40 ~ 12:00	Crack Growth Monitoring System for Concrete Structures Based on Non-contact Displacement Measurements T. Kusaka, Y. Nomura, T. Sakamoto, T. Fujii [Ritsumeikan University, Japan]	

SPECIAL SESSION		
Monitoring of Civil Engineering Structures with MEMS - I Chairs: C. Grosse (TU Munich, Germany), J. Lynch (Univ. of Michigan, USA)		
Chair: C. Grosse (TU Munich, Germany)		Location: ART 4
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
10:00 ~ 10:20	Fiber Optic Method for Buried Pipelines Health Assessment after Earthquake-Induced Ground Movement B. Glisic, Y. Yao, K. Oberste-Ufer [Princeton University, USA]	
10:20 ~ 10:40	Decentralized Fault Detection in Wireless Sensor Networks C. Lo, M. Liu, J. P. Lynch [University of Michigan, USA]	
10:40 ~ 11:00	Framework for Comparison Study of Stochastic Modal Identification Considering Accuracy and Efficiency M. Chang, S. N. Pakzad, C. Schanck [Lehigh University, USA]	
11:00 ~ 11:20	Automated System Identification and Validation of Numerical Models of Offshore Wind Turbines as Basis for SHM-Analysis M. W. Häckell, G. Haake, R. Rolfes [University of Hannover, Germany]	
11:20 ~ 11:40	Novel Sensor Concept for Monitoring of Wind Turbine Blades S. Zerbst ¹ , R. Rolfes ¹ , K. H. Haase ² , M. Knops ³ [1) University of Hannover, Germany; 2) HBM - Hottinger Baldwin Messtechnik GmbH, Germany. 3) REpower Systems AG, Germany]	
11:40 ~ 12:00	Laboratory Validation of MEMS-Based Sensors for Post-Earthquake Damage Assessment D. Zonta ¹ , D. Trapani ¹ , F. Larcher ¹ , A. Amditis ² , M. Bimpas ² , N. Bertsch ³ , A. Garetsos ⁴ , Y. Stratakos ⁴ , N. Saillen ⁵ , J. Santana ⁶ , T. Sterken ⁷ , T. Torfs ⁸ , D. Ulieru ⁹ [1) University of Trento, Italy; 2) National Technical University of Athens, Greece; 3) Memscap SA, France; 4) Advanced Microwave Systems Ltd., Greece; 5) Thermo Fisher Scientific, The Netherlands; 6) IMEC-NL, The Netherlands; 7) IMEC Ghent, Center for Microsystem Technology, Belgium; 8) IMEC, Belgium; 9) SITEX 45 SRL, Romania]	
12:00 ~ 13:00	Lunch at the Oval <i>Location: The Oval</i>	
Poster Sessions: Q & A		
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
13:00 ~ 14:05	Poster Session & Special Poster Session: NIST Technology Innovation Program (TIP) <i>Location: Dohrmann Grove</i>	
Aerospace Structures: Field Evaluation and Validation - II		
Chair: R. Ross (NASA Langley, USA)		Location: HC 200-002
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
14:05 ~ 14:25	Damage Detection Method for CFRP Bolted Joints using Embedded BOCDA Optical Fiber Sensor N. Saito ¹ , T. Yari ¹ , K. Nagai ¹ , K. Enomoto ² [1) Mitsubishi Heavy Industries, LTD., Japan; 2) RIMCOF Research Center of Advanced Metals and Composites, The Material Process Technology Center, Japan]	
14:25 ~ 14:45	Development of the Simultaneous Measurement System for Strain and Acoustic Emission using a Fiber Bragg Grating Sensor and a Fiber Ring Laser T. Nakajima ¹ , E. Sato ² , H. Tsuda ³ , A. Sato ⁴ , N. Kawai ² , H. Kawasaki ¹ [1) IHI Inspection & Instrumentation Co., Ltd, Japan; 2) Institute of Space and Astronautical Science, JAXA, Japan; 3) National Institute of Advanced Industrial Science & Technology, Japan; 4) IHI Aerospace Co. Ltd, Japan]	
14:45 ~ 15:05	Wireless and Batteryless Accelerometry for Aircraft Structural Health Monitoring R. Montheard ^{1,2} , C. Escriba ^{1,2} , J.-Y. Fourniols ^{1,2} , M. Lastapis ^{1,2} , J.-M. Prunet ³ , M. Bafleur ^{1,2} , J.-M. Dilhac ^{1,2} [1) CNRS, France; 2) Université de Toulouse, France; 3) Tag Technologies, France]	

15:05 ~ 15:25	Flight Data from an Airworthy Structural Health Monitoring System for an Unmanned Air Vehicle using Integrally Embedded Fiber Optic Sensors N. Gupta ¹ , Augustin M. J. ¹ , S. Sathya ¹ , R. Sundaram ¹ ; M. H. Prasad ² , A. C. R. Pillai ³ ; S. Gali ⁴ ; J. Balter, P. Guedj ⁴ , I. Kressel ⁴ ; A. Hendleman ⁵ , Y. Botsev ⁵ , N. Gorbato ⁵ , M. Tur ⁵ [1) National Aerospace Laboratories, India; 2) Aeronautical Development Establishment, India; 3) Consultant, Israel; 4) AI Engineering Division Ben Gurion International Airport, Israel; 5) Tel-Aviv University, Israel]	
15:25 ~ 15:45	Algorithms to Monitor Damaging Events on a Plane Blade with an Autonomous Embedded Microsystem M. Lastapis ^{1,2} , C. Escriva ^{1,2} , J.-Y. Fourniols ^{1,2} [1) CNRS, France; 2) Université de Toulouse, France]	

Sensors and Actuators Development - II		
Chair: V. Smelyanskiy (NASA Ames, USA)		Location: HC 200-030
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
14:05 ~ 14:25	Development and Qualification of FBG-based Strain Patches and Rosettes N. Kusche, V. G. Schukar, C. Schilder, E. Köppe, W. R. Habel [Federal Institute for Materials Research and Testing BAM, Germany]	
14:25 ~ 14:45	Characterization of Ultrasound Detection Using a Strain-Insensitive FBG Sensing System Incorporating Fiber Ring Laser H. Tsuda [National Institute of Advanced Industrial Science and Technology, Japan]	
14:45 ~ 15:05	Improved Sensor Concepts for Durability Monitoring of Reinforced Concrete Structures A. Holst, H. Budelmann, H.-J. Wichmann [University of Braunschweig, Germany]	
15:05 ~ 15:25	Photoacoustic Ultrasound Generation on an Optical Fiber Tip Using Gold Nanoparticles as the Target Material N. Wu, Y. Tian, X. Zou, X. Wang [University of Massachusetts Lowell, USA]	
15:25 ~ 15:45	Properties of Interdigital Transducers for Lamb-wave Based SHM Systems M. Manka ¹ , M. Rosiek ¹ , A. Martowicz ¹ , T. Uhl ¹ , T. Stepinski ² [1) AGH University of Science and Technology, Poland; 2) Uppsala University, Sweden]	

SPECIAL SESSION		
Bio-inspired Sensing and Actuation Technology - II		
Chairs: J. Lynch (Univ. of Michigan, USA), K. Loh (UC Davis, USA)		
Chair: K. Loh (UC Davis, USA)		Location: HC 200-034
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
14:05 ~ 14:25	Bio-inspired Computing Algorithms for Adaptive Structural Health Monitoring W. Liu, B. Chen [Michigan Technological University, USA]	
14:25 ~ 14:45	Field Validation of Flexure-Based Mobile Sensing Nodes on a Space Frame Bridge D. Zhu, J. Guo, Y. Wang, K. M. Lee [Georgia Institute of Technology, USA]	
14:45 ~ 15:05	Development of a Bio-inspired Bridge Health Monitoring System T. K. Lin ¹ , C. A. Tsai ² , M. Y. Shen ² , K. C. Chang ² , C. S. Lin ¹ [1) National Center for Research on Earthquake Engineering, Taiwan; 2) National Taiwan University, Taiwan]	
15:05 ~ 15:25	Towards Autonomous Wireless Sensors Systems in Civil Engineering. Paving the Way to an "Energy Oriented Design Method" V. L. Cam ¹ , M. Lossec ² , R. L. Maulf ¹ , L. Lemarchand ¹ , W. Martin ¹ , M. Le Pen ¹ [1) IFSTTAR, France; 2) ENS-Cachan/Bretagne, France]	
15:25 ~ 15:45	Radar Sensor based Accurate Tumor Tracking for Respiratory-Gated Lung Cancer Radiotherapy C. Gu ¹ , R. Li ² , X. Yang ³ , C. Li ¹ , S. B. Jiang ⁴ [1) Texas Tech University, USA; 2) Stanford University, USA; 3) University of Florida, USA; 4) University of California San Diego, USA]	

SPECIAL SESSION		
Hot Spot Monitoring - I		
Chairs: H. Sohn (KAIST, Korea), J.-B. Ihn (Boeing, USA), M. Leonard (AFRL, USA)		
Chair: H. Sohn (KAIST, Korea), J.-B. Ihn (Boeing, USA)		Location: HC 200-203
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
14:05 ~ 14:25	Development and Performance Quantification of an Ultrasonic Structural Health Monitoring System for Monitoring Fatigue Cracks on a Complex Aircraft Structure J.-B. Ihn ¹ , L. Pado ² , M. S. Leonard ³ , M. P. DeSimio ⁴ , S. E. Olson ⁴ [1] Boeing Research & Technology, USA; 2) Information Technology, USA; 3) Air Force Research Laboratory, Wright-Patterson AFB, USA; 4) University of Dayton Research Institute, USA]	
14:25 ~ 14:45	Hot-Spot Fatigue and Impact Damage Detection on a Helicopter Tailboom P. Qing ¹ , H. Wilson ² , A. G. Baines ² , N. Bordick ³ , S. Banerjee ¹ , H. Chung ¹ , S. Beard ¹ , M. Pappakostas ¹ [1] Acellent Technologies, Inc., USA; 2) Bell Helicopters Textron Inc., USA; 3) Aviation Applied Technology Directorate, USA]	
14:45 ~ 15:05	Damage Identification in Structural Components using Vibration and Wave Propagation Data S. Banerjee ¹ , F. Ricci ² , E. Monaco ² , A. Ma ³ [1] Indian Institute of Technology Bombay, India; 2) University of Naples, Italy; 3) University of California Los Angeles, USA]	
15:05 ~ 15:25	Damage Detection Techniques in Composite Structures Using Ultrasonic Guided Waves F. Ricci ¹ , E. Monaco ¹ , L. Lecce ¹ , S. Banerjee ² , A. K. Ma ³ [1] University of Naples Federico II, Italy; 2) Indian Institute of Technology Bombay, India; 3) University of California Los Angeles, USA]	
15:25 ~ 15:45		

Advanced Diagnostics for Damage Assessment - II		
Chair: H. Weiland (Alcoa, USA)		Location: HC 200-205
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
14:05 ~ 14:25	Robust Diagnostics for Bayesian Compressive Sensing Technique in Structural Health Monitoring Y. Huang ¹ , J. L. Beck ¹ , S. Wu ² , H. Li ² [1] Harbin Institute of Technology, P.R.China; 2) California Institute of Technology, USA]	
14:25 ~ 14:45	Damage Monitoring and Evaluation for Building Structures Based on Measurement of Relative Story Displacements by Noncontact-Type Sensors T. Hatada ¹ , M. Takahashi ¹ , R. Katamura ¹ , H. Hagiwara ¹ , I. Matsuya ² , K. Kanekawa ² , Y. Nitta ³ , A. Nishitani ² [1] Kajima Corporation, Japan; 2) Waseda University, Japan; 3) Ashikaga Institute of Technology, Japan]	
14:45 ~ 15:05	Joint Condition Identification with Partially Measured Frequency Response Function M. Wang, G. Zheng [Tsinghua University, China]	
15:05 ~ 15:25	Multi-classifier Fusion Method Based on the Reliability of the Individual Classifiers L. Al-Shrouf, D. Soeffker [University of Duisburg-Essen, Germany]	
15:25 ~ 15:45	Validation of a Hybrid Automated Modal Identification Algorithm for Structural Health Monitoring Applications C. Rainieri, G. Fabbrocino [University of Molise, Italy]	

