



The Engineering in Medicine and Biology Society of the IEEE advances the application of engineering sciences and technology to medicine and biology, promotes the profession, and provides global leadership for the benefit of its members and humanity by disseminating knowledge, setting standards, fostering professional development, and recognizing excellence.

The EMBS field of interest is the development and application of engineering concepts and methods to biology, medicine and health sciences to provide effective solutions to biological, medical and healthcare problems. The field encompasses the development of mathematical theories, physical, biological and chemical principles, computational models and algorithms, devices and systems for clinical, industrial and educational applications.

### **Engineering in Medicine and Biology Society**

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[www.embs.org](http://www.embs.org)

### **PUBLICATIONS**

IEEE PULSE: A Magazine of the IEEE Engineering  
in Medicine and Biology Society  
Transactions on Biomedical Engineering  
Journal of Biomedical Health and Informatics  
Transactions on Neural Systems and  
Rehabilitation Engineering  
Transactions on Medical Imaging

Transactions on NanoBioscience  
Transactions on Computational Biology and Bioinformatics  
Transactions on Biomedical Circuits and Systems  
Reviews on Biomedical Engineering  
IEEE Journal on Translational Engineering in  
Health & Medicine

### **ELECTRONIC PRODUCTS**

EMBS Electronic Resource

### **CONFERENCES**

Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)  
IEEE EMBS Special Topic Conference on Neural Engineering (NER)  
International Symposium on Biomedical Imaging (ISBI)  
International Conference on Biomedical Robotics and Biomechanics (BIOROB)  
International Conference on Rehabilitation Robotics (ICORR)  
Healthcare Innovation Conference (HIC)  
EMBS Micro and Nanotechnology in Medicine (MNM)  
Grand Challenges Conference Series (GCBE)  
IEEE EMBS International Conference on Biomedical and Health Informatics (BHI)  
IEEE EMBS Point-Of-Care Healthcare Technologies

### **SUMMER SCHOOLS Technically Co-Sponsored by EMBS**

International Summer School on Biomedical Imaging  
International Summer School on Biomedical Signal Processing  
International Summer School on Biocomplexity  
International Summer School on Information Technology in Biomedicine  
International Summer School on Emerging Technologies and Applications in Telemedicine:  
Addressing the Challenges of Chronic Disease Management  
International Summer School on Neural Engineering (ISSNE)



# ***Congratulations***

## **2013 EMBS AWARDS**

Annually, EMBS recognizes outstanding contributions of its members to the Society and the field of biomedical engineering.

### **DISTINGUISHED SERVICE AWARD**



**Donna Hudson**  
**UCSF Fresno**

*“For leadership and uncommon judgment as President of EMBS and service in IEEE TAB and being an inspiration and mentor for leaders in the field of Biomedical Engineering.”*

### **ACHIEVEMENT AWARDS**

#### **Academic Career Achievement Award**



**Theodore Berger**  
**University of Southern  
California**

*“For excellence in memory neural prosthesis from the stages of conceptualization to human clinical design.”*

#### **Early Career Achievement Award**



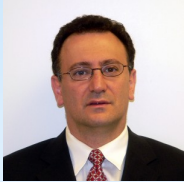
**Muhammad Hamid Zaman**  
**Boston University**

*“For seminal contributions to developing novel quantitative experimental and computational models of tumor development, growth and metastasis and for developing new engineering tools to address high impact global health challenges.”*

# 2013 EMBS AWARDS

(Continued)

## TECHNICAL ACHIEVEMENT AWARD



**Nicolas Chbat**  
Philips Research,  
North America

*“For contributions to advancing Intensive Care Unit cardiopulmonary medicine based on inventions that include non-invasively estimating breathing work, staging acute respiratory syndrome and kidney injury and modeling of disease predictors.”*



**Ali Khademhosseini**  
Harvard University

*“For pioneering contributions at the interface between engineering, biomaterials and biological sciences, especially applications of micro- and nanoengineered biomaterials for regenerative medicine.”*

## 2013 EMBS CHAPTER AWARDS

EMBS sponsors local activities worldwide through its Chapters for both Students and Members. Annually we acknowledge and recognize those Chapters whose activities embody best practices for the Society and its Members.

