

2009 SEM Fall Symposium Technical Program

Advanced Image-Based Measurement Methods: Recent Developments and Applications in Engineering and Medicine

MONDAY MORNING, October 5, 2009

- 7:45 - 8:00 AM **Introduction**, M.A. Sutton, University of South Carolina
- 8:00 AM Title to come
Dr. David Stargel, Program Director Air Force Office of Scientific Research
- 8:30 AM **Plenary (One hour presentation)**
Mechanics-based Volume Correlation: Applications in Mechanics and Biomechanics, #8
F. Hild, H. Leclerc, J.-N. Perie, LMT-Cachan; J. Rethore, LaMCoS; S. Roux, LMT-Cachan
- 9:30 AM 3D Deformation Analysis in Compacted Sugar Using X-ray Microtomography and Digital Volume Correlation, #30
F. Forsberg, Luleå University of Technology; C.R. Siviour, University of Oxford
- 10:00 AM **COFFEE BREAK**
Posters and videos available for viewing
- 10:30 AM Three-dimensional Full-field Measurements Using Confocal Microscopy and Digital Volume Correlation, #48
G. Ravichandran, California Institute of Technology
- 11:00 AM Measurement of Mechanical Properties and Deformation of Artificial Mesh and Animal Fascia by Digital Image Correlation Method, #11
W.-C. Wang, National Tsing Hua University; K.J. Yu, C.B. Liu, Kaohsiung Veterans General Hospital; T.P. Chu, Southern Illinois University, Carbondale; H.T. Shen, T.Y. Chang, National Tsing Hua University
- 11:30 AM Matching Microscope and Camera: A Digital Imperative, #10
W.G. Jerome, Vanderbilt University School of Medicine
- 12:00 PM Nanoparticle Labels for Co-localization at High Spatial Resolution, #39
R.M. Albrecht, University of Wisconsin, Madison

- 12:30 PM Characterizing Deformation-Induced Changes in Aortic Microstructure Using Image Processing Techniques, #22
D. Shahmirzadi, A.H. Hsieh, University of Maryland, College Park
- 12:50 - 1:05 PM **Panel Discussion** – all speakers
- 1:05 - 2:00 PM **LUNCH**
Posters and videos available for viewing

MONDAY AFTERNOON, October 5, 2009

- 2:00 PM **Plenary (One hour presentation)**
3D Optical Metrology Within Semitransparent Scattering Materials, #20
P.D. Ruiz, J.M. Huntley, Loughborough University; M.H. de la Torre-Ibarra, Centro de Investigaciones en Optica
- 3:00 PM Multi-view-DIC-based 3D Measurements, #51
J.-J. Orteu, Ecole des Mines d'Albi
- 3:30 - 4:00 PM **COFFEE BREAK**
Posters and videos available for viewing
- 4:00 PM Multi-scale Characterization of the Mechanics of Heterogeneous Structures Using DIC, #7
H.A. Bruck, University of Maryland, College Park
- 4:30 PM On the Use of Multiscale Image Correlation for the Study of Thermomechanical Fatigue, #46
J. Lambros, W. Abuzaid, J. Carrol, H. Sehitoglu, University of Illinois at Urbana Champaign
- 5:00 PM Identification of Dynamic Mechanical Properties of Materials Using Imaging Techniques, #15
F. Pierron, Arts et Metiers ParisTech
- 5:30 PM Mapping Martensitic Phase Transformation in Shape Memory Alloys, #40
K. Kim, University of Michigan; S. Desindes, Ecole Polytechnique; S. Daly, University of Michigan
- 6:00 - 6:15 PM **Panel Discussion** – all speakers