SPECIAL SESSION		
Wind Turbines Monitoring - II		
Chair: W. Staszewski (Sheffield University, UK)		
Chair: M. Wang (Northeastern University, USA), W. Staszewski (Sheffield University, UK)		Location: HC 200-303
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
14:05 ~ 14:25	Integrated Sensor System for Structural Integrity and Load Monitoring of Wind Turbines T. Arsenault ¹ , A. Achuthan ¹ , P. Marzocca ¹ , D. Anguiano ² , D. Cardenas ² , H. Elizalde ² , O. Probst ² , G. Coppotelli ³ [1] Clarkson University, USA; 2) Tecnológico de Monterrey, México; 3) University of Rome, Italy]	
14:25 ~ 14:45	A Full-scale Fatigue Test of 9-m CX-100 Wind Turbine Blades G. Park, K. M. Farinholt, S. G. Taylor, C. R. Farrar [Los Alamos National Laboratory, USA]	
14:45 ~ 15:05	Assessment of Structural Monitoring Techniques for a Small Wind Turbine Test Stand S. Manzato ¹ , M. Luczak ² , M. Firla ¹ , B. Peeters ¹ [1] LMS International, Belgium; 2) Polish Academy of Sciences, Poland]	

15:05 ~ 15:25	Structural Health Monitoring: An End User's Point of View P. Stephan, G. Moreau, S. Blairon [EDF R&D, France]	
15:25 ~ 15:45	PZT Active Frequency Based Wind Blade Fatigue to Failure Testing Results for Various Blade Designs R. J. Werlink [NASA Kennedy Space Center, USA]	

Operational Effects Consideration in SHM - II		
Chair: S. Galea (Defence Science and Technology Organisation, Australia)		Location: HC 200-305
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
14:05 ~ 14:25	Measurement of Distributed Strain and Deformation and Load Identification using Optical Fiber Strain Sensors K. Tachibana ¹ , H. Murayama ¹ , H. Igawa ² , T. Nakamura ² , J. Yokokawa ² [1] The University of Tokyo, Tokyo, Japan; 2) Japan Aerospace Exploratory Agency, Tokyo, Japan]	
14:25 ~ 14:45	Extension of the Generalized Unknown Input Kalman Filter for Online-Reconstruction of External Structural Loads Y. Niu, M. Klinkov, C.-P. Fritzen [University of Siegen, Germany]	
14:45 ~ 15:05	Characterization of the Temperature, Load and Damage Effects using Piezoelectric Transducer Patches Based on Fuzzy Clustering V. Lopes Jr. ¹ , C. G. Gonzalez ¹ , S. da Silva ² , S. Roy ³ , K. Kode ⁴ , F. Sunor ⁴ , F.-K. Chang ³ [1] Univ. Estadual Paulista - UNESP, Brazil; 2) Western Paraná State University, Brazil; 3) Dept. Aeronautics/Astronautics, Stanford University, USA; 4) Dept. Computational/Mathematical Engineering, Stanford University, USA]	
15:05 ~ 15:25	Effect of Water Temperature on the Laser-based Ultrasonic Testing of Immersed Structures P. Rizzo, E. Pistone [Department of Civil and Environmental Engineering, University of Pittsburgh, PA, USA]	
15:25 ~ 15:45	Machine Learning for Pipeline Monitoring Under Environmental and Operational Variations Y. Ying, J. H. Garrett, Jr., J. Harley, J. M. F. Moura, N. O'Donoghue, I. J. Oppenheim, J. Shi, L. Soibelman [Carnegie Mellon University, USA]	

Civil Infrastructures: Laboratory Demonstration - II		
Chair: K. Worden (Sheffield University, UK)		Location: ART 2
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
14:05 ~ 14:25	Experimental Verification of Controlled Substructure Identification Using Control Devices: A Preliminary Simulation Study C. DeVore ¹ , E. A. Johnson ¹ , R. Christenson ² [1) University of Southern California, USA; 2) University of Connecticut, USA]	
14:25 ~ 14:45	High Frequency Axle Box Acceleration for Early Detection of Squats: Numerical Simulation, Prototype Development and Testing Z. Li ¹ , M. Molodova ¹ , R. Dollevoet ² [1) Delft University of Technology, The Netherlands; 2) ProRail, The Netherlands]	
14:45 ~ 15:05	A Comparison of Experimental Characterization Results for Multiple Bridge Spans of the Same Design R. Maestri, T. Wank, K. A. Grimmelsman [University of Arkansas, USA]	
15:05 ~ 15:25	Damage Assessment with Time Series Analysis using a Wireless Sensors M. Gul, T. Terrell, MJ Levy, F. N. Catbas [University of Central Florida, USA]	
15:25 ~ 15:45	An Ultrasonic Guided Wave Sensor for Gas Accumulation Detection in Nuclear Emergency Core Cooling Systems L. Yu, Y. J. Shin, J. Wang, Y. Shen [University of South Carolina, USA]	

SPECIAL SESSION

Monitoring of Civil Engineering Structures with MEMS - II

Chairs: C. Grosse (TU Munich, Germany), J. Lynch (Univ. of Michigan, USA)

Chair:

J. Lynch (University of Michigan, USA), C. Grosse (TU Munich, Germany)

Location:

ART 4

TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
14:05 ~ 14:25	Modal Identification of Steel Bridges Using Wireless Sensor Network S. Dorvash, S. N. Pakzad, R. C. Knorr, L. M. Horwath [Lehigh University, USA]	
14:25 ~ 14:45	Challenges and Possibilities of WSNs in the Dynamic Monitoring of Existent Structures R. Aguilar ¹ , L. F. Ramos ² , P. B. Lourenço ² , R. Severino ³ , R. Gomes ³ , P. Gandra ³ , M. Alves ³ , E. Tovar ³ [1) Pontifical Catholic University of Perú, Perú; 2) University of Minho, Portugal; 3) Polytechnic Institute of Porto, Portugal]	
14:45 ~ 15:05	Acoustic Emission Sensors Circular Array for Concrete Structure Damaging Source DOA Estimation Q. Wang, X. Liu [China Jiliang University, P.R. China]	
15:05 ~ 15:25	Towards a Digital Image Correlation Based Strain Sensor M. Dutton, N. A. Hault, W. A. Take [Queen's University, Canada]	
15:25 ~ 15:45	An Innovative Non-Contact ECG and Biopotential Sensor Y. Sun, J. Berilla, X. (Bill) Yu [Case Western Reserve University, USA]	

15:45 ~ 16:00	Coffee Break <i>Location: Dohrmann Grove</i>	
---------------	--	--

Panel Discussion: Aerospace

TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
16:00 ~ 17:15	SHM for CBM and Intelligent Structures: Where Shall be the Efforts for the Next 5 Years? Chair: D. Inman (Virginia Tech, USA) Panelists: TBA <i>Location: Memorial Auditorium</i>	

18:30 ~ 22:00	SHM Networking Welcome Night <i>Location: Frost Amphitheater</i>	
---------------	--	--

TECHNICAL PROGRAM

- POSTER SESSIONS -

Tuesday, September 13th

Poster Session (Display starts at 11:00, Q&A Session : 13:00 ~ 14:05) Location: Dohrmann Grove		
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
11:00 ~ 14:05	RAPID System for Hot Spot Corrosion Monitoring of Gas Pipelines F. Li ¹ , S. Banerjee ¹ , M. Pappakostas ¹ , H. Chung ¹ , S. Beard ¹ , G. Chang ² [1) Acellent Technologies, Inc., Sunnyvale CA, USA; 2) Acellent Intern from the King's Academy, Sunnyvale CA, USA]	
11:00 ~ 14:05	Mission and Scale Analysis on SHM of UAV's M. Celebi [Turkish Air Force Academy, Turkey]	
11:00 ~ 14:05	Damage Monitoring Based on Wave Illumination of Structures Y. Liu, N. Mechbal, M. Vergé [Arts et Métiers ParisTech, France]	
11:00 ~ 14:05	Structural Health Monitoring During Progressive Damage Test of S101 Bridge M. Döhler ¹ , F. Hille ² , L. Mevel ¹ , W. Rücker ² [1) INRIA, Campus de Beaulieu, Rennes, France; 2) BAM, Division Buildings and Structures, Berlin, Germany]	
11:00 ~ 14:05	Fatigue Crack Detection Using Guided Waves and Probability-based Imaging Approach M. Lu ¹ , X. Lu ² , L. Zhou ¹ , Z. Su ¹ , L. Ye ³ , F. Li ² [1) The Hong Kong Polytechnic University, Kowloon, Hong Kong SAR; 2) Shanghai Jiao Tong University, Shanghai, China 3) University of Sydney, Australia]	
11:00 ~ 14:05	Experimental Investigation of the Excitation Level in System Identification of Frame Structures Using Linear Shakers N. Nakata, K. Coleman [Johns Hopkins University, USA]	
11:00 ~ 14:05	Simulation Method of Selection of Diagnostic Parameters in the Process of Monitoring the Rail Vehicle's Conditions A. Chudzikiewicz, B. Sowinski [Warsaw University of Technology, Poland]	
11:00 ~ 14:05	Identifying Foundation Impedance Properties from Seismic Records A. Irizarry ¹ , D. Bernal ² , L. Suárez ¹ [1) University of Puerto Rico at Mayaguez, Puerto Rico; 2) Northeastern University at Boston, USA]	
11:00 ~ 14:05	Self Focusing of 2D Arrays for SHM of Plate-Like Structures Using Time Reversal Operator L. Ambrozinski ¹ , T. Stepinski ² , T. Uhl ¹ [1) AGH University of Science and Technology, Poland; 2) Uppsala University, Sweden]	
11:00 ~ 14:05	Understanding The Effects of a Breathing Crack on the Dynamic Response of Cantilever-type Structures for Damage Detection A.U. Rehman, K. Worden, J. A. Rongong [University of Sheffield, UK]	
11:00 ~ 14:05	Finite Element Driven Damage Detection of a Skewed Highway Bridge with Pin and Hanger Assemblies A. A. Mosavi, H. Sedarat, A. Emami-Naeini, V. Jacob, A. Krimotat, J. Lynch [SC Solutions, Inc, USA]	
11:00 ~ 14:05	A System for Static and Dynamic Monitoring of Ice-Sport Arena G. Boldyrev, A. Zhivaev [NPP Geotek Ltd, Russia]	
11:00 ~ 14:05	Wireless, Batteryless Distributed Strain Sensing for Structural Health Monitoring C. Palmer ¹ , A. Gutterman ¹ , G. Argenna ¹ , V. Inclan ² , A. Zyuzin ² [1) Impact Technologies LLC, USA; 2) Illionix LLC, USA]	
11:00 ~ 14:05	High Sampling Rate Fiber-Optic Extensometry for Ultrasonic Wave Detection C. E. García, J. A. Güemes, A. Fernández [Polytechnic University of Madrid, Spain]	
11:00 ~ 14:05	Application of Polarization-maintaining Fiber Bragg Grating to Optical Frequency Domain Reflectometry for Simultaneous Measurements of Strain and Temperature Distributions D. Wada, H. Murayama, H. Igawa, K. Omichi and K. Kageyama [The University of Tokyo, Japan]	
11:00 ~ 14:05	Simulation Platform for UWB Impulse Radio Wireless Sensor Networks Dedicated to Aeronautic Applications D. Dragomirescu ¹ , A. Thain ² , F. Camps ¹ , F. Perget ¹ , A. Lecointre ¹ , A. Berthe ¹ , R. Plana ¹ [1) University of Toulouse, France; 2) EADS Innovation Work, Austria]	

