49th Annual Conference on Information Sciences and Systems

MARCH 18, 19 AND 20 ● 2014 ● HODSON HALL ● JOHNS HOPKINS UNIVERSITY

Hosted by the Department of Electrical and Computer Engineering with technical co-sponsorship by IEEE
Abstract:

We live in an era of data deluge. Pervasive sensors collect massive amounts of information on every bit of our lives, churning out enormous streams of raw data in various formats. Mining information from unprecedented volumes of data promises to limit the spread of epidemics and diseases, identify trends in financial markets, learn the dynamics of emergent social-computational systems, and also protect critical infrastructure including the smart grid and the Internet’s backbone network. While Big Data can be definitely perceived as a big blessing, big challenges also arise with large-scale datasets. The sheer volume of data makes it often impossible to run analytics using a central processor and storage, and distributed processing with parallelized multi-processors is preferred while the data themselves are stored in the cloud. As many sources continuously generate data in real time, analytics must often be performed “on-the-fly” and without an opportunity to revisit past entries. Due to their disparate origins, massive datasets are noisy, incomplete, prone to outliers, and vulnerable to cyber-attacks. These effects are amplified if the acquisition and transportation cost per datum is driven to a minimum. Overall, Big Data present challenges in which resources such as time, space, and energy, are intertwined in complex ways with data resources. Given these challenges, ample signal processing opportunities arise. This tutorial lecture outlines ongoing research in novel models applicable to a wide range of Big Data analytics problems, as well as algorithms to handle the practical challenges, while revealing fundamental limits and insights on the mathematical trade-offs involved.

Biography:

Georgios B. Giannakis (Fellow’97) received his Diploma in Electrical Engr. from the Ntl. Tech. Univ. of Athens, Greece, 1981. From 1982 to 1986 he was with the Univ. of Southern California (USC), where he received his MSc. in Electrical Engineering, 1983, MSc. in Mathematics, 1986, and Ph.D. in Electrical Engr., 1986. Since 1999 he has been a professor with the Univ. of Minnesota, where he now holds an ADC Chair in Wireless Telecommunications in the ECE Department, and serves as director of the Digital Technology Center. His general interests span the areas of communications, networking and statistical signal processing – subjects on which he has published more than 370 journal papers, 630 conference papers, 20 book chapters, two edited books and two research monographs (h-index 109). Current research focuses on big data analytics, wireless cognitive radios, mobile ad hoc networks, renewable energy, power grid, gene-regulatory, and social networks. He is the (co-) inventor of 22 patents issued, and the (co-) recipient of 8 best paper awards from the IEEE Signal Processing (SP) and Communications Societies, including the G. Marconi Prize Paper Award in Wireless Communications. He also received Technical Achievement Awards from the SP Society (2000), from EURASIP (2005), a Young Faculty Teaching Award, the G. W. Taylor Award for Distinguished Research from the University of Minnesota, and the IEEE Fourier Technical Field Award (2014). He is a Fellow of EURASIP, and has served the IEEE in various posts, including that of a Distinguished Lecturer.
High throughput real-time instruments are needed to acquire large data sets for detection and classification of rare events. Enabled by the photonic time stretch digitizer, a new class of instruments with record throughputs have led to the discovery of optical rogue waves [1], detection of rare cancer cells [2], and the highest analog-to-digital conversion performance ever achieved [3]. Featuring continuous operation at 100 million frames per second and shutter speed of less than a nanosecond, the time stretch camera is ideally suited for screening of blood and other biological samples. It has enabled detection of breast cancer cells in blood with record, one-in-a-million, sensitivity [2]. Owing to their high real-time throughput, instruments produce a torrent of data – equivalent to several 4K movies per second – that overwhelm data acquisition, storage, and processing operations. This predicament calls for technologies that compress images in optical domain and in real-time. An example of this, based on warped stretch transformation and non-uniform Fourier domain sampling will be reported.

Biography:

Prof. Jalali is the Northrop-Grumman Endowed Chair in Optoelectronics and Professor of Electrical Engineering at UCLA with joint appointments in the Biomedical Engineering and in the UCLA David Geffen School of Medicine. He is a Fellow of IEEE, the Optical Society of America (OSA), the American Physical Society (APS) and SPIE. He is the recipient of the R.W. Wood Prize from Optical Society of America for the invention and demonstration of the first Silicon Laser, and the Aron Kressel Award of the IEEE Photonics Society, the IET Achievement Medal, and the Distinguished Engineering Achievement Award from the Engineers Council.
MIMO I Session

Session Code: A1L-A
Location: Hodson 210
Date: Wednesday, March 18, 2015
Time: 09:00-11:45
Chair: Taneli Riihonen

