

National Science Foundation US-Tunisia Workshop

Research and Educational Advances in Smart Micro-sensing and Biomimetic Sensors

- **Saturday, December 18th, 2010**

8.00AM – 9.30AM: BREAKFAST

9.30AM – 10.00AM: General opening – Host conference ICAMEM

10.00AM – 10.30AM: Dr. Ali Nayfeh, Virginia Polytechnic Institute and State University: “*Nonlinear phenomena in MEMS and NEMS-a micro-sensor for measuring minute gas and biological masses*” – **(joint with ICAMEM - plenary)**.

10.30AM – 11.00AM: **(ICAMEM presentation)**: Dr. Muhammad Hajj, Virginia Polytechnic Institute and State University: “*Multi-physics modeling and sensitivity analysis of nonlinear systems*”

10.30AM – 11.00AM: COFFEE BREAK

11.30AM – 12.40PM: Discussion (Room 7)

12.50PM – 14.20PM: LUNCH

14.30PM – 15.00PM: Dr. Charles Farrar, Los Alamos National Laboratory: “*Challenges for Developing Cognitive, Adaptive Infrastructure Systems*” – **(joint with ICAMEM - plenary)**.

15.00PM – 15.30PM: Dr. Sami F. Masri, University of Southern California: “*Some Approaches for Fault Detection in Monitoring Sensors*”.

15.30PM – 16.00PM: Dr. Daniele Inaudi, SMARTEC SA – Switzerland: “*Fiber Optic SHM systems*”.

16.00PM – 16.30PM: Dr. Andrew Swartz, Michigan Technological University: “*Dense Distributed Sensor and Actuator Networks - Lessons from Nature*”.

16.30PM – 17.00PM: Dr. Joel Conte, University of California, San Diego: “*System and Damage Identification Studies of Large/Full-Scale Structural Specimens Subjected to Seismic Testing*”.

17.00PM – 17.40PM: COFFEE BREAK – ICAMEM poster session

17.40PM – 19.00PM: **Optional Session:**

“*Forced vibration analyses of a piezoelectric/elastic/viscoelastic/elastic structures*” L. Azrar

“*Possible explanation of discrepancy in flexoelectric coefficient $12 f$ for barium titanate: surface piezoelectric layers*”. M. Gharbi

“An embedded crack in a functionally graded magneto-electroelastic infinite medium”, M Rkik
“Numerical study of actuation capabilities of shape memory alloys hybrid composites” O. Ltaif

19.00PM: DINNER

• **Sunday, December 19th, 2010**

7.00AM – 8.30AM: BREAKFAST

8.30AM – 9.00AM: Dr. James Beck, California Institute of Technology: *“Bayesian Ockham Razor for Assessing System Models using Sensor Data”* – **(joint with ICAMEM)**.

9.00AM – 9.30AM: Dr. Alison Flatau, University of Maryland: *“Biomimetic Macro and Micro-scale Flow Sensors”*.

9.30AM – 10.00AM: Dr Nizar Lajnef, Michigan State University: *“High Density, Self-Sustained Sensing Systems for Usage Monitoring of Mechanical Structures”*.

10.00AM – 10.20AM: Dr. Venkatesh Kodur, Michigan State University: *“Need for Sensing Technologies for Mitigating Fire Hazard in Built Infrastructure”*.

10.20AM – 10.50AM: COFFEE BREAK

10.50AM – 11.20AM (**ICAMEM presentation**): Dr. Tomasz Lekszycki, Institute of Fundamental Technological Research, Polish Academy of Sciences: *“Investigation and modeling of bone fracture healing”*.

11.20AM – 12.30AM: Discussion (Room 7).

13.00PM – 14.30PM: LUNCH

14.30PM – 15.00PM: Dr. Andrew Smyth, Columbia University: *“Dynamic Sensor Data Fusion: Developments for Structural and Mechanical Systems using Dual State Parameter Estimation Techniques”* – **(joint with ICAMEM)**.

15.00PM – 15.30PM: Dr. Ayeche Benjeddou, High Institute of Mechanics, Paris: *“Toward realistic piezoelectric sensor response modeling, simulation, and benchmarking”*.

15.30PM – 16.00PM: Lahcen Azrar: Faculté des Sciences et Techniques de Tanger, Morocco: *“Electro-elastic overall properties of piezoelectric composites by multiple sites self-consistent model structures”*.

16.00PM – 16.20PM: Dr Karim Chatti, Michigan State University: *“Sensing Needs for Enhanced Long-term Performance Monitoring of Pavement Structures”*.

16.20PM – 16.40PM: Dr Wajih Gafsi, Technology High Institute of Sfax: “*Confinement of vibrations in variable-geometry nonlinear flexible beam*”.

16.40PM – 17.20PM: COFFEE BREAK – ICAMEM poster session

19.00PM: DINNER

21.00PM: RECEPTION

• **Monday, December 20th, 2010**

7.00AM – 8.30AM: BREAKFAST

8.30AM – 9.00AM: Dr. Hojjat Adelli, Ohio State University: “*Wavelet-Chaos-Neural Network Models for Vibration Control and Health Monitoring of Large Irregular Structures*” – **(joint with ICAMEM - plenary)**.

9.00AM – 9.30AM (**ICAMEM presentation**): Dr. Samir Gerges, Federal University of Santa Catarina, Brazil: “*Contact pressure for earmuff comfort*”.

9.30AM – 10.00AM (**ICAMEM presentation**): Dr. V. Rajendran, K. S. Rangasamy College of Technology, India: “*On-line measurement of ultrasonic velocity and attenuation at elevated temperatures*”.

10.00AM – 10.30AM: COFFEE BREAK

10.30AM – 11.50AM: **Students Presentations**

“*Shape influence on the performance of beam-based piezoelectric energy harvesters*” S. Ayed – Student, Virginia Tech

“*Dynamic study of a capacitive MEMS switch with double clamped-clamped microbeams*” H. Sammali – Student, Tunisia Polytechnic School

“*Mechanical tuning of piezoelectric energy harvesters for temperature compensation*” M. Rhimi – Student, Michigan State University

“*Lamb Waves Based Techniques for Damage Detection*” B. Wybrecht and J. Paul – Undergraduate Students, Michigan State University.

11.50AM – 12.30PM: Discussion (Educational Issues)

12.30AM – 12.50PM: Discussion - Closure

12.50PM: LUNCH