TECHNICAL PROGRAM

Overview

Update: 2011-09-06

Monday, September 12th

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 13th

	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**			Speaker: Brad G. Osgood [Stanford University, USA]				*Location: Memorial Auditorium*	
08:10 ~ 08:40	**Keynote 1**			Speaker: Matthias Buderath [Cassidian, Germany]				*Location: Memorial Auditorium*	
08:40 ~ 09:10	**Keynote 2**			Speaker: Jim Cycon [Sikorsky, USA]				*Location: Memorial Auditorium*	
09:10 ~ 09:40	**Keynote 3**			Speaker: H. Felix Wu [NIST, USA]				*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**			Poster Session, Special Poster Session: NIST Technology Innovation Program (TIP)				*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**			Chair: D. Inman				*Location: Memorial Auditorium*	
18:30 ~ 22:00	**SHM Networking Welcome Night**							*Location: Frost Amphitheater*	

Wednesday, September 14th

	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**			Speaker: Les Lee [AFOSR, USA]				*Location: Memorial Auditorium*	
09:00 ~ 09:30	**Keynote 5**			Speaker: Luis G. dos Santos [Embraer, Brazil]				*Location: Memorial Auditorium*	
09:30 ~ 10:00	**Keynote 6**			Speaker: Peter Foote [BAE Systems, UK], Grant Gordon [Honeywell, USA], Mark Derriso [AFRL, USA]				*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 Public Hearing Session	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**			Chairs: A. Hess, B. Glisic				*Location: Memorial Auditorium*	
18:30 ~ 22:00	**Banquet and Award Night**							*Location: Crowne Plaza Hotel Cabana, Palo Alto*	

Thursday, September 15th

	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**			Speaker: Anne S. Kiremidjian [Stanford University, USA]				*Location: Annenberg Auditorium (ART 1)*	
09:00 ~ 09:30	**Keynote 8**			Speaker: Dennis Roach [Sandia National Laboratories, USA]				*Location: Annenberg Auditorium (ART 1)*	
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**			Chair: C. Farrar				*Location: Annenberg Auditorium (ART 1)*	
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**			Chair: J. Lynch				*Location: Annenberg Auditorium (ART 1)*	

HC: History Corner (200) / **ART**: Cummings (Nathan) Art Building

T E C H N I C A L P R O G R A M

Tuesday, September 13th

07:00 ~ 08:00	**Registration** *Location: Dohrmann Grove*	

07:00 ~ 08:00	**Light Continental Breakfast** *Location: Dohrmann Grove*	

Opening Remarks

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

Keynotes

Chair:
A. Srivastrava (NASA Ames, USA)

Location:
Memorial Auditorium

TIME	TUESDAY, SEPTEMBER 13	PROC. PAGE NO.
08:10 ~ 08:40	**Integration of Structural Health Monitoring Systems into Unmaned Aerial Systems - Challenges and Opportunities** Matthias Buderath [Cassidian, Germany]	3 (BROCHURE: 4)
08:40 ~ 09:10	**The Journey to Incorporate Health Monitoring and Condition Based Maintenance** Jim Cycon [Sikorsky, USA]	11 (BROCHURE: 4)
09:10 ~ 09:40	**The Challenges of Structural Health Monitoring Technologies in Civil Infrastructure** H. Felix Wu [NIST, USA]	- (BROCHURE: 5)

09:40 ~ 10:00	**Coffee Break** *Location: Dohrmann Grove*	

Poster Sessions

TIME	TUESDAY, SEPTEMBER 13	PROC. PAGE NO.
09:40 ~ 14:05	**Poster Session** **&** **Special Poster Session: NIST Technology Innovation Program (TIP)** *Location: Dohrmann Grove*	(BROCHURE: 19)

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	PROC. 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]	405
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]	413

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]	421
11:00 ~ 11:20	**Overview of CVM Technology Tests Performed by Embraer** R. P. Rulli, P. A. da Silva [Embraer S.A. Lima, Brazil]	432
11:20 ~ 11:40	**Advanced System-Level Reliability Analysis and Prediction with Field Data Integration** T. Meyer[1], J. Berg[1], A. Palladino[1], A. Sarlashkar[1], S. Hussain[2], D. Lamb[2] [1) Impact Technologies, USA; 2) US Army RDECOM-TARDEC, USA]	439
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. Dantele[3], Z. Djinovic[4], F. Graf[5], T. Natschläger[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]	447

Sensors and Actuators Development - I

Chair:
I. Oppenheim (Carnegie Mellon University, USA), P. Qing (COMAC, China)

Location:
HC 200-030

TIME	*TUESDAY, SEPTEMBER 13*	*PROC. 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]	1519
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]	1417
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]	1424
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]	1434
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]	1442
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]	1449