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<th>Paper ID</th>
<th>Title/Author</th>
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<tr>
<td>1011</td>
<td>A Probabilistic Downlink Beamforming Approach with Multiplicative and Additive Channel Errors Andreas Gründinger, Johannes Pickart, Michael Joham, Wolfgang Utsch...</td>
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<td>1074</td>
<td>Feedback Rate Optimization in Receiver-Coordinated Distributed Transmit Beamforming for Wireless Power Transfer Rui Wang, Radu David, Donald Brown III</td>
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<td>1023</td>
<td>Sample Support Requirements for Nonlinear Adaptive Beamforming Peter Vouras</td>
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<td>1003</td>
<td>Characterization of Pattern Reconfigurable Antenna Arrays for MIMO Systems George Sworo, Damiano Patron, Kapil Dandekar, Moshe Kam</td>
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<td>1076</td>
<td>Quantized Beamforming in Massive MIMO Hong Yang, Thomas Marzetta</td>
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Audio/Visual: 410-516-6699
Wireless Networks I Session

**Session Code:** A1L-B  
**Location:** Hodson 301  
**Date:** Wednesday, March 18, 2015  
**Time:** 09:00-11:45  
**Chair:** Michael Dinitz  
**Proctor:** Congyuan Yang

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<th>Paper ID</th>
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</table>
| 1006     | Node-Based Scheduling with Provable Evacuation Time  
          | Bo Ji, Jie Wu |
| 1111     | Performance Analysis of IEEE 802.15.3c-Based mmW Wireless Networks  
          | Roberto Valentini, Marco Levorato, Carlo Fischione |
| 1120     | Component Based Modeling of Routing Protocols for Mobile Ad Hoc Networks  
          | Evripidis Paraskevas, John Baras |
| 1060     | Distributed RF Sensing Using Software-Defined Radios  
          | Kareem Bonna, Emmanuel Kanterakis, Wei Su, Troy Ryder, Predrag Spas... |
| 1065     | Combined Sensor Information for Detection  
          | Karla Hernández |

**Audio/Visual:** 410-516-6699
Session Code: A1L-C
Location: Hodson 303
Date: Wednesday, March 18, 2015
Time: 09:00-11:45
Chair: Pablo A. Iglesias

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<tr>
<th>Paper ID</th>
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<tr>
<td>1032</td>
<td>Fractional Fliess Operators: Two Approaches</td>
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<td>Irina Winter-Arboleda, W. Steven Gray, Luis Duffaut Espinosa</td>
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<td>1100</td>
<td>Disturbance Observer Structure Based Internal Model Control for Time Delay Systems</td>
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<td>Sudeshna Dasgupta, Smita Sadhu, Tapan Kumar Ghoshal</td>
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<td>1058</td>
<td>Analytic Left Inversion of SISO Lotka-Volterra Models</td>
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<td>W. Steven Gray, Luis Duffaut Espinosa, Kurusch Ebrahimi-Fard</td>
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<td>1004</td>
<td>Synchronization of Heterogeneous Kuramoto Oscillators with Graphs of Diameter Two</td>
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<td>Andrey Gushchin, Enrique Mallada, Ao Tang</td>
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<td>1046</td>
<td>Diffusive Clock Synchronization in Highly Dynamic Networks</td>
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<td>Matthias Függer, Thomas Nowak, Bernadette Charron-Bost</td>
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Neural and Neuromorphic Processing Session

Session Code: A1L-D
Location: Hodson 305
Date: Wednesday, March 18, 2015
Time: 09:00-11:45
Chair: Andreas Andreou

Proctor: Chia-hsun Chiang

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| 1140     | Design of a Vanishing Point Algorithm for Custom ASIC  
Martin Villemur, Martin Di Federico, Pedro Julian, Andreas G. Andreou... |
| 1139     | FPGA Implementation of a Deep Belief Network Architecture for Character Recognition Using Stochastic Computation  
Kayode Sanni, Guillaume Garreau, Jamal Lottier Molin, Andreas G. Andreou... |
| 1142     | Neuronal Common Input Strength is Unidentifiable from Average Firing Rates and Synchrony  
Daniel Jeck, Ernst Niebur |
| 1138     | Markov Chain Monte Carlo Inference on Graphical Models using Event Based Processing on the SpiNNaker Neuromorphic Architecture  
Daniel R. Mendat, Sang Chin, Steve Furber, Andreas G. Andreou |
| 1143     | Closed Form Jitter Methods for Neuronal Spike Train Analysis  
Daniel Jeck, Ernst Niebur |

Audio/Visual: 410-516-6699
# MIMO II Session

**Session Code:** A3L-A  
**Location:** Hodson 210  
**Date:** Wednesday, March 18, 2015  
**Time:** 1400-17:15 pm  
**Chair:** Peter Vouras

