

# **2015 53rd Annual Allerton Conference on Communication, Control, and Computing (Allerton 2015)**

**Monticello, Illinois, USA  
29 September – 2 October'4237**

**Pages 1-754**



**IEEE Catalog Number: CFP1540F-POD  
ISBN: 978-1-5090-1825-3**

**Copyright © 2015 by the Institute of Electrical and Electronic Engineers, Inc  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\*This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP1540F-POD
ISBN (Print-On-Demand):	978-1-5090-1825-3
ISBN (Online):	978-1-5090-1824-6

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# TABLE OF CONTENTS

---

---

## WeA1 – Dynamic and Control of Network Systems

**Library**

**Chair:** Beck, Carolyn (*University of Illinois*)  
**Co-Chair:** Nedich, Angelia (*University of Illinois*)  
**Organizer(s):** Beck, Carolyn (*University of Illinois*)  
Nedich, Angelia (*University of Illinois*)  
Olshevsky, Alexander (*University of Illinois*)

### **On the Rate of Learning in Distributed Hypothesis Testing ..... 1**

Lalitha, Anusha *University of California, San Diego*  
Javidi, Tara\* *University of California, San Diego*

### **Fundamental Limitations for Anonymous Distributed Systems with Broadcast Communications ..... 9**

Hendrickx, Julien M.\* *UCL*  
Tsitsiklis, John N. *Massachusetts Institute of Technology*

### **Distributed Proportional Stochastic Coordinate Descent with Social Sampling ..... 17**

Ghassemi, Mohsen *Rutgers University*  
Sarwate, Anand D.\* *Rutgers University*

### **Shared Hidden State and Network Representations of Interconnected Dynamical Systems ..... 25**

Warnick, Sean\* *Brigham Young University*

### **Universality and Minimal Controllability of Random Systems ..... n/a**

O'Rourke, Sean *University of Colorado, Boulder*  
Touri, Behrouz\* *University of Colorado, Boulder*

---

---

## WeA2 – Social Networks

**Solarium**

**Chair:** Bolouki, Sadegh (*Lehigh University*)

### **When Can Two Unlabeled Networks Be Aligned under Partial Overlap? ..... 33**

Kazemi, Ehsan *EPFL*  
Yartseva, Lyudmila *EPFL*  
Grossglauser, Matthias\* *EPFL*

### **Polling One's Friends: A Graph Theoretic View ..... 43**

Zhu, Chenguang\* *Stanford University*  
Abadi, Hossein Karkeh *Stanford University*  
Prabhakar, Balaji *Stanford University*

<b>Epidemic Spread Over Networks with Agent Awareness and Social Distancing .....</b>	<b>51</b>
Paarporn, Keith*	<i>Georgia Institute of Technology</i>
Eksin, Ceyhun	<i>Georgia Institute of Technology</i>
Weitz, Joshua S.	<i>Georgia Institute of Technology</i>
Shamma, Jeff S.	<i>Georgia Institute of Technology</i>

<b>Provision of Non-Excludable Public Goods on Networks: From Equilibrium to Centrality Measures .....</b>	<b>58</b>
Naghizadeh, Parinaz*	<i>University of Michigan - Ann Arbor</i>
Liu, Mingyan	<i>University of Michigan</i>

<b>Spectral Detection on Sparse Hypergraphs .....</b>	<b>66</b>
Angelini, Maria Chiara	<i>Università La Sapienza di Roma</i>
Caltagirone, Francesco*	<i>Laboratoire de Physique Statistique, Ecole Normale Supérieure</i>
Krzakala, Florent	<i>ESPCI Paristech</i>
Zdeborová, Lenka	<i>Institut de Physique Théorique</i>

<b>WeA3 – Queuing Theory and Performance Analysis</b>	<b>Butternut</b>
<b>Chair:</b> Wang, Qiong ( <i>University of Illinois at Urbana-Champaign</i> )	

<b>Distributed Load Management in Anycast-Based CDNs .....</b>	<b>74</b>
Sinha, Abhishek*	<i>Massachusetts Institute of Technology</i>
Mani, Pradeepkumar	<i>Microsoft</i>
Liu, Jie	<i>Microsoft</i>
Flavel, Ashley	<i>Microsoft</i>
Maltz, David A.	<i>Microsoft</i>

<b>Blocking Avoidance in Transportation Systems .....</b>	<b>83</b>
Zhou, Shanyu*	<i>University of Illinois, Chicago</i>
Seferoglu, Hulya	<i>University of Illinois, Chicago</i>

<b>Queueing Analysis of Service Deferrals for Load Management in Power Systems .....</b>	<b>91</b>
Ferragut, Andrés*	<i>Universidad ORT Uruguay</i>
Paganini, Fernando	<i>Universidad ORT Uruguay</i>

<b>On Scheduling Redundant Requests with Cancellation Overheads .....</b>	<b>99</b>
Lee, Kangwook*	<i>University of California, Berkeley</i>
Pedarsani, Ramtin	<i>University of California, Berkeley</i>
Ramchandran, Kannan	<i>University of California, Berkeley</i>

<b>Efficient Replication of Queued Tasks for Latency Reduction in Cloud Systems .....</b>	<b>107</b>
Joshi, Gauri*	<i>Massachusetts Institute of Technology</i>
Soljanin, Emina	<i>Bell Labs, Alcatel-Lucent</i>
Wornell, Gregory	<i>Massachusetts Institute of Technology</i>

**WeA4 – Coding Theory****Pine****Chair:** Zeh, Alexander (*Technion*)**Concentration to Zero Bit-Error Probability for Regular LDPC Codes on the Binary Symmetric****Channel: Proof by Loop Calculus ..... 115**Vuffray, Marc\*  
Misiakiewicz, Theodor*Los Alamos National Laboratory  
Ecole Normale Supérieure de Paris***Spatially-Coupled Codes for Write-Once Memories ..... 125**Kumar, Santhosh\*  
Vem, Avinash  
Narayanan, Krishna  
Pfister, Henry D.*Texas A&M University  
Texas A&M University  
Texas A&M University  
Duke University***Energy-Adaptive Codes ..... 132**Jeong, Haewon\*  
Grover, Pulkit*Carnegie Mellon University  
Carnegie Mellon University***Inactivation Decoding Analysis for LT Codes ..... 140**Lázaro, Francisco\*  
Liva, Gianluigi  
Bauch, Gerhard*DLR - German Aerospace Center  
DLR - German Aerospace Center  
Hamburg University of Technology***Linear Code Duality between Channel Coding and Slepian–Wolf Coding ..... 147**Wang, Lele\*  
Kim, Young-Han*University of California, San Diego  
University of California, San Diego***WeA5 – Stochastic Systems and Control****Lower Level****Chair:** Chen, Xudong (*University of Illinois at Urbana-Champaign*)**Rare Events of Marked Finite Point Processes ..... 153**

Honnappa, Harsha\*

*Purdue University***The Feedback Capacity of the Binary Symmetric Channel with a No-Consecutive-Ones****Input Constraint ..... 160**Sabag, Oron\*  
Permuter, Haim H.  
Kashyap, Navin*Ben Gurion University  
Ben Gurion University  
Indian Institute of Science***On Kelly Betting: Some Limitations ..... 165**Hsieh, Chung-Han  
Barmish, B. Ross\**University of Wisconsin, Madison  
University of Wisconsin, Madison***Pseudo-Gradient Based Local Voltage Control in Distribution Networks ..... 173**Zhou, Xinyang\*  
Farivar, Masoud  
Chen, Lijun*University of Colorado, Boulder  
Caltech  
University of Colorado, Boulder*

<b>Bounded Stability in Networked Systems with Parameter Mismatch and Adaptive Decentralized Estimation .....</b>	<b>181</b>
Manaffam, Saeed	<i>University of Central Florida</i>
Seyedi, Alireza	<i>University of Central Florida</i>
Vosoughi, Azadeh	<i>University of Rochester</i>
Javidi, Tara*	<i>University of California, San Diego</i>

<b>WeA6 – Control and Optimization in Energy Systems I</b>	<b>Visitor Center</b>
<b>Chair:</b> Dominguez-Garcia, Alejandro ( <i>University of Illinois</i> )	
<b>Organizer(s):</b> Dominguez-Garcia, Alejandro ( <i>University of Illinois</i> )	

<b>Inferring the Behavior of Distributed Energy Resources with Online Learning .....</b>	<b>187</b>
Ledva, Gregory S.	<i>University of Michigan</i>
Balzano, Laura	<i>University of Michigan</i>
Mathieu, Johanna L.*	<i>University of Michigan</i>

<b>Enabling Renewable Resource Integration: The Balance between Robustness and Flexibility .....</b>	<b>195</b>
Martínez, Gabriela	<i>Cornell University</i>
Liu, Jialin	<i>Cornell University</i>
Li, Bowen	<i>University of Michigan</i>
Mathieu, Johanna L.	<i>University of Michigan</i>
Anderson, C. Lindsay*	<i>Cornell University</i>

<b>On the Design of Wholesale Electricity Markets under Uncertainty .....</b>	<b>203</b>
Bose, Subhonmesh*	<i>Cornell University</i>

<b>Linear Approximations to AC Power Flow in Rectangular Coordinates .....</b>	<b>211</b>
Dhople, Sairaj V.*	<i>University of Minnesota</i>
Guggilam, Swaroop S.	<i>University of Minnesota</i>
Chen, Yu Christine	<i>University of British Columbia</i>

<b>Online Learning for Demand Response .....</b>	<b>218</b>
Kalathil, Dileep	<i>University of California, Berkeley</i>
Rajagopal, Ram*	<i>Stanford University</i>

