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**Sunday, June 28, 09:00-12:30**

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**Tutorial T1 (101)**

Recovering the Unseen: Old and New

*Emmanuel J. Candes, California Institute of Technology*

**Tutorial T2 (102)**

Fountain Codes

*Amin Shokrollahi, EPFL*

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**Sunday, June 28, 14:00-17:30**

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**Tutorial T3 (101)**

Writing on a Clean Slate: New Models and Algorithms for the Internet and for Data Centers

*Balaji Prabhakar, Stanford University*

**Tutorial T4 (102)**

Interference Management: An Information Theoretic View

*David Tse, UC Berkeley*

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**Sunday, June 28, 18:00 ~**

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**Welcome Reception (104~105)**

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**Monday, June 29, 08:30-09:30**

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**Plenary 1 (Auditorium/ 301)**

Randomized Dimensionality Reduction: A New Framework for Signal Processing and Communications

*Richard Baraniuk, Rice University*

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**Monday, June 29, 09:50-11:10**

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Mon 09:50-11:10

**101**

**MA1-1: Finite Precision Compressive Sensing**

Bit Precision Analysis for Compressed Sensing

*Ehsan Ardestanizadeh, Mahdi Cheraghchi, Amin Shokrollahi*

Optimal Quantization of Random Measurements in Compressed Sensing

*John Sun, Vivek Goyal*

A Comparative Study of Quantized Compressive Sensing Schemes

*Wei Dai, Hoa Pham, Olgica Milenkovic*

Number of Measurements in Sparse Signal Recovery

*Sibi Bhaskaran, Stephen Hanly, Paul Tune*

**MA1-2: Relay Channel: Capacity and Bounds I**

Outer Bounds for User Cooperation

*Ravi Tandon, Sennur Ulukus*

A New Capacity Upper Bound for “Relay-with-Delay” Channels

*Amir Salimi, Mohammad Reza Aref, Mahtab Mirmohseni*

Approximate Capacity of a Class of Gaussian Relay-Interference Networks

*Soheil Mohaje, Suhas Diggav, David Tse*

Deterministic Relay Networks with State Information

*Sung-Hoon Lim, Young-Han Kim, Sae-Young Chung*

**MA1-3: Multiple Descriptions**

The Rate Transfer Argument in Two-Stage Scenarios: When Does It Matter?

*Ertem Tuncel*

Gaussian Multiple Description Coding with Individual and Central Distortion Constraints

*Jun Chen*

Consolidating Achievable Regions of Multiple Descriptions

*Lei Zhao, Paul Cuff, Haim Permuter*

Binary Erasure Multiple Descriptions: Worst-Case Distortion

*Ebad Ahmed, Aaron Wagner*

**MA1-4: Combinatorial Properties of LDPC Codes I**

Weight Distributions of Multi-Edge Type LDPC Codes

*Kenta Kasai, Tomoharu Awano, David Declercq, Charly Poulliat, Kohichi Sakaniwa*

Binary Weight Distribution of Non-Binary LDPC Codes

*Iryna Andriyanova, Vishwambhar Rathi, Jean-Pierre Tillich*

On the Number of Minimum Weight Codewords of SFA-LDPC Codes

*Yuichi Kaji*

On the Fundamental System of Cycles in the Bipartite Graphs of LDPC Code Ensembles

*Igal Sason*

**MA1-5: Space-Time Coding I**

Low Complexity Distributed STBCs with Unitary Relay Matrices for any Number of Relays

*G. Susinder Rajan, B. Sundar Rajan*

Codes over M2 (F2) and Applications to Golden Space-Time Coded Modulation

*Frederique Oggier, Patrick Sole, Jean-Claude Belfiore*

A Novel Construction of Complex Orthogonal Designs with Maximal Rate and Low-PAPR  
*Smarajit Das, B. Sundar Rajan*

Linear Receiver Based High-Rate Space-Time Block Codes  
*Wei Zhang, Jinhong Yuan*

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Mon 09:50-11:10

208B

**MA1-6: Network Coding and Capacity I**

A Generalized Cut-Set Bound  
*Amin Gohari, Venkat Anantharam*

Analog Network Coding Mappings in Gaussian Multiple-Access Relay Channels  
*Sha Yao, Mikael Skoglund*

Compressed Network Coding Vectors  
*Mahdi Jafarisiavoshani, Lorenzo Keller, Christina Fragouli, Katerina Argyraki*