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| 1097     | Theoretical Bound on Modulation Classification for Multiple-Input Multiple-Output (MIMO) Systems Over Unknown, Flat Fading Channels  
Yu Liu, Alexander Haimovich, Wei Su, Emmanuel Kanterakis |
| 1034     | Deterministic Selection of Pilot Tones for Compressive Estimation of MIMO-OFDM Channels  
Zahra Shakeri, Waheed U. Bajwa |
| 1035     | MIMO-OFDM Non-Regenerative Relay Channel Estimation Using Compressed Sensing  
Abbas Akbarpour-Kasgari, Mehrdad Ardebilipour, Fatemeh Afghah |
| 1096     | Modulation Classification for MIMO-OFDM Signals via Gibbs Sampling  
Yu Liu, Osvaldo Simeone, Alexander Haimovich, Wei Su |

**Audio/Visual:** 410-516-6699
Wireless Networks II
Session

Session Code: A3L-B
Location: Hodson 301
Date: Wednesday, March 18, 2015
Time: 1400-17:15 pm
Chair: Michael Dinitz

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<tr>
<td>1022</td>
<td>Driver-Based Adaptation of Vehicular Ad Hoc Networks for Design of Active Safety Systems</td>
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<td>1112</td>
<td>Effect of MAC Type and Speed on Neighbor Discovery in Wireless Train Networks</td>
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<td>1072</td>
<td>Random Symmetric Gossip Consensus with Overhearing Nodes in Wireless Networks</td>
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<td>1017</td>
<td>Game-Theory Based Power and Spectrum Virtualization for Maximizing Spectrum Efficiency Over Mobile Cloud-Computing Wireless Networks</td>
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<td>1042</td>
<td>Distributed Cloud Association in Downlink Multicloud Radio Access Networks</td>
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Detection and Estimation
Session

Session Code: A3L-C
Location: Hodson 303
Date: Wednesday, March 18, 2015
Time: 1400-17:15 pm
Chair: Predrag Spasojevic
Proctor: Shuai Huang

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<th>Paper ID</th>
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<tr>
<td>1029</td>
<td>An Efficient Multivariate Generalized Gaussian Distribution Estimator: Application to IVA&lt;br&gt;Zois Boukouvalas, Geng-Shen Fu, Tulay Adali</td>
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<td>1123</td>
<td>False Information Detection with Minimum Mean Squared Errors for Bayesian Estimation&lt;br&gt;Ruixin Niu, Jingyang Lu</td>
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<td>1098</td>
<td>1-Bit Matrix Completion Under Exact Low-Rank Constraint&lt;br&gt;Sonia Bhaskar, Adel Javanmard</td>
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<td>1071</td>
<td>Analysis of Data-Based Methods for Approximating Fisher Information in the Scalar Case&lt;br&gt;Shenghan Guo</td>
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<td>1122</td>
<td>EM-Based Channel Estimation from Crowd-Sourced RSSI Samples Corrupted by Noise and Interference&lt;br&gt;Silvija Kokalj-Filipovic, Larry Greenstein</td>
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Session Code: A3L-D
Location: Hodson 305
Date: Wednesday, March 18, 2015
Time: 1400-17:15 pm
Chair: James C. Spall

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<td>1028</td>
<td>Efficiently Detecting Lack of Robustness in Finite Alphabet Logistic Networks &lt;br&gt;Vincent Yan, Danielle Tarraf</td>
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<td>1084</td>
<td>Error Bound Analysis of the Least-Mean-Squares Algorithm in Linear Models &lt;br&gt;Jingyi Zhu, James Spall</td>
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<td>1026</td>
<td>Distributed Generator and Load-Side Secondary Frequency Control in Power Networks &lt;br&gt;Changhong Zhao, Enrique Mallada, Steven Low</td>
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<td>1102</td>
<td>A Distributed, Real-Time and Non-Parametric Approach to Demand Response in the Smart Grid &lt;br&gt;Sairam Goguri, Joseph Hall, Raghuraman Mudumbai, Soura Dasgupta</td>
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Proctor: Congyuan Yang
### Medical and Neuromorphic Diagnosis, Measurement and Perception Session

**Session Code:** A3L-E  
**Location:** Hodson 311  
**Date:** Wednesday, March 18, 2015  
**Time:** 1400-17:15 pm  
**Chair:** Andreas Andreou