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*	*PROC. 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]	1709
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]	1717
10:40 ~ 11:00	**Integrated Piezo-Element Drive Electronics for Structural Health Monitoring** Y. Guo, B. Murmann [Stanford University]	1724
11:00 ~ 11:20	**Micropillar Sensing Element for Bio-Inspired Flow Sensors** J. Tao, X. Yu, J. Berilla [Case Western Reserve University, USA]	1732
11:20 ~ 11:40	**A Bio-Inspired Nanocomposite for Photocurrent-based Strain Sensing** D. Ryu, K. J. Loh [University of California, Davis, USA]	1740
11:40 ~ 12:00	**Improving the Reliability of Sensor Skins for Structural Health Monitoring** I. Mohammad, H. Huang [University of Texas at Arlington, USA]	1748

Prognostics and Data Mining for Health Management - I

Chair: C. Farrar (Los Alamos National Laboratory, USA)

Location: HC 200-203

TIME	TUESDAY, SEPTEMBER 13	PROC. 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]	1225
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]	1233
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]	1241
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 Politécnica de Catalunya, Spain]	1250
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]	1258
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]	1266

Advanced Diagnostics for Damage Assessment - I

Chair: T. Stepinski (Uppsala University, Sweden)

Location: HC 200-205

TIME	TUESDAY, SEPTEMBER 13	PROC. 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]	55
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]	63
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]	71
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]	79
11:20 ~ 11:40	**Nonlinear Cointegration as a Combinatorial Optimisation Problem** E. J. Cross, K. Worden [University of Sheffield, UK]	87
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]	95

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	PROC. 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]	2595
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]	2603
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]	2611

11:00 ~ 11:20	**Structural Integrity Monitoring of the Critical Zones in the Wind Turbine Composite Blades with the use of Integrated Sensors - SESS Poject** 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]	2619
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]	2629
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]	2637

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*	*PROC. 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]	1131
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]	1139
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 Insitute of Technology, USA]	1150
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]	1206
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]	1165
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 Composties, Japan]	1173

Civil Infrastructures: Laboratory Demonstration - I

Chair: F. Casciati (University of Pavia, Italy), A. Holst (TU Braunschweig, Germany)

Location: ART 2

TIME	*TUESDAY, SEPTEMBER 13*	*PROC. 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]	759
10:20 ~ 10:40	**Ultrasonic Wall Thickness Monitoring at High Temperatures (>500 ℃)** F. Cegla[1], P. Cawley[1], J. Allin[2], J. Davies[2] [1) Imperial College, UK; 2) Permasense Ltd, UK]	767
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]	775
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]	783
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]	791
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]	799

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	PROC. 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]	2125
10:20 ~ 10:40	**Decentralized Fault Detection in Wireless Sensor Networks** C. Lo, M. Liu, J. P. Lynch [University of Michigan, USA]	2133
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]	2141
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]	2149
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]	2157
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]	2165

12:00 ~ 13:00	**Lunch at the Oval** *Location: The Oval*	

Poster Sessions: Q & A

TIME	TUESDAY, SEPTEMBER 13	PROC. PAGE NO.
13:00 ~ 14:05	**Poster Session & Special Poster Session: NIST Technology Innovation Program (TIP)** *Location: Dohrmann Grove*	(BROCHURE: 19)

Aerospace Structures: Field Evaluation and Validation - II

Chair: R. Ross (NASA Langley, USA)

Location: HC 200-002

TIME	TUESDAY, SEPTEMBER 13	PROC. 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]	455
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]	463
14:45 ~ 15:05	**Wireless and Batteryless Accelerometry for Aircraft Structural Health Monitoring** R. Monthéard[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]	471

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. Gorbatov[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]	479
15:25 ~ 15:45	**Algorithms to Monitor Damaging Events on a Plane Blade with an Autonomous Embedded Microsystem** M. Lastapis[1,2], C. Escriba[1,2], J.-Y. Fourniols[1,2] [1) CNRS, France; 2) Université de Toulouse, France]	487

Sensors and Actuators Development - II

Chair: V. Smelyanskiy (NASA Ames, USA)

Location: HC 200-030

TIME	*TUESDAY, SEPTEMBER 13*	*PROC. 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]	1457
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]	1466
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]	1472
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]	1480
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]	1488

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*	*PROC. PAGE NO.*
14:05 ~ 14:25	**Bio-inspired Computing Algorithms for Adaptive Structural Health Monitoring** W. Liu, B. Chen [Michigan Technological University, USA]	1756
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]	1764
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]	1772
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]	1780
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]	1788

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*	*PROC. 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]	1899
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]	1907
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. Mal[3] [1) Indian Institute of Technology Bombay, India; 2) University of Naples, Italy; 3) University of California Los Angeles, USA]	1915
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. Mal[3] [1) University of Naples Federico II, Italy; 2) Indian Institue of Technology Bombay, India; 3) University of California Los Angeles, USA]	1923

Advanced Diagnostics for Damage Assessment - II

Chair: N. Phan (US Navy, USA)

Location: HC 200-205

TIME	*TUESDAY, SEPTEMBER 13*	*PROC. 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]	103
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]	111
14:45 ~ 15:05	**Joint Condition Identification with Partially Measured Frequency Response Function** M. Wang, G. Zheng [Tsinghua University, China]	119
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]	127
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]	135

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*	*PROC. 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]	2647
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]	2655
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]	2663