<b>Cluster-and-Connect: An Algorithmic Approach to Generating Synthetic Electric Power Network Graphs .....</b>	<b>223</b>
Hu, Jiale	<i>Arizona State University</i>
Sankar, Lalitha*	<i>Arizona State University</i>
Mir, Darakhshan J.	<i>Wellesley College</i>

**WeB1 – Distributed Storage I****Library**

**Chair:** Duursma, Iwan (*University of Illinois*)  
**Co-Chair:** Sprintson, Alex (*Texas A&M University*)  
**Organizer(s):** Duursma, Iwan (*University of Illinois*)  
 Soljanin, Emina (*Alcatel-Lucent Bell Labs*)  
 Sprintson, Alex (*Texas A&M University*)

**Applications of Polymatroid Theory to Distributed Storage Systems ..... 231**

Westerbäck, Thomas *Aalto University*  
 Freij-Hollanti, Ragnar *Aalto University*  
 Hollanti, Camilla\* *Aalto University*

**Communication Cost for Updating Functions when Message Updates are Sparse: Connections to Maximally Recoverable Codes ..... n/a**

Narayana Moorthy, Prakash\* *Massachusetts Institute of Technology*  
 Médard, Muriel *Massachusetts Institute of Technology*

**Some New Constructions of Minimum Storage Regenerating Codes ..... n/a**

Goparaju, Sreechakra\* *University of California, San Diego*  
 Fazeli, Arman *University of California, San Diego*  
 Vardy, Alexander *University of California, San Diego*

**[n, k] Minimum-Storage Regenerating Code for all d's in the Range {k, k+1, ..., n-1} Simultaneously ..... n/a**

Tamo, Itzhak\* *Tel-Aviv University*  
 En Gad, Eyal *University of Southern California*

**WeB2 – Distributed Control****Solarium**

**Chair:** Belabbas, Mohamed-Ali (*University of Illinois, Urbana-Champaign*)  
**Co-Chair:** Olshevsky, Alexander (*University of Illinois at Urbana-Champaign*)  
**Organizer(s):** Belabbas, Mohamed-Ali (*University of Illinois*)  
 Olshevsky, Alexander (*University of Illinois*)

**Averaging Methods for Stabilization of Bilinear Sparse Matrix Control Systems ..... n/a**

Gharesifard, Bahman\* *Queen's University*

**On Observability in Networked Control Systems with Packet Losses ..... 238**

Jungers, Raphaël M.\* *Université Catholique de Louvain*  
 Kundu, Atreyee *Eindhoven University of Technology*  
 Heemels, W.P.M.H. (Maurice) *Eindhoven University of Technology*

**Consensus-Based Distributed Optimization with Malicious Nodes ..... 244**

Sundaram, Shreyas\* *Purdue University*  
 Gharesifard, Bahman *Queen's University*

**Distributed Estimation of Betweenness Centrality ..... 250**

Wang, Wei *University of Oklahoma*  
 Tang, Choon Yik\* *University of Oklahoma*

<b>Exploiting Memory in Dynamic Average Consensus .....</b>	<b>258</b>
Van Scoy, Bryan	<i>Northwestern University</i>
Freeman, Randy A.*	<i>Northwestern University</i>
Lynch, Kevin M.	<i>Northwestern University</i>

<b>WeB3 – Wireless Communication Systems I</b>	<b>Butternut</b>
<b>Chair:</b> Chan, Chung ( <i>The Chinese University of Hong Kong</i> )	

<b>Optimizing Large-Scale MIMO Cellular Downlink: Multiplexing, Diversity, or Interference Nulling? .....</b>	<b>266</b>
Hosseini, Kianoush*	<i>University of Toronto</i>
Yu, Wei	<i>University of Toronto</i>
Adve, Raviraj S.	<i>University of Toronto</i>

<b>Adaptive CSMA under the SINR Model: Fast Convergence through Local Gibbs Optimization .....</b>	<b>271</b>
Swamy, Peruru Subrahmanya*	<i>Indian Institute of Technology Madras</i>
Ganti, Radha Krishna	<i>Indian Institute of Technology Madras</i>
Jagannathan, Krishna	<i>Indian Institute of Technology Madras</i>

<b>Mean-Field Hard-Core Model of Interference in Ad-Hoc Wireless Networks .....</b>	<b>279</b>
Tanaka, Toshiyuki	<i>Kyoto University</i>
Prabh, K. Shashi*	<i>Shiv Nadar University</i>

<b>Improving MIMO Detection Performance in Presence of Phase Noise using Norm Difference Criterion .....</b>	<b>286</b>
Datta, Tanumay*	<i>Centrale Supélec</i>
Yang, Sheng	<i>Centrale Supélec</i>

<b>A Primal-Dual Approach to Delay Minimizing User Association in Cellular Networks .....</b>	<b>293</b>
Wildman, Jeffrey*	<i>Drexel University</i>
Osmanlioğlu, Yusuf	<i>Drexel University</i>
Weber, Steven	<i>Drexel University</i>
Shokoufandeh, Ali	<i>Drexel University</i>

<b>WeB4 – Information Theoretic Approaches in Wireless Communications I</b>	<b>Pine</b>
<b>Chair:</b> Berry, Randall ( <i>Northwestern University</i> )	

<b>Energy Harvesting Communication using Limited Battery with Efficiency .....</b>	<b>301</b>
Ashraphijuo, Mehdi*	<i>Columbia University</i>
Aggarwal, Vaneet	<i>Purdue University</i>
Wang, Xiaodong	<i>Columbia University</i>

<b>Finite-SNR Regime Analysis of the Gaussian Wiretap Multiple-Access Channel .....</b>	<b>307</b>
Babaheidarian, Parisa*	<i>Boston University</i>
Salimi, Somayeh	<i>KTH Royal Institute of Technology</i>
Papadimitratos, Panos	<i>KTH Royal Institute of Technology</i>

**Rate Splitting Is Approximately Optimal for Fading Gaussian Interference Channels ..... 315**  
Sebastian, Joyson\* *University of California, Los Angeles*  
Karakus, Can *University of California, Los Angeles*  
Diggavi, Suhas *University of California, Los Angeles*  
Wang, I-Hsiang *National Taiwan University*

**Degrees of Freedom of Bursty Multiple Access Channels with a Relay ..... 322**  
Kim, Sunghyun *KAIST*  
Suh, Changho\* *KAIST*

**Robust Regularized ZF in Decentralized Broadcast Channel with Correlated CSI Noise ..... 329**  
Li, Qianrui\* *Mitsubishi Electric R&D Centre Europe*  
de Kerret, Paul *Eurecom*  
Gesbert, David *Eurecom*  
Gresset, Nicolas *Mitsubishi Electric R&D Centre Europe*

**WeB5 – Network Games and Algorithms I Lower Level**  
**Chair:** Akyol, Emrah (*University of Illinois*)

**Decentralized Scheduling with Data Locality for Data-Parallel Computation on Peer-To-Peer Networks ..... 337**  
Wang, Weina\* *Arizona State University*  
Barnard, Matthew *Arizona State University*  
Ying, Lei *Arizona State University*

**Simple High-Performance Algorithms for Scheduling Jobs in the Cloud ..... 345**  
Ghaderi, Javad\* *Columbia University*

**Network Flow Routing under Strategic Link Disruptions ..... 353**  
Dahan, Mathieu\* *Massachusetts Institute of Technology*  
Amin, Saurabh *Massachusetts Institute of Technology*

**A Non-Zero-Sum, Sequential Detection Game ..... 361**  
Soper, Braden\* *University of California, Santa Cruz*  
Musacchio, John *University of California, Santa Cruz*

**Controlled Matching Game for User Association and Resource Allocation in Multi-Rate WLANs ..... 372**  
Touati, Mikael *Orange Labs*  
El-Azouzi, Rachid\* *University of Avignon*  
Coupechoux, Marceau *Telecom ParisTech and CNRS LTCI*  
Altman, Eitan *INRIA*  
Kelif, Jean-Marc *Orange Labs*

**WeB6 – Control and Optimization in Energy Systems II****Visitor Center****Chair:** Dominguez-Garcia, Alejandro (*University of Illinois*)**Organizer(s):** Dominguez-Garcia, Alejandro (*University of Illinois*)**An Efficient Method to Locate All the Load Flow Solutions - Revisited ..... 381**Lesieutre, Bernard\*  
Wu, Dan*University of Wisconsin, Madison*  
*University of Wisconsin, Madison***Large Scale Charging of Electric Vehicles: A Multi-Armed Bandit Approach ..... 389**Yu, Zhe\*  
Xu, Yunjian  
Tong, Lang*Cornell University*  
*Singapore University of Technology and Design*  
*Cornell University***Dispatching Thermal Power Plants under Water Constraints ..... 396**Fooladivanda, Dariush\*  
Taylor, Joshua A.*University of Toronto*  
*University of Toronto***Fast Power System Analysis via Implicit Linearization of the Power Flow Manifold ..... 402**Bolognani, Saverio\*  
Dörfler, Florian*ETH Zurich*  
*ETH Zurich***Computational Challenges in Modeling, Optimization and Control of coupled Natural Gas and Power Networks ..... n/a**