**Proctor:** Akshay Rangamani

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</table>
| 1141     | A Neural Model for Perceptual Organization of 3D Surfaces  
Brian Hu, Rudiger von der Hey, Ernst Niebur |
| 1137     | How is Motion Integrated into a Proto-Object Based Visual Saliency Model?  
Jamal Lottier Molin, Ralph Etienne-Cummings, Ernst Niebur |
| 1135     | Visual Attention with Deep Neural Networks  
Alfredo Canziani, Eugenio Culurciello |
| 1134     | Mapping the Cardiac Acousteome: An Overview of Technologies, Tools and Methods  
Andreas G. Andreou, Theodore Abraham, William R. Thompson, Jung Hee.. |
| 1136     | Mechanical Design, Instrumentation and Measurements from a Hemoacoustic Cardiac Phantom  
Hani Bakhshaeef, Guillaume Garreau, Gaspar Tognetti, Thomas Kilmar, ... |

Audio/Visual: 410-516-6699
# Cooperative Communications and Networking Session

**Session Code:** B1L-A  
**Location:** Hodson 311  
**Date:** Thursday, March 19, 2015  
**Time:** 09:00-11:45  
**Chair:** Fatemah Afghah  
**Proctor:** Congyuan Yang

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<tr>
<th>Paper ID</th>
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</table>
| 1007     | A Novel Multi-Criteria Relay Selection Scheme in Cooperation Communication Networks  
          | Behrooz Razeghi, Niloofar Okati, Ghosheh Abed Hodtani                                     |
| 1020     | Impact of Spatial Diversity on Spectral Efficiency of Cooperative Relaying  
          | Guangyi Liu, Yao Xiao, Hao Feng, Leonard Cimini Jr.                                        |
| 1041     | Impact of Direct Link on Outage of Cooperative Full-Duplex Relaying  
          | Li Li, Leonard Cimini Jr., Xiang-Gen Xia                                                  |
| 1109     | Throughput Maximizing Games in the Two-Hop Relay Channel with Energy Cooperation  
          | Burak Varan, Aylin Yener                                                                    |
| 1045     | Multi-Hop Relaying with Optimal Decode-and-Forward Transmission Rate and Self-Immunity to Mutual Interference Among Wireless Nodes  
          | Xiaohua Li, Jeong Kyun Lee                                                                  |

**Audio/Visual:** 410-516-6699
# Security and Privacy Session

**Session Code:**  B1L-B  
**Location:**  Hodson 301  
**Date:**  Thursday, March 19, 2015  
**Time:**  09:00-11:45  
**Chair:**  Taneli Riihonen  
**Proctor:**  Shannon Alt

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<tr>
<th>Paper ID</th>
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| 1121     | Secrecy Capacity of the Ergodic Layered Erasure Wiretap Channel  
Mohammad K. Hossan, Sanjay Karmakar |
| 1057     | IM Session Identification by Outlier Detection in Cross-Correlation Functions  
Saad Saleh, Muhammad Ilyas, Khawar Khurshid, Alex Liu, Hayder Radha |
| 1063     | Resilient and Secure Network Design for Cyber Attack-Induced Cascading Link Failures in Critical Infrastructures  
Yezekael Hayel, Quanyan Zhu |
| 1128     | Privacy Preserving Node Selection: a Physical Layer Approach  
Shalabh Jain, John Baras |

Audio/Visual:  410-516-6699
**Applications and Coding Session**

**Session Code:** B1L-C  
**Location:** Hodson 303  
**Date:** Thursday, March 19, 2015  
**Time:** 09:00-11:45  
**Chair:** Benjamin Belzer

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<tr>
<th>Paper ID</th>
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| 1052     | Analog Joint Source-Channel Coding for Transmission of Correlated Senders Over Separated Noisy Channels  
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| 1005     | A Hybrid ARQ Scheme Using LDPC Codes with Stochastic Decoding  
*Kuo-Lun Huang, Vincent Gaudet, Masoud Salehi* |
| 1019     | Signal Processing for Two Dimensional Magnetic Recording Using Voronoi Model Averaged Statistics  
*Morteza Mehrnoush, Benjamin Belzer, Krishnamoorthy Sivakumar, Roger...* |
| 1020     | Rate Compatible IRA Codes Using Row Splitting for 5G Wireless  
*Brennan Young, Swapnil Mhaske, Predrag Spasojevic* |
| 1070     | Hybrid Analog-Digital Coding for Nonuniform Memoryless Sources  
*Lu Li, Javier Garcia-Frias* |

Audio/Visual: 410-516-6699
Audio Signal Processing
Session

Session Code: B1L-D
Location: Hodson 305
Date: Thursday, March 19, 2015
Time: 09:00-11:45
Chair: Mounya Elhilali
Proctor: Dimitra Emmanouilidou