MONDAY EARLY EVENING, October 5, 2009

- 6:15 - 7:15 PM **Spotlight on Posters and Videos**
Join the poster authors for wine and cheese and a chance to discuss their work.
- Deformation Pattern Based Digital Image Correlation Method and its Applications, #12
J.X. Gao, Z.W. Liu, H.X. Shang, The Welding Institute
- Diagnostics for Simultaneous Thermal/Structural Response of Surfaces Under Combined Loading, #29
T.J. O'Hern, J.M. Suo-Anttila, Sandia National Laboratories; H.W. Schreier, Correlated Solutions, Inc.; T.J. Miller, Sandia National Laboratories
- Application of DIC to the Peeling of Elastic Adhesive Tapes, #31
C. Kovalchick, California Institute of Technology; A. Molinari, Universite de Metz; G. Ravichandran, California Institute of Technology
- A Four-camera System for Compression Testing of Bones, #33
H. Yao, W. Tong, Southern Methodist University
- Heterogeneous Behavior of Metals Under Quasi-static and Dynamic Loadings, #34
L. Bodelot, California Institute of Technology; L. Sabatier, E. Charkaluk, P. Dufrénoy, Laboratoire de Mécanique de Lille; G. Ravichandran, California Institute of Technology
- A New Noncontact Method to Determine Dynamic Constitutive Behavior of Polymers Based on High-speed Imaging and DIC, #35
Y. Zhu, North Carolina State University; K. Ravi-Chandar, University of Texas at Austin
- Digital Holography for Investigation of Wave Mechanical Systems, #36
Palevicius, G. Janusas, R.P. Bansevicius, R. Bendikiene, Kaunas University of Technology
- Investigation of Self-resonance Phenomena in Vibration Excitation System, #37
K.M. Ragulskis, R. Palevicius, A. Palevicius, R. Bendikiene, Kaunas University of Technology
- Investigation of Periodical Microstructures Using Coherent Radiation, #38
G. Janusas, A. Palevicius, R. Bendikiene, R. Palevicius, Kaunas University of Technology
- Investigation of Active Screen Plasma Nitriding Parameters on Surface Properties of a Low Alloy Steel, #44
F. Taherkhani, AmirKabir University of Technology; A. Taherkhani, Islamic Azad University of Takestan
- Full-field Optical Strain Sensor for Multi-scale Strain Measurement, #55
J. Wang, W. Zhou, A.K. Asundi, Nanyang Technological University
- Quantification of Left Ventricular Blood Vorticity Pattern by the Novel Method of Echocardiographic Particle Image Velocimetry, #58
A. Kheradvar, University of South Carolina; H. Houle, Siemens Medical Solutions; G. Pedrizzetti, University of Trieste; G. Tonti, SS. Annunziata Hospital; T. Belcik, M. Ashraf, J.R. Lindner, Oregon Health & Science University; M. Gharib, California Institute of Technology; D. Sahn, Oregon Health & Science University

TUESDAY MORNING, October 6, 2009

- 7:45 - 8:00 AM **Topics and Discussions** - M.A. Sutton
- 8:00 AM Quantitative Error Assessment in Image Matching: Basic Concepts and Recent Results, #50
M.A. Sutton, Y. Wang, University of South Carolina; H.W. Schreier, Correlated Solutions, Inc.
- 8:30 AM Optical Microscopy Based Nanoscale Mechanics Enabled by Digital Image Correlation, #19
I. Chasiotis, University of Illinois at Urbana-Champaign
- 9:00 AM State-of-the-art Vision Based Automated Measurement of Microsystems, #53
R.J. Pryputniewicz, Worcester Polytechnic Institute
- 9:30 AM Micro and Nanoscale Mechanical Characterization, #17
H. Jin, W.Y. Lu, Sandia National Laboratories
- 10:00 - 10:30 AM **COFFEE BREAK**
Posters and videos available for viewing
- 10:30 AM Drift and Spatial Distortion Elimination in Atomic Force Microscopy Images by the Digital Image Correlation Technique, #47
Z.-H. Xu, X. Li, M.A. Sutton, N. Li, University of South Carolina
- 11:00 AM Measurement of Deformation in Micro-structure Using Moiré Grating and Micro-marker Techniques Under Scanning Electronic Microscope, #6
H.M. Xie, Tsinghua University; Z.W. Liu, Beijing Institute of Technology; C.Z. Gu, Chinese Academy of Science; Y.G. Meng, F.L. Dai, Tsinghua University
- 11:30 AM Regional Identification by Digital Height Correlation of Nanolevel Surface Profile, #21
N. Tada, N. Yagi, I. Shimizu, M. Uchida, Okayama University
- 12:00 - 12:15 PM **Panel Discussion** – all speakers
- 12:15 - 1:15 PM **LUNCH**
Posters and videos available for viewing

TUESDAY AFTERNOON, October 6, 2009

- 1:15 PM **Plenary** (One hour presentation)
Ultra-fast Micro PIV for Study of Shocks in Polymers, #13
R.J. Adrian, Arizona State University; M.J. Murphy, S. Clarke, Los Alamos National Laboratory
- 2:15 PM Full-field Deformation Measurement of Fixed and Flapping-wing MAVs, #52
P.G. Ifju, P. Wu, University of Florida, Gainesville
- 2:45 PM Calibration and Evaluation of a Volumetric Three-component Velocimetry System, #32
W. Tong, H. Yao, Southern Methodist University
- 3:15 - 3:45 PM **COFFEE BREAK**
Posters and videos available for viewing
- 3:45 PM Optical Nanoprobe Based on Surface Plasmon Polaritons, #54
W. Zhou, Nanyang Technological University
- 4:15 PM The Application of Ultra-high Speed Digital Imaging, #14
P.L. Reu, Sandia National Laboratories
- 4:45 PM Image Correlation for Shaking and Moving Cameras, #18
T.J. Miller, Sandia National Laboratories
- 5:15 PM Deformation Measurement of Concrete Structures Based on ESPI and DIC, #16
X.Y. He, Y.Q. Dai, Southeast University
- 5:45 - 6:05 PM **Panel Discussion** – all speakers
- 6:15 - 6:20 PM Closure
- 6:20 - 6:30 PM Brief Discussion of Wednesday's Workshop