Chertkov, Michael\*

*Los Alamos National Laboratory***WeC1 – Network Inference****Library****Chair:** Kiyavash, Negar (*University of Illinois*)**Organizer(s):** Kiyavash, Negar (*University of Illinois*)**Finding Planted Subgraphs via the Schur-Horn Relaxation ..... n/a**Candogan, Utkan  
Chandrasekaran, Venkat\**California Institute of Technology*  
*California Institute of Technology***Precise High-Dimensional Error Analysis of Regularized M-Estimators ..... 410**Thrapoulidis, Christos\*  
Abbasi, Ehsan  
Hassibi, Babak*California Institute of Technology*  
*California Institute of Technology*  
*California Institute of Technology***Causal Inference for Empirical Time Series based on the Postulate of Independence of Cause and Mechanism ..... n/a**

Besserve, Michel\*

*MPI for Intelligent Systems***Data-Driven Learning of the Number of States in Multi-State Autoregressive Models ..... 418**Ding, Jie  
Noshad, Mohammad  
Tarokh, Vahid\**Harvard University*  
*Harvard University*  
*Harvard University***On Causal Discovery Based on Functional Causal Models ..... n/a**

Zhang, Kun\*

*Carnegie Mellon University*

**WeC2 – Information Theory I****Solarium****Chair:** Kar, Soumya (*Carnegie Mellon University*)

<b>Distributed Information-Theoretic Biclustering of Two Memoryless Sources .....</b>	<b>426</b>
Pichler, Georg*	<i>Vienna University of Technology</i>
Piantanida, Pablo	<i>SUPELEC</i>
Matz, Gerald	<i>Vienna University of Technology</i>
<b>Adder MAC and Estimates for Rényi Entropy .....</b>	<b>434</b>
Ajjanagadde, Ganesh*	<i>Massachusetts Institute of Technology</i>
Polyanskiy, Yury	<i>Massachusetts Institute of Technology</i>
<b>On the Communication Complexity of Greater-Than .....</b>	<b>442</b>
Natarajan Ramamoorthy, Sivaramakrishnan*	<i>University of Washington</i>
Sinha, Makrand	<i>University of Washington</i>
<b>Information Dissipation in Noiseless Lossy In-Network Function Computation .....</b>	<b>445</b>
Yang, Yaoqing*	<i>Carnegie Mellon University</i>
Grover, Pulkit	<i>Carnegie Mellon University</i>
Kar, Soumya	<i>Carnegie Mellon University</i>
<b>A Simple Algorithm for Approximation by Nomographic Functions .....</b>	<b>453</b>
Limmer, Steffen*	<i>Fraunhofer Heinrich Hertz Institute</i>
Mohammadi, Jafar	<i>Fraunhofer Heinrich Hertz Institute</i>
Stańczak, Sławomir	<i>Fraunhofer Heinrich Hertz Institute</i>

**WeC3 – Network Games and Algorithms II****Butternut****Chair:** Balzano, Laura (*University of Michigan*)

<b>Simple Learning in Weakly Acyclic Games and Convergence to Nash Equilibria .....</b>	<b>459</b>
Pal, Siddharth	<i>University of Maryland, College Park</i>
La, Richard J.*	<i>University of Maryland, College Park</i>
<b>Mechanism Design for Fair Allocation .....</b>	<b>467</b>
Sinha, Abhinav*	<i>University of Michigan</i>
Anastasopoulos, Achilleas	<i>University of Michigan</i>
<b>A Game-Theoretic Approach to Quality Control for Collecting Privacy-Preserving Data .....</b>	<b>474</b>
Wang, Weina*	<i>Arizona State University</i>
Ying, Lei	<i>Arizona State University</i>
Zhang, Junshan	<i>Arizona State University</i>
<b>Convergence of Heterogeneous Distributed Learning in Stochastic Routing Games .....</b>	<b>480</b>
Krichene, Syrine	<i>ENSIMAG</i>
Krichene, Walid*	<i>University of California, Berkeley</i>
Dong, Roy	<i>University of California, Berkeley</i>
Bayen, Alexandre	<i>University of California, Berkeley</i>

<b>A Consensus Algorithm for Networks with Process Noise and Quantization Error .....</b>	<b>488</b>
Rego, Francisco F.C.*	<i>EPFL - IST</i>
Pu, Ye	<i>EPFL</i>
Alessandretti, Andrea	<i>EPFL - IST</i>
Aguiar, A. Pedro	<i>University of Porto</i>
Jones, Colin N.	<i>EPFL</i>

<b>WeC4 – Network Coding and Information Theory</b>	<b>Pine</b>
<b>Chair:</b> Salimi, Amir ( <i>Texas A&amp;M University</i> )	

<b>Cooperative Data Exchange with Unreliable Clients .....</b>	<b>496</b>
Heidarzadeh, Anoosheh*	<i>Texas A&amp;M University</i>
Sprintson, Alex	<i>Texas A&amp;M University</i>

<b>On the Representability of Integer Polymatroids: Applications in Linear Code Construction .....</b>	<b>504</b>
Salimi, Amir*	<i>Texas A&amp;M University</i>
Médard, Muriel	<i>Massachusetts Institute of Technology</i>
Cui, Shuguang	<i>Texas A&amp;M University</i>

<b>Revisiting the Multiplicity Codes: A New Class of High-Rate Locally Correctable Codes .....</b>	<b>509</b>
Wu, Liyasi*	<i>Nanyang Technological University</i>

<b>Coding Schemes for Discrete Memoryless Multicast Networks with and without Feedback .....</b>	<b>514</b>
Wu, Youlong*	<i>Technische Universität München</i>

<b>An Alternative Proof of Channel Polarization for Channels with Arbitrary Input Alphabets .....</b>	<b>522</b>
Guo, Jing*	<i>University of Cambridge</i>
Sayir, Jossy	<i>University of Cambridge</i>
Qin, Minghai	<i>HGST Research</i>
Guillén i Fàbregas, Albert	<i>ICREA and Universitat Pompeu Fabra</i>

<b>WeC5 – Control Applications</b>	<b>Lower Level</b>
<b>Chair:</b> Chertkov, Michael ( <i>Los Alamos National Laboratory</i> )	

<b>Algorithms for Scheduling Deadline-Sensitive Malleable Tasks .....</b>	<b>530</b>
Wu, Xiaohu	<i>Eurecom</i>
Loiseau, Patrick*	<i>Eurecom</i>

<b>Car-Following Models with Delayed Feedback: Local Stability and Hopf Bifurcation .....</b>	<b>538</b>
Kamath, Gopal Krishna*	<i>Indian Institute of Technology Madras</i>
Jagannathan, Krishna	<i>Indian Institute of Technology Madras</i>
Raina, Gaurav	<i>Indian Institute of Technology Madras</i>

<b>Design of Linear &amp; Nonlinear Observers for a Turning Process with Implicit State-Dependent Delay .....</b>	<b>546</b>
Ahmed, Aftab*	<i>Georgia Institute of Technology</i>
Verriest, Erik I.	<i>Georgia Institute of Technology</i>

**The ISO Problem: Decentralized Stochastic Control via Bidding Schemes** ..... 552  
Singh, Rahul\* *Texas A&M University*  
Kumar, P.R. *Texas A&M University*  
Xie, Le *Texas A&M University*

**Interaction Variables for Distributed Numerical Integration of Nonlinear Power System Dynamics** ..... 560  
Cvetković, Miloš\* *Massachusetts Institute of Technology*  
Ilić, Marija *Carnegie Mellon University*

---

**WeC6 – Optimization and Estimation** **Visitor Center**  
**Chair:** Moustakides, George (*Rutgers University, and University of Patras*)

---

**Finite-State Approximations to Constrained Markov Decision Processes with Borel Spaces** ..... 567  
Saldi, Naci\* *Queen's University*  
Yüksel, Serdar *Queen's University*  
Linder, Tamás *Queen's University*

**Enabling Service Function Chaining through Routing Optimization in Software Defined Networks** ..... 573  
Gushchin, Andrey\* *Cornell University*  
Walid, Anwar *Bell Labs, Alcatel-Lucent*  
Tang, Ao *Cornell University*

**Utility Fair RAT Selection in Multi-Homed LTE/802.11 Networks** ..... 582  
Partov, Bahar\* *Trinity College*  
Leith, Douglas J. *Trinity College*

**Robust Estimation using Context-Aware Filtering** ..... 590  
Ivanov, Radoslav\* *University of Pennsylvania*  
Atanasov, Nikolay *University of Pennsylvania*  
Pajic, Miroslav *Duke University*  
Pappas, George *University of Pennsylvania*  
Lee, Insup *University of Pennsylvania*

---

**WeD1 – Allerton Class 2015** **Library**  
**Chair:** Nedich, Angelia (*University of Illinois*)  
**Co-Chair:** Do, Minh (*University of Illinois*)  
**Organizer(s):** Nedich, Angelia (*University of Illinois*)

---

**An Efficient Algorithm for Computing Maximal Excludable Sets in Reachability Games** ..... n/a  
Kamble, Vijay\* *University of California, Berkeley*  
Walrand, Jean *University of California, Berkeley*

**Finite-time Analysis of the Distributed Detection Problem** ..... 598  
Shahrampour, Shahin\* *University of Pennsylvania*  
Rakhlín, Alexander *University of Pennsylvania*  
Jadbabaie, Ali *University of Pennsylvania*

**Event-triggered Stabilization of Linear Systems under Channel Blackouts** ..... 604  
Tallapragada, Pavankumar\* *University of California, San Diego*  
Franceschetti, Massimo *University of California, San Diego*  
Cortés, Jorge *University of California, San Diego*

**Sparse Covariance Estimation and Kernel Random Matrices** ..... n/a  
Deshpande, Yash\* *Stanford University*  
Montanari, Andrea *Stanford University*