Algebraic Network Coding: A New Perspective  
*Dinesh Kumar K R, Andrew Thangaraj*

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Mon 09:50-11:10

209

**MA1-7: Sequences and Correlation I**

Systematic Constructions of Zero-Correlation Zone Sequences  
*Ching-Wei Chen, Yen-Cheng Liu, Yu Ted Su*

New Sequence Families with Zero or Low Correlation Zone via Interleaving Techniques  
*Honggang Hu, Guang Gong*

Design of Low Correlation Zone Sequence Sets of Period  $kN$   
*Jin-Ho Chung, Kyeongcheol Yang*

Constructions of Families with Unequal Auto- and Cross-Correlation Constraints  
*Jose Ortiz-Ubarri, Oscar Moreno*

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Mon 09:50-11:10

210

**MA1-8: Information Measures**

On Truth, Belief, and Experience  
*Flemming Topsøe*

Concavity of Entropy under Thinning  
*Yaming Yu, Oliver Johnson*

Tsallis Differential Entropy and Divergences Derived from the Generalized Shannon-Khinchin Axioms  
*Hiroki Suyari, Makoto Tsukada*

On the Interplay between Shannon's Information Measures and Reliability Criteria  
*Siu-Wai Ho*

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**Monday, June 29, 11:30-12:50**

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Mon 11:30-12:50

101

## **MA2-1: Compressive Sensing and Applications**

Linear Compressive Networks

*Naveen Goela, Michael Gastpar*

Sparsity-Embracing Multiuser Detection for CDMA Systems with Low Activity Factor

*Hao Zhu, Georgios B. Giannakis*

A Sparsity Detection Framework for On-Off Random Access Channels

*Sundeep Rangan, Alyson Fletcher, Vivek Goyal*

Performance Bounds on Compressed Sensing with Poisson Noise

*Rebecca Willett, Maxim Raginsky*

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Mon 11:30-12:50

**102**

## **MA2-2: Relay Channel: Capacity and Bounds II**

Achievable Rates and Capacity for Gaussian Relay Channels with Correlated Noises

*Jinhua Jiang, Andrea Goldsmith, Shuguang Cui*

Capacity of Relay Channels with ISI and Colored Gaussian Noise

*Chiranjib Choudhuri, Urbashi Mitra*

The Capacity Region of the Parallel Partially Cooperative Relay Broadcast Channel with Unmatched Degraded Subchannels

*Reza Khosravi-Farsani, Mahtab Mirmohseni, Bahareh Akhbari, Hamed Firouzi, Mohammad Reza Aref*

A New Achievable Rate for the Gaussian Parallel Relay Channel

*Saeed Changiz Rezaei, Shahab Oveis Gharan, Amir K. Khandani*

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Mon 11:30-12:50

**203A**

## **MA2-3: Lossless Compression**

Efficient Implementation of the Generalized Tunstall Code Generation Algorithm

*Michael Baer*

Malleable Coding with Edit-Distance Cost

*Lav Varshney, Julius Kusuma, Vivek Goyal*

Two Recursive Versions of the Shannon Code

*Mohammadali Khosravifard, Hamed Narimani, T. Aaron Gulliver*

Merge Source Coding

*Bruno Avila, Eduardo Lober*

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Mon 11:30-12:50

**203B**

## **MA2-4: Combinatorial Properties of LDPC Codes II**

Lower Bounds on the Graphical Complexity of Finite-Length LDPC Codes

*Igal Sason*

Linear Programming Bounds on the Degree Distributions of LDPC Code Ensembles

*Igal Sason*

Absdet-Pseudo-Codewords and Perm-Pseudo-Codewords: Definitions and Properties

*Roxana Smarandache, Pascal Vontobel*

**MA2-5: ARQ**

On the Existence of Proper Codes for Error Detection  
*Torleiv Kløve*

A Novel Bit-Level DS Combining Scheme for MIMO Systems with HARQ  
*Jinhuan Xia, Tiejun Lv*

Outage Efficient Strategies for Network MIMO with Partial CSIT  
*Mari Kobayashi, Merouane Debbah, Jean-Claude Belfiore*

MIMO ARQ Systems with Multi-Level Feedback  
*Khoa Nguyen, Lars K. Rasmussen, Albert Guillen i Fabregas, Nick Letzepis*

**MA2-6: Network Coding and Capacity II**

Network Computing Capacity for the Reverse Butterfly Network  
*Rathinakumar Appuswamy, Massimo Franceschetti, Nikhil Karamchandani, Ken Zeger*

