

## CURRICULUM VITAE

# GIOLA SANTONI-BOTTAI

Department of Mechanical Engineering  
University of South Carolina  
300 Main Street  
Columbia, SC 29208  
Tel.: 803-777-0619, FAX: 803-777-0106  
E-mail: santoni@sc.edu  
Web site: [http://www.me.sc.edu/Research/lamss/NV/HTML/L\\_first.html](http://www.me.sc.edu/Research/lamss/NV/HTML/L_first.html)

### EDUCATION

April 2010                      Philosophy Doctor in Mechanical Engineering, University of South Carolina, Columbia, SC  
May 2009                        Certificate in Applied Statistic, University of South Carolina, Columbia, SC  
April 1999                        *Laurea* in Aerospace Engineering, University of Pisa, Pisa, Italy

### EMPLOYMENT HISTORY

2002-present                  Research Assistant, Laboratory for Adaptive Materials and Smart Structures, University of South Carolina, Columbia, SC  
2008-present                  Teaching Assistant, University of South Carolina, Columbia, SC  
2001-2002                      Product Engineer, Core Engineering, Magna Intier, Livorno, Italy  
2000-2001                      Project Manager, General Electric Oil & Gas, Firenze, Italy  
1999-2000                      Project Engineer, D.S. Ingegneria dei Sistemi S.p.A., Pisa, Italy

### TEACHING ACTIVITY

Fall 2008-present              EMCH 367 Fundamentals of Microprocessors for Mechanical Engineers, University of South Carolina, Columbia, SC (Teaching Assistant: held lab sessions, graded homework assignments, projects, and exams)

### FUNDED RESEARCH PROJECTS

- 1        "Exact Modeling of Power and Energy Transduction for Optimum Design of Structurally-Integrated Thin-Film Active Sensors.", Year 1, \$239,997 for 3 years, V. Giurgiutiu (PI), National Science Foundation. #0925466  
Personal contribution: Exact analytical modeling of the shear-lag interaction between a thin-film active sensor and the multi-modal ultrasonic waves present in the structure.

- 2 "Self-Powered Wireless Sensor Network for Structural Bridge Health Prognosis", Year 1, 2009, \$54,000 for 36 months, V. Giurgiutiu (PI), NIST-TIP, FA9550-04-0085.  
Personal contribution: Theoretic model of PWAS-structure interaction in active and passive (acoustic emission) health monitoring; theoretic power consumption for autonomous health monitoring system.
- 3 "Predictive Methodologies for the Design of Lamb-Wave Piezoelectric Wafer Active Sensors for Structural Health Monitoring, Damage Detection, and Failure Prevention", Year 6, \$232,720 for 36 months (2 years extension), V. Giurgiutiu (PI), April 2004, NSF CMS 0408578.  
Personal contribution: Micromechanical Coupling between PWAS and Structure for various Lamb Modes; Shear Layer Modeling; Optimal Energy Transfer between PWAS and Structure; Lamb-Wave Tuning with Broadband PWAS transducers on isotropic and anisotropic plates.
- 4 "Collaboration on STTR T7-02 Space Qualified Nondestructive Evaluation and Health Monitoring Technology", NASA-STTR Grant NGAI 05.0068 through NextGen Aeronautics, Inc.  
Personal contribution: sensor layout test through probability of detection curves; supervise and coordinate the development of miniaturize hardware and damage detection software; perform durability and survivability tests; perform and supervise structural component test.

## PUBLICATIONS

(Though in some publications the author's name appears as "Bottai" or "Santoni", for clarity it is listed here as "Santoni-Bottai")

### Journal Papers in Peer-Review Archival Journals

- 1 Yu, L., **Santoni-Bottai, G.**, Giurgiutiu, V., "Shear Lag Solution for Tuning Ultrasonic Piezoelectric Wafer Active Sensors with Applications to Lamb Wave Array Imaging", *Journal of Engineering Science* (under review)
- 2 Giurgiutiu V; **Santoni-Bottai G.**, "An Extension of the Shear Lag Solution for Structurally Attached Ultrasonic Active Sensors", *AIAA Journal*, vol. 47, issue 8, pp. 1980-1983, Technical Notes, August 2009
- 3 Yu, L.; **Santoni-Bottai, G.**; Xu, B.; Liu, W.; Giurgiutiu, V., "Piezoelectric Wafer Active Sensors for In Situ Ultrasonic-Guided Wave SHM", *Journal of Fatigue & Fracture of Engineering Materials & Structures*, Vol.31, pp.611-628, 2008
- 4 **Santoni-Bottai, G.**; Yu, L.; Xu, B.; Giurgiutiu, V., "Lamb Wave Mode Tuning of Piezoelectric Wafer Active Sensors for Structural Health Monitoring", *ASME Journal of Vibration and Acoustics*, Vol. 129, No. 6, pp. 752-762, 2007