### **Best New Student Branch Chapter or Club**

*IEEE Engineering in Medicine and Biology Society  
Student Branch Chapter at Hashemite University  
Jordan*

### **Outstanding Student Branch Chapter or Club**

*CICB - Concepcion Student Club  
Chile*

### **Best New Chapter**

*IEEE EMBS Shanghai Chapter*

### **Outstanding Chapter Award**

*Dallas—EMBS*

# CONGRATULATIONS TO THE 2013 STUDENT PAPER COMPETITION FINALISTS

## Geographic Finalists

### *Asia Pacific Finalist*

**Tianruo Guo**

**University of New South Wales**

*“Cell-Specific Modeling of Retinal Ganglion Cell Electrical Activity”*

### *European Finalist*

**Dominic Heger**

**Karlsruhe Institute of Technology**

*“Subject-To-Subject Transfer for CSP Based BCIs: Feature Space Transformation and Decision-Level Fusion”*

### *Latin America Finalist*

**Erick Argüello**

**Universidad Simon Bolivar**

*“New Trends in Computational Modeling: A Neuroid-based Retina Model”*

### *North America Finalist*

**Cheng Chen**

**Johns Hopkins University**

*“Effect of Hypothermia on Cortical and Thalamic Signals in Anesthetized Rats”*

## Open Finalists

### **Austin Brockmeier**

**University of Florida**

*“Information-Theoretic Metric Learning: 2-D Linear Projections of Neural Data for Visualization”*

### **Ren Koda**

**Tokyo University of A&T**

*“Active Control of Microbubbles Stream in Multi-Bifurcated Flow by Using 2D Phased Array Ultrasound Transducer”*

### **Patjanaporn Chalacheva**

**University of Southern California**

*“An Extended Model of Blood Pressure Variability: Incorporating the Respiratory Modulation of Vascular Resistance”*

### **Pavitra Krishnaswamy**

**Massachusetts Institute of Technology**

*“Reference-Free Harmonic Regression Technique to Remove EEG-fMRI Ballistocardiogram Artifacts”*

### **Jean H. Chang**

**Massachusetts Institute of Technology**

*“Needle-Free Interstitial Fluid Acquisition Using a Lorentz-Force Actuated Jet Injector”*

### **Mathieu Nadeau**

**Université de Sherbrooke**

*“Control of Rapid Hypothermia Induction by Total Liquid Ventilation: Preliminary Results”*

### **Sinisa Colic**

**University of Toronto**

*“Low Frequency-Modulated High Frequency Oscillations in Seizure-Like Events Recorded from In-Vivo MeCP2-Deficient Mice”*

### **Kenta Shimba**

**The University of Tokyo**

*“Bidirectional Synaptic Connection between Primary and Stem Cell-Derived Neurons in Co-Culture Device”*

### **Mirna Guirgis**

**University of Toronto**

*“The Role of Delta-Modulated High Frequency Oscillations in Seizure State Classification”*

### **Devy Widjaja**

**KU Leuven**

*“Stress Classification by Separation of Respiratory Modulations in Heart Rate Variability Using Orthogonal Subspace Projection”*

### **Aaron Young**

**Northwestern University**

*“An Intent Recognition Strategy for Transfemoral Amputee Ambulation across Different Locomotion Modes”*

# 2013 IEEE EMBS Fellow Members

**Khosrow Behbehani**

University of Texas at Arlington

*for contributions to development of respiratory therapy devices  
in chronic pulmonary diseases chronic pulmonary diseases*

**Vince Calhoun**

The University of New Mexico

*for contributions to data-driven processing of multimodal brain  
imaging and genetic data*

**Andrzej Cichocki**

RIKEN Brain Science Institute

*for contributions to applications of blind signal processing and  
artificial neural networks*

**Aaron Fenster**

Western University

*for contributions to medical imaging and ultrasound-guided  
intervention*

**Rolf Johansson**

Lund University

*for contributions to system identification and adaptive control*

**Leo Joskowicz**

The Hebrew University of Jerusalem

*for contributions to computer assisted surgery and medical  
image processing*

**Yanda Li**

Tsinghua University

*for contributions to research and education in signal processing  
and bioinformatics*

**Danilo Mandic**

Imperial College London

*for contributions to multivariate and nonlinear learning  
systems*

**Cian Mathuna**

Tyndall National Institute

*for leadership in the development of power supply using  
micromagnetics on silicon*