11:00 ~ 14:05	Versatile and Easy-to-Assemble Measurement System for Impedance-Based Structural Health Monitoring F.G. Baptista ¹ , J.V. Filho ¹ , N. Oki ¹ , A.E. Turra ¹ , V. Lopes Jr. ¹ , D.J. Inman ² [1] Sao Paulo State University, Brazil; 2) Virginia Tech, USA]	
11:00 ~ 14:05	Fiber-Optic Extensometer Array in a Small Alcove at 1.25-km Depth in the Sanford Laboratory at Homestake, Lead, South Dakota H. F. Wang ¹ , J.R. Gage ¹ , D. O. Fratta ¹ , M. M. MacLaughlin ² , A. Turner ³ [1] University of Wisconsin-Madison, USA; 2) Montana Tech, USA; 3) Micron Optics Inc, USA]	
11:00 ~ 14:05	Overview of the European FP 7 Project "Aircraft Integrated Structural Health Assessment II" with Focus on the Detection of Corrosive and Hydraulic Liquids by Gauges on the Collapse of Percolation Conductivity H. Pfeiffer, M. Wevers [Katholieke Universiteit Leuven, Belgium]	
11:00 ~ 14:05	Inherently Conductive Polymer Based Structure Health Monitoring Sensor for Composite H. Yang, A. K. Singh, B. W. Pitts, G. J. Tregre, P. J. Kinlen [Crosslink, USA]	
11:00 ~ 14:05	Inter-digitized Transducers (IDTs) for Structural Health Monitoring (SHM) Applications J. K. Na ¹ , S. Kühr ² , Carl Druffner ³ [1] Edison Welding Institute, USA; 2) University of Dayton Research Institute, USA; 3) Mound Laser and Photonics Center, USA]	
11:00 ~ 14:05	Acoustic Emission Evaluation of Cavitation Erosion in Hydraulic Turbines F. R. Queiroz ¹ , E. B. Medeiros ² , L. V. Donadon ² , M. T. Corrêa de Faria ² [1] CTE.O Furnas Centrais Elétricas, Brazil; 2) UFMG, Brazil]	
11:00 ~ 14:05	Anomalous Wave Propagation Imaging with Adjacent Wave Subtraction: Composite Wing Application C. C. Chia ¹ , J. R. Lee ¹ , C. Y. Park ¹ , He. J. Shin ² [1] Chonbuk National University, Korea; 2) Aeronautical Technology Directorate, Agency for Defense Development, Korea]	
11:00 ~ 14:05	Application of Fuzzy Set Theory in Structural Health Monitoring to Pattern Different States of an RC Bridge at Interstate 40 M. Azarbayejani ¹ , M. R. Taha ² [1] University of Texas-Pan American, USA; 2) University of New Mexico, USA]	
11:00 ~ 14:05	Experimental Broadband Estimation of Guided Waves Group Velocity with High Signal to Noise Ratio N. Quaegebeur, P. Masson, P. Micheau, N. Mrad [Universite de Sherbrooke, Canada]	
11:00 ~ 14:05	Image Processing Technique for Vibrothermographic Field Tests M. Szwedo, L. Pieczonka, T. Uhl [AGH University of Science and Technology, Poland]	
11:00 ~ 14:05	A Time Domain Spectral Element for Coupled Piezoelectric Actuator/Sensor with Complex Thin-walled Assembly Structures R. Mohamed, P. Masson [Univeristé de Sherbrooke, Canada]	
11:00 ~ 14:05	Structural Health Monitoring System Based on Electromechanical Impedance Measurements M. Rosiek, A. Martowicz, T. Uhl [AGH University of Science and Technology, Poland]	
11:00 ~ 14:05	Monitoring of 3D Composite Structures Using Fiber Optic Bragg Grating Sensors M. Dvořák, J. Had, M. Růžicka, Z. Pošvář [Czech Technical University in Prague, Czech Republic]	
11:00 ~ 14:05	Wavelet-based SVM System for Evaluation of Wear States and Remaining Life Time M.-S. Saadawia, G. Li, D. Söffker [University of Duisburg-Essen, Germany]	
11:00 ~ 14:05	Adaptive Fuzzy-based Approach for Classification of System's States H. Aljoumaa, D. Söffker [University of Duisburg-Essen, Germany]	
11:00 ~ 14:05	Uncertainty Assessment in Structural Health Monitoring S.Sankararaman, S. Mahadevan [Vanderbilt University, USA]	
11:00 ~ 14:05	Characterization of an Elastomer Based Autonomous Sensing-Actuating System S. Raghavan, M. B. Subbanna [Hindustan Aeronautics Limited, India]	
11:00 ~ 14:05	Analysis of Bearing Damage Using a Multibody Model and a Test Rig for Validation Purposes W. Jacobs ¹ , M. Malago ² , R. Boonen ¹ , D. Moens ¹ , P. Sas ¹ [1] Catholic University of Leuven, Belgium; 2) Università degli studi di Ferrara, Italy]	
11:00 ~ 14:05	Design of a Wheeled Climbing Robot for Automatic Inspection of Hydraulic Turbine Blade with Curved Surface Z. Wu ^{1,2} , Q. Chen ¹ , Z. Sun ¹ , W. Zhang ¹ [1] Tsinghua University, China; 2) University of California, Berkeley, USA]	
11:00 ~ 14:05	An Optimal Image-based Method for Identification of AE Sources on Plate Structure G. Yan, L. Zhou [Nanjing University of Aeronautics and Astronautics, China]	
11:00 ~ 14:05	Residual Life Prediction of Steel I-beams Using Acoustic Emission and Back Propagation Neural Networks Y. Zhang, F. Barsoum, E. Hill, Y. Kwan, A. Korcak [Embry-Riddle Aeronautical University, Florida, USA]	

11:00 ~ 14:05	Optical Fiber Sensors as a Tool for Structural Health Monitoring of Smart Composite Materials: From Fabrication to Mechanical Characterization X. Chapeleau, M. Drissi-Habti [LUNAM, IFSTTAR, Dept. MACS, France]	
11:00 ~ 14:05	Energy Harvesting and Structural Health Monitoring of Membranes M. R. Sunny, R. Singh, C. Sultan, R. K. Kapania [Virginia Tech, USA]	
11:00 ~ 14:05	Fatigue Damage Evolution Monitoring of Basalt Fiber Reinforced Polymer Plates using PZT Acoustic Emission Combining with Scanned Electronic Microstructure Technique H. Li, W. Wang, Z. Qu, W. Zhou [Harbin Institute of Technology, China]	
11:00 ~ 14:05	1000+ FBG Sensor Interrogator System using High Power Swept Laser H. Hung, Y. Anjan [Optilab, USA]	

Special Poster Session: National Institute of Standards & Technology (NIST) - Technology Innovation Program (Display starts at 11:00, Q&A Session : 13:00 ~ 14:05) <i>Location: Dohrmann Grove</i>		
TIME	TUESDAY, SEPTEMBER 13	PAGE NO.
11:00 ~ 14:05	Early Concrete Bridge Deck Deterioration Detection and Rehabilitation by ANDERS N. Gucunski [Rutgers University, USA]	
11:00 ~ 14:05	Detection and Characterization of Chloride Induced Corrosion on Steel Reinforcement by Acoustic Emission M. Gonzalez-Nunez, S. Momeni, A. Pollock, R. Gostautas [Mistras Group Inc., USA]	
11:00 ~ 14:05	Development of a Mobile Acoustic Air-coupled Subsurface Sensing System for Pavement Property Detection Y. Lu, Y. Cao, Y. Zhang, G. McDaniel, M. L. Wang [Northeastern University, USA]	
11:00 ~ 14:05	Improving the Acquisition Speed of Ground Penetrating Radar Systems R. Birken, C. Oden, D. Huston, T. Xia [Northeastern University, USA]	
11:00 ~ 14:05	Use of Parabolic Reflectors for Signal Amplification in Air-coupled Impact-Echo Testing J. Zhu [University of Texas at Austin, USA]	
11:00 ~ 14:05	Simulation of In-air Waves Generated by the Zero-Group-Velocity S1 Lamb Mode J. Zhu [University of Texas at Austin, USA]	
11:00 ~ 14:05	Damage Tracking on a Fracture Critical Bridge J. Fasl, A. A. Yousef [University of Texas at Austin, USA]	
11:00 ~ 14:05	Passive, Wireless Corrosion Sensors for Reinforced Concrete Structures J. Fasl, A. A. Yousef [University of Texas at Austin, USA]	
11:00 ~ 14:05	Distributed Multi-parameter Fiber-optic Sensor for Water Infrastructure Monitoring Y. Zadorozhny [Optellios, Inc., USA]	
11:00 ~ 14:05	Development of a Multiscale Monitoring and Health Assessment Framework for Effective Management of Levees and Flood-Control Infrastructure Systems M. Zeghal [Rensselaer Polytechnic Institute, USA; Geocomp, USA]	
11:00 ~ 14:05	Wireless Monitoring of the New Carquinez Bridge J. Lynch [University of Michigan, USA]	
11:00 ~ 14:05	Finite-Element Driven Damage Detection of the Telegraph Road Bridge A. Mosavi [SC Solutions, USA]	
11:00 ~ 14:05	Characterization of AE Source Mechanisms for Fatigue Crack Growth in Steel Bridges M. Hossain, J. Yu, P. Ziehl [University of South Carolina, USA]	
11:00 ~ 14:05	Wind Harvesting for Running SHM Systems M. A. Karami, J. Farmer, D. J. Inman [Virginia Tech, USA]	
11:00 ~ 14:05	Advanced Health Management of Civil Infrastructures using SCANSn System S. Banerjee ¹ , H. Chung ¹ , D. Zhang ¹ , S. Beard ¹ , F.-K. Chang ² , I. Li ¹ [1] Acellent Technologies Inc., USA; 2) Stanford University, USA]	

TECHNICAL PROGRAM

Wednesday, September 14th

08:00 ~ 08:30	Light Continental Breakfast <i>Location: Dohrmann Grove</i>	
---------------	---	--

Keynotes		
Chair: H. Speckmann (Airbus, Germany)		Location: Memorial Auditorium

TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
08:30 ~ 09:00	Multifunctional Design Perspective for Bio-inspired Systems Allowing Autonomic Response Les Lee [AFOSR, USA]	
09:00 ~ 09:30	Embraer Perspective on the Introduction of SHM into Current and Future Commercial Aviation Programs Luis G. dos Santos [Embraer, Brazil]	
09:30 ~ 10:00	The Aerospace Industry Steering Committee on Structural Health Monitoring and Management (AISC-SHM): Progress on SHM Guidelines for Aerospace Peter Foote [BAE Systems, UK], Grant Gordon [Honeywell, USA], Mark Derriso [USAF AFRL, USA]	