15:05 ~ 15:25	**Structural Health Monitoring: An End User's Point of View** P. Stephan, G. Moreau, S. Blairon [EDF R&D, France]	2671
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]	2680

Operational Effects Consideration in SHM - II

Chair:
S. Galea (Defence Science and Technology Organisation, Australia)

Location:
HC 200-305

TIME	*TUESDAY, SEPTEMBER 13*	*PROC. 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]	1180
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]	1188
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. Gonsalez[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]	1196
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]	1158
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'Donoughue, I. J. Oppenheim, J. Shi, L. Soibelman [Carnegie Mellon University, USA]	1214

Civil Infrastructures: Laboratory Demonstration - II

Chair:
K. Worden (Sheffield University, UK)

Location:
ART 2

TIME	*TUESDAY, SEPTEMBER 13*	*PROC. 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]	807
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]	815
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]	823
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]	831
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]	839

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*	*PROC. PAGE NO.*
14:05 ~ 14:25	**Modal Identification of Steel Truss Bridges Using Wireless Sensor Network** S. Dorvash, S. N. Pakzad, R. C. Knorr, L. M. Horwath [Lehigh University, USA]	2173
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]	2181
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]	2189
15:05 ~ 15:25	**Towards a Digital Image Correlation Based Strain Sensor** M. Dutton, N. A. Hoult, W. A. Take [Queen's University, Canada]	2195
15:25 ~ 15:45	**An Innovative Non-Contact ECG and Biopotential Sensor** Y. Sun, J. Berilla, X. (Bill) Yu [Case Western Reserve University, USA]	2203

15:45 ~ 16:00	**Coffee Break** *Location: Dohrmann Grove*	

Panel Discussion: Aerospace

TIME	*TUESDAY, SEPTEMBER 13*	*PROC. 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:* M. Buderath (Cassidian, Germany), C. Davis (Boeing, USA), M. Derriso (AFOSR, USA), A. Ghoshal (US Army, USA), V. Smelyanskiy (NASA Ames, USA), H. Speckmann (Airbus, Germany) *Location: Memorial Auditorium*	

18:30 ~ 22:00	**SHM Networking Welcome Night** *Location: Frost Amphitheater*	

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	PROC. 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]	733
11:00 ~ 14:05	**Mission and Scale Analysis on SHM of UAV's** M. Celebi [Turkish Air Force Academy, Turkey]	516
11:00 ~ 14:05	**Damage Monitoring Based on Wave Illumination of Structures** Y. Liu, N. Mechbal, M. Vergé [Arts et Métiers ParisTech, France]	322
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]	748
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]	282
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]	872
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]	1103
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]	880
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]	1119
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]	848
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]	963
11:00 ~ 14:05	**A System for Static and Dynamic Monitoring of Ice-Sport Arena** G. Boldyrev, A. Zhivaev [NPP Geotek Ltd, Russia]	378
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]	368
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]	1620
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]	370
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]	955

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]	1612
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]	1580
11:00 ~ 14:05	**Overview of the European FP 7 Project "Aircraft Integrated Structural Health Assesment 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]	1572
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]	1603
11:00 ~ 14:05	**Inter-digitized Transducers (IDTs) for Structural Health Monitoring (SHM) Applications** J. K. Na[1], S. Kuhr[2], Carl Druffner[3] [1) Edison Welding Institute, USA; 2) University of Dayton Research Institute, USA; 3) Mound Laser and Photonics Center, USA]	1587
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]	742
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]	651
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]	888
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]	1111
11:00 ~ 14:05	**Image Processing Technique for Vibrothermographic Field Tests** M. Szwedo, L. Pieczonka, T. Uhl [AGH University of Science and Technology, Poland]	298
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]	947
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]	314
11:00 ~ 14:05	**Monitoring of 3D Composite Structures Using Fiber Optic Bragg Grating Sensors** M. Dvořák, J. Had, M. Růžička, Z. Pošvář [Czech Technical University in Prague, Czech Republic]	1595
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]	1349
11:00 ~ 14:05	**Adaptive Fuzzy-based Approach for Classification of System's States** H. Aljoumaa, D. Söffker [University of Duisburg-Essen, Germany]	290
11:00 ~ 14:05	**Uncertainty Assessment in Structural Health Monitoring** S.Sankararaman, S. Mahadevan [Vanderbilt University, USA]	1399
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) Universitá degli studi di Ferrara, Italy]	971
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]	864
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]	306
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]	856

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)

Location: Dohrmann Grove

TIME	*TUESDAY, SEPTEMBER 13*	*PROC. 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** *Location: Dohrmann Grove*	

Keynotes

Chair:
J. Chang (Army Research Laboratory, USA)

Location:
Memorial Auditorium

TIME	WEDNESDAY, SEPTEMBER 14	PROC. PAGE NO.
08:30 ~ 09:00	**Multifunctional Design Perspective for Bio-inspired Systems Allowing Autonomic Response** Les Lee [AFOSR, USA]	- (BROCHURE: 5)
09:00 ~ 09:30	**Embraer Perspective on the Introduction of SHM into Current and Future Commercial Aviation Programs** Luis G. dos Santos [Embraer, Brazil]	19 (BROCHURE: 6)
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]	- (BROCHURE: 6)

