KATIA GENOVESE

Received M.Sc. *magna cum laude* in Mechanical Engineering at Polytechnic of Bari, Italy, and Ph.D. in Machine Design at University 'Federico II' in Naples (2002). Worked as researcher at Laser Research Centre (Bari, ITALY -1998) and as visiting researcher at Nottingham University (UK-1999), Union College (Schenectady, NY, USA-2005), Centro de Investigaciones en Optica (León, Guanajuato, Mexico-2006/07, 2011, 2013), Ecole Nationale Supérieure des Mines (Saint Etienne, France-2008, 2010, 2012), Department of Biomedical Engineering - Texas A&M University (College Station, TX, USA-2009), Department of Biomedical Engineering - Yale University (New Haven, CT, USA-2011, 2012), Department of Biomedical Engineering - University of Arizona (Tucson, AZ, USA-2012). In 2002, joined the School of Engineering at University of Basilicata, (Potenza, ITALY), as Assistant Professor in Machine Design. Classes taught: Strength of Materials, Machine Design, Computer Assisted Design. Lectured at Polytechnic of Bari and University of Lecce on Advanced Optical Techniques for Stress Measurement. Member of organizing committee of ICEM 12th and scientific committees of New trends in Fatigue and Fracture 2005, ICEM 15th, Euromech Colloquium 2012, ICEM 16th, 5-ISEM'2015 and 9-SOI. Reviewer for over 20 journals in the field of Experimental Mechanics and Biomechanics. Chair of the Optical Methods Division and Inverse Methods Division of the International Society of Experimental Mechanics (2009-2012). Director of the Experimental Mechanics Laboratory at University of Basilicata. She authored/co-authored 32 journal papers and 50 papers on international conferences.

Research areas concern optical methods for deformation measurement (Moiré, Electronic Speckle Pattern Interferometry, Fringe Projection, Digital Image Correlation) and hybrid numerical/experimental methods for inverse mechanical characterization of materials. She is currently working in biomechanics wherein test protocols based on full-field optical techniques are particularly suited to investigate biological materials properties given their non-contact and high resolution capabilities. In particular, in collaboration with Dr. Jay Humphrey (Yale University), she recently developed the Panoramic Digital Image Correlation (p-DIC) system in order to address the need to develop a more sophisticated video-based method to measure accurate full-3D geometric reconstruction and quantify heterogeneous strain fields on excised arteries, particularly in the complex geometries that associate with (e.g., bifurcations) or manifest from (e.g., aneurysms) vascular diseases.

Selected publications

1. K. Genovese, A. Montes, A. Martinez, S.L. Evans (2015). *Full-surface deformation measurement of anisotropic tissue under indentation*. MEDICAL ENGINEERING AND PHYSICS, accepted.

2. K. Genovese, L. Casaletto, J. Humphrey, J. Lu (2014). *Digital Image Correlation Based Point-wise Inverse Characterization of Heterogeneous Material Properties of Gallbladder In Vitro*. PROCEEDINGS OF THE ROYAL SOCIETY A: Mathematical, Physical & Engineering 470: 20140152.

3. V.H. Flores, L. Casaletto, K. Genovese, A. Montes, J.A. Rayas, A. Martinez (2014). *A Panoramic Fringe Projection system*. OPTICS AND LASERS IN ENGINEERING, 58: 80-84.

4. J.D. Pyne, K. Genovese, L. Casaletto, J.P. Vande Geest (2014). *Sequential-Digital Image Correlation for mapping human posterior sclera and optic nerve head deformation*. ASME JOURNAL OF BIOMECHANICAL ENGINEERING, 136: 021002-1,12.

5. V.H. Flores, A. Martinez, J.A. Rayas, K. Genovese (2013). *Spatial location in 360° of reference points over an object by using stereo vision.* REVISTA MEXICANA DE FISICA E. ISSN**:** 18703542, 0035001X.

6. K. Genovese, Y.U. Lee, A.Y. Lee, J.D. Humphrey (2013). *An improved panoramic digital image correlation method for vascular strain analysis and material characterization*. JOURNAL OF THE MECHANICAL BEHAVIOUR OF BIOMEDICAL MATERIALS, Special issue on 'Inverse Problems', vol. 27, p.132.142.

7. K. Genovese, L. Casaletto, J.A. Rayas, V. Flores, A. Martinez (2013). *Stereo-Digital Image Correlation (DIC) measurements with a single camera using a biprism.* OPTICS AND LASERS IN ENGINEERING, vol. 51/3, p.278-285.

8. P. Badel, K. Genovese, S. Avril (2012). *3D residual stress field in arteries: a method combining optical full-fields measurements and finite element reconstruction.* STRAIN, 48/6, p.528-538.

9. K. Genovese, M.J. Collins, Y.U. Lee, J.D. Humphrey (2012). *Regional Finite Strains in a Murine Angiotensin-II Induced Model of Dissecting Abdominal Aortic Aneurysms*, CARDIOVASCULAR ENGINEERING AND TECHNOLOGY, vol. 3/2, p.194-202.

10. K. Genovese, E. Cosola, L. Lamberti, M.V. Bux, F.R. Grassi, C. Pappalettere, R.G. Carlaio (2012). *Experimental-numerical investigation on the biomimetic recovery of natural tooth structural response after porcelain veneer restoration*. STRAIN, vol. 48/1, p.30-48.

11. K. Genovese, Y.U. Lee, J.D. Humphrey (2011). *Novel optical system for in vitro quantification of full surface strain fields in small arteries: II. Correction for refraction and illustrative results*. COMPUTER METHODS IN BIOMECHANICS AND BIOMEDICAL ENGINEERING,vol. 14/3, p.227-237.

