SPIE. SMART STRUCTURES+ NONDESTRUCTIVE EVALUATION

Embassy Suites by Hilton Denver
Denver, Colorado, United States
3 - 7 March 2019

Nano-, Bio-, Info-Tech Sensors and 3D Systems

This conference has an open **call for papers:**

SUBMIT AN ABSTRACT
(SIGN IN REQUIRED)

Submission guidelines for Authors and Presenters

Important Dates

SHOW | HIDE

Abstract Due:
22 August 2018

Author Notification:
29 October 2018

Manuscript Due Date:
6 February 2019

Conference Committee

SHOW | HIDE

Conference Chair

Jaehwan Kim, Inha Univ. (Korea, Republic of)

Conference Co-Chairs

Kyo D. Song, Norfolk State Univ. (United States)
Ilkwon Oh, KAIST (Korea, Republic of)
Ajit Khosla, Yamagata Univ. (Japan)

Program Committee

Amir Ameli, Washington State Univ. Tri-Cities (United States)
Kean C. Aw, The Univ. of Auckland (New Zealand)
Anja Boisen, Technical Univ. of Denmark (Denmark)
Christina L. Brantley, U.S. Army Research, Development and Engineering Command (United States)
Wei Chen, Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO) CAS (China)
Sang H. Choi, NASA Langley Research Ctr. (United States)
Eugene Edwards, U.S. Army Research, Development and Engineering Command (United States)
Hidemitsu Furukawa, Yamagata Univ. (Japan)
Srinivasan Gopalakrishnan, Indian Institute of Science (India)
Seiich Hata, Nagoya Univ. (Japan)
Taizo Hayashida, JSR Corp. (Japan)
Mamoru Kawakami, Yamagata Univ. (Japan)
Adrian Koh, National Univ. of Singapore (Singapore)
Kimiya Komurasaki, The Univ. of Tokyo (Japan)
Hideki Kyogoku, Kindai Univ. (Japan)

Program Committee continued...

Kam K. Leang, The Univ. of Utah (United States)
Uhn Lee, Gachon Univ. Gil Medical Ctr. (Korea, Republic of)
Yirong Lin, The Univ. of Texas at El Paso (United States)
Hani E. Naguib, Univ. of Toronto (Canada)
Hidenori Okuzaki, Univ. of Yamanashi (Japan)
Simon Park, Univ. of Calgary (Canada)
Steve Park, KAIST (Korea, Republic of)
Maurizio Porfiri, NYU Tandon School of Engineering (United States)
Yongrae Roh, Kyungpook National Univ. (Korea, Republic of)
Debiprosad Roy Mahapatra, Indian Institute of Science (India)
Ashok Srivastava, Louisiana State Univ. (United States)
Hiroya Tanaka, Keio Univ. (Japan)
Tauno Vaha-Heikkila, VTT Technical Research Ctr. of Finland (Finland)
Vijay K. Varadan, The Pennsylvania State Univ. (United States)
Wei-Chih Wang, Univ. of Washington (United States)
W. Hong Yeo, Georgia Institute of Technology (United States)
Hargsoon Yoon, Norfolk State Univ. (United States)
Xuanhe Zhao, Massachusetts Institute of Technology (United States)

Call for Papers

This conference considers new ideas, technologies, and potential applications across a wide range of disciplines critical to nano-, bio-, and info-technologies based sensors and systems as applied to health monitoring of human and complex systems in engineering and medicine. This year's theme focuses on emerging areas of wearable technology, smart textile innovation, organic thin films and printable flex electronics, thought-controlled devices and systems, mobile wearable healthcare systems, wireless power feedback routines and devices for medical technology, smart optical materials technology, long-life micro-power systems, and thermoelectric energy conversion films and systems. Along with the research on sensors using nanostructures, sensor networking technology enables us to imagine a future where billions of people regularly access applications in global network as their daily routine. Newly developed technology of nanoscale sensors integrated with microelectronic components, especially with wireless communication devices will generate significant impact in broad range of applications such as human health care, national security and the environmental monitoring. The integration of the nanoscale sensors with RFID and wireless communication systems will provide vast opportunities for biological sensor applications, especially for physiological monitoring of human health and bio-hazard material detection system networked with personal mobile phone and internet services. The experimental, technological, and theoretical aspects of the relevant micro and nanoscience in engineering and medicine are welcome. A special focus will be given to antiterrorist efforts, homeland defense applications, security electronics, and reliability/failure issues and human disease monitoring and control.

Next generation of nanosensor systems in healthcare will depend on low cost manufacturing and integration of sensors by 3D printing of novel materials. 3D printing is currently one of the most emerging technologies. 3D printing implied with Internet of Things (IoT) will make 3D devices communicate each other. Our aim for introducing this important area in this conference is to visualize leading ideas for exchanging and to make networking place with the most updated information of 3D technology among scientists, researchers, and engineers covering vast number of disciplines and develop novel knowledge in healthcare for improving the quality of life. A smart textile innovation section will also devote new technology approach using 3D printing sensors on e-bra, e-shirt, e-underwear, e-bedsheets, garments to be used in space exploration and military uniforms. A hands-on training on 3D printing will also be set up in the conference and a certificate will be given as completion of the training in this emerging technology.