10:00 ~ 10:20	**Coffee Break** *Location: Dohrmann Grove*	

Aerospace Structures: Field Evaluation and Validation - III

Chair:
B. Glass (Lockheed Martin, USA)

Location:
HC 200-002

TIME	WEDNESDAY, SEPTEMBER 14	PROC. 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]	493
10:40 ~ 11:00	**Real-Time Condition Assessment of RAPTOR Telescope Systems** C. J. Stull, S. G. Taylor, J. Wren, D. L. Mascareñus, C. R. Farrar [Los Alamos National Laboratory, USA]	501
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]	509

AISC Guidebook Development Public Hearing Session

TIME	WEDNESDAY, SEPTEMBER 14	PROC. PAGE NO.
11:20 ~ 11:50	*Chair:* P. Foote (BAE Systems, UK) *Location: HC 200-002*	

Sensors and Actuators Development - III

Chair:
P. Hagedorn (TU Darmstadt, Germany)

Location:
HC 200-030

TIME	WEDNESDAY, SEPTEMBER 14	PROC. PAGE NO.
10:20 ~ 10:40	**Piezoelectric Paint as Spatially Distributed Modal Sensors** C. Yang, C.-P. Fritzen [University of Siegen, Germany]	1496

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]	1504
11:00 ~ 11:20	**RF-powered Wireless Strain Sensor** Y. Hew, A. Yu, H. Huang [University of Texas at Arlington, USA]	1512
11:20 ~ 11:40	**Very Dense Arrays of Sensors for SHM Based on Large Area Electronics** B. Glisic, N. Verma [Princeton University, USA]	1409
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]	1527

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*	*PROC. 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]	1932
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]	1940
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]	1948
11:20 ~ 11:40	**Baseline-free Crack Detection in Nuclear Power Plants** H. Lee, H. Sohn [Korea Advanced Institute of Science and Technology, Korea]	1956
11:40 ~ 12:00	**Ultrasonic Structural Health Monitoring of Cable Structures** H. Sprenger, L. Gaul [University of Stuttgart, Germany]	2693

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*	*PROC. 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]	2417
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]	2429
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]	2437
11:20 ~ 11:40	**The Need and Requirements for Validating Damage Detection Capability** E. A. Lindgren, C. F. Buynak [Air Force Research Laboratory, USA]	2444
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]	2452

Advanced Diagnostics for Damage Assessment - III

Chair: J. Huang (Boeing, USA)

Location: HC 200-205

TIME	WEDNESDAY, SEPTEMBER 14	PROC. PAGE NO.
10:20 ~ 10:40	**Power Losses in PZT Disk Actuators' Adhesive** R. Dugnani [Exponent Failure Analysis Associates, USA]	143
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]	151
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]	159
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]	167
11:40 ~ 12:00	**Time-Domain Localized Structural Damage Identification with Incomplete Excitation Measurements** J. He, B. Xu [Hunan University, China]	175

Prognostics and Data Mining for Health Management - II

Chair: K. Goebel (NASA Ames, USA)

Location: HC 200-303

TIME	WEDNESDAY, SEPTEMBER 14	PROC. 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]	1274
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]	1283
11:00 ~ 11:20	**Prognostics and Diagnostics of Rotorcraft Bearings** M. Haile, A. Ghoshal, D. Le [US Army Research Laboratory, USA]	1292
11:20 ~ 11:40	**Bayesian Sensitivity Analysis of Numerical Models for Structural Health Monitoring** R. J. Barthorpe [The University of Sheffield, U.K.]	1300
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]	1309

Novel Signal Processing Techniques - I

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

Location: HC 200-305

TIME	WEDNESDAY, SEPTEMBER 14	PROC. 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. Mattone[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]	981
10:40 ~ 11:00	**Impact Echo Signal Interpretation using Ensemble Empirical Mode Decomposition** Z. Xie, X. Wei, Y. Zhang [Georgia Institute of Technology, USA]	989
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]	997
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]	1005
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]	1013

Civil Infrastructures: Field Evaluation and Validation - I

Chair: H. Wenzel (Vienna Consulting Engineers, Austria)

Location: ART 2

TIME	*WEDNESDAY, SEPTEMBER 14*	*PROC. 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]	661
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]	669
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]	677
11:20 ~ 11:40	**An Innovative Method to Measure Bridge Deflection using Simple Telecom Fiber** P. Kung , L. Wang [QPS Photronics Inc., Canda]	684
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]	692

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*	*PROC. 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]	1675
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]	1683
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]	1691
11:20 ~ 11:40	**Distributed Sensor Network for Structural Health Monitoring of Ships** B. W. Roeder, R. R. Klug [McQ Inc., USA]	1699

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*	*PROC. 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]	525
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]	531

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]	539
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]	547

Sensors and Actuators Development - IV

Chair:
T. Uhl (AGH University of Science and Technology, Poland)