### Refereed Papers in Peer-Reviewed Major Conference Proceedings

- 1 **Santoni-Bottai, G.**; Giurgiutiu, V., "Lamb Wave Tuning between Piezoelectric Wafer Active Sensors and Host Structure: Experiments and Modeling", *Proceedings of ASME International Mechanical Engineering Congress and Exposition*, Chicago, IL, paper # IMECE2006-13533, CD-ROM, Nov. 5-10, 2006

### Papers in Major National and International Conference Proceedings

- 1 Giurgiutiu V.; **Santoni-Bottai G.**, "Piezoelectric Wafer Active Sensors for Structural Health Monitoring of Composite Structures", 51st AIAA/ASME/ASCE/AHS/ASC Structures,

Structural Dynamics, and Materials Conference, 18th AIAA/ASME/AHS Adaptive Structures Conference, Orlando, Florida, paper #209768, 12-15 April, 2010

- 2 **Santoni-Bottai G.**; Giurgiutiu V., “Shear lag solutions for solid-state actuators bonded to structures in SHM applications”, Proceedings of the 7th International Workshop on Structural Health Monitoring Sept 9-11 2009
- 3 **Santoni-Bottai, G.**; Pollock, P. J.; Behling, T.; Giurgiutiu, V.; Bland, S. M.; Joshi, S. P., “Damage Detection in Cryogenic Composites for Space Applications Using Piezoelectric Wafer Active Sensors”, 49th AIAA Structures, Structural Dynamics, and Materials Conference, 16th Adaptive Structures Conference, Schaumburg, IL, paper # AIAA-2008-1968, 7-10 Apr. 2008
- 4 Giurgiutiu, V, Yu, L., **Santoni-Bottai, G.**, Xu, B. “Lamb Wave Tuning for Piezoelectric Wafer Active Sensor Applications in In-Situ Structural Health Monitoring”, Review of Progress in Quantitative Nondestructive Evaluation, Golden, Colorado, Jul. 22-27, 2007
- 5 **Santoni-Bottai, G.**; Chrysochoidis, N. A.; Giurgiutiu, V.; Saravanos, A. D. “Analytical and Experimental Evaluation of Piezoelectric Wafer Active Sensors Performances for Lamb Waves based Structural Health Monitoring in Composite Laminates”, SPIE Smart Structures and NDE, San Diego, CA, 19 22 Mar. 2007
- 6 **Santoni-Bottai, G.**; Giurgiutiu, V., “Lamb wave interaction between piezoelectric wafer active sensors and host structure in a composite material”, Proceedings of the 5th International Workshop on Structural Health Monitoring, Stanford University, CA, pp. 1777-1784, 11-14 Sept. 2005
- 7 **Santoni-Bottai, G.**; Giurgiutiu, V., “Simulation of the Lamb Wave Interaction between Piezoelectric Wafer Active Sensors and Host Structure”, SPIE's 12th International Symposium on Smart Structures and Materials and 10th International Symposium on NDE for Health Monitoring and Diagnostics, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems Conference, San Diego, CA, San Diego, CA, paper # 5765-29, 6-10 Mar. 2005
- 8 Fantoni G.; **Santoni-Bottai, G.**; Taviani, C.; Vezzi, F., “Synergies between Engineering Solutions in QFD Analysis”, 10th International Conference on Concurrent Enterprising, Seville, Spain, vol. 1, pp 87-94, Jun. 14-16 2004
- 9 Troiani E.; Palavisini M.; **Santoni-Bottai G.**, “Valutazione numerica della strain energy release rate per lo studio della propagazione della delaminazione nei materiali compositi”; XV Congresso Nazionale AIDAA, Torino, Italy, 15-19 Nov. 1999

#### PhD Dissertation

*Fundamental studies in the lamb-wave interaction between piezoelectric wafer active sensor and host structure during structure health monitoring*, Ph.D. Dissertation, University of South Carolina, Columbia, SC

#### Bachelor Dissertation

*Study of the delamination growth in materials composite with the numerical evaluation of the Strain Energy Release Rate*, University of Pisa, Pisa, Italy

#### Patents

Giurgiutiu, V., Yu, Y., Liu, W., Xu, B., **Santoni-Bottai, G.**, "Structural Health Monitoring Apparatus and Methodology ", USCRF# 730, US Provisional Application 61/088, 047, Aug. 12, 2008

## **PROFESSIONAL AND SCIENTIFIC SERVICE**

### Professional Societies Memberships

Acoustical Society of America

Society of Photo-Optical Instrumentation Engineers

American Society of Mechanical Engineers

### Reviewer for Major National and International Journals

*Composite Science and Technology*, Elsevier

*Ultrasonics*, Elsevier

*Sensors*, Basel, Switzerland

*Smart Materials and Structures*, IOP Electronic Journals