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<tr>
<th>Paper ID</th>
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| 1078     | Indoor Multiple Sound Source Tracking Using Refined TDOA Measurements  
           Longji Sun, Qi Cheng |
| 1030     | Modeling Goal-Directed Attention in Tone Sequences Using a Weighted Kalman Filter  
           Debmalya Chakrobarty, Mounya Elhilali |
| 1015     | Analysis of Compressed Speech Signals in an Automatic Speaker Recognition System  
           Richard Metzger, John Doherty, David Jenkins |
| 1036     | Detection of Speech Tokens in Noise Using Adaptive Spectrotemporal Receptive Fields  
           Ashwin Bellur, Mounya Elhilali |

Audio/Visual: 410-516-6699
**Topics in Wireless Communications**

**Session**

**Session Code:** B3L-A

**Location:** Hodson 210

**Date:** Thursday, March 19, 2015

**Time:** 14:00-17:15

**Chair:** Arlene Cole-Rhodes

**Proctor:** Congyuan Yang

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<tr>
<td>1061</td>
<td>How Long Before I Regain My Signal? Tingting Lu, Pei Liu, Shivendra Panwar</td>
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<td>1095</td>
<td>Evaluating Real-Time CMA Equalization of Measured SOQPK-TG Data Arlene Cole-Rhodes, Serge KoneDossongui, Michael Rice</td>
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<td>1051</td>
<td>Improving Coherence in Distributed Miso Communication Systems with Local Accelerometer Measurements Donald Brown III, Radu David, Patrick Bidigare</td>
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<td>1009</td>
<td>Symbol-Rate Blind Equalization Based on Constrained Blind Separation Zhengwei Wu, Saleem Kassam</td>
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<td>1124</td>
<td>Energy Efficiency Region for Gaussian Multiple Access Channels Under Different Power Consumption Models Chengming Zhou, Jing Li, Leonard Cimini Jr.</td>
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<td>1067</td>
<td>Robust Recognition of Linear and Nonlinear Digital Modulations of RRC Pulse Trains Mohammad Bari, Milos Doroslovacki</td>
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**Audio/Visual:** 410-516-6699
Applications of Information Theory

Session

Session Code: B3L-B
Location: Hodson 301
Date: Thursday, March 19, 2015
Time: 14:00-17:15
Chair: Joel Morris

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<td>1031</td>
<td>A High Probability Bound on the Mutual Information Across an Observed Discrete Memoryless Channel Michael Tope, Joel Morris</td>
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<td>1105</td>
<td>Capacity Region of Two Interfering MIMO Multiple Access Channels with Strong Interference Sanjay Karmakar, Noopur Modi</td>
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<tr>
<td>1010</td>
<td>Bounds on the Outage Constrained Capacity of the Single-Antenna Gaussian Relay Channel Andreas Gründinger, Lennart Gerdes, Michael Joham, Wolfgang Utschic...</td>
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<td>1021</td>
<td>Achievable Rate Regions and Self-Interference Channel Estimation in Hybrid Full-Duplex/Half-Duplex Radio Links Dani Korpi, Taneli Riihonen, Mikko Valkama</td>
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<tr>
<td>1125</td>
<td>Characterizing Rate Distortion Region for Video Coding from First Principles Kamesh Namuduri, Gayatri Mehta</td>
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Photonic Systems
Session

Session Code: B3L-C
Location: Hodson 303
Date: Thursday, March 19, 2015
Time: 14:00-17:15
Chair: Amy Foster

Proctor: Bryan Bosworth

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| 1054     | Lower Bounds on the Channel Capacity of ASCO-OFDM and ADO-OFDM
          | Nan Wu, Yeheskel Bar-Ness |
| 1037     | Power Allocation for Downlink Multi-User SC-FDMA Visible Light Communication Systems
          | Mohamed Kashef, Mohamed Abdallah, Khalid Qarage |
| 1055     | Performance of Two Dimensional Asymmetrically and Symmetrically Clipping Optical OFDM in AWGN
          | Nan Wu, Yeheskel Bar-Ness |
| 1118     | All-Optical NAND Logic Gate Using Four-Wave Mixing
          | Kangmei Li, Hong-Fu Ting, Mark Foster, Amy Foster |
| 1088     | Sparsity and Self-Adaptivity in Anamorphic Stretch Transform
          | Ata Mahjoubfar, Jacky Chan, Mohammad Asghari, Bahram Jalali |
| 1133     | High-Speed Compressed Sensing Measurement Using Spectrally-Encoded Ultrafast Laser Pulses
          | Bryan T Bosworth, Jasper R Stroud, Dung N Tran, Trac D Tran, Sang C... |

Audio/Visual: 410-516-6699
### Cognitive Radio Networks Session

**Session Code:** B3L-D  
**Location:** Hodson 305  
**Date:** Thursday, March 19, 2015  
**Time:** 14:00-17:15  
**Chair:** Fatemah Afghah