**Sparse Covariance Estimation Based on Sparse-Graph Codes** ..... 612  
Pedarsani, Ramtin\* *University of California, Berkeley*  
Lee, Kangwook *University of California, Berkeley*  
Ramchandran, Kannan *University of California, Berkeley*

**Error Correction in Sequencing Data: Fundamental Limits and Algorithmic Challenges** ..... n/a  
Shomorony, Ilan\* *University of California, Berkeley*  
Courtade, Thomas *University of California, Berkeley*  
Tse, David *University of California, Berkeley*

---

**WeD2 – Information Theory II** **Solarium**  
**Chair:** Kamath, Sudeep (*Princeton University*)

---

**Second-Order Coding Rate for m-Class Source-Channel Codes** ..... 620  
Shkel, Yanina Y.\* *Princeton University*  
Tan, Vincent Y.F. *National University of Singapore*  
Draper, Stark C. *University of Toronto*

**Reverse Hypercontractivity using Information Measures** ..... 627  
Kamath, Sudeep\* *Princeton University*

**Non-Isomorphic Distribution Supports for Calculating Entropic Vectors** ..... 634  
Liu, Yunshu\* *Drexel University*  
Walsh, John MacLaren *Drexel University*

**Variable-Length Channel Codes with Probabilistic Delay Guarantees** ..... 642  
Altuğ, Yücel\* *Princeton University*  
Poor, H. Vincent *Princeton University*  
Verdú, Sergio *Princeton University*

**An Information-Theoretic Measure of Dependency among Variables in Large Datasets** ..... 650  
Mousavi, Ali\* *Rice University*  
Baraniuk, Richard G. *Rice University*

---

**WeD3 – Statistical Signal Processing** **Butternut**  
**Chair:** Liu, Tie (*Texas A&M University*)

---

**Statistical and Computational Guarantees for the Baum-Welch Algorithm** ..... 658  
Yang, Fanny\* *University of California, Berkeley*  
Balakrishnan, Sivaraman *University of California, Berkeley*  
Wainwright, Martin J. *University of California, Berkeley*

<b>Group-Invariant Subspace Clustering .....</b>	<b>666</b>
Aeron, Shuchin*	Tufts University
Kernfeld, Eric	University of Washington
<b>Is the Direction of Greater Granger Causal Influence the same as the Direction of Information Flow? .....</b>	<b>672</b>
Venkatesh, Praveen	Carnegie Mellon University
Grover, Pulkit*	Carnegie Mellon University
<b>MMSE of Probabilistic Low-Rank Matrix Estimation: Universality with Respect to the Output Channel .....</b>	<b>680</b>
Lesieur, Thibault*	CEA IPHT
Krzakala, Florent	École Normale Supérieure
Zdeborova, Lenka	CEA IPHT
<b>Stochastic Optimization for Deep CCA via Nonlinear Orthogonal Iterations .....</b>	<b>688</b>
Wang, Weiran*	Toyota Technological Institute at Chicago
Arora, Raman	Johns Hopkins University
Livescu, Karen	Toyota Technological Institute at Chicago
Srebro, Nathan	Toyota Technological Institute at Chicago

## **WeD4 – Coding Techniques and Applications I**

**Pine**

**Chair:** Shum, Kenneth (*The Chinese University of Hong Kong*)

<b>Masking Trapped Charge in Flash Memories .....</b>	<b>696</b>
Wachter-Zeh, Antonia*	Technion – Israel Institute of Technology
Yaakobi, Eitan	Technion – Israel Institute of Technology
<b>Balanced Codes for Data Retention of Multi-Level Flash Memories with Fast Page Read .....</b>	<b>704</b>
Qin, Minghai*	HGST Research
Mateescu, Robert	HGST Research
Guyot, Cyril	HGST Research
Bandic, Zvonimir	HGST Research
<b>Joint Decoding of Content-Replication Codes for Flash Memories .....</b>	<b>712</b>
Li, Qing*	Texas A&M University
Chang, Huan	Texas A&M University
Jiang, Anxiao (Andrew)	Texas A&M University
Haratsch, Erich F.	Seagate Technology
<b>Polar Codes for Secure Write-Efficient Memories .....</b>	<b>720</b>
Li, Qing*	Texas A&M University
Jiang, Anxiao (Andrew)	Texas A&M University
<b>Near-Optimal Multi-Version Codes .....</b>	<b>728</b>
Khabbazzian, Majid*	University of Alberta

**WeD5 – Economics in Networked Systems****Lower Level**

**Chair:** Nedich, Angelia (*University of Illinois*)  
**Co-Chair:** Wei, Ermin (*Northwestern University*)  
**Organizer(s):** Nedich, Angelia (*University of Illinois*)  
 Wei, Ermin (*Northwestern University*)

**Optimal Investment for Epidemic Containment in Networked Populations** ..... n/a  
 Preciado, Victor M.\* *University of Pennsylvania*

**Efficiency of Supply Function Equilibrium in Networked Markets** ..... 733  
 Xiao, Yuanzhang\* *Northwestern University*  
 Bandi, Chaithanya *Northwestern University*  
 Wei, Ermin *Northwestern University*

**Distributed Optimization Decomposition for Joint Economic Dispatch and Frequency Regulation** ..... 736  
 Cai, Desmond *California Institute of Technology*  
 Mallada, Enrique *California Institute of Technology*  
 Wierman, Adam\* *California Institute of Technology*

**Representations of Information Structures** ..... 737  
 Das, Sanmay\* *Washington University in St. Louis*  
 Kamenica, Emir *University of Chicago*

**Investment and Competition with Positive Externalities in Open Networks** ..... 744  
 Liu, Chang *Northwestern University*  
 Xiao, Yuanzhang *Northwestern University*  
 Wei, Ermin *Northwestern University*  
 Berry, Randall A.\* *Northwestern University*

**Global Stochastic Consensus Over Time-Varying Dynamic Networks** ..... n/a  
 Hong, Mingyi\* *Iowa State University*  
 Chang, Tsung-Hui *National Taiwan University of Science and Technology*

**Identifying Trust in Social Networks with Stubborn Agents, with Application to Market Decisions** ..... 747  
 Wai, Hoi-To\* *Arizona State University*  
 Scaglione, Anna *Arizona State University*  
 Leshem, Amir *Bar-Ilan University*

**WeD6 – Control****Visitor Center**

**Chair:** Javidi, Tara (*University of California, San Diego*)

**Convex Formulations of Dynamic Network Traffic Assignment for Control of Freeway Networks** ..... 755  
 Como, Giacomo\* *Lund University*  
 Lovisari, Enrico *CNRS*  
 Savla, Ketan *University of Southern California*

**Architecture and Implementation of an Information-Centric Device-to-Device Network ..... 763**  
 Wu, Yu\* *Arizona State University*  
 Barnard, Matthew *Arizona State University*  
 Ying, Lei *Arizona State University*

**Robust Temporal Logic Model Predictive Control ..... 772**  
 Sadraddini, Sadra\* *Boston University*  
 Belta, Calin *Boston University*

**ThA1 – Distributed Decision Making Library**  
**Chair:** Başar, Tamer (*University of Illinois*)  
**Co-Chair:** Nedich, Angelia (*University of Illinois*)  
**Organizer(s):** Başar, Tamer (*University of Illinois*)  
 Nedich, Angelia (*University of Illinois*)  
 Veeravalli, Venugopal (*University of Illinois*)

**Optimal Multi-Vehicle Adaptive Search with Entropy Objectives ..... 780**  
 Ding, Huanyu *Boston University*  
 Castañón, David A.\* *Boston University*

**Unlabeled Sensing: Solving a Linear System with Unordered Measurements ..... 786**  
 Unnikrishnan, Jayakrishnan\* *General Electric*  
 Haghighatshoar, Saeid *Technische Universität Berlin*  
 Vetterli, Martin *EPFL*

**Design of Transmit-Diversity Schemes in Detection Networks under Secrecy Constraints ..... 794**  
 Nadendla, V. Sriram Siddhardh (Sid)\* *Syracuse University*  
 Liu, Sijia *Syracuse University*  
 Varshney, Pramod K. *Syracuse University*

**A Decentralized Approach to Robust Subspace Recovery ..... 802**  
 Rahmani, Mostafa *University of Central Florida*  
 Atia, George K.\* *University of Central Florida*

**ThA2 – Sequential and Quickest Change Detection Solarium**  
**Chair:** Fellouris, Georgios (*University of Illinois*)  
**Organizer(s):** Veeravalli, Venugopal (*University of Illinois*)

**Quickest Detection of Gauss-Markov Random Fields ..... 808**  
 Heydari, Javad *Rensselaer Polytechnic Institute*  
 Tajer, Ali\* *Rensselaer Polytechnic Institute*  
 Poor, H. Vincent *Princeton University*

**Change-Point Estimation in High Dimensional Linear Regression Models via Sparse Group Lasso ..... 815**  
 Zhang, Bingwen *Worcester Polytechnic Institute*  
 Geng, Jun *Harbin Institute of Technology*  
 Lai, Lifeng\* *Worcester Polytechnic Institute*

**Optimum Shewhart Tests for Markovian Data** ..... 822  
Moustakides, George V.\* *University of Patras*

**Multi-Sensor Gradual Change Detection** ..... 827  
Cao, Yang *Georgia Institute of Technology*  
Xie, Yao\* *Georgia Institute of Technology*

**Quickest Detection and Sequential Identification in Systems with Correlated Noise and in Coupled Systems** ..... n/a  
Hadjiliadis, Olympia\* *Brooklyn College, City University of New York*