Location:
HC 200-030

TIME	*WEDNESDAY, SEPTEMBER 14*	*PROC. PAGE NO.*
13:00 ~ 13:20	**Power Management in a Wireless Sensor for Structural Monitoring Application** S. Casciati[1], L. Faravell[2], Z. Chen[2] [1) University of Catania at Syracuse, Italy; 2) University of Pavia, Italy]	1535
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]	1543
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]	1550
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]	1558

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*	*PROC. 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]	1963
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]	1969
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]	1978
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]	1986

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*	*PROC. 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]	2460
13:20 ~ 13:40	**Challenges and Approach for SHM Technology Transition** S. Beard, S. Banerjee [Acellent Technologies, Inc., USA]	2468
13:40 ~ 14:00	**FAA Research & Development Efforts in SHM** P. Swindell, D. Roach, I. Won [FAA, USA]	2480
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]	2485

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*	*PROC. 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]	1996
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]	2004
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]	2012
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]	2020

Prognostics and Data Mining for Health Management - III

Chair: T. Kundu (University of Arizona, USA)

Location: HC 200-303

TIME	*WEDNESDAY, SEPTEMBER 14*	*PROC. PAGE NO.*
13:00 ~ 13:20	**Artificial Neural Network Based Damage Detection From Lamb Wave Response** A. Baranwal, M. Mitra [IIT Bombay, India]	1317
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]	1325
13:40 ~ 14:00	**Cognitive Architectures for Real-Time ISHM** J. A. Crowder [Raytheon Intelligence and Information Systems, USA]	1333
14:00 ~ 14:20	**Integration of Structural Health Monitoring and Fatigue Damage Prognosis** Y. Ling, S. Mahadevan [Vanderbilt University, USA]	1314

Novel Signal Processing Techniques - II

Chair: C.-P. Fritzen (University of Siegen, Germany)

Location: HC 200-305

TIME	*WEDNESDAY, SEPTEMBER 14*	*PROC. 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]	1021
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]	1029
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]	1037
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]	1045

Civil Infrastructures: Field Evaluation and Validation - II

Chair: N. Nakata (Johns Hopkins University, USA)

Location: ART 2

TIME	WEDNESDAY, SEPTEMBER 14	PROC. PAGE NO.
13:00 ~ 13:20	**Development of Reliable and Low-Power Wireless Health Monitoring Systems for Highway Bridges** D. Potter[1], J. Fasl[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]	701
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]	709
13:40 ~ 14:00	**Risk Based Civil SHM and Life Cycle Management** H. Wenzel, R. Veit-Egerer, M. Widmann [Vienna Consulting Engineers, Austria]	717
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]	725

Advanced Monitoring for Load / Environments

Chair: D. Huston (University of Vermont, USA)

Location: ART 4

TIME	WEDNESDAY, SEPTEMBER 14	PROC. 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]	333
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]	343
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]	354
14:00 ~ 14:20	**Experimental Evaluation of a Wavelet-Based FEM and its Application to Load History Identification** M. M. Mota, L. Pahlavan, C. Kassapolgou [Delft University of Technology, The Netherlands]	362

14:20 ~ 14:40	**Coffee Break** *Location: Dohrmann Grove*	

SHM in Action

TIME	WEDNESDAY, SEPTEMBER 14	PROC. PAGE NO.
14:40 ~ 17:00	*Chairs:* A. Hess (Hess PHM Group, USA), B. Glisic (Princeton University, USA) *Location: Memorial Auditorium*	(BROCHURE: 29)

18:30 ~ 22:00	**Banquet and Award Night** *Location: Crowne Plaza Hotel Cabana, Palo Alto*	