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| 1025     | A Two-Layer Coalitional Game Among Rational Cognitive Radio Users  
          | Yuan Lu, Alexandra Duel-Hallen |
| 1048     | Spectrum Sharing in Cooperative Cognitive Radio Networks: a Matching Game Framework  
          | Nima Namvar, Fatemeh Afghah |
| 1008     | Blind Block Partitioned Tensor Decomposition for Radio Activity Estimation by a Single Sensor  
          | Christopher Mueller-Smith, Predrag Spasojevic |
| 1069     | Identification of L-Ary CPFSK in a Fading Channel Using Approximate Entropy  
          | Mohammad Bari, Milos Doroslovacki |
| 1027     | Optimal Energy Efficient Scheme for MIMO-Based Cognitive Radio Networks With Antenna Selection  
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**Audio/Visual:** 410-516-6699
Computer and Networked Systems Session

Session Code: C1L-A
Location: Hodson 210
Date: Friday, March 20, 2015
Time: 09:00-12:15
Chair: Philippe Pouliquen

Proctor: Kayode Sanni

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| 1038     | One-Sided Binary Tree-Crossbar Switching for on-Chip Networks  
Yavuz Oruç |
| 1043     | A Locality Preserving One-Sided Binary Tree - Crossbar Switch Wiring Design Algorithm  
Devrim Sahin |
| 1108     | Energy-Aware Real-Time Scheduling on Heterogeneous Multi-Processor  
Gang Wang, Wenming Li, Xiali Hei |
| 1059     | A Survey of Wireless Data Center Networks  
Emna Baccour, Sebti Foufou, Ridha Hamila, Mounir Hamdi |
| 1066     | A Case Study of Internet Fast Lane  
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Audio/Visual: 410-516-6699
Sparsity Session

Session Code: C1L-B

Location: Hodson 301

Date: Friday, March 20, 2015

Time: 09:00-12:15

Chair: Trac Tran

Proctor: Shuai Huang

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<tr>
<td>1101</td>
<td>Online Subspace Learning and Nonlinear Classification of Big Data with Misses Fatemeh Sheikholesalami, Georgios Giannakis</td>
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<tr>
<td>1013</td>
<td>Truncated and Smoothed Schatten-P Function for Robust Tensor Recovery Mohammed Al-Qizwini, Hayder Radha</td>
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<td>1091</td>
<td>Online Sketching of Big Categorical Data with Absent Features Yanning Shen, Morteza Mardani, Georgios Giannakis</td>
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<tr>
<td>1090</td>
<td>Online Spectrum Cartography via Quantized Measurements Daniel Romero, Seung-Jun Kim, Georgios Giannakis</td>
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<td>1064</td>
<td>LFM Signal Detection and Estimation Based on Sparse Representation Mohsen Joneidi, Alireza Zaeemzadeh, Shideh Rezaeifar, Mahdi Abavisa...</td>
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<td>1089</td>
<td>Short-Term Wind Power Forecasting Using Nonnegative Sparse Coding Yu Zhang, Seung-Jun Kim, Georgios Giannakis</td>
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</table>

Audio/Visual: 410-516-6699
**Queuing Markov Processes**

**Session**

**Session Code:** C1L-C  
**Location:** Hodson 303  
**Date:** Friday, March 20, 2015  
**Time:** 09:00-12:15  
**Chair:** None

<table>
<thead>
<tr>
<th>Paper ID</th>
<th>Title/Author</th>
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</thead>
</table>
| 1049     | Distributed Strategic Mode Selection for Large-Scale D2D Communications Based on Queue State Information  
**Yezekael Hayel, Eran Simhon, David Starobinski, Quanyan Zhu** |
| 1082     | Effects of Downsampling on Statistics of Discrete-Time Semi-Markov Processes  
**Phuoc Vu, Shuangqing Wei, Benjamin Carroll** |
| 1014     | Optimal Call Admission and Preemption Control for Public Safety Communications  
**Ahsan-Abbas Ali, Shuangqing Wei, Lijun Qian** |

Audio/Visual: 410-516-6699
Topic in Networking
Session

Session Code: C1L-D
Location: Hodson 305
Date: Friday, March 20, 2015
Time: 09:00-12:15
Chair: Taneli Riihonen

