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Bio-Inspired/Biomimetic Sensor Technologies and Applications

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Editors

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Introduction

Bioinspired/biomimetic technologies are a fast growing field that attempts to take advantage of the plethora of ideas and models in nature that work to an extraordinary degree of perfection. One application of immediate relevance of bioinspired technologies is to develop smart sensor systems that employ a heterogeneous group of multi-modal sensors, and perform real time processing and communication of data. With increasing emphasis on the Size, Weight and Power and Cost (SwaP-C) requirements for deployed systems, it is imperative that future sensor platforms take advantage of processes/mechanisms found in nature to design miniaturized electronic, optical and computational systems. These sensor systems must leverage biomimetic models of the animal/insect world to enable substantial reduction in processing requirements and to achieve real time operation.

The conference included sixteen papers organized into four technical sessions consisting of Sensors, Acoustic Detection, Locomotion and Robotics, and Algorithms. One of the sixteen papers was presented as a poster in the poster session. Each session included an invited paper by a leading expert in the field. The following invited papers were presented:

- Super-bright, stable, reproducible, SERS biotags for simultaneous identification of multiple biomarkers by Professor Martin Moskovits (Univ. of California, Santa Barbara)
- Biomimetic smart sensors for autonomous robotic behavior part I: acoustic processing by Dr Socrates Deligeorges (BioMimetic Systems, Inc.)
- Mechanisms of frictional adhesion in biological adhesion and locomotion by Professor Jacob Israelachvili (Univ. of California, Santa Barbara)
- GeoTrack: global video tracking by networks of unmanned aircraft systems by Dr Prabir Barooah (Univ. of Florida)

We thank all the authors for their presentations and all the participants for a successful first symposium on Bioinspired/Biomimetic Sensor Technologies and Applications. We thank all the Program Committee members for their assistance in conference planning and organizing. Our thanks to all the session chairs. Last but not the least, our special thanks to SPIE staff for their dedication and help in organizing the symposium.

We hope that the conference theme will continue to generate interest and bring together researchers working in the multiple areas of biology, engineering, the physical sciences and medicine in applying designs and processing models inspired from biological systems to realize microsensor systems that provide

unprecedented situational awareness meeting concurrently the SWaP-C requirements.

Nicholas F. Fell, Jr.
Venkataraman S. Swaminathan