TECHNICAL PROGRAM

- SHM in Action -

Wednesday, September 14th

SHM in Action			
Chair: A. Hess (Hess PHM Group, USA), B. Glisic (Princeton University, USA)			***Location:*** Memorial Auditorium
TIME	***INSTITUTION***		***DESCRIPTION***
14:40 ~ 14:45			Opening Remarks
14:45 ~ 14:50	NATIONAL INSTRUMENTS	**National Instruments, USA**	National Instruments would demonstrate a new low-power wireless sensor device for strain gages and show the programming of the intelligent wireless device for local data processing of strain data using LabVIEW.
14:54 ~ 14:59	MISTRAS A World of NDT Solutions	**Mistras Group Inc., USA**	The 4-channel Acoustic Emission wireless node is designed as a local area monitoring system capable of detecting damage onset or progression such as crack growth, active corrosion, delamination formation in composites, impact damage, etc.
15:03 ~ 15:08	PRINCETON UNIVERSITY	**Princeton University, USA**	Demonstrating Bridge Health Monitoring system to show live measurements to the audience and also show the "Playback" software for analysis of events showing important loading in the form of heavy truck and related deformation captured by cameras and sensors.
15:12 ~ 15:17	metis design	**Metis Design Corporation, USA**	MDC plans to demonstrate real-time damage detection on representative composite structure using 3 sensor node digital sensor network to cover the large specimen (over 1 m²), data will be wireless transferred to a laptop for fast visualization of the damage. Single as well as multiple damage events introduced simultaneously.
15:21 ~ 15:26	Optilab	**Optilab, USA**	Optilab will demonstrate how the FBG Sensor Interrogator (FSI), a measurement system for FBG based optical sensing applications, can simultaneously have low speed sensing with 0.1 pm resolution and high speed sensing of 200 Hz and up in a single chassis. Furthermore, Optilab will demonstrate scalability of this FSI and innovative C-based software that can be streamed to computers and mobile devices in a numerical, graphical 2D, or 3D model visual interface.
15:30 ~ 15:35	SIM	**Structure Inspection & Monitoring Inc., USA**	Demonstrates the development of SIM Diagnostic Software, as part of Bridge Health monitoring system, to exploit the capabilities of smart sensors where the cost of data communications may be a major portion of the cost. The software reports data summaries on an exception basis to help engineers track changes not predicted from the latest model estimate stored at the data center.
15:39 ~ 15:44	Georgia Tech	**Georgia Tech, USA**	A 5-min video will be presented on our latest research exploiting mobile sensor networks for SHM. Integrating mobility with sensing nodes resolves some most critical challenges faced by current static wireless sensor networks. Multiple mobile sensing nodes form an organic mobile sensor network that can search for potential structural damage.
15:48 ~ 15:53	ACELLENT technologies, inc	**Acellent Technologies Inc., USA**	Acellent will demonstrate the wireless multifunctional sensing capabilities of SMART Layer technology, including impact monitoring, damage detection, and structural state sensing. This unique demonstration will be performed in real-time on a real world structure showcasing our remote monitoring capabilities.

15:57 ~ 16:02	Critical materials	**Critical Materials, Portugal**	Demonstration of PRODDIA® software platform focused on the continuous evaluation of material condition and structural integrity of critical components. Demonstration includes 3 minutes demo of the software workbench with a case study and 2 minutes video showing PRODDIA main features and other results.
16:06 ~ 16:11	Advitam	**Advitam, USA**	Advitam will demonstrate bridge health monitoring system that was installed back in 2004 on the Rion-Antirion Bridge http://en.wikipedia.org/wiki/Rion-Antirion_Bridge
16:15 ~ 16:20	VCE	**VCE Holding GmbH, Austria**	VCE would demonstrate how monitoring can influence Life Cycle Engineering. An example of the Life Cycle Software will be shown where changes in measurement or in management affect the Life Cycle Curve and therefore the predicted remaining lifetime in real time. This tool can help decision makers where and when to invest in their infrastructure to optimize costs and the state of preservation.
16:24 ~ 16:29	University of Michigan	**University of Michigan, USA**	This SHM-in-action demonstration will describe a permanent wireless monitoring system installed on the New Carquinez Bridge in Vallejo, CA. Access to the bridge monitoring system will be conducted to highlight the sensor network installed and to showcase variety of cyber infrastructure tools developed to support the automated interrogation of bridge response data.
16:33 ~ 16:38	SACL	**Stanford University (SACL), USA**	The Structures and Composites Lab will demonstrate the importance of combining offline training algorithms with real-time diagnostics for monitoring composite structures. Both damage classification and quantification models are the result of currently developed learning algorithms.
16:42 ~ 16:47	EC Electronics	**EC Electronics, USA**	EC Electronics will demonstrate a new portable low-power battery operated wireless mechanical impedance sensor device PI-8000 (8 channels) to assess the condition of monitoring structure. Hotspot Monitoring of damage progression through real-time damage detection based on PI-8000 will be shown. PI-8000 system can be easily expandable up to 128 units.
16:51 ~ 16:56	Katholieke Universiteit Leuven	**Katholieke Universiteit Leuven, Belgium**	A live-demonstration of a percolation sensor for detecting the presence of corrosive liquids in floor beam/seat track structure of airplanes.
16:56 ~ 17:00			Closing Remarks

TECHNICAL PROGRAM

Thursday, September 15th

08:00 ~ 08:30	**Light Continental Breakfast** *Location: Dohrmann Grove*	

Keynotes

Chair: J. Michaels [Georgia Tech, USA]

Location: Annenberg Auditorium (ART 1)

TIME	THURSDAY, SEPTEMBER 15	PROC. PAGE NO.
08:30 ~ 09:00	**Structural Health Monitoring for Civil Infrastructure - From Instrumentation to Decision Support** Anne S. Kiremidjian [Stanford University, USA]	27 (BROCHURE: 7)
09:00 ~ 09:30	**Does the Maturity of Structural Health Monitoring Technology Match User Readiness?** Dennis Roach [Sandia National Laboratories, USA]	39 (BROCHURE: 7)

09:30 ~ 10:00	**Coffee Break** *Location: Dohrmann Grove*	

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	PROC. 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]	555
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]	562
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]	570
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]	578
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]	586
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]	593

SPECIAL SESSION

Structural Health Monitoring of Wind Turbines

Chair: J. R. White (Sandia National Laboratories, USA)

Chair: J. R. White (Sandia National Laboratories, USA)