**Chris Myers**

University of Utah

*for contributions to design and testing for asynchronous, analog,  
and genetic circuits*

**Michael Neuman**

Michigan Technological University

*for contributions to biomedical sensors and instrumentation  
with clinical applications*

**Christian Pichot**

French National Center for Scientific Research  
(CNRS)

*for contributions to microwave tomography and antenna  
designs*

**Michael Savageau**

University of California, Davis

*for application of systems engineering concepts to molecular  
biology*

**Erchin Serpedin**

Texas A&M University

*for contributions to synchronization of communication systems*

**Stefano Soatto**

University of California, Los Angeles

*for contributions to dynamic visual processes*

**Antonius Van der Steen**

Erasmus MC

*for development of ultrasound diagnostic techniques for  
vulnerable plaque detection*

San Diego  
California

International IEEE EMBS Conference on



Neural  
Engineering



November  
6th-8th  
2013

Call for Papers –  
June 5!



**Conference Co-Chairs:**

Bin He

Metin Akay

**Organizing Committee:**

Lei Ding

Dominique Durand

Dario Farina

Shangkai Gao

David Guiraud

Nigel Lovell

Silvestro Micera

Justin C. Sanchez

Neural Engineering is an emerging core discipline, which coalesces neuroscience with engineering. Please join us at:

The **6th International IEEE EMBS Conference on Neural Engineering**, which will be held at the Sheraton San Diego Hotel and Marina - CA from **6-8 November 2013**, just before **The Society for Neuroscience Annual Meeting**. Members of both the Neuroscience and Engineering Communities are encouraged to attend this highly multidisciplinary meeting. The conference will highlight the emerging engineering innovations in the restoration and enhancement of impaired sensory, motor, and cognitive functions, novel engineering for deepening knowledge of brain function, and advanced design and use of neurotechnologies.

Neural engineering draws expertise from computational neuroscience, neurology, neurosurgery, electrical engineering, materials engineering, and cell and molecular neuroscience. Through innovations in neurotechnology the community seeks to synergize scientists, engineers, and clinicians toward improved medical therapies.

Contributions are invited in the following area (but not limited to):

- ▶ Neuroimaging
- ▶ Brain-Computer and Brain-Machine Interfaces
- ▶ Neural Computation and Modeling
- ▶ Neuro-Nanotechnology
- ▶ Neural Prostheses
- ▶ Neuro-Robotics
- ▶ Cognitive Engineering and Science
- ▶ Deep Brain Stimulation
- ▶ Rehabilitation Engineering

Submission instructions, registration, and more information can be found at: [HTTP://NEURO.EMBS.ORG/2013/](http://NEURO.EMBS.ORG/2013/)

To register: <http://www.cvent.com/d/5cq4wk>

**Important Dates - 2013:**

▶ [Online 4-Page Paper Submission Dates:](#)  
Closes **June 5, 2013**

Notification of 4-Page Acceptance on or before: **July 8, 2013**

Final 4-Page Paper Upload and Deadline for Author registration on or before: **July 15, 2013**

▶ **Best Paper Competition Deadline:**  
**June 30, 2013**

▶ [Online 1-Page Paper Submission Dates:](#)  
Opens **June 15** —  
Closes **June 30, 2013**  
(1 page papers presented as posters only, will not be published in Xplore, and will only be posted on line)

Notification of 1-Page Acceptance on or before: **August 1, 2013**

Final 1-Page Paper Upload and Deadline for Author registration on or before: **August 8, 2013**

▶ **Hotel Reservation for Group Rate Cut off:**  
**October 14, 2013, 5pm PST**





# IEEE International Symposium on Biomedical Imaging

April 28 — May 2, 2014, Beijing, China



## IEEE

### Conference Chairs

**Ge Wang**  
Rensselaer Polytechnic  
Institute, USA

**Bin He**  
University of Minnesota  
USA

### Program Chairs

**Jie Tian**  
Chinese Academy of Sciences  
China

**Laure Blanc-Féraud**  
CNRS, I3S & INRIA-SAM  
France

### Organizing Committee

Cristian Badea, Jing Bai,  
Guanghong Chen, Xinjian  
Chen, Bruno De Man,  
Yiping Du, Gultekin Gulsen,  
Marc Kachelrieß, Jimin Liang,  
Murray Loew, Atsushi  
Momose, Françoise Peyrin,  
Dinggang Shen, Xiangyang  
Tang, Yu-ping Wang,  
Kaiming Ye, Hengyong Yu,  
Yantian Zhang, Jun Zhao

