IEEE International Conference on Communications

Call for Papers for Selected Areas in Communications Symposium Molecular, Biological, and Multi-Scale Communications Track (SAC-8 MBMC)

Symposium Track Chairs

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Submissions must be done through EDAS at: https://edas.info/newPaper.php?c=22649&track=81064
The paper submission deadline is October 14, 2016.

Scope and Motivation

As a result of recent advances in MEMS/NEMS and systems biology, as well as the emergence of synthetic bacteria and lab/process-on-a-chip techniques, it is now possible to design chemical "circuits", custom organisms, micro/nanoscale swarms of devices, and a host of other new systems at small length scales, and across multiple scales (e.g., micro to macro). This success opens up a new frontier for interdisciplinary signaling techniques using chemistry, biology, novel electron transfer, and other principles not previously examined. This track is devoted to the principles, design, and analysis of signaling and information systems that use physics beyond conventional electromagnetism, particularly for small-scale and multi-scale applications. This includes: molecular, quantum, and other physical, chemical and biological (and biologically-inspired) techniques; as well as new signaling techniques at these scales. As the boundaries between communication, sensing and control are blurred in these novel signaling systems, research contributions in a diversity of disciplines are invited.

Main Topics of Interest

Original research articles are solicited in, but not limited to, the following areas:

- Mathematical modeling of biological, molecular or multi-scale communication
- Channel model design and analysis
- Molecular computing
- DNA sequencing
- Biological, molecular or multi-scale networking
- Implementation and laboratory experiments
- Systems biology
- Data-starved or data-rich statistical analyses of biological systems
- Industrial applications
- Biological circuits
- Biosystem analysis and control
- Information/communication theory for analysis of biological systems
- Unconventional electromagnetism for small or multi-scale applications
- Experiment-based studies on information processes or networks in biology

Biographies

Urbashi Mitra received the B.S. and the M.S. degrees from the University of California at Berkeley in 1987 (high honors) and 1989 respectively, both in Electrical Engineering and Computer Science. From 1989 until 1990 she worked as a Member of Technical Staff at Bellcore in Red Bank, NJ. In 1994, she received her Ph.D. from Princeton University in Electrical Engineering. From 1994 to 2000, Dr. Mitra was in the Department of Electrical Engineering at The Ohio State University, Columbus, Ohio. Dr. Mitra joined the University of Southern California in 2001, where she is currently the Dean's Professor of Electrical Engineering. Her research interests include biological communication systems, wireless communications, underwater acoustic communications, network optimization, sparse approximation theory, and actuated sensor networks. Dr. Mitra is the Editor-in –Chief of the IEEE Transactions on Molecular, Biological and Multi-scale Communications. She is a former Associate Editor of the IEEE publications: Transactions on Communications, Transactions on Information Theory, Transactions on Signal Processing and Journal of Oceanic Engineering. She has served on the IEEE Information Theory Society's Board of Governors (2002-2007, 2012-2017) and the IEEE Signal Processing Society's Technical Committee on Signal Processing for Communications and Networks (2012-2016). Dr. Mitra is a Fellow of the IEEE. She is the recipient of: 2012 Globecom Signal Processing for Communications Symposium Best Paper Award, 2012 NAE Lillian Gilbreth Lectureship, USC Center for Excellence in Research Fellowship (2010-2013), the 2009 DCOSS Applications & Systems Best Paper Award, Texas Instruments Visiting Professor (Fall 2002, Rice University), 2001 Okawa Foundation Award, 2000 OSU College of Engineering Lumley Award for Research, 1997 OSU College of Engineering MacQuigg Award for Teaching, and a 1996 National Science Foundation CAREER Award

Andrew Eckford is an Associate Professor in the Department of Electrical Engineering and Computer Science at York University, Toronto, Ontario. He received the B.Eng. degree from the Royal Military College of Canada in 1996, and the M.A.Sc. and Ph.D. degrees from the University of Toronto in 1999 and 2004, respectively, all in Electrical Engineering. Andrew held postdoctoral fellowships at the University of Notre Dame and the University of Toronto, prior to taking up a faculty position at York in 2006. Andrew's research interests include the application of information theory to nonconventional channels and systems, especially the use of molecular and biological means to communicate. Andrew is also a co-author of the textbook *Molecular Communication*, published by Cambridge University Press, and his research on molecular communication has been covered in media including the *Wall Street Journal* and *The Economist*. He is the Associate Editor-in-Chief of the IEEE Transactions on Molecular, Biological and Multi-scale Communications.