Network Coding Capacity: A Functional Dependence Bound  
*Satyajitsinh Thakor, Alex Grant, Terence Chan*

A Lower Bound on the Capacity of Wireless Erasure Networks with Random Node Locations  
*Rayyan Jaber, Jeffrey Andrews*

On the Capacity of Non-Coherent Network Coding  
*Mahdi Jafarisiavoshani, Soheil Mohajer, Christina Fragouli, Suhas Diggavi*

**MA2-7: Sequences and Correlation II**

New Quaternary Sequences with Ideal Autocorrelation Constructed From Binary Sequences with Ideal Autocorrelation  
*Ji-Woong Jang, Young-Sik Kim, Sang-Hyo Kim, Jong-Seon No*

New Construction of Quaternary Sequences with Ideal Autocorrelation from Legendre Sequences  
*Young-Sik Kim, Ji-Woong Jang, Sang-Hyo Kim, Jong-Seon No*

New Quaternary Sequences with Optimal Autocorrelation  
*Young-Sik Kim, Ji-Woong Jang, Sang-Hyo Kim, Jong-Seon No*

Computing the Biases of Parity-Check Relations  
*Anne Canteaut, Maria Naya-Plasencia*

**MA2-8: Information Inequalities**

The Entropy Power of a Sum Is Fractionally Superadditive  
*Mokshay Madiman, Farhad Ghassemi*

A Vector Generalization of Costa Entropy-Power Inequality and Applications

*Ruoheng Liu, Tie Liu, H. Vincent Poor, Shlomo Shamai*

Bounds on the Mutual Informations of the Binary Sums of Bernoulli Random Variables

*Payam Pakzad, Venkat Anantharam, Amin Shokrollahi*

Entropy Bounds for a Markov Random Subfield

*Matt Reyes, David Neuhoff*

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**Monday, June 29, 12:50-14:40**

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**Panel Discussion and Meeting (Students only/ 105)**

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**Monday, June 29, 14:40-16:00**

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Mon 14:40-16:00

**101**

**MP1-1: Matrix Completion and Compressive Sensing**

Efficient and Guaranteed Rank Minimization by Atomic Decomposition

*Kiryung Lee, Yoram Bresler*

A Channel Coding Perspective of Recommendation Systems

*Onkar Dabeer, Bikash Dey, S.T. Aditya*

Matrix Completion from a Few Entries

*Raghunandan Keshavan, Sewoong Oh, Andrea Montanari*

Sparse Linear Representation

*Young-Han Kim, Halyun Jeong*

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Mon 14:40-16:00

**102**

**MP1-2: Bi-Directional Relaying**

On the DMT of Bidirectional Relaying with Limited Feedback

*Tung Kim, H. Vincent Poor*

The Multi-Way Relay Channel

*Deniz Gunduz, Aysin Yener, Andrea Goldsmith, H. Vincent Poor*

Power Allocation Strategies and Lattice Based Coding Schemes for Bi-Directional Relaying

*Makesh Pravin Wilson, Krishna Narayanan*

A Class of Bi-Directional Multi-Relay Protocols

*Sang Kim, Natasha Devroye, Vahid Tarokh*

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Mon 14:40-16:00

**203A**

**MP1-3: Source Coding**

On the Statistical Physics of Directed Polymers in a Random Medium and Their Relation to Tree Codes

*Neri Merhav*

Fundamental Limits of Almost Lossless Analog Compression

*Yihong Wu, Sergio Verdu*

Compression of Graphical Structures  
*Yongwook Choi, Wojciech Szpankowski*

Minimum Expected Length of Fixed-to-Variable Lossless Compression of Memoryless Sources  
*Wojciech Szpankowski, Sergio Verdu*

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Mon 14:40-16:00

203B

**MP1-4: LDPC Decoding I**

Decreasing Error Floor in LDPC Codes by Parity-Check Matrix Extensions  
*Omer Fainzilber, Eran Sharon, Simon Litsyn*

Analysis of Error Floors of LDPC Codes under LP Decoding over the BSC  
*Shashi Kiran Chilappagari, Bane Vasic, Mikhail Stepanov, Michael Chertkov*

On LP Decoding of Nonbinary Expander Codes  
*Vitaly Skachek*

An LP Decoding Algorithm Based on Primal Path-Following Interior Point Method  
*Tadashi Wadayama*