<table>
<thead>
<tr>
<th>Paper ID</th>
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<tbody>
<tr>
<td>1053</td>
<td>Performance Evaluation of NSC in DTNs&lt;br&gt;Wei Bai, Richard La, Ginnah Lee, Greg Stein</td>
</tr>
<tr>
<td>1077</td>
<td>Spectral Clustering of Large-Scale Communities via Random Sketching and Validation&lt;br&gt;Panagiotis Traganitis, Konstantinos Slavakis, Georgios Giannakis</td>
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<tr>
<td>1087</td>
<td>A Link Between Consensus Building and Low Density Parity Check Decoding&lt;br&gt;Kamesh Namuduri, Murali Varanasi, Bill Buckles</td>
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Audio/Visual: 410-516-6699
Image Processing Session

Session Code: C1L-E
Location: Hodson 311
Date: Friday, March 20, 2015
Time: 09:00-12:15
Chair: Abolfazi Razi
Proctor: Shannon Alt

<table>
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<tr>
<th>Paper ID</th>
<th>Title/Author</th>
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| 1012     | Structured Outlier Models for Robust Dictionary Learning  
Pedro Forero, Scott Shafer, Josh Harguess |
| 1115     | "Am I Your Sibling?" Inferring Kinship Cues from Facial Image Pairs  
Sherin Mathews, Chandra Kambhamettu, Kenneth Barner |
| 1047     | Independent Vector Analysis by Entropy Rate Bound Minimization  
Geng-Shen Fu, Matthew Anderson, Tulay Adali |
| 1073     | Independent Vector Analysis for SSVEP Signal Enhancement  
Darren Emge, François-Benôit Vialatte, Gérard Dreyfus, Tulay Adali |

Audio/Visual: 410-516-6699
Local Dining
<table>
<thead>
<tr>
<th>Restaurant Name</th>
<th>Type of Cuisine</th>
<th>Hours</th>
<th>Location</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Ambassador Dining Room</td>
<td>Royal Indian</td>
<td>Mon-Thurs: 11:30AM-2:30PM, 5-10PM, Fri-Sat: 11:30AM-2:30PM, 5-11PM, Sun: 11:30AM-2:30PM, 5-10PM</td>
<td>3811 Canterbury Rd., Baltimore, MD 21218</td>
<td>(410) 366-1484</td>
</tr>
<tr>
<td>Barnes and Noble Café</td>
<td>Sandwiches and savories; coffee</td>
<td>Mon-Sat: 9AM-9PM, Sun: 10AM-9PM</td>
<td>Ground floor, Charles Commons 3330 Saint Paul Street, Baltimore, MD 21218</td>
<td>(410) 516-8317</td>
</tr>
<tr>
<td>Chipotle Mexican Grill</td>
<td>Mexican</td>
<td>Mon-Sun: 11AM-10PM</td>
<td>3201 Saint Paul Street, Baltimore, MD 21218</td>
<td>(410) 662-1701</td>
</tr>
<tr>
<td>Chocolatea Café</td>
<td>Coffee; Deli eats; chocolate products</td>
<td>Mon-Fri: 8AM-8PM, Sat: 9AM-7PM, Sun: 9AM-5PM</td>
<td>3811 Canterbury Road, Baltimore, MD 21218</td>
<td>(410) 662-1701</td>
</tr>
<tr>
<td><strong>The Restaurant at the Colonnade</strong></td>
<td>American cuisine with a twist</td>
<td>Sun-Thurs: 7AM-10PM</td>
<td>Fri-Sat: 7AM-11PM</td>
<td>4 West University Parkway, Baltimore, MD 21218</td>
</tr>
<tr>
<td>-----------------------------------</td>
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<tr>
<td><a href="http://www.colonnadebaltimore.com/images/cmsimg_1407937976.jpg">Image</a></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Donna’s (Charles Village)</strong></th>
<th>American fair/up-scale dining</th>
<th>Mon-Thurs: 7AM-9:30PM</th>
<th>Fri: 7AM-10:30PM</th>
<th>3101 Saint Paul Street, Baltimore, MD 21218</th>
<th>(410) 889-3410</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://donnas.com/wp-content/uploads/2012/05/vck-patio-150x150.jpg">Image</a></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Eddie’s Market</strong></th>
<th>Gourmet sandwiches and groceries</th>
<th>Mon-Sat: 7AM-9PM</th>
<th>Sun; 7AM-5PM</th>
<th>3117 Saint Paul Street, Baltimore, MD 21218</th>
<th>(410) 889-1558</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://s3-media3.fl.yelpcdn.com/bphoto/4N4cWrn1mpgDvEeUKbt4NQ/l.jpg">Image</a></td>
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</table>