---

**ThA3 – Data Storage** **Butternut**  
Chair: Tamo, Itzhak (*Tel-Aviv University*)

---

**Weight Enumerators and Higher Support Weights of Maximally Recoverable Codes** ..... 835  
Lalitha, V.\* *International Institute of Information Technology, Hyderabad*  
Lokam, Satyanarayana V. *Microsoft Research, Bangalore*

**Three Stories on a Two-Sided Coin: Index Coding, Locally Recoverable Distributed Storage, and Guessing Games on Graphs** ..... 843  
Arbabjolfaei, Fatemeh\* *University of California, San Diego*  
Kim, Young-Han *University of California, San Diego*

**Durable Network Coded Distributed Storage** ..... 851  
Abdrashitov, Vitaly\* *Massachusetts Institute of Technology*  
Médard, Muriel *Massachusetts Institute of Technology*

**Subset Source Coding** ..... 857  
MolavianJazi, Ebrahim\* *Pennsylvania State University*  
Yener, Aylin *Pennsylvania State University*

**A Probabilistic Approach towards Exact-Repair Regeneration Codes** ..... 865  
Elyasi, Mehran\* *University of Minnesota*  
Mohajer, Soheil *University of Minnesota*

---

**ThA4 – Sensor Networks I** **Pine**  
Chair: La, Hung (*University of Nevada*)

---

**Compressive and Collaborative Mobile Sensing for Scalar Field Mapping in Robotic Networks** ..... 873  
Nguyen, Minh T.\* *Oklahoma State University*  
La, Hung M. *University of Nevada*  
Teague, Keith A. *Oklahoma State University*

**The Absence of Isolated Node in Geometric Random Graphs** ..... 881  
Zhao, Jun\* *Carnegie Mellon University*

**On the Resilience to Node Capture Attacks of Secure Wireless Sensor Networks** ..... 887  
Zhao, Jun\* *Carnegie Mellon University*

**Scaling Laws for Reliable Data Dissemination in Shared Loss Multicast Trees ..... 894**  
 Yadgar, Ron\* *Ben-Gurion University of the Negev*  
 Cohen, Asaf *Ben-Gurion University of the Negev*  
 Gurewitz, Omer *Ben-Gurion University of the Negev*

**An Information Theoretic Technique for Harnessing Attenuation of High Spatial Frequencies to Design Ultra-High-Density EEG ..... 901**  
 Grover, Pulkit\* *Carnegie Mellon University*  
 Weldon, Jeffrey A. *Carnegie Mellon University*  
 Kelly, Shawn K. *Carnegie Mellon University*  
 Venkatesh, Praveen *Carnegie Mellon University*  
 Jeong, Haewon *Carnegie Mellon University*

**ThA5 – Security Adversarial Machine Learning ..... Lower Level**  
**Chair:** Kiyavash, Negar (*University of Illinois*)  
**Co-Chair:** Mittal, Prateek (*Princeton University*)  
**Organizer(s):** Kiyavash, Negar (*University of Illinois*)  
 Langbort, Cedric (*University of Illinois*)  
 Mittal, Prateek (*Princeton University*)

**Privacy-Preserving Deep Learning ..... 909**  
 Shokri, Reza\* *University of Texas, Austin*  
 Shmatikov, Vitaly *Cornell University*

**Adversarial Knowledge in Secure Communication ..... n/a**  
 Safavi-Naini, Rei\* *University of Calgary*

**Information-Theoretic Private Interactive Mechanism ..... 911**  
 Moraffah, Bahman *Arizona State University*  
 Sankar, Lalitha\* *Arizona State University*

**ThA6 – Information Theory and Source Coding ..... Visitor Center**  
**Chair:** Pokutta, Sebastian (*Georgia Institute of Technology*)

**Memoryless Sampling Rate Distortion ..... 919**  
 Boda, Vinay Praneeth\* *University of Maryland, College Park*  
 Narayan, Prakash *University of Maryland, College Park*

**The Price of Uncertainty in Communication ..... 924**  
 Braverman, Mark *Princeton University*  
 Juba, Brendan\* *Washington University in St. Louis*

**Excess Distortion in Lossy Compression: Beyond One-Shot Analysis ..... 928**  
 Kochman, Yuval\* *Hebrew University of Jerusalem*  
 Wornell, Gregory W. *Massachusetts Institute of Technology*

**Single Letter Characterization of Average-Case Strong Redundancy of Compressing Memoryless Sequences ..... 935**  
 Hosseini, Maryam *University of Hawaii*  
 Santhanam, Narayana\* *University of Hawaii*

<b>A Geometric Perspective on Guesswork .....</b>	<b>941</b>
Beirami, Ahmad*	<i>Duke University &amp; Massachusetts Institute of Technology</i>
Calderbank, Robert	<i>Duke University</i>
Christiansen, Mark	<i>National University of Ireland, Maynooth</i>
Duffy, Ken	<i>National University of Ireland, Maynooth</i>
Makhdoumi, Ali	<i>Massachusetts Institute of Technology</i>
Médard, Muriel	<i>Massachusetts Institute of Technology</i>

## ThB1 – Distributed Storage II

**Library**

**Chair:** Duursma, Iwan (*University of Illinois*)  
**Co-Chair:** Soljanin, Emina (*Alcatel-Lucent Bell Labs*)  
**Organizer(s):** Duursma, Iwan (*University of Illinois*)  
Soljanin, Emina (*Alcatel-Lucent Bell Labs*)  
Sprintson, Alex (*Texas A&M University*)

<b>Storage Codes and Group Representation .....</b>	<b>n/a</b>
Shum, Kenneth*	<i>The Chinese University of Hong Kong</i>

<b>Finding the Fundamental Limits of Storage Systems by Computation .....</b>	<b>n/a</b>
Tian, Chao*	<i>University of Tennessee, Knoxville</i>
Liu, Tie	<i>Texas A&amp;M University</i>

<b>Constructions of MDS Codes via Random Vandermonde and Cauchy Matrices Over Small Fields .....</b>	<b>949</b>
Dau, Son Hoang*	<i>University of Illinois, Urbana Champaign</i>
Song, Wentu	<i>Singapore University of Technology and Design</i>
Sprintson, Alex	<i>Texas A&amp;M University</i>
Yuen, Chau	<i>Singapore University of Technology and Design</i>

<b>Optimal Locally Repairable Codes via Generalized Code Concatenation .....</b>	<b>n/a</b>
Zeh, Alexander*	<i>Technion, Israel Institute of Technology</i>

<b>When do the Availability Codes Make the Stored Data More Available? .....</b>	<b>956</b>
Kadhe, Swanand*	<i>Texas A&amp;M University</i>
Soljanin, Emina	<i>Bell Labs, Alcatel-Lucent</i>
Sprintson, Alex	<i>Texas A&amp;M University</i>

## ThB2 – Information Theory and Applications

**Solarium**

**Chair:** Viswanath, Pramod (*University of Illinois*)  
**Organizer(s):** Viswanath, Pramod (*University of Illinois*)

<b>Coded MapReduce .....</b>	<b>964</b>
Li, Songze	<i>University of Southern California</i>
Maddah-ali, Mohammad Ali	<i>Bell Labs, Alcatel-Lucent</i>
Avestimehr, A. Salman*	<i>University of Southern California</i>

<b>Some Applications of Strong Data Processing Inequalities in Statistics .....</b>	<b>n/a</b>
Kamath, Sudeep*	<i>Princeton University</i>

<b>An Efficient Algorithm for Information Decomposition and Extraction .....</b>	<b>972</b>
Makur, Anuran Kozynski, Fabián Huang, Shao-Lun Zheng, Lizhong*	Massachusetts Institute of Technology Massachusetts Institute of Technology Massachusetts Institute of Technology Massachusetts Institute of Technology
<b>Measuring Secrecy by the Probability of a Successful Guess .....</b>	<b>980</b>
Issa, Ibrahim* Wagner, Aaron B.	Cornell University Cornell University
<b>On Shannon Capacity and Causal Estimation .....</b>	<b>988</b>
Kidambi, Rahul Kannan, Sreeram*	University of Washington University of Washington
<b>Clustering by Multivariate Mutual Information under Chow–Liu Tree Approximation .....</b>	<b>993</b>
Chan, Chung* Liu, Tie	The Chinese University of Hong Kong Texas A&M University

### ThB3 – Optimization

**Butternut**

**Chair:** Gupta, Abhishek (*Ohio State University*)

<b>Maximizing Profit of Cloud Brokers under Quantized Billing Cycles: A Dynamic Pricing Strategy Based on Ski-Rental Problem .....</b>	<b>1000</b>
Saha, Gourav* Pasumarthy, Ramkrishna	Indian Institute of Technology Madras Indian Institute of Technology Madras
<b>Scheduling, Pricing, and Efficiency of Non-Preemptive Flexible Loads under Direct Load Control ...</b>	<b>1008</b>
Gupta, Abhishek* Jain, Rahul Rajagopal, Ram	Ohio State University University of Southern California Stanford University
<b>Dual Subgradient Methods using Approximate Multipliers .....</b>	<b>1016</b>
Valls, Víctor Leith, Douglas J.*	Trinity College Dublin Trinity College Dublin
<b>Directed-Distributed Gradient Descent .....</b>	<b>1022</b>
Xi, Chenguang* Khan, Usman A.	Tufts University Tufts University
<b>Systems of Quadratic Equations: Efficient Solution Algorithms and Conditions for Solvability .....</b>	<b>1027</b>
Dvijotham, Krishnamurthy*	California Institute of Technology