Organic electronics provide environmentally friendly devices and material technologies that are built on flexible and conformal substrates. The flexible electronics is a key enabler for a number of platform technologies such printed transistors, smart electronic textiles, electronic papers and displays, embedded power sources and integrated sensing devices. A number of low-cost and large-area electronic applications also include smart cards, smart price, and inventory tags such as RFIDs.

The conference aims to add the following areas to promote interdisciplinary exchange in understanding engineering systems from biological ones: nanowires, carbon nanotubes, magnetic nanotubes, organic electronics, MEMS, bioMEMS, nanostructures, nanoelectronics, microfluidics, high selectivity and sensitivity biological and chemical sensors, detection of harmful chemical and biological agents, microsensors for radioactivity, low power consumption physical and chemical sensors, security electronics, reliability and failure aspects, biomedical applications, biomimetics, fast DNA sequencing, smart drug delivery, polymer electronics, nanooptics, analytical techniques at nanoscale, nanoassembly behavior, nanointegration, noise aspects and information technology at nanoscale, multifunctional nanosystems, and nano/bio interface.

This conference will also focus on advanced methods for the testing, reliability, packaging, and metrology of micro-and nano-scale materials and devices. Papers are solicited on, but not limited to, the following or related topics:

Wearable technologies and interfacing with industries

- e-textile based smart garments
- cardiac monitoring e-bra, e-bro, and e-band aid
- monitoring neurological disorder with flexible wireless EEG, EOG, EMG sensors
- smart communication module with smart phone, Wi-Fi, GSM, GPRS
- monitoring the on-set of sudden cardiac death of athletes, soldiers
- panel with industries pursuing the wearable technology
- organic thin film and printable electronics
- integration of flex electronics for wearable medical devices.

3D printing and smart sensor system innovation

- 3D printing of materials (e.g., metal, polymer, ceramic, composites, etc.)
- computer aided design (CAD) and application
- Internet of Things (IoT) in 3D printing
- 3D printing in biomedical and medical applications; tissue engineering, surgery, orthopedics, healthcare
- 3D printing or additive manufacturing of EEG, ECG devices, 'footware and shoes', etc.
- 3D printing of nano and microsensor systems
- 3D printing for space
- wearable power
- textile based super capacitors
- 3D printing of textile garments, nanosensors and integration.

Novel materials and integration technologies

- nanomaterials
- carbon nanotubes
- 3D nanostructures
- biomaterials
- nanowires
- integration of nano-and micro-sensors with microelectronics
- integration of sensors with flexible organic electronics
- novel nanomaterials for display systems
- materials for flexible RFID systems.

Smart optical materials and device applications

- candidate materials and growth
- field coupling techniques for control and operation
- spectral shifters
- refractive index shifters
- characterization methodology of smart materials
- new device concepts with smart optical materials
- bandgap energy model and restructuring
- conformable physical optics
- error-free temporal and spatial tenability.

Energetic materials and long-lasting micro-power system

- energetic materials with quantum modification
- mobilization of deep level potential-well
- enhanced surface energy for artificial catalysis
- micro-power device concepts for long-life operation
- emerging and nascent materials for micro-power devices.

Integrated nano- and micro- structures

- smart sensors, smart actuators
- smart microsystems
- nanosystems
- drug delivery systems
- nondestructive methods for nano-engineered materials, nano- structures, and nano-devices.

Remote control and communication

- microantenna, rectenna
- remote sensing
- RF MEMS
- reconfigurable antenna
- microwave and millimeter wave components and devices.

Simulation, modeling, and IT software

- CAD/CAM for nanosystems
- design tools for integrated MEMS and NEMS
- electro-thermo-mechanical modeling
- microfluidics modeling
- IT-related software.

Thought-controlled devices and systems

- EEG, EOG, EMG signal acquisition system
- interfacing robot
- electroactive-polymer-based artificial muscles
- brain-computer interface; brain-machine interface.

Applications in engineering and medicine

- thermoelectric energy conversion systems
- thin-film hybrid PV/thermoelectric solar panels
- biomedical
- pharmaceutical
- bio-implantable chip for disease monitoring and control
- neurotransmitter and stimulator; neurosurgical procedures
- cardiovascular monitoring sensors and systems
- nanomedicine and drug delivery
- wireless communication protocols
- surgical procedures and nanosystems implementation
- glucose sensor system
- physiological monitoring
- smart textiles
- sleep apnea
- wireless power feedback routines and devices for medical applications.

This conference has an open **call for papers:**

SUBMIT AN ABSTRACT
(SIGN IN REQUIRED)

Submission guidelines for Authors and Presenters