Location: HC 200-030

TIME	THURSDAY, SEPTEMBER 15	PROC. 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]	1656

10:20 ~ 10:40	**Investigation of Various Condition Monitoring Techniques Based on a Damaged Wind Turbine Gearbox** S. Sheng [NREL, USA]	1664
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]	394
11:00 ~ 11:20	**Passive Damage Monitoring of Wind Turbine Rotor Blades using Cyclic Signal Processing** J. R. White [Sandia National Laboratories, USA]	1648
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]	1639
11:40 ~ 12:00	**Inertial Energy Harvester for Monitoring Wind Turbine Blades** B. Joyce, J. Farmer, D. J. Inman [Virginia Tech, USA]	1631

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*	*PROC. PAGE NO.*
10:00 ~ 10:20	**Wirelss Sensor Network for Guided Wave Propagation with Piezoelectric Transducers** C. Dürager[1], A. Heinzelmann[2], D. Riederer[2] [1) Swiss Federal Laboratories of Materials Science and Technology, Switzerland; 2) Interstate University of Applied Sciences of Technology, Switzerland]	2028
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]	2035
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]	2043
11:00 ~ 11:20	**Distributed Optical Fiber Smart Sensors for Structural Health Monitoring** G. Wild, S. Hinckley [Centre for Communications Engineering Research, Australia]	2050
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]	2058
11:40 ~ 12:00	**Efficient Guided Wave SHM Baseline Capture and Selection** A. J. Croxford, O. Putikis, P. D. Wilcox [University of Bristol, UK]	2067

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*	*PROC. 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]	2495
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]	2504
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]	2512
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]	2521

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]	2529
11:40 ~ 12:00	**Predictive Modeling of Ultrasonics SHM with PWAS Transducers** M. Gresil, Y. Shen, V. Giurgiutiu [University of South Carolina, USA]	2537

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*	*PROC. 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]	183
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]	191
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]	200
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]	208
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]	216
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]	224

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*	*PROC. PAGE NO.*
10:00 ~ 10:20	**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) Massachusets Institute of Technology, USA]	1807
10:20 ~ 10:40	**Computation of Lifetime Value of Information for Monitoring Systems** M. Pozzi, A. D. Kiureghian [University of California, Berkeley, USA]	1799
10:40 ~ 11:00	**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]	1839
11:00 ~ 11:20	**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]	1815
11:20 ~ 11:40	**Uncertainty Quantification in Transmissibility-Derived Features Used for Fault Detection** Z. Mao, M. D. Todd [University of California San Diego, USA]	1823
11:40 ~ 12:00	**Quantifying Damage Measures for a Composite Steel Girder Bridge using 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]	1831

Novel Signal Processing Techniques - III

Chair: C. Palmer (Impact-Technologies, LLC., USA)

Location: HC 200-305

TIME	*THURSDAY, SEPTEMBER 15*	*PROC. 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]	1053
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]	1062
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]	1070
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]	1079
11:20 ~ 11:40	**Finite Element Model Based State Estimation in Mechanical and Structural Systems** E. M. Hernandez [University of Vermont, USA]	1087
11:40 ~ 12:00	**Hybrid Immune Algorithm for Structural Health Monitoring Using Acceleration Data** R. Li, A. Mita [Keio University, Japan]	1095

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*	*PROC. 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]	2311
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]	2319
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]	2327
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]	2342
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]	2359

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*	*PROC. 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]	2215
10:20 ~ 10:40	**Terahertz Phonon Amplification and Sasing in Semiconductor Superlattice Structures** R. P. Beardsley, A. J. Kent [University of Nottingham, UK]	2223

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]	2231
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]	2237
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]	2245
11:40 ~ 12:00	**Robust Vision-Based Approaches for Structural Health Monitoring** M. R. Jahanshahi, S. F. Masri [University of Southern California, USA]	2252

12:00 ~ 13:20	**Lunch at the Oval** *Location: The Oval*	

Faculty / Student Panel

TIME	THURSDAY, SEPTEMBER 15	PROC. PAGE NO.
12:00 ~ 13:20	*Chair:* C. Farrar (Los Alamos National Laboratory, USA) *Panelists:* K. Loh (UC Davis, USA), J.-B. Ihn (Boeing, USA), J. Lynch (University of Michigan, USA), S. Arms (Microstrain, USA), E. Flynn (Metis, USA), A. Kumar (Acellent Technologies Inc., USA), J. Michaels (Georgia Tech, USA) *Location: Annenberg Auditorium (ART 1)*	(BROCHURE: 40)

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	PROC. 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]	601
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]	609
14:00 ~ 14:20	**Bond Graph Model of a Thin SHM Piezoelectric Energy Harvester** T. Sainthuile[1], C. Delebarre[1], S. Grondell[1], C. Paget[2] [1) University of Valenciennes and Hainaut-Cambresis, France; 2) Airbus, UK]	618
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]	626
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]	635
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]	643

Quantification / Validation / Certification

Chair: C. Buynak (AFRL, USA)