10:00 ~ 10:20	Coffee Break <i>Location: Dohrmann Grove</i>	
---------------	--	--

Aerospace Structures: Field Evaluation and Validation - III		
Chair: B. Glass (Lockheed Martin, USA)		Location: HC 200-002

TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
10:20 ~ 10:40	Numerical Predictions of Elastic Wave Scattering from a Sub-surface Defect in an F-111 Wing Skin W. H. Ong ¹ , W. K. Chiu ¹ , S. C. Rosalie ² , N. Rajic ² [1) Department of Mechanical & Aerospace Engineering, Monash University, Australia; 2) Defence Science & Technology Organisation, Air Vehicles Division, Australia]	
10:40 ~ 11:00	Real-Time Condition Assessment of RAPTOR Telescope Systems C. J. Stull, S. G. Taylor, J. Wren, D. L. Mascareñas, C. R. Farrar [Los Alamos National Laboratory, USA]	
11:00 ~ 11:20	Autonomous Battery-less Wireless Strain Gage for Structural Health Monitoring V. Olariu ¹ , A. Gnadinger ¹ , J. Bao ² , V. Giurgiutiu ² [1) Albido Corporation, USA; 2) University of South Carolina, USA]	

AISC-Guidebook Development Panel Session		
TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
11:20 ~ 11:50	Chair: P. Foote (BAE Systems, UK) <i>Location: HC 200-002</i>	

Sensors and Actuators Development - III		
Chair: P. Hagedorn (TU Darmstadt, Germany)		Location: HC 200-030

TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
10:20 ~ 10:40	Piezoelectric Paint as Spatially Distributed Modal Sensors C. Yang, C.-P. Fritzen [University of Siegen, Germany]	
10:40 ~ 11:00	Towards Smart Sonar Transducers Polarimetric Sensing for Sonar Array Compensation S. G. Pierce, G. M. H. Flockhart, M. McGuire, A. Bennecer, G. Hayward, G. Thursby, G. Stewart, B. Culshaw [University of Strathclyde, UK]	

11:00 ~ 11:20	RF-powered Wireless Strain Sensor Y. Hew, A. Yu, H. Huang [University of Texas at Arlington, USA]	
11:20 ~ 11:40	Very Dense Arrays of Sensors for SHM Based on Large Area Electronics B. Glisic, N. Verma [Princeton University, USA]	
11:40 ~ 12:00	Detecting the Debonding of Adhesively Mounted Sensors in an Optimally Designed Structural Health Monitoring System M. K. Jones, D. L. Parker [Miltec Research & Technology, USA]	

SPECIAL SESSION Hot Spot Monitoring - II Chairs: H. Sohn (KAIST, Korea), J.-B. Ihn (Boeing, USA), M. Leonard (AFRL, USA)		
Chair: J.-B. Ihn (Boeing, USA), M. Leonard (AFRL, USA)		Location: HC 200-034
TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
10:20 ~ 10:40	Reference-free Structural Health Monitoring for Detecting Delamination in Composite Plates C. M. Yeum ¹ , H. Sohn ¹ , J.-B. Ihn ² , H. J. Lim ¹ [1] Korea Advanced Institute of Science and Technology, Korea; 2) Boeing Research & Technology, USA]	
10:40 ~ 11:00	Ultrasonic Guided Wave SHM for Probabilistic Fatigue Crack Growth Prognostics C. J. Lissenden, W. L. McGill, S. Li [Pennsylvania State University, USA]	
11:00 ~ 11:20	Guided Wave Based SHM Approach using SAFT-Algorithm for Impact Detection in Composite Materials L. Schubert ¹ , R. Schwerz ¹ , M. Leibowitz ² , U. Lieske ¹ , B. Frankenstein ¹ [1] Fraunhofer Institute for Non-Destructive Testing, Dresden, Germany; 2) RAFAEL, Israel]	
11:20 ~ 11:40	Baseline-free Crack Detection in Nuclear Power Plants H. Lee, H. Sohn [Korea Advanced Institute of Science and Technology, Korea]	
11:40 ~ 12:00	Ultrasonic Structural Health Monitoring of Overhead Transmission Lines H. Sprenger, L. Gaul [University of Stuttgart, Germany]	

SPECIAL SESSION Verification and Validation of Damage Sensing - I Chair: E. Medina (AFRL, USA)		
Chair: E. Medina (AFRL, USA), S. Beard (Acellent Technologies Inc., USA)		Location: HC 200-203
TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
10:20 ~ 10:40	On the Performance Quantification of Active Sensing SHM Systems using Model-assisted POD Methods I. Mueller ¹ , V. Janapati ¹ , S. Banerjee ² , K. Lonkar ¹ , S. Roy ¹ , F.-K. Chang ¹ [1] Stanford University, USA; 2) Acellent Technologies Inc., USA]	
10:40 ~ 11:00	Certification in Structural Health Monitoring Systems C. M. Schubert Kabban ¹ , Mark Derriso ² [1] Air Force Institute of Technology and Air Force Research Lab, USA; 2) Air Force Research Laboratory, USA]	
11:00 ~ 11:20	Model Assisted Probability of Detection Evaluation of a Health Monitoring System by using CUDA Technology A. Gallina ¹ , P. Packo ¹ , L. Ambrozinski ¹ , T. Uhl ¹ , W.J. Staszewski ² [1] AGH-UST, Poland; 2) Sheffield University, UK]	
11:20 ~ 11:40	The Need and Requirements for Validating Damage Detection Capability E. A. Lindgren, C. F. Buynak [Air Force Research Laboratory, USA]	
11:40 ~ 12:00	Protocol for Reliability Assessment of Structural Health Monitoring Systems Incorporating Model-assisted Probability of Detection (MAPOD) Approach J. C. Aldrin ¹ , E. A. Medina ² , E. A. Lindgren ² , C. F. Buynak ² , J. S. Knopp ² [1] Computational Tools, Gurnee, USA; 2) Air Force Research Laboratory, Wright-Patterson AFB, USA]	

Advanced Diagnostics for Damage Assessment - III

Chair:

J. Huang (Boeing, USA)

Location:

HC 200-205

TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
10:20 ~ 10:40	Power Losses in PZT Disk Actuators' Adhesive R. Dugnani [Exponent Failure Analysis Associates, USA]	
10:40 ~ 11:00	Sensitivity of the Excitelet Imaging Algorithm on Material Properties for Isotropic Structures P.-C. Ostiguy, P. Masson, N. Quaegebeur, S. Elkoun [Universite de Sherbrooke, Canada]	
11:00 ~ 11:20	Damage Detection Index Based on Statistical Inference and PCA L. E. Mujica, M. Ruiz, F. Pozo and J. Rodellar [Universitat Politècnica de Catalunya, Spain]	
11:20 ~ 11:40	Effective Damage Sensitive Feature Extraction Methods for Crack Detection using Flaw Scattered Ultrasonic Wave Field Signal S. K. Yadav ¹ , S. Banerjee ² , T. Kundu ¹ [1] University of Arizona, USA; 2) Acellent Technologies Inc, USA]	
11:40 ~ 12:00	Time-Domain Localized Structural Damage Identification with Incomplete Excitation Measurements J. He, B. Xu [Hunan University, China]	

Prognostics and Data Mining for Health Management - II

Chair:

K. Goebel (NASA Ames, USA)

Location:

HC 200-303

TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
10:20 ~ 10:40	Impact Damage Characterisation using a Statistical Approach M.T.H. Sultan ¹ , K. Worden ² , W.J. Staszewski ² [1] University Putra Malaysia, Malaysia; 2) University of Sheffield, UK]	
10:40 ~ 11:00	Accelerated Aging Experiments for Prognostics of Damage Growth in Composite Materials A. Saxena ¹ , K. Goebel ¹ , C. C. Larrosa ² , V. Janapati ² , S. Roy ² , F.-K. Chang ² [1] NASA Ames Research Center, USA; 2) Stanford University, USA]	
11:00 ~ 11:20	Prognostics and Diagnostics of Rotorcraft Bearings M. Haile, A. Ghoshal, D. Le [US Army Research Laboratory, USA]	
11:20 ~ 11:40	Bayesian Sensitivity Analysis of Numerical Models for Structural Health Monitoring R. J. Barthorpe [The University of Sheffield, U.K.]	
11:40 ~ 12:00	Adaptive Classification Based on Multisensor Decision L. Al-Shrouf ¹ , M. S. Saadawia ¹ , N. Szczepanski ² , D. Söffker ¹ [1] University of Duisburg-Essen, Germany; 2) Mines Engineering Centre, Germany]	

Novel Signal Processing Techniques - I

Chair:

J.-M. Dilhac (LAAS-CNRS, France)

Location:

HC 200-305

TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
10:20 ~ 10:40	Real-Time Characterization of Aerospace Structures using Onboard Strain Measurement Technologies and Inverse Finite Element Method A. Tessler ¹ , J. L. Spangler ² , M. Matrone ³ , M. Gherlone ³ , M. Di Sciuva ³ [1] NASA Langley Research Center, USA; 2) Lockheed Martin Aeronautics Company, USA; 3) Politecnico di Torino, Italy]	
10:40 ~ 11:00	Impact Echo Signal Interpretation using Ensemble Empirical Mode Decomposition Z. Xie, X. Wei, Y. Zhang [Georgia Institute of Technology, USA]	
11:00 ~ 11:20	Mode Conversion Estimation of Filleted T-Joint using FEM and 3D Laser Vibrometry J. T. Ayers ¹ , E. Swenson ² , M. Ruzzene ³ , A. Ghoshal ¹ [1] Army Research Laboratory, USA; 2) AFIT/ENY, USA; 3) Georgia Institute of Technology, USA]	
11:20 ~ 11:40	Detection of Impact Strain Waves in Composites by High-Speed FBG Sensor System with AWG Filter Y. Okabe ¹ , N. Watanabe ¹ , M. Shimazaki ¹ , H. Soejima ² , T. Ogisu ² [1] The University of Tokyo, Japan; 2) Fuji Heavy Industries Ltd., Japan]	
11:40 ~ 12:00	The Application of Compressed Sensing to Detecting Damage in Structures D. Mascarenas, D. Hush, J. Theiler, C. Farrar [Los Alamos National Laboratory, USA]	

Civil Infrastructures: Field Evaluation and Validation - I

Chair:

H. Wenzel (Vienna Consulting Engineers, Austria)

Location:

ART 2

TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
10:20 ~ 10:40	Self Powered Wireless Sensor Network for Structural Bridge Health Prognosis: Achievements in the First Two Years V. Godinez ¹ , A. Pollock ¹ , M. Gonzalez ¹ , S. Momeni ¹ , R. Gostautas ¹ , R. Fustos ¹ , B. Newlin ¹ , D. Inman ² , J. Farmer ² , S. Priya ² , P. Zielh ³ , J. Caicedo ³ , B. Zarate ³ , L. Yu ³ , V. Giurgiutiu ³ , A. Nanni ⁴ [1) Mistras Group Inc., USA; 2) Virginia Tech, USA; 3) University of South Carolina, USA; 4) University of Miami, USA]	
10:40 ~ 11:00	Fatigue Crack Monitoring with an Ultrasonic Sparse Array on a Real Steel Structure Component M. Vospernig ¹ , R. Heuer ² , M. Reiterer ¹ [1) RED BERNARD GmbH, Austria; 2) Vienna University of Technology, Austria]	
11:00 ~ 11:20	Challenges and Strategies in Remote Sensing Implementation for Bridge Monitoring S-E Chen ¹ , E. Hauser ¹ , K. Rehm ² and C. Boyle ³ [1) University of North Carolina at Charlotte, USA; 2) AASHTO, USA; 3) Boyle Consulting Inc., USA]	
11:20 ~ 11:40	An Innovative Method to Measure Bridge Deflection using Simple Telecom Fiber P. Kung, L. Wang [QPS Photonics Inc., Canada]	
11:40 ~ 12:00	Diagnostic Performance Indication through Field Testing of a Bridge Superstructure M. V. Gangone ¹ , M. J. Whelan ² , K. D. Janoyan ¹ [1) Clarkson University, USA; 2) University of North Carolina at Charlotte, USA]	