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Mon 14:40-16:00

208A

**MP1-5: Feedback in Wireless Communication**

Some Observations on Limited Feedback for Multiaccess Channels  
*Anand Sarwate, Michael Gastpar*

Throughput of Precoded Broadcast Transmission with Noisy Feedback  
*Alon Shalev Housfater, Teng Joon Lim*

Eigen-Beamforming with Delayed Feedback and Channel Prediction  
*Tr Ramya, Srikrishna Bhashyam*

Limited Feedback for Multi-Carrier Beamforming: A Rate-Distortion Approach  
*Mingguang Xu, Dongning Guo, Mike Honig*

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Mon 14:40-16:00

208B

**MP1-6: Network Coding and Decoding**

Valuable Messages and Random Outputs of Channels in Linear Network Coding  
*Ning Cai*

Separate Network Coding for Private and Common Messages from One Source to Two Sinks  
*Kunihiko Harada, Hirotsuke Yamamoto*

Decoding Network Codes by Message Passing  
*Daniel Salmond, Alex Grant, Ian Grivell, Terence Chan*

Multishot Codes for Network Coding: Bounds and a Multilevel Construction  
*Roberto Nóbrega, Bartolomeu Uchôa-Filho*

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Mon 14:40-16:00

209

**MP1-7: Sequences and Applications**

New QAM Golay Complementary Pairs with Unequal Sequence Power  
*Ying Li, Yen-Wen Huang*

Z-Connectable Complete Complementary Codes and Its Application in CDMA Systems  
*Chenggao Han, Takeshi Hashimoto*

Grouped Complementary Codes for Multicarrier CDMA Systems  
*Zhenyu Zhang, Fanxin Zeng, Wei Chen, Zhiyong Shi*

Optimal Variable-Weight Optical Orthogonal Codes via Cyclic Difference Families  
*Dianhua Wu, Pingzhi Fan, HengChao Li, Udaya Parampalli*

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Mon 14:40-16:00

210

**MP1-8: Estimation I**

Convergence Rate on a Nonparametric Estimator for the Conditional Mean  
*Dong Sik Kim*

Recursive Filtering and Smoothing for Gaussian Reciprocal Processes with Continuous Indices  
*Divyanshu Vats, Jose Moura*

Mutual Information Approximation via Maximum Likelihood Estimation of Density Ratio  
*Taiji Suzuki, Masashi Sugiyama, Toshiyuki Tanaka*

Histogram-Based Estimation for the Divergence Revisited  
*Jorge Silva, Shrikanth Narayanan*

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**Monday, June 29, 16:20-18:00**

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Mon 16:20-18:00

101

**MP2-1: Sparse Recovery I**

$\ell_2/\ell_1$ -Optimization and Its Strong Thresholds in Approximately Block-Sparse Compressed Sensing  
*Mihailo Stojnic*

Explicit Thresholds for Approximately Sparse Compressed Sensing via  $\ell_1$ -Optimization  
*Mihailo Stojnic*

Weighted  $\ell_1$  Minimization for Sparse Recovery with Prior Information  
*Amin Khajehnejad, Weiyu Xu, Amir Avestimehr, Babak Hassibi*

Modified-CS: Modifying Compressive Sensing for Problems with Partially Known Support  
*Namrata Vaswani, Wei Lu*

On Sharp Performance Bounds for Robust Sparse Signal Recoveries  
*Weiyu Xu, Babak Hassibi*

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Mon 16:20-18:00

102

**MP2-2: Decode-Forward Relaying**

A Simple Scheme for Delay-Tolerant Decode-and-Forward Based Cooperative Communication  
*Manav Bhatnagar, Are Hjørungnes, Merouane Debbah*

Decode and Forward Relays: Full Diversity with Randomized Distributed Space-Time Coding  
*David Gregoratti, Xavier Mestre*



Signal Combining for Relay Transmission with Rateless Codes

*Azad Rawanschid, Lutz Lampe, Johannes Huber*

On the Diversity Analysis of Decode-and-Forward Protocol with Multiple Antennas

*Xianglan Jin, Dong-Sup Jin, Jong-Seon No, Dong-Joon Shin*

Simultaneous Partial and Backward Decoding Approach for Two-Level Relay Networks

*Leila Ghabeli, Mohammad Reza Aref*

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Mon 16:20-18:00

203A

### **MP2-3: Random-Process Compression**

Distortion-Rate Tradeoff of a Source Uniformly Distributed over the Composite PF (N) and the Composite Stiefel Manifolds