### ThB4 – Information Theory III

**Pine**

**Chair:** Kostina, Victoria (*California Institute of Technology*)

<b>Lossless Secure Source Coding: Yamamoto's Setting .....</b>	<b>1032</b>
Asoodeh, Shahab* Alajaji, Fady Linder, Tamas	Queen's University Queen's University Queen's University

<b>Control Approach to Computing the Feedback Capacity for Stationary Finite Dimensional Gaussian Channels .....</b>	<b>1038</b>
Li, Chong*	<i>Qualcomm Research</i>
Elia, Nicola	<i>Iowa State University</i>
<b>Covert Communications on Poisson Packet Channels .....</b>	<b>1046</b>
Soltani, Ramin*	<i>University of Massachusetts, Amherst</i>
Goeckel, Dennis	<i>University of Massachusetts, Amherst</i>
Towsley, Don	<i>University of Massachusetts, Amherst</i>
Houmansadr, Amir	<i>University of Massachusetts, Amherst</i>
<b>Dirty-Paper Integer Forcing .....</b>	<b>1053</b>
He, Wenbo	<i>Boston University</i>
Nazer, Bobak*	<i>Boston University</i>
Shamai, Shlomo	<i>Technion, Israel Institute of Technology</i>
<b>Erasure Adversarial Wiretap Channels .....</b>	<b>1061</b>
Wang, Pengwei	<i>University of Calgary</i>
Safavi-Naini, Reihaneh*	<i>University of Calgary</i>
Lin, Fuchun	<i>University of Calgary</i>

<b>ThB5 – Sparse Signal Processing</b>	<b>Lower Level</b>
<b>Chair:</b> Chi, Yuejie ( <i>Ohio State University</i> )	

<b>An Empirical Comparison of Sampling Techniques for Matrix Column Subset Selection .....</b>	<b>1069</b>
Wang, Yining*	<i>Carnegie Mellon University</i>
Singh, Aarti	<i>Carnegie Mellon University</i>
<b>A Characterization of Deterministic Sampling Patterns for Low-Rank Matrix Completion .....</b>	<b>1075</b>
Pimentel-Alarcón, Daniel L.*	<i>University of Wisconsin, Madison</i>
Boston, Nigel	<i>University of Wisconsin, Madison</i>
Nowak, Robert D.	<i>University of Wisconsin, Madison</i>
<b>Optimal Trade-Off between Sampling Rate and Quantization Precision in A/D Conversion .....</b>	<b>1083</b>
Kipnis, Alon*	<i>Stanford University</i>
Eldar, Yonina C.	<i>Technion, Israel Institute of Technology</i>
Goldsmith, Andrea J.	<i>Stanford University</i>
<b>Efficient Object Detection for High Resolution Images .....</b>	<b>1091</b>
Lu, Yongxi*	<i>University of California, San Diego</i>
Javidi, Tara	<i>University of California, San Diego</i>
<b>Coded Caching for Reducing CSIT-Feedback in Wireless Communications .....</b>	<b>1099</b>
Zhang, Jingjing	<i>Eurecom</i>
Engelmann, Felix	<i>Eurecom</i>
Elia, Petros*	<i>Eurecom</i>

**ThB6 – Cryptography****Visitor Center****Chair:** Prabhakaran, Manoj (*University of Illinois*)**Organizer(s):** Prabhakaran, Manoj (*University of Illinois*)**Hiding Computation** ..... n/a  
Sahai, Amit\* *University of California, Los Angeles***Improved OR Composition of Sigma-protocols** ..... n/a  
Scafuro, Alessandra\* *BU and NEU***Towards Optimal Garbled Circuit Constructions** ..... n/a  
Rosulek, Mike\* *Oregon State University***Cryptography with One-Way Communication** ..... n/a  
Garg, Sanjam *IBM*  
Ishai, Yuval *Technion, Israel Institute of Technology and UCLA*  
Kushilevitz, Eyal\* *Technion, Israel Institute of Technology*  
Ostrovsky, Rafail *University of California, Los Angeles*  
Sahai, Amit *University of California, Los Angeles***Distribution Design** ..... n/a  
Beimel, Amos *Ben Gurion University*  
Gabizon, Ariel *Technion, Israel Institute of Technology*  
Ishai, Yuval\* *Technion, Israel Institute of Technology and UCLA*  
Kushilevitz, Eyal *Technion, Israel Institute of Technology***Information Asymmetry and Secure Computation** ..... n/a  
Khurana, Dakshita *University of California, Los Angeles*  
Maji, Hemanta\* *University of California, Los Angeles*  
Sahai, Amit *University of California, Los Angeles***ThC1 – Interdisciplinary Statistical Physics****Library****Chair:** Lu, Yue (*Harvard University*)**Co-Chair:** Pfister, Henry (*Duke University*)**Organizer(s):** Lu, Yue (*Harvard University*)Milenkovic, Olgica (*University of Illinois*)Pfister, Henry (*Duke University*)**Belief-Propagation Reconstruction for Compressed Sensing: Quantization vs.****Gaussian Approximation** ..... 1106  
Lian, Mengke *Duke University*  
Pfister, Henry D.\* *Duke University***Phase Retrieval using Iterative Projections: Dynamics in the Large Systems Limit** ..... 1114Li, Gen *Tsinghua University*  
Gu, Yuantao *Tsinghua University*  
Lu, Yue M.\* *Harvard University*

**Learning Higher-Order Binary Markov Random Fields via Anti-Concentration** ..... n/a  
Bresler, Guy\* *Massachusetts Institute of Technology*

**ThC2 – Recent Developments in Information Theory, Statistics and Probability I Solarium**

**Chair:** Raginsky, Maxim (*University of Illinois at Urbana-Champaign*)  
**Co-Chair:** Wu, Yihong (*University of Illinois*)  
**Organizer(s):** Raginsky, Maxim (*University of Illinois at Urbana-Champaign*)  
Wu, Yihong (*University of Illinois*)

**Information Inequalities for Networks and Applications to Secure Computation** ..... n/a  
Prabhakaran, Vinod M.\* *Tata Institute of Fundamental Research*

**Information Theory and Polyhedral Combinatorics** ..... 1119  
Pokutta, Sebastian\* *Georgia Institute of Technology*

**Bounds for Codes on Pentagon and Other Cycles** ..... n/a  
Dalai, Marco\* *University of Brescia*  
Polyanskiy, Yury *Massachusetts Institute of Technology*

**Data Compression with Low Distortion and Finite Blocklength** ..... 1127  
Kostina, Victoria\* *California Institute of Technology*

**Cut-Set Bound is Loose for Gaussian Relay Networks** ..... 1135  
Wu, Xiugang\* *Stanford University*  
Özgür, Ayfer *Stanford University*

**ThC3 – Wireless Communication Systems II Butternut**

**Chair:** Eryilmaz, Atilla (*Ohio State University*)

**Optimal Scheduling of Real-Time Traffic in Wireless Networks with Delayed Feedback** ..... 1143  
Kim, Kyu Seob *Massachusetts Institute of Technology*  
Li, Chih-Ping *Massachusetts Institute of Technology*  
Kadota, Igor\* *Massachusetts Institute of Technology*  
Modiano, Eytan *Massachusetts Institute of Technology*

**Distortion-Memory Tradeoffs in Cache-Aided Wireless Video Delivery** ..... 1150  
Hassanzadeh, P.\* *New York University*  
Erkip, E. *Polytechnic University*  
Llorca, J. *Bell Labs, Alcatel-Lucent*  
Tulino, A. *Bell Labs, Alcatel-Lucent*

**Database-Aided Distributed Channel Assignment in Spectrum Sharing** ..... 1158  
Cai, Mingming\* *University of Notre Dame*  
Laneman, J. Nicholas *University of Notre Dame*

**On the Distribution and Mean of Received Power in Stochastic Cellular Network** ..... 1166  
Cao, Fengming\* *Toshiba Research Europe*  
Ganesh, Ayalvadi *University of Bristol*  
Armour, Simon *University of Bristol*  
Sooriyabandara, Mahesh *Toshiba Research Europe*

<b>On Proactive Caching with Demand and Channel Uncertainties .....</b>	<b>1174</b>
Muppirisetty, L. Srikar*	<i>Chalmers University of Technology</i>
Tadrous, John	<i>Ohio State University</i>
Eryilmaz, Atilla	<i>Ohio State University</i>
Wymeersch, Henk	<i>Chalmers University of Technology</i>

<b>ThC4 – Sensor Networks II</b>	<b>Pine</b>
<b>Chair:</b> Zhu, Hao ( <i>University of Illinois</i> )	

<b>Sharp Transitions in Random Key Graphs .....</b>	<b>1182</b>
Zhao, Jun*	<i>Carnegie Mellon University</i>

<b>Absence of Isolated Nodes in Inhomogeneous Random Key Graphs .....</b>	<b>1189</b>
Yağan, Osman*	<i>Carnegie Mellon University</i>

<b>Data Dissemination Problem in Wireless Networks .....</b>	<b>1197</b>
Kubjas, Ivo	<i>University of Tartu</i>
Skachek, Vitaly*	<i>University of Tartu</i>

<b>On the Computational Complexity of the Solvability of Information Flow Problem with Hierarchy Constraint .....</b>	<b>1205</b>
Takeda, Yuki*	<i>Nara Institute of Science and Technology</i>
Kaji, Yuichi	<i>Nara Institute of Science and Technology</i>
Ito, Minoru	<i>Nara Institute of Science and Technology</i>

<b>Optimal Large-MIMO Data Detection with Transmit Impairments .....</b>	<b>1211</b>
Ghods, Ramina	<i>Cornell University</i>
Jeon, Charles	<i>Cornell University</i>
Maleki, Arian	<i>Columbia University</i>
Studer, Christoph*	<i>Cornell University</i>