SPECIAL SESSION

Advanced SHM for Ship Structures

Chair: L. Salvino (US Navy, USA)

Chair:

L. Salvino (US Navy, USA), R. Kuo (Exxon Mobile Upstream Research, USA)

Location:

ART 4

TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
10:20 ~ 10:40	Compressive Sensing Approach for Structural Health Monitoring of Ship Hulls S. M. O'Connor, J. P. Lynch, A. C. Gilbert [University of Michigan, USA]	
10:40 ~ 11:00	Structural Damage Identification in Stiffened Plate Fatigue Specimens using Piezoelectric Active Sensing B. L. Grisso ¹ , G. Park ² , L. W. Salvino ¹ , C. R. Farrar ² [1) Naval Surface Warfare Center, Carderock Division, USA; 2) Los Alamos National Laboratory, USA]	
11:00 ~ 11:20	Health Monitoring of Aluminum Weldings with the Surface Response to Excitation (SuRE) Approach I. N. Tansel ¹ , B. L. Grisso ² , G. Singh ¹ , G. Singh ¹ , S. Korla ¹ , L. W. Salvino ² [1) Florida International University, USA; 2) NSWC Carderock Div., USA]	
11:20 ~ 11:40	Distributed Sensor Network for Structural Health Monitoring of Ships B. W. Roeder, R. R. Klug [McQ Inc., USA]	
11:40 ~ 12:00		

12:00 ~ 13:00

Lunch at the Oval

Location: The Oval

Aerospace Structures: Laboratory Demonstration - I

Chair:

J. McFeat (BAE Systems, UK)

Location:

HC 200-002

TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
13:00 ~ 13:20	Monitoring the Degradation by Fire of Composite Laminates by Embedded FBG Sensors A. Güemes, C. E. Garcia-Gonzalez, I. Gonzalez-Requena, C. De Miguel-Giraldo [Technical University of Madrid, Spain]	
13:20 ~ 13:40	Nonlinear Ultrasonic Techniques for Nondestructive Damage Assessment in Metallic Materials J.-Y. Kim ¹ , L. J. Jacobs ¹ , J. Qu ² [1) Georgia Institute of Technology, USA; 2) Northwestern University, USA]	

13:40 ~ 14:00	Hierarchical Sensing System Combining a Fiber-Optic Network and Distributed Built-In Capillary Sensors for Impact Damage Monitoring of CFRP Structures H. Banshoya, S. Minakuchi, N. Takeda [The University of Tokyo, Japan]	
14:00 ~ 14:20	Waveguided and Noncontacting Thermoacoustic Sensing of Thermal Protection Systems D. Huston, D. Hurley, D. Fletcher, W. Owens [University of Vermont, USA]	

Sensors and Actuators Development - IV		
Chair: T. Uhl (AGH University of Science and Technology, Poland)		Location: HC 200-030
TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
13:00 ~ 13:20	Power Management in a Wireless Sensor for Structural Monitoring Application S. Casciati ¹ , L. Faravelli ² , Z. Chen ² [1] University of Catania at Syracuse, Italy; 2) University of Pavia, Italy]	
13:20 ~ 13:40	Integrating Diamond Sensors in Silicon Technology Integrated Circuits T. Sanders ¹ , G. Hess ¹ , J. Davidson ² [1] AET Inc., USA; 2) Vanderbilt University, USA]	
13:40 ~ 14:00	Development of a Bi-Axial Accelerometer Based on Intensity Modulated Plastic Optical Fiber for Wind Turbine Monitoring Y. Ge, S.T. Quek, K.S.C. Kuang [National University of Singapore, Singapore]	
14:00 ~ 14:20	Intelligent Structural Health Monitoring Using Carbon Nanomaterial Networks S.W. Kim, S. H. Hwang, Y. B. Park [Ulsan National Institute of Science and Technology (UNIST), Republic of Korea]	

SPECIAL SESSION		
Hot Spot Monitoring - III		
Chairs: H. Sohn (KAIST, Korea), J.-B. Ihn (Boeing, USA), M. Leonard (AFRL, USA)		
Chair: M. Leonard (AFRL, USA), H. Sohn (KAIST, Korea)		Location: HC 200-034
TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
13:00 ~ 13:20	Strain Monitoring and Damage Detection of Single-Lap Joint with Embedded FBGs H. Murayama ¹ , D. Wada ¹ , K. Kageyama ¹ , K. Uzawa ¹ , H. Igawa ² [1] School of Engineering, The University of Tokyo, Japan; 2) Japan Aerospace Exploration Agency, Japan]	
13:20 ~ 13:40	Health Monitoring of Composite Structures Using Carbon Nanotube and Acoustic Sensors G. J. Gallo ¹ , L. Gao ¹ , E. T. Thostenson ¹ , T.-W. Chou ¹ , S. Das ² , C. Cheung ² , B. Shen ² , S. Banerjee ² [1] University of Delaware, USA; 2) Acellent Technologies Inc. USA]	
13:40 ~ 14:00	Acousto-Ultrasonic In Situ Monitoring of Fatigue Cracking in an Aircraft Wing Skin Specimen S. Galea, C. Rosalie, N. Rajic [Defence Science and Technology Organisation, Australia]	
14:00 ~ 14:20	Crack Detection using Combinations of Acoustic Emission and Guided Wave Signals from Bonded Piezoelectric Transducers M. M. Derriso ¹ , J. E. Little II ¹ , K. A. Vehorn ¹ , M. J. Davies ² , M. P. DeSimio ² [1] AFRL/RBSA, USA; 2) University of Dayton Research Institute, USA]	

SPECIAL SESSION		
Verification and Validation of Damage Sensing - II		
Chair: E. Medina (AFRL, USA)		
Chair: S. Beard (Acellent Technologies Inc., USA), E. Medina (AFRL, USA)		Location: HC 200-203
TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
13:00 ~ 13:20	Demonstration of Model Assisted Reliability Assessment Protocol on a Proposed Low Frequency Vibration Based Damage Sensing Case E. A. Medina ¹ , J. C. Aldrin ² , J. Santiago ³ , E. A. Lindgren ¹ , C. F. Buynak ¹ , J. S. Knopp ¹ [1] Air Force Research Laboratory, USA; 2) Computational Tools, USA; 3) Consultant Aventura, USA]	
13:20 ~ 13:40	Challenges and Approach for SHM Technology Transition S. Beard, S. Banerjee [Acellent Technologies, Inc., USA]	
13:40 ~ 14:00	FAA Research & Development Efforts in SHM P. Swindell, D. Roach, I. Won [FAA, USA]	
14:00 ~ 14:20	Condition-Based Maintenance Plus and Maintenance Credit Validation D. D. Le ¹ , A. Ghoshal ¹ , E. Cuevas ² [1] US Army Research Laboratory, USA; 2) Federal Aviation Administration, USA]	

SPECIAL SESSION		
Intelligent Sensor Networks for SHM - I		
Chairs: J. Lynch (Univ. of Michigan, USA), A. Swartz (Michigan Techn. Univ., USA)		
Chair: J. Lynch (University of Michigan, USA), A. Swartz (Michigan Technological University, USA)		Location: HC 200-205
TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
13:00 ~ 13:20	Autonomous Structural Condition Monitoring Based on Dynamic Code Migration and Cooperative Information Processing in Wireless Sensor Networks K. Smarsly ¹ , K. H. Law ¹ , M. König ¹ [1] Stanford University, USA; 2) Ruhr-University Bochum, Germany]	
13:20 ~ 13:40	An Intelligent Wireless Structural Health Monitoring Solution for Urban Search and Rescue A. Zimmerman ¹ , J. Lynch ² , G. Zussman ³ , D. Rubenstein ³ [1] Civionics, LLC, USA; 2) University of Michigan, USA; 3) Columbia University, USA]	
13:40 ~ 14:00	Towards Low-Cost Structural Health Monitoring with Sensor Networks in Earthquake Damage Detection T. Fujiwara ¹ , H. S. Ulusoy ² , M. Q. Feng ² [1] Hakodate National College of Technology, Japan; 2) University of California Irvine, USA]	
14:00 ~ 14:20	Novel Optical-Fiber-Based Cure Monitoring Technique for Large-scale Composite Structures by Hybrid Brillouin-Rayleigh System Y. Ito, K. Fujimoto, S. Minakuchi, T. Mizutani, N. Takeda [University of Tokyo, Japan]	

Prognostics and Data Mining for Health Management - III		
Chair: T. Kundu (University of Arizona, USA)		Location: HC 200-303
TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
13:00 ~ 13:20	Artificial Neural Network Based Damage Detection From Lamb Wave Response A. Baranwal, M. Mitra [IIT Bombay, India]	
13:20 ~ 13:40	Integration of Data Mining Operations for Structural Health Monitoring E. Sonnleitner ¹ , H. Kosorus ¹ , S. Anderlik ¹ , R. Stumptner ¹ , B. Freudenthaler ² , H. Allmer ³ , J. Kung ¹ [1] Johannes Kepler University, Linz, Austria; 2) Software Competence Center, Hagenberg, Austria; 3) VCE Holding GmbH, Wien Austria]	
13:40 ~ 14:00	Multiple Information Agents for Real-Time ISHM: Architectures for Real-Time Warfighter Support J. A. Crowder [Raytheon Intelligence and Information Systems, USA]	
14:00 ~ 14:20	Integration of Structural Health Monitoring and Fatigue Damage Prognosis Y. Ling, S. Mahadevan [Vanderbilt University, USA]	

Novel Signal Processing Techniques - II		
Chair: C.-P. Fritzen (University of Siegen, Germany)		Location: HC 200-305
TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
13:00 ~ 13:20	Measuring the Average Thickness of a Plate using a Bayesian Method and Free Vibration Data E. Z. Moore ¹ , K. D. Murphy ¹ , J. M. Nichols ² [1] University of Connecticut, USA; 2) U.S. Naval Research Lab, USA]	
13:20 ~ 13:40	Morphological Filtering of SHM Datasets D. K. McNeill ¹ , M. Soiferman ² [1] University of Manitoba, Canada; 2) YRT Ltd., Canada]	
13:40 ~ 14:00	Examination of Wear Phenomena by using Filtering Techniques for FDI Purposes K.-U. Dettmann, D. Baccar, D. Soeffker [University of Duisburg-Essen, Germany]	
14:00 ~ 14:20	Automated Data Interpretation for Modal Identification of a Truss Bridge J. Zhang ¹ , F.L. Moon ² , E.M. Aktan ² [1] Southeast University, China; 2) Drexel University, USA]	

Civil Infrastructures: Field Evaluation and Validation - II

Chair:

N. Nakata (Johns Hopkins University, USA)

Location:

ART 2

TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
13:00 ~ 13:20	Development of Reliable and Low-Power Wireless Health Monitoring Systems for Highway Bridges D. Potter ¹ , J. Fas ² , V. Samaras ² , T. Helwig ² , S. Wood ² , R. Lindenberg ³ , K. Frank ⁴ [1) National Instruments, USA; 2) University of Texas at Austin, USA; 3) Wiss, Janney, Elstner Associates, Inc., USA; 4) Hirschfeld Industries, USA]	
13:20 ~ 13:40	Design and Application of a Wireless Sensor Network for Vibration-Based Performance Assessment of a Tied Arch Bridge M. J. Whelan [UNC Charlotte, USA]	
13:40 ~ 14:00	Risk Based Civil SHM and Life Cycle Management H. Wenzel, R. Veit-Egerer, M. Widmann [Vienna Consulting Engineers, Austria]	
14:00 ~ 14:20	Integration of SHM into Bridge Management Systems: Case Study – Z24 Bridge E. Figueiredo ¹ , L. Radu ¹ , G. Park ² , C. Farrar ² [1) Catholic University of Portugal, Portugal; 2) Los Alamos National Laboratory, USA]	

Advanced Monitoring for Load / Environments

Chair:

D. Huston (University of Vermont, USA)

Location:

ART 4

TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
13:00 ~ 13:20	Design of a Self-powered Load Monitoring System for Hot Spot Applications Y. Y. Lin ¹ , M. Taya ¹ , J.-B. Ihn ² [1) University of Washington, USA; 2) Boeing Research & Technology, USA]	
13:20 ~ 13:40	A Robust Impact-force Determination Technique for Complex Structures I. Mueller ¹ , K. Vonnieda ¹ , S. Das ² , F.-K. Chang ¹ [1) Stanford University, USA; 2) Acellent Technologies Inc., USA]	
13:40 ~ 14:00	Analytical Formulation for the Determination of Torsional Forces and Shear Stresses in Hydraulic Steel Structures From Field Experiments A. J. Alicea ¹ , G. Riveros ² [1) University of Puerto Rico at Mayaguez, USA; 2) U.S. Army Corps of Engineers - Engineer Research and Development Center, USA]	
14:00 ~ 14:20	Experimental Evaluation of a Wavelet-Based FEM and its Application to Load History Identification M. M. Mota, L. Pahlavan, C. Kassapoglou [Delft University of Technology, The Netherlands]	

Coffee Break

Location: Dohrmann Grove

SHM in Action

TIME	WEDNESDAY, SEPTEMBER 14	PAGE NO.
14:40 ~ 17:00	Chair: TBA Location: Memorial Auditorium	

Banquet and Award Night

Location: Crowne Plaza Hotel Cabana, Palo Alto

TECHNICAL PROGRAM

Thursday, September 15th

08:00 ~ 08:30	Light Continental Breakfast <i>Location: Dohrmann Grove</i>	
---------------	---	--

Keynotes		
Chair: J. Michaels [Georgia Tech, USA]		Location: Memorial Auditorium
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
08:30 ~ 09:00	Structural Health Monitoring for Civil Infrastructure - From Instrumentation to Decision Support Anne S. Kiremidjian [Stanford University, USA]	
09:00 ~ 09:30	Does the Maturity of Structural Health Monitoring Technology Match User Readiness? Dennis Roach [Sandia National Laboratories, USA]	

09:30 ~ 10:00	Coffee Break <i>Location: Dohrmann Grove</i>	
---------------	--	--

Aerospace Structures: Laboratory Demonstration - II		
Chair: S.-R. Lin (The Aerospace Corporation, USA), S. Lee (Hong Kong Univ. of Science & Technology, Hong Kong)		Location: HC 200-002
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
10:00 ~ 10:20	Piezoelectric Wafer Active Sensor Network for Aircraft Structures Damage Localisation: Pitch-Catch Method H. Boukabache, M. Matmat, S. Ksouri, C. Escriba, J.-Y. Fourniols [French National Centre for Scientific Research & Toulouse University, France]	
10:20 ~ 10:40	Detecting the Point of Impact on an Anisotropic Cylindrical Surface using only Four Acoustic Sensors T. Hajzargarbashi ¹ , H. Nakatani ² , T. Kundu ¹ , N. Takeda ² [1] University of Arizona, USA; 2) University of Tokyo, Japan]	
10:40 ~ 11:00	Impact Damage Assessment by Sensor Signal Analysis R. John ¹ , I. Read ¹ , W. MacPherson ² [1] BAE Systems, UK; 2) Heriot-Watt University, UK]	
11:00 ~ 11:20	Beam Shape Sensing using Inverse Finite Element Method: Theory and Experimental Validation M. Gherlone ¹ , P. Cerracchio ¹ , M. Mattone ¹ , M. D. Sciuva ¹ , A. Tessler ² [1] Politecnico di Torino, Italy; 2) NASA Langley Research Center, USA]	
11:20 ~ 11:40	Integrated Optical Fibers into Aluminium Extrusions Enabling Structural Health Monitoring of Aerospace Structures G. Pouget ¹ , A. Fernandez-Lopez ² , A. Güemes ² , J.C. Ehrström ¹ [1] Constellium CRV, France; 2) Polytechnic University of Madrid, Spain]	
11:40 ~ 12:00	Early Results of Lamb Waves Approach to Assess Corrosion Damage using Direct Image Path in an Aeronautical Aluminum Alloy F. Dotta, F. S. da Silva, A. B. da Silva [Embraer S.A., Brazil]	

SPECIAL SESSION		
Structural Health Monitoring of Wind Turbines		
Chair: J. R. White (Sandia National Laboratories, USA)		Location: HC 200-030
Chair: J. R. White (Sandia National Laboratories, USA)		
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
10:00 ~ 10:20	Vibration Based Damage Detection for Structures of Offshore Wind Energy Plants C. Fritzen, P. Kraemer [University of Siegen, Germany]	

10:20 ~ 10:40	Investigation of Various Condition Monitoring Techniques Based on a Damaged Wind Turbine Gearbox S. Sheng [NREL, USA]	
10:40 ~ 11:00	Distributed Optical Fiber Sensing for Wind Blade Strain Monitoring and Defect Detection A. M. Kaplan, S. M. Klute, D. K. Gifford, A. D. Heaney [Luna Innovations Incorporated]	
11:00 ~ 11:20	Passive Damage Monitoring of Wind Turbine Rotor Blades using Cyclic Signal Processing J. R. White [Sandia National Laboratories, USA]	
11:20 ~ 11:40	Load Shaping for Maximizing Energy Capture and Structural Health in a HAWT using Rotor-Mounted Inertial Sensors J. Yutzy, D. E. Adams [Purdue Center for Systems Integrity, USA]	
11:40 ~ 12:00	Inertial Energy Harvester for Monitoring Wind Turbine Blades B. Joyce, J. Farmer, D. J. Inman [Virginia Tech, USA]	

SPECIAL SESSION Intelligent Sensor Networks for SHM - II Chairs: J. Lynch (Univ. of Michigan, USA), A. Swartz (Michigan Techn. Univ., USA)		
Chair: A. Swartz (Michigan Technological University, USA), W. K. Chiu (Monash University, Australia)		Location: HC 200-034
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
10:00 ~ 10:20	Wireless Sensor Network for Guided Wave Propagation with Piezoelectric Transducers C. Dürager ¹ , A. Heinzelmänn ² , D. Riederer ² [1] Swiss Federal Laboratories of Materials Science and Technology, Switzerland; 2) Interstate University of Applied Sciences of Technology, Switzerland]	
10:20 ~ 10:40	Architecture of a Remote Impedance-Based Structural Health Monitoring System used in Aircrafts L. G. A. Martins ¹ , R. M. Finzi Neto ² , C. A. Gallo ³ , L. V. Palomino ³ , P. Moneda ³ , D. A. Rade ³ , V. Steffen Jr. ³ [1] School of Computations, Federal University of Uberlandia, Brazil; 2) Federal University of Goias, Brazil; 3) School of Mechanical Engineering, Federal University of Uberlandia, Brazil]	
10:40 ~ 11:00	Implementation of a Receptance-based SHM Algorithm on Wireless Smart Sensors S. Jang ¹ , S. H. Sim ² , B. F. Spencer Jr. ³ [1] University of Connecticut, USA; 2) Ulsan Institute of Science and Technology, South Korea; 3) University of Illinois at Urbana-Champaign, USA]	
11:00 ~ 11:20	Distributed Optical Fiber Smart Sensors for Structural Health Monitoring G. Wild, S. Hinckley [Centre for Communications Engineering Research, Australia]	
11:20 ~ 11:40	Deformation Monitoring of Shield Tunnel Based on Distributed Optical Fiber Strain Sensing Technology S. Song, Z. Wu, C. Yang, C. Wan, S. Shen [International Institute for Urban System Engineering, Southeast University, China]	
11:40 ~ 12:00	Efficient Guided Wave SHM Baseline Capture and Selection A. J. Croxford, O. Putikis, P. D. Wilcox [University of Bristol, UK]	

SPECIAL SESSION Wave Propagation Simulation - I Chairs: W. Staszewski (Sheffield University, UK), W. Ostachowicz (PAS, Poland)		
Chair: W. Ostachowicz (PAS, Poland), W. Staszewski (Sheffield University, UK)		Location: HC 200-203
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
10:00 ~ 10:20	A Wavelet-Based Spectral Finite Element Method for Simulating Elastic Wave Propagation L. Pahlavan, C. Kassapoglou, Z. Gürdal [Delft University of Technology, The Netherlands]	
10:20 ~ 10:40	A Method to Detect Structural Damage Using High-Frequency Seismograms V. M. Heckman, M. D. Kohler, T. H. Heaton [California Institute of Technology, USA]	
10:40 ~ 11:00	Development of SEM-based PESEA Code for Modeling PZT Induced Acousto-ultrasonic Waves Propagating in Metallic & Composite Structures K. Lonkar, F.-K. Chang [Stanford University, USA]	
11:00 ~ 11:20	Nonlinear Guided Waves: Theoretical Considerations and Applications to Thermal Stress Measurement in Continuous Welded Rails C. Nucera, F. L. di Scalea [University of California San Diego, USA]	

11:20 ~ 11:40	Local Interaction Simulation of Guided-wave Propagation in Composite Plates using CLoVER Transducer K. S. Nadella, C. E. S. Cesnik [University of Michigan, USA]	
11:40 ~ 12:00	Predictive Modeling of Ultrasonics SHM with PWAS Transducers M. Gresil, Y. Shen, V. Giurgiutiu [University of South Carolina, USA]	

Advanced Diagnostics for Damage Assessment - IV		
Chair: M. Scheerer (Aerospace & Advanced Composites GmbH, Austria), D. Dragomirescu (LAAS-CNRS, France)		Location: HC 200-205
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
10:00 ~ 10:20	A Novel Damage Sensitive Feature Based on State-Space Representation A. Clement ¹ , S. Laurens ¹ , S. Girard ² [1] Université de Toulouse, France; 2) LJK & INRIA Rhône-Alpes, France]	
10:20 ~ 10:40	Damage Classification in Composite Laminates; Matrix Micro-Cracking and Delamination C. Larrosa, K. Lonkar, S. Shankar, F.-K. Chang [Stanford University, USA]	
10:40 ~ 11:00	Identifying Scatter Targets in 2D Space using In Situ Phased-Arrays for Guided Wave Structural Health Monitoring E. B. Flynn ¹ , M. D. Todd ² , S. S. Kessler ¹ , C. T. Dunn ¹ [1] Metis Design Corporation, USA; 2) University of California San Diego, USA]	
11:00 ~ 11:20	Reference-Free Damage Identification using Statistical Modeling A. Medda ¹ , V. DeBrunner ² [1] US Army Aeromedical Research Laboratory, USA; 2) Florida State University, USA]	
11:20 ~ 11:40	Infrared Thermography and Piezoelectric Patches for Impact Damage Detection in Composite Structures G. M. Carlomagno, C. Meola, F. Ricci [University of Naples Federico II, Italy]	
11:40 ~ 12:00	An Integrated Structural Intensity based Damage Detection Approach for Nonlinear behaving Damage F. Semperlotti ¹ , S. C. Conlon ² , E. C. Smith ² [1] University of Notre Dame, USA; 2) The Pennsylvania State University, USA]	