### Contact

D.bernstein@ieee.org

The IEEE International Symposium on Biomedical Imaging (ISBI) has established itself as the prime conference in the field of biomedical imaging at large since 2002. The theme of ISBI'14 is "Innovative, Integrative, Informative". Based on the success of the ISBI tradition, we will test novel features for ISBI'14, including informetric measures, data papers, and best paper competition (see website below for details).

The conference, at **Renaissance Beijing Capital Hotel, Beijing, China**, will begin with pre-meeting tutorials, and highlight a scientific program of plenary talks, special sessions, oral and poster presentations. High-quality results are solicited on all aspects of biomedical imaging, including but not limited to image formation, processing and analysis, performance assessment, hybrid imaging, and imaging informatics. Submissions (4-pages for oral or poster, 1-page for late breaking) are encouraged on anatomical, functional, cellular and molecular imaging, either basic or translational research. Four-page papers will be published on IEEE Xplore.

### Plenary Speakers

**Zhi-Pei Liang, University of Illinois at Urbana – Champaign, USA**

**Norbert Pelc, Stanford University, USA**

**Roderic Pettigrew, National Institutes of Health, USA**

**Brian Pogue, Dartmouth College, USA**



### Important Dates

**Tutorial, Special, Invited Sessions, & Challenges Proposal Submission**  
Jun 3 — Jul 1, 2013

**4-Page Paper Submission**  
Aug 1 — Oct 18, 2013  
**Notification**  
Nov 25, 2013  
**Upload & Registration**  
Dec 20, 2013

**Best Paper Deadline**  
Oct 18, 2013

**1-Page Paper Submission**  
Nov 1 — Dec 12, 2013  
**Notification**  
Dec 24, 2013  
**Upload & Registration**  
Jan 7, 2014

## Innovative • Integrative • Informative



<http://biomedicalimaging.org/2014>



## 36<sup>th</sup> Annual International Conference of the IEEE Engineering in Medicine and Biology Society

*"Discovering, Innovating, and Engineering Future Biomedicine"*

**Sheraton Chicago Hotel and Towers**  
**August 27 – 31, 2014**



### First Announcement

The 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'14) will be held from August 27-31, 2014 at the Sheraton Hotel & Towers, Chicago, Illinois, USA. The overall theme of the conference is **"Discovering, Innovating, and Engineering Future Biomedicine"**. It will cover diverse topics from cutting-edge biomedical and healthcare technology research and development, clinical applications, to biomedical education. The conference program will consist of high-profile plenary/keynote lectures, symposia, workshops, invited sessions, oral and poster sessions, and exhibitions. All papers will be peer reviewed; accepted papers will appear in the Conference Proceedings and be indexed by IEEE Xplore and Medline/PubMed.

*All are welcome to participate in this exciting meeting as author, attendee, and/or exhibitor; Proposals for organizing special sessions on emerging topics in the following themes are also encouraged:*

- ✓ Biomedical Signal Processing
- ✓ Biomedical Imaging and Image Processing
- ✓ Bioinstrumentation, Biosensors, and Bio-Micro/Nano Technologies
- ✓ Bioinformatics & Computational Biology, Systems Biology, and Modeling Methodologies
- ✓ Cardiovascular and Respiratory Systems Engineering
- ✓ Neural and Rehabilitation Engineering
- ✓ Tissue Engineering and Biomaterials
- ✓ Biomechanics and Biorobotics
- ✓ Therapeutic Systems, Devices & Technologies, and Clinical Engineering
- ✓ Healthcare Information Systems and Telemedicine
- ✓ Biomedical Engineering Education

**For more information, please visit the EMBC'14 website: <http://embc.embs.org/2014>**

**Conference Chairs:** Zhi-Pei Liang, University of Illinois at Urbana-Champaign  
Xiaochuan Pan, University of Chicago

**Program Chairs:** Jeffrey Duerk, Case Western Reserve University  
Jim Ji, Texas A&M University