<b>ThC5 – Detection and Estimation</b>	<b>Lower Level</b>
<b>Chair:</b> Chi, Yuejie ( <i>Ohio State University</i> )	

<b>On Pathwise Convergence of Particle &amp; Grid Based Nonlinear Filters: Feller vs Conditional Regularity .....</b>	<b>1219</b>
Kalogerias, Dionysios S.*	<i>Rutgers University</i>
Petropulu, Athina P.	<i>Rutgers University</i>

<b>New Guarantees for Blind Compressed Sensing .....</b>	<b>1227</b>
Aghagolzadeh, Mohammad*	<i>Michigan State University</i>
Radha, Hayder	<i>Michigan State University</i>

<b>Bounds on Variance for Symmetric Unimodal Distributions .....</b>	<b>1235</b>
Chung, Hye Won*	<i>University of Michigan</i>
Sadler, Brian M.	<i>Army Research Laboratory</i>
Hero, Alfred O.	<i>University of Michigan</i>

**Quantile Search: A Distance-Penalized Active Learning Algorithm for Spatial Sampling ..... 1241**

Lipor, John\*  
Balzano, Laura  
Kerkez, Branko  
Scavia, Don

*University of Michigan*  
*University of Michigan*  
*University of Michigan*  
*University of Michigan*

**Are Slepian-Wolf Rates Necessary for Distributed Parameter Estimation? ..... 1249**

El Gamal, Mostafa\*  
Lai, Lifeng

*Worcester Polytechnic Institute*  
*Worcester Polytechnic Institute*

**ThC6 – Information Theoretic Approaches in Wireless Communications II *Visitor Center***

**Chair:** Shomorony, Ilan (*University of California, Berkeley*)

**Informational Bottlenecks in Two-Unicast Wireless Networks with Delayed CSIT ..... 1256**

Vahid, Alireza\*  
Shomorony, Ilan  
Calderbank, Robert

*Duke University*  
*University of California, Berkeley*  
*Duke University*

**Partial Compute-Compress-and-Forward for Limited Backhaul Uplink Multicell Processing ..... 1264**

Estella Aguerri, Iñaki\*  
Zaidi, Abdellatif

*Huawei Research France*  
*Huawei Research France*

**Asymptotically Optimal Distributed Channel Allocation: A Competitive Game-Theoretic Approach ..... 1272**

Bistriz, Ilai\*  
Leshem, Amir

*Tel-Aviv University*  
*Bar-Ilan University*

**Fundamental Relationships between Energy and Delay in Streaming ..... 1280**

Uzair Baig, Mirza\*  
Høst-Madsen, Anders

*University of Hawaii*  
*University of Hawaii*

**Anywhere Decoding: Low-Overhead Basestation Cooperation for Interference- and Fading-Limited Wireless Environments ..... 1286**

Pezeshki, Hamed\*  
Laneman, J. Nicholas

*University of Notre Dame*  
*University of Notre Dame*

**ThD1 – Community Detection and Correlation Clustering *Library***

**Chair:** Milenkovic, Olgica (*University of Illinois*)  
**Organizer(s):** Milenkovic, Olgica (*University of Illinois*)

**Nonparametric Graphon Estimation with Covariates ..... n/a**

Chandna, Swati\*  
Olhede, Sofia  
Wolfe, Patrick

*University College London*  
*University College London*  
*University College London*

**Network Clustering with Higher-Order Structures ..... n/a**

Benson, Austin\*  
Gleich, David  
Leskovec, Jure

*Stanford University*  
*Purdue University*  
*Stanford University*

<b>Constant Factor Approximation for Balanced Cut in the PIE Model</b> .....	n/a
Makarychev, Konstantin*	<i>Microsoft</i>
Makarychev, Yury	<i>Toyota Technological Institute at Chicago</i>
Vijayaraghavan, Aravindan	<i>Northwestern University</i>
<b>Searching for a Single Community in a Graph</b> .....	n/a
Sanghavi, Sujay*	<i>University of Texas, Austin</i>
<b>Spectral Algorithms for Clustering</b> .....	n/a
Rao, Anup*	<i>University of Washington</i>
<b>Parallel Correlation Clustering on Big Graphs</b> .....	n/a
Papailiopoulos, Dimitris*	<i>University of California, Berkeley</i>
<b>Recent Developments on the Stochastic Block Model</b> .....	n/a
Abbe, Emmanuel*	<i>Princeton University</i>

## ThD2 – Recent Developments in Information Theory, Statistics and Probability II *Solarium*

**Chair:** Wu, Yihong (*University of Illinois*)  
**Co-Chair:** Raginsky, Maxim (*University of Illinois at Urbana-Champaign*)  
**Organizer(s):** Raginsky, Maxim (*University of Illinois at Urbana-Champaign*)  
Wu, Yihong (*University of Illinois*)

<b>A Joint Typicality Approach to Compute-Forward</b> .....	<b>1294</b>
Lim, Sung Hoon	<i>EPFL</i>
Feng, Chen	<i>University of British Columbia</i>
Nazer, Bobak*	<i>Boston University</i>
Gastpar, Michael	<i>EPFL</i>
<b>Extracting Semantic Information without Linguistic Cues from Generic Sentences</b> .....	<b>1302</b>
Madiman, Mokshay*	<i>University of Delaware</i>
Deo, Ashwini	<i>Yale University</i>
<b>Recovering Communities in Weighted Stochastic Block Models</b> .....	<b>1308</b>
Jog, Varun	<i>University of Pennsylvania</i>
Loh, Po-Ling*	<i>University of Pennsylvania</i>
<b>Guaranteed Blind Sparse Spikes Deconvolution</b> .....	n/a
Chi, Yuejie*	<i>Ohio State University</i>
<b>Vector Control Systems with Unpredictable Actuation</b> .....	<b>1316</b>
Hariyoshi, Ena	<i>University of California, Berkeley</i>
Ranade, Gireeja*	<i>Microsoft Research, Redmond</i>
Sahai, Anant	<i>University of California, Berkeley</i>

**ThD3 – Machine Learning II****Butternut****Chair:** Mousavi, Ali (*Rice University*)**Cost Effective Algorithms for Spectral Bandits ..... 1323**Hanawal, Manjesh Kumar\*  
Saligrama, Venkatesh*Boston University*  
*Boston University***Mean-Variance and Value at Risk in Multi-Armed Bandit Problems ..... 1330**Vakili, Sattar\*  
Zhao, Qing*Cornell University*  
*Cornell University***A Deep Learning Approach to Structured Signal Recovery ..... 1336**Mousavi, Ali\*  
Patel, Ankit B.  
Baraniuk, Richard G.*Rice University*  
*Rice University*  
*Rice University***Inferning Trees ..... 1344**Karzand, Mina\*  
Bresler, Guy*Massachusetts Institute of Technology*  
*Massachusetts Institute of Technology***Active Learning from Noisy and Abstention Feedback ..... 1352**Yan, Songbai\*  
Chaudhuri, Kamalika  
Javidi, Tara*University of California, San Diego*  
*University of California, San Diego*  
*University of California, San Diego***ThD4 – Coding Techniques and Applications II****Pine****Chair:** Sankar, Lalitha (*Arizona State University*)**Threshold Functions in Random s-Intersection Graphs ..... 1358**

Zhao, Jun\*

*Carnegie Mellon University***Exploring Connections between Sparse Fourier Transform Computation and Decoding of Product Codes ..... 1366**Thenkarai Janakiraman, Nagaraj  
Emmadi, Santosh  
Narayanan, Krishna\*  
Ramchandran, Kannan*Texas A&M University*  
*Texas A&M University*  
*Texas A&M University*  
*University of California, Berkeley***Linear Superposition Coding for the Gaussian MAC with Quantized Feedback ..... 1374**Farthofer, Stefan\*  
Matz, Gerald*Vienna University of Technology*  
*Vienna University of Technology***Using Deterministic Decisions for Low-Entropy Bits in the Encoding and Decoding of Polar Codes ..... 1380**Chou, Rémi A.\*  
Bloch, Matthieu R.*Georgia Institute of Technology*  
*Georgia Institute of Technology*

**ThD5 – Graph Signal Processing****Lower Level**

**Chair:** Nedich, Angelia (*University of Illinois*)  
**Co-Chair:** Ribeiro, Alejandro (*University of Pennsylvania*)  
**Organizer(s):** Nedich, Angelia (*University of Illinois*)  
Ribeiro, Alejandro (*University of Pennsylvania*)

**Graph Reconstruction from the Observation of Diffused Signals ..... 1386**

Pasdeloup, Bastien *Telecom Bretagne*  
Rabbat, Michael\* *McGill University*  
Gripon, Vincent *Telecom Bretagne*  
Pastor, Dominique *Telecom Bretagne*  
Mercier, Grégoire *Telecom Bretagne*

**Distributed Signal Processing with Graph Spectral Dictionaries ..... 1391**

Thanou, Dorina\* *EPFL*  
Frossard, Pascal *EPFL*

**Markov Chain Sparsification with Independent Sets for Approximate Value Iteration ..... 1399**

Pavez, Eduardo *University of Southern California*  
Michelusi, Nicolò *University of Southern California*  
Anis, Aamir *University of Southern California*  
Mitra, Urbashi *University of Southern California*  
Ortega, Antonio\* *University of Southern California*

**Distributed Implementation of Linear Network Operators using Graph Filters ..... 1406**

Segarra, Santiago\* *University of Pennsylvania*  
Marques, Antonio G. *Rey Juan Carlos University*  
Ribeiro, Alejandro *University of Pennsylvania*