*Rajesh Krishnamachari, Mahesh Varanasi*

Stochastic Stability of Adaptive Quantizers for Markov Sources

*Serdar Yuksel*

Arithmetic Encoding of Markov Random Fields

*Matt Reyes, David Neuhoff*

Length of Minimal Forbidden Words on a Stationary Ergodic Source

*Takahiro Ota, Hiroyoshi Morita*

Coding Theorem for General Stationary Memoryless Channel Based on Hash Property

*Jun Muramatsu, Shigeki Miyake*

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Mon 16:20-18:00

203B

### **MP2-4: Analysis of LDPC Codes I**

Reconstruction of Convolutional Codes from Noisy Observation

*Maxime Cote, Nicolas Sendrier*

Short Quasi-Cyclic LDPC Codes from Convolutional Codes

*Irina Bocharova, Boris Kudryashov, Roman Satyukov, Stephan Stiglmayr*

Decoding of MDP Convolutional Codes over the Erasure Channel

*Virtudes Tomás, Joachim Rosenthal, Roxana Smarandache*

Trapping Set Analysis of Protograph-Based LDPC Convolutional Codes

*David Mitchell, Ali Pusane, Daniel Costello*

Exact Erasure Channel Density Evolution for Protograph-Based Generalized LDPC Codes

*Michael Lentmaier, Marcos Tavares, Gerhard Fettweis*

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Mon 16:20-18:00

208A

### **MP2-5: Wireless Channels**

Delay-Optimal Distributed Power and Transmission Threshold Control for S-ALOHA Network with FSMC Fading Channels

*Huang Huang, Vincent Lau*

Average Capacity Analysis of Continuous-Time Frequency-Selective Rayleigh Fading Channels with Correlated Scattering Using Majorization

*Eduard Jorswieck, Martin Mittelbach*

Full Diversity Blind Signal Designs for Unique Identification of Frequency Selective Channels

*Jian-Kang Zhang*

Capacity-Achieving Codes for Channels with Memory and Maximum-Likelihood Decoding

*Jung Hyun Bae, Achilleas Anastasopoulos*

Online Maximizing Weighted Throughput in a Fading Channel

*Fei Li, Zhi Zhang*

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Mon 16:20-18:00

208B

### **MP2-6: Cognitive Radio and Capacity**

A Cognitive Network with Clustered Decoding

*Amos Lapidot, Nathan Levy, Shlomo Shamai, Michele Wigger*

On the Capacity of Multi-User Cognitive Radio Networks

*Amin Jafarian, Sriram Vishwanath*

On the Capacity of Partially Cognitive Radios

*Goochul Chung, Sriram Sridharan, Sriram Vishwanath, Chan Soo Hwang*

An Improved Achievable Rate Region for Causal Cognitive Radio

*Seyed Hossein Seyedmehdi, Jinhua Jiang, Yan Xin, Xiaodong Wang*

Capture Analysis in Wireless Radio Systems with Multi-Packet Reception Capabilities

*Andrea Zanella, Michele Zorzi, Ramesh Rao*

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Mon 16:20-18:00

209

### **MP2-7: Sequences and Complexity**

An Algorithm for Computing Bidirectional Minimal Polynomials for Multisequences

*Liping Wang*

A Differential Equation Method to Derive the Formulas of the T-Complexity and the LZ-Complexity

*Kenji Hamano, Hirosuke Yamamoto*

A k-Cube Graph Construction for Mappings from Binary Vectors to Permutations

*Khmaies Ouahada, Hendrik Ferreira*

Structural Complexity of Random Binary Trees

*En-hui Yang, John Kieffer, Wojciech Szpankowski*

Fast Enumeration of Run-Length-Limited Words

*Yulia Medvedeva, Boris Ryabko*

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Mon 16:20-18:00

210

### **MP2-8: Detection**

Bayesian Quickest Change Process Detection

*Vasanthan Raghavan, Venugopal Veeravalli*

Least Favorable Distributions for Robust Quickest Change Detection

*Jayakrishnan Ummikrishnan, Venugopal Veeravalli, Sean Meyn*

A Sequential Procedure for Simultaneous Detection and State Estimation of Markov Signals

*Emanuele Grossi, Marco Lops, Vasileios Maroulas*

On MIMO Detection under Non-Gaussian Target Scattering: The Power-Limited Case  
*Augusto Aubry, Marco Lops, Antonia Tulino, Luca Venturino*