SPECIAL SESSION		
Decision Making in Structural Health Monitoring - I		
Chairs: D. Zonta (Univ. of Trento, Italy), M. Todd (UC San Diego, USA)		
Chair: D. Zonta (University of Trento, Italy), M. Todd (UC San Diego, USA)		Location: HC 200-303
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
10:00 ~ 10:20	Computation of Lifetime Value of Information for Monitoring Systems M. Pozzi, A. D. Kiureghian [University of California, Berkeley, USA]	
10:20 ~ 10:40	Carbon Nanotube (CNT) Enhancements for Aerosurface State Awareness S. S. Kessler ¹ , C. T. Dunn ¹ , S. S. Wicks ² , R. G. de Villoria ² , B. L. Wardle ² [1] Metis Design Corporation, USA; 2) Massachusetts Institute of Technology, USA]	
10:40 ~ 11:00	Optimal Sensor Placement and Weighted Residual Method in Loads Estimation Supporting Structural Health Monitoring C. Haynes, M. Todd, K. Napolitano, H. Matt [University of California San Diego, USA]	
11:00 ~ 11:20	Uncertainty Quantification in Transmissibility-Derived Features Used for Fault Detection Z. Mao, M. D. Todd [University of California San Diego, USA]	
11:20 ~ 11:40	Comparing Measured Response Uncertainty for a Composite Steel Girder Bridge to Damage Obtained in Finite Element Analysis S. Plude ¹ , R. Christenson ¹ , J. DeWolf ¹ , A. Jamalipour ² [1] University of Connecticut, USA; 2) Connecticut Department of Transportation, USA]	
11:40 ~ 12:00	Hybrid Coherent/Incoherent Beam Forming Diagnostic Approach to Naval Assets S. S. Kessler ¹ , E. B. Flynn ¹ , M. D. Todd ² [1] Metis Design Corporation, USA; 2) University of California San Diego, USA]	

Novel Signal Processing Techniques - III		
Chair: C. Palmer (Impact-Technologies, LLC., USA)		Location: HC 200-305
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
10:00 ~ 10:20	Structural Health Monitoring of an Advanced Composite Aircraft Structure using a Modal Approach T. H. Ooijevaar, R. Loendersloot, L. L. Warnet, R. Akkerman, A. de Boer [University of Twente, The Netherlands]	
10:20 ~ 10:40	On the Application of Bayesian Analysis and Advanced Signal Processing Techniques for the Impact Monitoring of Smart Structures M. A. Torres-Arredondo, C. Yang, C.-P. Fritzen [University of Siegen, Germany]	
10:40 ~ 11:00	Comparison of Damage Localization based on Modal Filters using Strain Measurements and Acceleration Measurements A. Deraemaeker, G. Tondreau [Université Libre de Bruxelles, Belgium]	
11:00 ~ 11:20	Multi-source Acoustic Emission Signals Analysis Based on Blind Source Separation using Macro Fiber Composite H. Nasser ¹ , W. Zhou ² [1) Centre de Recherche Public Henri Tudor, Luxembourg; 2) Harbin Institute of Technology, China]	
11:20 ~ 11:40	Finite Element Model Based State Estimation in Mechanical and Structural Systems E. M. Hernandez [University of Vermont, USA]	
11:40 ~ 12:00	Hybrid Immune Algorithm for Structural Health Monitoring Using Acceleration Data R. Li, A. Mita [Keio University, Japan]	

SPECIAL SESSION SHM Benchmark for High-rise Structures - I Chair: Y.Q. Ni (HKPU, Hong Kong)		
Chair: Y.Q. Ni (Hong Kong Polytechnic University, Hong Kong), T. Hatada (Kajima, Japan)		Location: ART 2
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
10:00 ~ 10:20	An Integrated MATLAB Toolbox for Optimal Sensor Placement Based on Multiple Optimization Strategies T. H. Yi, H. N. Li, M. Gu [Dalian University of Technology, China]	
10:20 ~ 10:40	Experimental Verification of Substructure Damage Detection Method using ARX and ARMAX L. Mei, A. Mita, Z. Xing [Keio University, Yokohama, Japan]	
10:40 ~ 11:00	Application of Distributed Optical Fiber Strain Measurement into Geotechnical Engineering Monitoring B. Shi, D. Zhang, H. H. Zhu, C. Liu [Nanjing University, China]	
11:00 ~ 11:20	Structural Safety Monitoring During Construction of Shanghai Expo Puxi Entertainment Hall Z. Ming ¹ , L. Jun ² [1) Tongji University, P.R.China; 2) Shanghai Geotechnical Investigations & Design Institute Co., Ltd, China]	
11:20 ~ 11:40	Proactive Condition Assessment in Civil Engineering using Automated Multi-Sensor Systems M. Stoppel ¹ , J. H. Kurz ² , A. Taffe ¹ , C. Boller ² [1) Federal Institute for Materials Research and Testing, Germany, 2) Fraunhofer Institute for Nondestructive Testing, Germany]	
11:40 ~ 12:00		

SPECIAL SESSION Non-contact Sensing Technologies - I Chair: H. Sohn (KAIST, Korea)		
Chair: H. Sohn (KAIST, Korea), J. Yang (University of South Carolina, USA)		Location: ART 4
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
10:00 ~ 10:20	Detection and Sizing of Subsurface Impedance Discontinuities using Acoustic Wavefield Images T. E. Michaels, J. E. Michaels, M. Ruzzene [Georgia Institute of Technology, USA]	
10:20 ~ 10:40	Terahertz Phonon Amplification and Sasing in Semiconductor Superlattice Structures R. P. Beardsley, A. J. Kent [University of Nottingham, UK]	

10:40 ~ 11:00	Lamb Wave Interaction with a T-Joint C. Allen, C. T. Owens, E. D. Swenson [Air Force Institute of Technology, USA]	
11:00 ~ 11:20	The Search for Optimal Sensor Network in Lamb Wave-based SHM Method P. Malinowski, T. Wandowski, W. Ostachowicz [Polish Academy of Sciences, Poland]	
11:20 ~ 11:40	Experimental Studies of Structure Inspection and Damage Detection Based on Elastic Waves Energy Distribution M. Radzienski, W. Ostachowicz [Polish Academy of Sciences, Poland]	
11:40 ~ 12:00	Robust Vision-Based Approaches for Structural Health Monitoring M. R. Jahanshahi, S. F. Masri [University of Southern California, USA]	

12:00 ~ 13:20	Lunch at the Oval <i>Location: The Oval</i>	
---------------	---	--

Faculty / Student Panel		
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
12:00 ~ 13:20	Chair: C. Farrar (Los Alamos National Laboratory, USA) Panelists: TBA <i>Location: TBA</i>	

Aerospace Structures: Laboratory Demonstration - III		
Chair: S. Huang (NASA Ames, USA), A. Kumar (Acellent Technologies Inc., USA)		Location: HC 200-002
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
13:20 ~ 13:40	Contact Pressure and Ultrasonic Damage Feature(s) in Health Monitoring of L-shaped Bolted Joints in Aerospace Structures M. Jalalpour ¹ , A. El-Osery ² , E. Austin ³ , M. R. Taha ¹ [1] University of New Mexico, USA; 2) New Mexico Tech., Socorro, USA; 3) Moog CSA Engineering, USA]	
13:40 ~ 14:00	Application of Unscented Kalman Filters, Wavelet Packet Transforms and Feedback Control to Monitoring and Compensate Damaged Aircraft Structures R. Vepa [University of London, UK]	
14:00 ~ 14:20	Bond Graph Model of a Thin SHM Piezoelectric Energy Harvester T. Sainthuil ¹ , C. Delebarre ¹ , S. Grondell ¹ , C. Paget ² [1] University of Valenciennes and Hainaut-Cambresis, France; 2) Airbus, UK]	
14:20 ~ 14:40	Impact Location Based on Multi-agent Coordination and Fusion for Large Structures D. Liang, S.-F. Yuan [Nanjing University of Aeronautics and Astronautics, China]	
14:40 ~ 15:00	An Integrated Monitoring System for Damage Detection by Carbon Fibers and Optical Fibers H. Huang ¹ , Z. S. Wu ¹ , C. Q. Yang ² [1] Ibaraki University, Japan; 2) Southeast University, China]	
15:00 ~ 15:20	Advanced Approach for Multi-Site Damage Monitoring on Aircraft Fuselage Panel using Sparse PZT Actuator/Sensor Arrays R. Hedl ¹ , J. Finda ¹ , G. Parthasarathy ² [1] Honeywell International, Czech Republic; 2) Honeywell International, USA]	

Quantification / Validation / Certification		
Chair: C. Buynak (AFRL, USA)		Location: HC 200-030
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
13:20 ~ 13:40	Sensor Location Analysis for Fatigue Crack Detection using Nonlinear Acoustics R. B. Jenal ¹ , W. J. Staszewski ^{1,2} , A. Klepka ² and T. Uhl ² [1] Sheffield University, UK; 2) AGH University of Science and Technology, Poland]	
13:40 ~ 14:00	Uncertainty Quantification and Validation of Finite Element Models of Bridge Structures J. Marin, M. Nishio, Y. Fujino [The University of Tokyo, Japan]	
14:00 ~ 14:20	Identification of the Stiffness Distribution using BOTDR Y. Goldfeld, A. Klar [Technion - Israel Institute of Technology, Israel]	

14:20 ~ 14:40	Co-bonding of Piezoelectric Sensors on CFRP Structures M. Bach ¹ , B. Eckstein ¹ , N. Jacquiel ² , R. Bertrand ² , C. Stolz ³ [1) EADS Innovation Works, Germany; 2) Airbus Operations GmbH, Germany; 3) Cassidian, Germany]	
14:40 ~ 15:00	Development of Probability of Detection Data for Structural Health Monitoring Damage Detection Techniques Based on Acoustic Emission D. O. Gagar ¹ , P. E. Irving ¹ , I. Jennions ¹ , P. Foote ² , I. Read ² , J. McFeat ³ [1) Cranfield IVHM Centre, BAE Systems, UK; 2) BAE Systems, ATC Sowerby, Bristol, UK; 3) BAE Systems, Warton Aerrodrome, Lancashire, UK]	
15:00 ~ 15:20		

SPECIAL SESSION		
Intelligent Sensor Networks for SHM - III		
Chairs: J. Lynch (Univ. of Michigan, USA), A. Swartz (Michigan Techn. Univ., USA)		
Chair: J. Lynch (University of Michigan, USA), A. Swartz (Michigan Technological University, USA)		Location: HC 200-034
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
13:20 ~ 13:40	Use of Carbon Nanotubes for Strain Sensing of Epoxy Based Composites J. Rams, M. Sánchez, M. Campo, A. Jimenez, A. Urefia [Rey Juan Carlos University, Spain]	
13:40 ~ 14:00	Wireless Links for Global Positioning System Receivers F. Casciati, L. Wu [University of Pavia, Italy]	
14:00 ~ 14:20	Automatic Wireless Transfer of Acquired Usage Monitoring Data N. Cranley, S. Wilmot [ACRA CONTROL, Ireland]	
14:20 ~ 14:40	Sandwich Node Architecture for Task Preemption in Wireless Sensor Networks for Structural Health Monitoring Applications Z. Wang, S. N. Pakzad, L. Cheng [Lehigh University, USA]	
14:40 ~ 15:00	Smart Battery-Free Wireless Sensor Networks for Structural Health Monitoring A. Abedi, A. Razi, F. Afghah [Univeristy of Maine, USA]	
15:00 ~ 15:20	Military-Standard Sensor Nodes for the SmartBrick Structural Health Monitoring Platform A. Gunasekaran, P. N. Chulick, S. Sedigh, A. R. Hurson [Department of Electrical and Computer Engineering, Missouri University of Science and Technology, USA]	