**Energy-Efficient Route Planning for Autonomous Aerial Vehicles based on Graph****Signal Recovery ..... 1414**

Ji, Tianxi\* *Carnegie Mellon University*  
Chen, Siheng *Carnegie Mellon University*  
Varma, Rohan *Carnegie Mellon University*  
Kovačević, Jelena *Carnegie Mellon University*

**ThD6 – Information Theory IV****Vistor Center**

**Chair:** Wagner, Aaron (*Cornell University*)

**Bounds between Contraction Coefficients ..... 1422**

Makur, Anuran\* *Massachusetts Institute of Technology*  
Zheng, Lizhong *Massachusetts Institute of Technology*

**Are Generalized Cut-Set Bounds Tight for the Deterministic Interference Channel? ..... 1430**

Kiamari, Mehrdad\* *University of Southern California*  
Avestimehr, A. Salman *University of Southern California*

**Achievable Sum-Rate of the Two-User Gaussian Interference Channel through Rate-Splitting and Successive Decoding ..... 1438**

Haghi, Ali\* *University of Waterloo*  
Khandani, Amir K. *University of Waterloo*

**Cache-Enabled Broadcast Packet Erasure Channels with State Feedback ..... 1446**  
 Ghorbel, Asma\* *Centrale Supélec*  
 Kobayashi, Mari *Centrale Supélec*  
 Yang, Sheng *Centrale Supélec*

**FrA1 – Inverse Problems**

**Library**

**Chair:** Do, Minh (*University of Illinois*)  
**Organizer(s):** Do, Minh (*University of Illinois*)

**Dictionary Recovery using Nonconvex Optimization ..... n/a**  
 Wright, John\* *Columbia University*

**Statistical and Information-Theoretic Optimization and Performance Bounds of Video Steganography ..... 1454**  
 Sharifzadeh, Mehdi\* *University of Illinois, Chicago*  
 Schonfeld, Dan *University of Illinois, Chicago*

**Data-Dependent Weighted LASSO under Poisson Noise ..... n/a**  
 Jiang, Xin *Duke University*  
 Reynaud-Bouret, Patricia *University of Nice*  
 Rivoirard, Vincent *University of Paris-Dauphine*  
 Sansonnet, Laure *Argo ParisTech*  
 Willett, Rebecca\* *University of Wisconsin, Madison*

**FrA2 – Neural Information**

**Solarium**

**Chair:** Varshney, Lav R. (*University of Illinois at Urbana-Champaign*)  
**Organizer(s):** Varshney, Lav R. (*University of Illinois at Urbana-Champaign*)

**Complexity of Neural Population Activity in Primary Visual Cortex ..... n/a**  
 Cowley, Benjamin *Carnegie Mellon University*  
 Smith, Matthew *University of Pittsburgh*  
 Kohn, Adam *Einstein College of Medicine*  
 Yu, Byron\* *Carnegie Mellon University*

**Optimizing Deep Brain Stimulation for Treatment of Epilepsy and Parkinson’s Disease ..... n/a**  
 Netoff, Theoden\* *University of Minnesota*

**Optimization Theory of Hebbian/anti-Hebbian Networks for PCA and Whitening ..... 1458**  
 Pehlevan, Cengiz *Simons Foundation*  
 Chklovskii, Dmitri B.\* *Simons Foundation*

**Scalable Inference of Neural Dynamical Systems ..... 1466**  
 Fletcher, Alyson K.\* *University of California, Santa Cruz*

**Sparse Dynamical Models of Time-Varying Natural Images ..... n/a**  
 Olshausen, Bruno\* *University of California, Berkeley*

## Minimum and Maximum Entropy Distributions for Binary Systems with known Means and

**Pairwise Correlations** ..... n/a  
Albanna, Badr F *Fordham University*  
Sohl-Dickstein, Jascha *Stanford University*  
DeWeese, Michael R\* *University of California, Berkeley*

### **FrA3 – Geometric and Topological Methods in Data Analysis and Control** **Butternut**

**Chair:** Baryshnikov, Yuliy (*University of Illinois*)  
**Co-Chair:** Belabbas, Mohamed-Ali (*University of Illinois, Urbana-Champaign*)  
**Organizer(s):** Baryshnikov, Yuliy (*University of Illinois*)  
Belabbas, Mohamed-Ali (*University of Illinois, Urbana-Champaign*)

**A Topological Obstruction in Control** ..... n/a  
Mansouri, Abdol-Reza\* *Queen's University*

**Metric Structures on Networks and Applications** ..... **1470**  
Chowdhury, Samir *Ohio State University*  
Mémoli, Facundo\* *Ohio State University*

**Convexity and Coding in One-Layer Feedforward Networks** ..... n/a  
Giusti, Chad\* *University of Pennsylvania*  
Itskov, Vladimir *Pennsylvania State University*  
Kronholm, William *Whittier College*

**Multiresolution Matrix Factorization** ..... n/a  
Kondor, Risi\* *University of Chicago*  
Teneva, Nedelina *University of Chicago*  
Mudrakarta, Pramod K *University of Chicago*

**Exploiting Structure in Grassmann Valued Data Sets** ..... n/a  
Peterson, Chris\* *Colorado State University*

### **FrA4 – Machine Learning** **Pine**

**Chair:** Oh, Sewoong (*University of Illinois, Urbana-Champaign*)  
**Organizer(s):** Oh, Sewoong (*University of Illinois, Urbana-Champaign*)

**Individualized Rank Aggregation using Nuclear Norm Regularization** ..... **1473**  
Lu, Yu *Yale University*  
Negahban, Sahand N.\* *Yale University*

**Sequential Information Maximization: When is Greedy Near-optimal?** ..... n/a  
Karbasi, Amin\* *Yale University*

**Spectral Detection for Sparsely Related Data** ..... n/a  
Zdeborova, Lenka\* *CEA*  
Krzakala, Florent *ESPCI Paristech*

**Convex Shmonvex: Dropping Convexity for Faster Semidefinite Optimization** ..... n/a  
Sanghavi, Sujay\* *University of Texas, Austin*

**Finding Principal Components on Graph Paths** ..... n/a  
 Asteris, Megasthenis *University of Texas, Austin*  
 Kyrillidis, Anastasios *University of Texas, Austin*  
 Dimakis, Alex\* *University of Texas, Austin*

**FrA5 – Information Processing for Big Data** **Lower Level**

**Chair:** Moulin, Pierre (*University of Illinois*)  
**Co-Chair:** Veeravalli, Venugopal (*University of Illinois*)  
**Organizer(s):** Moulin, Pierre (*University of Illinois*)  
 Veeravalli, Venugopal (*University of Illinois*)

**Efficient Distributed Topic Modeling with Provable Guarantees** ..... n/a  
 Ishwar, Prakash\* *Boston University*

**Subspace Clustering with Sparse Samples Corrupted** ..... n/a  
 Wang, Weiguang *Syracuse University*  
 Liang, Yingbin\* *Syracuse University*

**Scalable First-Order Algorithms for Rank Minimization** ..... n/a  
 Lafferty, John\* *University of Chicago*  
 Zheng, Qinqing *University of Chicago*

**Distributed Multi-Task Learning** ..... n/a  
 Wang, Jialei *University of Chicago*  
 Kolar, Mladen *University of Chicago*  
 Srebro, Nathan\* *Toyota Technological Institute at Chicago*

**Most Topic Models are Approximately Separable** ..... n/a  
 Saligrama, Venkatesh\* *Boston University*  
 Ishwar, Prakash *Boston University*  
 Ding, Weicong *Boston University*

**FrA6 – Information Theory and Wireless Communication** **Visitor Center**

**Chair:** Viswanath, Pramod (*University of Illinois*)

**Performance Analysis for Multi-User Systems under Distributed Opportunistic Scheduling** ..... 1480  
 Shmuel, Ori\* *Ben-Gurion University of the Negev*  
 Cohen, Asaf *Ben-Gurion University of the Negev*  
 Gurewitz, Omer *Ben-Gurion University of the Negev*

**Delay in Cooperative Communications: Higher Multiplexing Gain in Gaussian Interference Channels with Full-Duplex Transmitters** ..... 1486  
 Haghi, Ali\* *University of Waterloo*  
 Mohammadzadeh, Neda *University of Waterloo*  
 Khandani, Amir K. *University of Waterloo*

**On the Eschenauer-Gligor Key Predistribution Scheme under On-Off Communication Channels: The Absence of Isolated Nodes** ..... 1494  
 Makowski, Armand M. *University of Maryland*  
 Yağan, Osman\* *Carnegie Mellon University*

<b>Linear-Feedback MAC-BC Duality for Correlated BC-Noises, and Iterative Coding .....</b>	<b>1502</b>
Belhadj Amor, Selma*	<i>INRIA</i>
Wigger, Michèle	<i>Telecom ParisTech</i>
<b>A Low-Latency Algorithm for Stochastic Decoding of LDPC Codes .....</b>	<b>1510</b>
Huang, Kuo-Lun*	<i>Northeastern University</i>
Gaudet, Vincent C.	<i>University of Waterloo</i>
Salehi, Masoud	<i>Northeastern University</i>
<b>A Hybrid Petri Net Formalism and Resource Allocation in Distributed Control Systems .....</b>	<b>1516</b>
Bajcinca, Naim*	<i>University of Kaiserslautern</i>
Almodaresi, Elham	<i>Yazd University</i>
Ruan, Minfeng	<i>Shanghai Jiao Tong University</i>