12. K. Genovese, Y.U. Lee, J.D. Humphrey (2011). *Novel optical system for in vitro quantification of full surface strain fields in small arteries: I. Theory and design*. COMPUTER METHODS IN BIOMECHANICS AND BIOMEDICAL ENGINEERING, vol. 14/3, p.213-225.

13. D. Spera, K. Genovese, A. Voloshin (2011). *Application of Stereo-Digital Image Correlation to full-field 3-D deformation measurement of intervertebral disc*. STRAIN, vol. 47/s1.

14. A. Martinez, J.A. Rayas, H.J. Puga, K. Genovese (2010). *Iterative estimation of the topography measurement by fringe-projection method with divergent illumination by considering the pitch variation along the x and y directions*. OPTICS AND LASERS IN ENGINEERING, vol. 48/9, p.877-881.

15. K. Genovese (2009). *A video-optical system for time-resolved whole-body measurement on vascular segments*. OPTICS AND LASERS IN ENGINEERING, vol. 47, p. 995-1008.

16. R. Rodriguez Vera, K. Genovese, J.A. Rajas, F. Mendoza Santoyo (2009). *Vibration analysis at micro-scale by Talbot fringe projection method*. STRAIN,vol. 45/3, p. 249-258.

17. E. Cosola, K. Genovese, L. Lamberti, C. Pappalettere (2008). *A general framework for identification of hyper-elastic membranes with moiré techniques and multi-point simulated annealing*. INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES, vol. 45/24, p.6074-6099.

18. E. Cosola, K. Genovese, L. Lamberti, C. Pappalettere (2008). *Mechanical characterization of biological membranes with moiré techniques and multi-point simulated annealing*. EXPERIMENTAL MECHANICS, vol. 48/4, p. 465-478.

19. K. Genovese, L. Lamberti, C. Pappalettere (2008). *Mechanical characterization of bio-tissues with optical techniques and global optimization.* JOURNAL OF OPTICS RESEARCH , vol. 11/1-2, p. 97-158.

20. A. Martinez, J.A. Rayas, R. Cordero, K. Genovese (2008). *Analysis of Optical configurations for ESPI.* OPTICS AND LASERS IN ENGINEERING, vol. 46, p. 48-54.

21. K. Genovese (2007). *Radial metrology application to whole-body measurement on hyperelastic tubular samples*. OPTICS AND LASERS IN ENGINEERING, vol. 45/11, p.1059-1066.

22. U. Galietti, K. Genovese, L. Lamberti, D. Posa (2007). *A simple Projection Moiré system to measure displacements of aircraft structures*. JOURNAL OF STRAIN ANALYSIS FOR ENGINEERING DESIGN, vol. 42/6, p. 477/495.

23. M. Corsalini, K. Genovese, L. Lamberti, C. Pappalettere, M. Carella, S. Carossa (2007). *A laboratory comparison of individual Targis/Vectris posts with standard fiberglass posts*. INTERNATIONAL JOURNAL OF PROSTHODONTICS, vol. 20/2, p. 190-192.

24. K. Genovese, C. Pappalettere (2007). *Axial Stereo-Photogrammetry for 360-deg measurement on tubular samples*. OPTICS AND LASERS IN ENGINEERING, vol. 45/5, p. 637-650.

25. K. Genovese, L. Lamberti, C. Pappalettere (2006). *Structural behaviour of endodontically treated teeth under thermo-mechanical loading.* Proceedings of the Institution of Mechanical Engineers, Part H: JOURNAL OF ENGINEERING IN MEDICINE, vol. 220/8, p. 909-928.

26. K. Genovese, C. Pappalettere (2006). *Whole 3-D shape reconstruction of vascular segments under pressure via Fringe Projection Techniques*. OPTICS AND LASERS IN ENGINEERING, vol. 44/12, p. 1311-1323.

27. K. Genovese, L. Lamberti, C. Pappalettere (2006). *Mechanical characterization of hyperelastic materials with fringe projection and optimization techniques*. OPTICS AND LASERS IN ENGINEERING, vol. 44/5, p. 423-442.

28. K. Genovese, L. Lamberti, C. Pappalettere (2005). *Improved global-local simulated annealing formulation for solving non-smooth engineering optimization problems*. INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES, vol. 42/1, p. 203-237.

29. K. Genovese, L. Lamberti, C. Pappalettere (2005). *Finite Element analysis of a new customized composite post system for endodontically treated teeth*. JOURNAL OF BIOMECHANICS, vol. 38/12, p.2375-2389.

30. K. Genovese, L. Lamberti, C. Pappalettere (2004). A *new hybrid technique for in-plane mechanical characterization of orthotropic materials*. EXPERIMENTAL MECHANICS, vol. 44/6, p.584-592.

31. K. Genovese, L. Lamberti, C. Pappalettere (2004). *A comprehensive ESPI based system for combined measurement of shape and deformation of electronic components*. OPTICS AND LASERS IN ENGINEERING, vol. 42/5, p. 543-562.

32. D. Biccari, K. Genovese, C. Pappalettere C (2002). *Static and Fatigue Behaviour of Sandwich Composite Panels Joined by Blind Fasteners*. KEY ENGINEERING MATERIALS, vol. 221-222, p.61-70.

33. G. Demelio, K. Genovese, C. Pappalettere (2001). *An experimental investigation of static and fatigue behaviour of sandwich composite panels joined by fasteners.* COMPOSITES. PART B: ENGINEERING, vol. 32, p. 299-308.