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Imaging Methods for Novel Materials and Challenging Applications, Volume 3

Proceedings of the 2012 Annual Conference on Experimental and Applied Mechanics

Springer

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Preface

Imaging Methods for Novel Materials and Challenging Applications, Volume 3: Proceedings of the 2012 Annual Conference on Experimental and Applied Mechanics represents one of seven volumes of technical papers presented at the Society for Experimental Mechanics SEM 12th International Congress & Exposition on Experimental and Applied Mechanics, held at Costa Mesa, California, June 11–14, 2012. The full set of proceedings also includes volumes on: Dynamic Behavior of Materials, Challenges in Mechanics of Time-Dependent Materials and Processes in Conventional and Multifunctional Materials, Experimental and Applied Mechanics, Mechanics of Biological Systems and Materials, MEMS and Nanotechnology, and Composite Materials and Joining Technologies for Composites.

Each collection presents early findings from experimental and computational investigations on an important area within Experimental Mechanics. The conference track Imaging Methods for Novel Materials and Challenging Applications was organized by: Helena Jin, *Sandia National Laboratories California;* Cesar A. Sciammarella, *Illinois Institute of Technology;* Cosme Furlong, *Worcester Polytechnic Institute;* Sanichiro Yoshida, *Southeastern Louisiana University,* and sponsored by the SEM Optical Methods and Applied Photoelasticity, Thermomechanics & InfraRed Imaging, and Biological Systems & Materials Technical Divisions.

With the advancement in imaging instrumentation and lighting resources, as well as in the image acquisition and processing technology, imaging methods have gained wide applications across the experimental mechanics society. These applications include study of varieties of materials, such as metals, composites, MEMS, nanomaterials, and soft and biomaterials. The measurements cover a wide range of spatial and temporal resolutions.

This book provides a platform for researchers to exchange ideas and to encourage cross-fertilization of various disciplines. It covers a wide range of imaging techniques and their applications in the following general areas:

- Role of optical interferometry in advancement of material characterization
- Three-dimensional imaging and volumetric correlation
- Digital holography and experimental mechanics
- Digital image correlation
- Metrology and displacement measurement at different scales
- Optical methods for dynamic tests
- Optical methods for and with MEMS and NEMS
- Thermomechanics and infrared imaging
- Imaging methods applied to biomaterials and soft materials
- Applied photoelasticity
- Optical measurement systems using polarized light
- Hybrid imaging techniques
- Contouring of surfaces
- Novel optical techniques

The organizers would like to thank keynote and invited speakers, authors, presenters, session organizers, and chairs for their participation in this track. We also appreciate the help and support from SEM staff.

The opinions expressed herein are those of the individual authors and not necessarily those of the Society for Experimental Mechanics, Inc.

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