Conditional Dependence in Distributed Detection: How Far Can We Go?  
*Hao Chen, Pramod Varshney, Biao Chen*

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**Tuesday, June 30, 08:30-09:30**

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**Plenary 2 (Auditorium/ 301)**

It's Easier to Approximate  
*David Tse, University of California at Berkeley*

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**Tuesday, June 30, 09:50-11:10**

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Tue 09:50-11:10

**101**

**TA1-1: Sparse Recovery II**

Compressed Sensing over Finite Fields  
*Stark Draper, Sheida Malekpour*

Sublinear Compressive Sensing Reconstruction via Belief Propagation Decoding  
*Hoa Pham, Wei Dai, Olgica Milenkovic*

Support Recovery in Compressed Sensing: An Estimation Theoretic Approach  
*Amin Karbasi, Ali Hormati, Soheil Mohajer, Martin Vetterli*

Conditions for Recovery of Sparse Signals Correlated by Local Transforms  
*Ivana Tasic, Pascal Frossard*

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Tue 09:50-11:10

**102**

**TA1-2: Cooperation I**

Iterative Decoding for Superposition Modulation-Based Cooperative Transmission  
*Tao Yang, Jinhong Yuan*

Rate-Maximizing Mappings for Memoryless Relaying  
*Syed Ali Abbas Zaidi, Majid Nasiri Khormuji, Sha Yao, Mikael Skoglund*

Reliable Source Transmission over Relay Networks with Side Information  
*Milad Sefidgaran, Bahareh Akhbari, Yalda Mohsenzadeh, Mohammad Reza Aref*

Diversity Analysis of Irregular Fractional Cooperation  
*Andrew Eckford, Josephine Chu, Raviraj Adve*

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Tue 09:50-11:10

**203A**

**TA1-3: Universal Compression**

Universal Coding for Distributions over Co-Trees  
*Henrik Petersen, Flemming Topsøe*

Finiteness of Redundancy, Regret, Shtarkov Sums, and Jeffreys Integrals in Exponential Families

*Peter Harremoës, Peter Grünwald*

Reducing the Space Complexity of a Bayes Coding Algorithm Using an Expanded Context Tree  
*Toshiyasu Matsushima*

Unrestricted BIC Context Tree Estimation for Not Necessarily Finite Memory Processes  
*Zsolt Talata, Tyrone Duncan*

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Tue 09:50-11:10

203B

**TA1-4: Lattice Codes**

Tail Behavior of Sphere-Decoding Complexity in Random Lattices  
*Dominik Seethaler, Joakim Jalden, Christoph Studer, Helmut Boelcskei*

Single-Gaussian Messages and Noise Thresholds for Decoding Low-Density Lattice Codes  
*Brian Kurkoski, Kazuhiko Yamaguchi, Kingo Kobayashi*

Power-Constrained Communications Using LDLC Lattices  
*Brian Kurkoski, Justin Dauwels, Hans-Andrea Loeliger*

Efficient Parametric Decoder of Low Density Lattice Codes  
*Yair Yona, Meir Feder*

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Tue 09:50-11:10

208A

**TA1-5: Channel Estimation**

Blind Per-State Detection of DPSK over Correlated Fading Channels  
*Alan Barbieri*

On Channel Estimation in Fast Fading Mobile Coded MIMO OFDM  
*Daniel Liu, Michael Fitz, Urbashi Mitra*

Practical Signaling with Vanishing Pilot-Energy for Large Noncoherent Block-Fading MIMO Channels  
*Keigo Takeuchi, Ralf Mueller, Mikko Vehkaperä, Toshiyuki Tanaka*

A Systematic Space-Time Code Design and Its Maximum-Likelihood Decoding for Combined Channel Estimation and Error Correction  
*Chia-Lung Wu, Mikael Skoglund, Chen Po-Ning, Yunghsiang Han*

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Tue 09:50-11:10

208B

**TA1-6: Network Wireless Communication**

Impact of CSIT on the Tradeoff of Diversity and Spatial Multiplexing in MIMO Channels  
*Xiaojuan Zhang, Yi Gong*

A G-Estimator of the MIMO Channel Ergodic Capacity  
*Pascal Vallet, Philippe Loubaton*

A Distributed Differential Space-Time Coding Scheme for Two-Way Wireless Relay Networks  
*Zoran Utkovski, Gilbert Yammine, Juergen Lindner*