Location: HC 200-030

TIME	THURSDAY, SEPTEMBER 15	PROC. 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]	1359
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]	1368

14:00 ~ 14:20	**Identification of the Stiffness Distribution using BOTDR** Y. Goldfeld, A. Klar [Technion - Israel Institute of Technology, Israel]	1376
14:20 ~ 14:40	**Co-bonding of Piezoelectric Sensors on CFRP Structures** M. Bach[1], B. Eckstein[1], N. Jacquel[2], R. Bertrand [2], C. Stolz[3] [1) EADS Innovation Works, Germany; 2) Airbus Operations GmbH, Germany; 3) Cassidian, Germany]	1384
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]	1391

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*	*PROC. 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. Ureña [Rey Juan Carlos University, Spain]	2075
13:40 ~ 14:00	**Wireless Links for Global Positioning System Receivers** F. Casciati, L. Wu [University of Pavia, Italy]	2082
14:00 ~ 14:20	**Automatic Wireless Transfer of Acquired Usage Monitoring Data** N. Cranley, S. Wilmot [ACRA CONTROL, Ireland]	2090
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]	2099
14:40 ~ 15:00	**Smart Battery-Free Wireless Sensor Networks for Structural Health Monitoring** A. Abedi, A. Razi, F. Afghah [Univeristy of Maine, USA]	2107
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]	2115

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*	*PROC. 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]	2545
13:40 ~ 14:00	**System Identification with Generalized Impulse and Frequency Response Function** R. R. Zhang, L. Gargab [Colorado School of Mines, USA]	2553
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]	2560
14:20 ~ 14:40	**SHM of Structural Materials by Means of Highly Nonlinear Solitary Waves** X. Ni, P. Rizzo [University of Pittsburgh, PA, USA]	2568
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]	2576
15:00 ~ 15:20	**Combining Guided Waves and Electromechanical Impedance Method for SHM Applications** X. Zhu, P. Rizzo [University of Pittsburgh, USA]	2584

Advanced Diagnostics for Damage Assessment - V

Chair: L. Gaul (University of Stuttgart, Germany)

Location: HC 200-205

TIME	*THURSDAY, SEPTEMBER 15*	*PROC. 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]	233
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]	241
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]	249
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]	257
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]	266
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]	274

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*	*PROC. 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]	1847
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]	1855
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]	1863
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]	1871
14:40 ~ 15:00	**A Multi-Non-Linear Civil SHM Model for Decision Support** H. Allmer, H. Wenzel, H. Allmer [Vienna Consulting Engineers, Austria]	1879
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]	1886

Modeling / Simulation

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

Location: HC 200-305

TIME	*THURSDAY, SEPTEMBER 15*	*PROC. 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]	899
13:40 ~ 14:00	**Finite Element Simulation of Compensation for Temperature Influence on Lamb Wave Propagation** Q. Wenzhong[1], D. J. Inman[2] [1) Wuhan University, China; 2) Virginia Tech., USA]	907

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]	915
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]	923
14:40 ~ 15:00	**Wave Propagation in Anisotropic Layered 2D Structures Using Spectral Finite Elements** B. Hennings, R. Lammering [Helmut Schmidt University, Germany]	931
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]	939

SPECIAL SESSION

SHM Benchmark for High-rise Structures - II

Chair: Y.Q. Ni (HKPU, Hong Kong)

Chair: ***Location:***

T. Hatada (Kajima, Japan), Y.Q. Ni (Hong Kong Polytechnic University, Hong Kong) ART 2

TIME	*THURSDAY, SEPTEMBER 15*	*PROC. 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]	2374
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]	2382
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]	2390
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]	2398
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]	2406

SPECIAL SESSION

Non-contact Sensing Technologies - II

Chair: H. Sohn (KAIST, Korea)

Chair: ***Location:***

K. Law (Stanford University, USA), H. Sohn (KAIST, Korea) ART 4

TIME	*THURSDAY, SEPTEMBER 15*	*PROC. 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]	2260
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]	2268
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]]	2276
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]	2284
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]	2292
15:00 ~ 15:20	**Damage Detection using Andrew Plots** F. Gharibnezhad, L. E. Muijca, J. Rodellar [Technical University of Catalonia, Spain]	2300

15:20 ~ 15:35	**Coffee Break** *Location: Dohrmann Grove*	

Panel Discussion: Civil and Mechanical Systems

TIME	THURSDAY, SEPTEMBER 15	PROC. PAGE NO.
15:35 ~ 17:00	**SHM for Life-Cycle Health Monitoring and Management:** **Where are the Gaps & How to get there?** *Chair:* J. Lynch (University of Michigan, USA) *Panelists:* I. Perez (ONR, USA), B. Spencer (University of Illinois, USA), C.-P. Fritzen (University of Siegen, Germany), A. Kiremidjian (Stanford University, USA), Z. Wu (Ibaraki University, Japan), H. Wenzel (VCE, Austria), S. Zerbst (University of Hannover, Germany) ***Note:*** *iPod Shuffle, T-Shirts, etc. as give-away gifts for panel participants.* *Location: Annenberg Auditorium (ART 1)*	