SPECIAL SESSION		
Wave Propagation Simulation - II		
Chairs: W. Staszewski (Sheffield University, UK), W. Ostachowicz (PAS, Poland)		
Chair: W. Staszewski (Sheffield University, UK), W. Ostachowicz (PAS, Poland)		Location: HC 200-203
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
13:20 ~ 13:40	Lamb Wave Techniques for Damage Detection in CFRP-Components - Is This Really Possible? W. Hillger, A. Szewieczek, D. Schmidt, M. Sinapius [German Aerospace Center (DLR), Germany]	
13:40 ~ 14:00	System Identification with Generalized Impulse and Frequency Response Function R. R. Zhang, L. Gargab [Colorado School of Mines, USA]	
14:00 ~ 14:20	Propagation of Guided Elastic Waves in Aircraft Structural Elements by the Spectral Finite Element Method A. Zak, W. Ostachowicz [Polish Academy of Sciences, Poland]	
14:20 ~ 14:40	SHM of Structural Materials by Means of Highly Nonlinear Solitary Waves X. Ni, P. Rizzo [University of Pittsburgh, PA, USA]	
14:40 ~ 15:00	Interaction of Elastic Waves with Delaminations in CFRP Structures: A Numerical Study using the Spectral Element Method H. Jung, R. T. Schulte, C.-P. Fritzen [University of Siegen, Germany]	
15:00 ~ 15:20	Combining Guided Waves and Electromechanical Impedance Method for SHM Applications X. Zhu, P. Rizzo [University of Pittsburgh, USA]	

Advanced Diagnostics for Damage Assessment - V

Chair:

L. Gaul (University of Stuttgart, Germany)

Location:

HC 200-205

TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
13:20 ~ 13:40	Experimentation and Detection Characters of Lamb Wave Phase Array on a Large Thin aluminium Plate D. Y. Gao, Z. J. Wu, M. J. Liu, Z. Wang [Dalian University of Technology, China]	
13:40 ~ 14:00	Damage Detection of Composite Structure Using Independent Component Analysis R. Hajrya, N. Mechbal, M. Verge [Process and Engineering in Mechanics and Materials Laboratory (PIMM), France]	
14:00 ~ 14:20	Rapid Localization and Ultrasonic Imaging of Multiple Damages in Structural Panel with Piezoelectric Sensor-Actuator Network G. Kolappan Geetha, V.T. Rathod, N. Chakraborty, D. Roy Mahapatra, S. Gopalakrishnan [Indian Institute of Science, India]	
14:20 ~ 14:40	Damage Assessment of CFRP Stiffened Panels by Electro-mechanical Impedance Method N.J. Ferreira, J.M. Silva, R.J. Guimaraes, P.J. Antunes, M.A. Baptista, J.C. Viana, G.R. Dias [Critical Materials, Lda, Portugal]	
14:40 ~ 15:00	Optimal Sensor Fusion for Structural Health Monitoring of Aircraft Composite Components W. Costiner ¹ , H. A. Winston ¹ , M. R. Gurvich ¹ , A. Ghoshal ² , G. S. Welsh ¹ , S. L. Butler ¹ , M. R. Urban ³ , N. Bordick ⁴ [1) United Technologies Research Center, USA; 2) Army Research Laboratory, USA; 3) Sikorsky Aircraft Corporation, USA; 4) Army Aviation Applied Technology Directorate, USA]	
15:00 ~ 15:20	Impact Location Identification and Damage Detection on Plate-like Structures using Time-reversal Method C. Chen ¹ , Y. Li ² , F-G Yuan ³ [1) Northwestern Polytechnical University, USA; 2) North Carolina State University, USA]	

SPECIAL SESSION

Decision Making in Structural Health Monitoring - II

Chairs: D. Zonta (Univ. of Trento, Italy), M. Todd (UC San Diego, USA)

Chair:

M. Todd (UC San Diego, USA), D. Zonta (University of Trento, Italy)

Location:

HC 200-303

TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
13:20 ~ 13:40	Streicker Bridge: The Impact of Monitoring on Decision Making D. Zonta ¹ , B. Glisic ² , S. Adriaenssens ³ [1) University of Trento, Italy; 2) Princeton University, USA]	
13:40 ~ 14:00	Advanced Sensing, Degradation Detection, Diagnostic and Prognostic Capabilities for Structural Health Management R. Clements ¹ , D. Darr ¹ , J. Morse ¹ , B. C. Laskowski ¹ , R. Betti ² , T. K. Ooi ³ , A. Corder ³ [1) Analatom Incorporated, USA; 2) Columbia University, USA; 3) Missile Defense Agency, USA]	
14:00 ~ 14:20	Acousto-optic Measurements in CFRP Laminates using Fiber Bragg Grating Sensors H. Toutanji ¹ , N. Mabry ¹ , C. Banks ² [1) University of Alabama in Huntsville, USA; 2) NASA Marshall Space Flight Center, USA]	
14:20 ~ 14:40	Uncertainties in Damage Identification and Lifetime Functions of Ageing Concrete Structures A. Del Grosso ¹ , F. Lanata ² [1) University of Genoa, Italy; 2) University of Nantes, France]	
14:40 ~ 15:00	A Multi-Non-Linear Civil SHM Model for Decision Support H. Allmer, H. Wenzel, H. Allmer [Vienna Consulting Engineers, Austria]	
15:00 ~ 15:20	Research on Software Platform of Bridge Health Monitoring System Based on Java EE & Scientific Computing Engine D.-H. Dan ¹ , Y. Zhao ¹ , X. Yan ² [1) Tongji University, P.R.China; 2) Shanghai Urban Construction Design and Research Institute, China]	

Modeling / Simulation

Chair:

F. Wu (Shanghai Jiao Tong University, China), P. Masson (Université de Sherbrooke, Canada)

Location:

HC 200-305

TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
13:20 ~ 13:40	Verification of Unified Framework for Plate Structures Using Kirchhoff's Plate Theory A. Dixit, S. Hanagud [Georgia Institute of Technology, USA]	
13:40 ~ 14:00	Finite Element Simulation of Compensation for Temperature Influence on Lamb Wave Propagation W. Z. Qu ¹ , D. J. Inman ² [1) Wuhan University, China; 2) Virginia Tech., USA]	

14:00 ~ 14:20	Experimental Validation of Algorithms for Wave Propagation Modeling in 2D and 3D Structures based on the Spectral Element Method W. Ostachowicz ^{1,2} , P. Kudela ¹ , M. Radzieński ¹ [1] Polish Academy of Sciences, Poland; 2) Gdynia Maritime University, Poland]	
14:20 ~ 14:40	Damage Assessment Using Hyperchaotic Excitation and Nonlinear Prediction Error S. Torkamani ¹ , E. A. Butcher ¹ , M. D. Todd ² , G. Park ³ [1] New Mexico State University, USA; 2) University of California San Diego, USA; 3) Los Alamos National Laboratory, USA]	
14:40 ~ 15:00	Wave Propagation in Anisotropic Layered 2D Structures Using Spectral Finite Elements B. Hennings, R. Lammering [Helmut Schmidt University, Germany]	
15:00 ~ 15:20	1-D and 2-D Modeling of Power and Energy Transduction of Piezoelectric Wafer Active Sensors for Structural Health Monitoring B. Lin, V. Giurgiutiu [University of South Carolina, USA]	

SPECIAL SESSION SHM Benchmark for High-rise Structures - II Chair: Y.Q. Ni (HKPU, Hong Kong)		
Chair: T. Hatada (Kajima, Japan), Y.Q. Ni (Hong Kong Polytechnic University, Hong Kong)		Location: ART 2
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
13:20 ~ 13:40	Operational Modal Analysis for a Benchmark High-rise Structure Y. Niu, P. Kraemer, C.-P. Fritzen [University of Siegen, Germany]	
13:40 ~ 14:00	An Efficient Sensor Placement Method for High-rise Structures - A Case Study: The Canton Tower, China T. H. Yi, H. N. Li, M. Gu [Dalian University of Technology, China]	
14:00 ~ 14:20	Information Entropy-based Algorithm of Sensor Placement Optimization for Structural Damage Detection S.-Q. Ye, Y.-Q. Ni [The Hong Kong Polytechnic University, Hong Kong]	
14:20 ~ 14:40	SSA-Based Stochastic Subspace Identification of Structures from Output-only Vibration Measurements C.-H. Loh ¹ , Y.-C. Liu ¹ , Y.-Q. Ni ² [1] National Taiwan University, Taiwan; 2) The Hong Kong Polytechnic University, Hong Kong]	
14:40 ~ 15:00	SHM Benchmark for High-rise Structures: Description of Host Structure and Measurement Data Y.-Q. Ni, Y. Xia, W. Lin, J.-M. Ko [The Hong Kong Polytechnic University, Hong Kong]	
15:00 ~ 15:20		

SPECIAL SESSION Non-contact Sensing Technologies - II Chair: H. Sohn (KAIST, Korea)		
Chair: K. Law (Stanford University, USA), H. Sohn (KAIST, Korea)		Location: ART 4
TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
13:20 ~ 13:40	Visualization of Lamb Wave Interaction with a 5 mm Fatigue Crack using 1D Ultra High Frequency Laser Doppler Vibrometry C. T. Owens, E. D. Swenson, C. Allen [United States Air Force Institute of Technology, USA]	
13:40 ~ 14:00	Developing a Wireless Two-dimensional Image-based Crack Sensor for Concrete Structures S. H. Man, C. Z. Ng, H. Muhammad, C. C. Chang, A. Bermak [Hong Kong University of Science and Technology, Hong Kong]	
14:00 ~ 14:20	Interaction of Lamb Waves with Fatigue Cracks in Aluminum Plates E. D. Swenson, C. T. Owens, C. Allen [Air Force Institute of Technology, USA]	
14:20 ~ 14:40	Localization of Crack Initiation in a Pipe Structure using a Laser Based Acoustic Emission Technique B. Park, H. Sohn [Department of Civil and Environmental Engineering, KAIST, Korea]	
14:40 ~ 15:00	Applications of the Vision-based Monitoring System using a Digital Image Correlation Technique to Long-span Bridge Cables S.-W. Kim, N.-S. Kim [Pusan National University, Korea]	
15:00 ~ 15:20	Damage Detection using Andrew Plots F. Gharibnezhad, L. E. Mujica, J. Rodellar [Technical University of Catalonia, Spain]	

15:20 ~ 15:35	Coffee Break <i>Location: Dohrmann Grove</i>	
---------------	--	--

Panel Discussion: Civil and Mechanical Systems

TIME	THURSDAY, SEPTEMBER 15	PAGE NO.
15:35 ~ 17:00	SHM for Life Cycle Management: Where are the Gaps & How can we get there? Chair: TBA Panelists: TBA <i>Location: TBA</i>	