A New Scaling Law on Throughput and Delay Performance of Wireless Mobile Relay Networks over Parallel Fading Channels  
*Rui Wang, Vincent Lau*

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Tue 09:50-11:10

209

## TA1-7: Quantum Codes

Quantum Error Correction via Codes over GF (2)

*Arijit Chowdhury, B. Sundar Rajan*

A Polynomial-Time Construction of Self-Orthogonal Codes and Applications to Quantum Error Correction

*Mitsuru Hamada*

Quantum LDPC Codes with Positive Rate and Minimum Distance Proportional to  $n^{1/2}$

*Gilles Zemor, Jean-Pierre Tillich*

New Decoding Algorithms for a Class of Subsystem Codes and Generalized Shor Codes

*Pradeep Sarvepalli, Andreas Klappenecker, Martin Roetteler*

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Tue 09:50-11:10

210

## TA1-8: Estimation II

Mismatched Estimation and Relative Entropy

*Sergio Verdu*

Relative Entropy and Score Function: New Information--Estimation Relationships through Arbitrary Additive Perturbation

*Dongning Guo*

Directed Information and Causal Estimation in Continuous Time

*Young-Han Kim, Haim Permuter, Tsachy Weissman*

On Concentration for Denoiser-Loss Estimators

*Erik Ordentlich, Krishnamurthy Viswanathan, Marcelo Weinberger*

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**Tuesday, June 30, 11:30-12:50**

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Tue 11:30-12:50

101

## TA2-1: Network Operations

Distributed Large Scale Network Utility Maximization

*Danny Bickson, Yoav Tock, Argyris Zymnis, Stephen Boyd, Danny Dolev*

The Delay Region for P2P File Transfer

*Yunnan Wu, Y. Charlie Hu, Jin Li, Philip Chou*

Broadcast Delay of Epidemic Routing in Intermittently Connected Networks

*Philippe Jacquet, Bernard Mans, Georgios Rodolakis*

Delay with Network Coding and Feedback

*Eleni Drinea, Christina Fragouli, Lorenzo Keller*

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Tue 11:30-12:50

102

## TA2-2: Cooperation II

On Cooperative Downlink Transmission with Frequency Reuse

*Majid Nasiri Khormuji, Mikael Skoglund*

Distortion Exponents for Decode-and-Forward Multi-Relay Cooperative Networks

*Jing Wang, Jie Liang, Sami Muhaidat*

Communication by Sleeping: Optimizing a Relay Channel under Wake and Transmit Power Costs  
*Vinod Prabhakaran, P. R. Kumar*

Power Allocation Game in a Four Node Relay Network: A Lower Bound on the Price of Anarchy  
*Ninoslav Marina, Are Hjørungnes*

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Tue 11:30-12:50

203A

### **TA2-3: Slepian-Wolf**

Asynchronous Slepian-Wolf Code Design  
*Zhibin Sun, Chao Tian, Jun Chen, Kon Max Wong*

Improved Slepian-Wolf Exponents via Witsenhausen's Rate  
*Benjamin Kelly, Aaron Wagner*

Slepian-Wolf Coding over Cooperative Networks  
*Mohammad Hossein Yassaee, Mohammad Reza Aref*

Distributed Source Coding without Slepian-Wolf Compression  
*Yang Yang, Zixiang Xiong*

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Tue 11:30-12:50

203B

### **TA2-4: Turbo Codes**

New Reduced State Space BCJR Algorithms for the ISI Channel  
*John Anderson, Adnan Prlja, Fredrik Rusek*

Analog Turbo Codes: A Chaotic Construction  
*Kai Xie, Peiyu Tan, Tiffany Jing Li, Ng Boon Chong*

Iterative Decoding on Multiple Tanner Graphs Using Random Edge Local Complementation  
*Joakim Knudsen, Constanza Riera, Lars Eirik Danielsen, Matthew Parker, Eirik Rosnes*

Robust Initial LLRs for Iterative Decoders in Presence of Non-Gaussian Noise  
*Arun Ayyar, Michael Lentmaier, Giridhar Krishnamurthy, Gerhard Fettweis*

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Tue 11:30-12:50

208A

### **TA2-5: Space-Time Coding II**

Time Domain Interference Cancellation for Alamouti Coded Cooperative OFDM Systems with Insufficient CP  
*Zhefeng Li, Xiang-Gen Xia*