<table>
<thead>
<tr>
<th><strong>Gertrude’s</strong></th>
<th>Fine Chesapeake cuisine</th>
<th>CLOSED MONDAY</th>
<th>Tues-Fri: 11:30AM-9PM</th>
<th>10 Art Museum Drive, Baltimore, MD 21218</th>
<th>(410) 889-3399</th>
</tr>
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<tbody>
<tr>
<td><a href="http://www.gertrudesbaltimore.com/images/slider-1.jpg">Image</a></td>
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<tr>
<td>Restaurant</td>
<td>Cuisine</td>
<td>Hours</td>
<td>Address</td>
<td>Phone</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------</td>
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<td>-------------</td>
<td></td>
</tr>
<tr>
<td>Niwana</td>
<td>Japanese</td>
<td>Mon-Sat 11:30AM-10:30PM, Sun 1PM-9:30</td>
<td>3 East 33rd Street, Baltimore, MD 21218</td>
<td>(410) 366-4115</td>
<td></td>
</tr>
<tr>
<td>One World Café</td>
<td>Vegetarian</td>
<td>Mon-Sun: 8AM-11PM</td>
<td>100 West University Parkway, Baltimore, MD 21210</td>
<td>(410) 235-5777</td>
<td></td>
</tr>
<tr>
<td>Orient Express</td>
<td>Chinese Food and Fresh Sushi</td>
<td>Mon-Thurs: 11AM-10PM, Fri-Sat: 11AM-11PM, Sun: 12PM-10PM</td>
<td>3111 Saint Paul Street, Baltimore, MD 21218</td>
<td>(410) 889-0003</td>
<td></td>
</tr>
<tr>
<td>The Paper Moon Diner</td>
<td>Diner food in an eclectic atmosphere</td>
<td>Sun, Mon, Wed, Thurs: 7AM-12AM</td>
<td>227 West 29th Street, Baltimore, MD 21211</td>
<td>(410) 889-4444</td>
<td></td>
</tr>
</tbody>
</table>
# Rocket to Venus

**Pub eats and brews**

Mon-Sat: 5PM-2AM  
Sun: 12PM-2AM  
3360 Chestnut Avenue, Baltimore, MD 21211  
(410) 235-7887

---

# Subway

**Subs and sandwiches**  
Open 24/7  
3233 Saint Paul Street, Baltimore, MD 21218  
(410) 235-0050

---

# Tambers

**Indian and American**

Mon-Wed: 10AM-10PM  
Thurs-Fri: 10AM-11PM  
Sat: 9AM-11PM  
Sun: 9AM-10PM  
3327 Saint Paul Street, Baltimore, MD 21218  
(410) 243-5777

---

# University Market

**Deli sandwiches, pasta and salads**  
3201 Saint Paul Street, Baltimore, MD 21218  
(410) 366-6630
<table>
<thead>
<tr>
<th>Restaurant</th>
<th>Cuisine</th>
<th>Hours</th>
<th>Address</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yama Sushi Bar</td>
<td>Japanese and Fresh sushi</td>
<td>Mon-Thurs: 11AM-2:30PM, 4:30PM-10PM</td>
<td>Green Spring Tower Square, 1030 West 41st Street, Baltimore, MD 21211</td>
<td>(410) 235-6888</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fri-Sat: 11AM-10:30PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun: 12PM-9:30PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golden West Café</td>
<td>New Mexican dishes and comfort food</td>
<td>Mon-Sat: 10AM-10PM</td>
<td>1105 West 36th Street, Baltimore, MD 21211</td>
<td>(410) 889-8891</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun: 9AM-9PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Charmery</td>
<td>Hometown, homemade ice cream flavors</td>
<td>Sun-Thurs: 12PM-10PM</td>
<td>801 West 36th Street, Baltimore, MD 21211</td>
<td>(410) 814-0493</td>
</tr>
<tr>
<td></td>
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<td>Fri-Sat: 12PM-11PM</td>
<td></td>
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</tbody>
</table>
Campus Map
We gratefully acknowledge the immeasurable contributions made by those who shared of their time and talent to review submissions for the 49th Annual CISS 2015 Conference.

Fatemah Afghah  Shenghan Guo  Jerry Prince
Mohamed-Slim Alouini  Alexander Haimovich  Domingo Rodriguez
Ben Belzer  Hynek Hermansky  Brian Sadler
Qi Cheng  Karla Hernandez Cuevas  Ed Schlesinger
Leonard Cimini  Pablo Iglesias  James Spall
Frederic Davidson  John Franklin  Predrag Spasojevic
Michael Dinitz  Sanjay Karmakar  Wei Su
Milos Doroslovacki  Saleem Kassam  Danielle Tarraf
Alexandra Duel-Hallen  Merve Kaya  Trac Duy Tran
Mark Foster  Silvija Kokalj-Filipovic  Parv Venkiitasubramaniam
Javier Garcia-Frias  Richard La  Rene Vidal
Georgios Giannakis  Thomas Marzetta  Howard Weinert
Brian Gruebel  Joel Morris  Xiang-Gen Xia