Some Properties of Alamouti-Like MISO Codes  
*Roope Vehkalahti*

Quadrature Partial Response Signaling Based on Alamouti Code  
*Kyoung-Young Song, Jae-Dong Yang, Xianglan Jin, Jong-Seon No, Habong Chung*

Novel Rotated Quasi-Orthogonal Space-Time Block Codes with the Fixed Nearest Neighbor Number  
*Jian-Kang Zhang, An-Zhong Wong*

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Tue 11:30-12:50

208B

### **TA2-6: Applications of LDPC Codes**

Adaptive Turbo Equalizer with Stopping Rule Based on LDPC Codes  
*Myungkyu Lee, Kyeongcheol Yang*

Demultiplexer Design for Multi-Edge Type LDPC Coded Modulation  
*Jing Lei, Wen Gao*

Disjoint LDPC Coding for Gaussian Broadcast Channels  
*Mahdi Ramezani, Masoud Ardakani*

Factor Graph Approach to Distributed Facility Location in Large-Scale Networks  
*Hung Ngo, Sungyoung Lee*

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Tue 11:30-12:50

209

### **TA2-7: Quantum Codes and Systems**

The Capacity of Quantum Channels with Side Information at the Transmitter  
*Frederic Dupuis*

Generalized Concatenation for Quantum Codes  
*Markus Grassl, Peter Shor, Bei Zeng*

Engineering Fault Tolerance for Realistic Quantum Systems via the Full Error Dynamics of Quantum Codes  
*Vaneet Aggarwal, Robert Calderbank, Gerald Gilbert, Yaakov Weinstein*

Receiver Design to Harness Quantum Illumination Advantage  
*Saikat Guha*

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Tue 11:30-12:50

210

### **TA2-8: Hypothesis Testing**

Vector Gaussian Hypothesis Testing and Lossy One-Helper Problem  
*Md Saifur Rahman, Aaron Wagner*

The Role of MVU Estimator and CRB in Binary Composite Hypothesis Tests  
*Ali Ghobadzadeh, Sayed Jalal Zahabi, Ali A. Tadaion*

Transformation Effects on Invariant Property of Invariant Hypothesis Tests and UMPI Detector  
*Ali Ghobadzadeh, Ali A. Tadaion, Mohammad Reza Taban*

On Arbitrarily Varying Markov Source Coding and Hypothesis LAO Testing by Non-Informed Statistician  
*Naira Grigoryan, Evgueni Haroutunian*

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**Tuesday, June 30, 12:50-14:40**

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**Awards Luncheon (103~105)**

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**Tuesday, June 30, 14:40-16:00**

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Tue 14:40-16:00

101

### **TP1-1: Errors and Erasures**

Protection against Link Errors and Failures Using Network Coding in Overlay Networks  
*Shizheng Li, Aditya Ramamoorthy*

Design of Efficient Robust Network Codes for Multicast Connections  
*Graham Booker, Alex Sprintson*

On Noncoherent Correction of Network Errors and Erasures with Random Locations  
*Svitlana Vyetrenko, Tracey Ho, Elona Erez*

Rate Regions for Coherent and Noncoherent Multisource Network Error Correction  
*Svitlana Vyetrenko, Tracey Ho, Michelle Effros, Joerg Kliever, Elona Erez*

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Tue 14:40-16:00

102

### **TP1-2: Scheduling in Relay Networks**

Optimal Schedules for the D-Node Half Duplex Phase Fading MRC  
*Lawrence Ong, Sarah Johnson, Mehul Motani*

Application of Joint Source-Relay Scheduling to Cooperative Multiple Access Channels  
*Zhiguo Ding*

Soft-Decision-and-Forward Protocol for Cooperative Communication Networks Based on Alamouti Code  
*Jae-Dong Yang, Kyoung-Young Song, Jong-Seon No, Dong-Joon Shin*

Analysis of Uncoordinated Opportunistic Two-Hop Wireless Ad Hoc Systems  
*Radha Krishna Ganti, Martin Haenggi*

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Tue 14:40-16:00

203A

### **TP1-3: Coding with Side Information**

Efficient On-line Schemes for Encoding Individual Sequences with Side Information at the Decoder  
*Avraham Reani, Neri Merhav*

Source Coding with a Side Information 'Vending Machine' at the Decoder  
*Tsachy Weissman, Haim Permuter*

Lossy Source Coding with Gaussian or Erased Side-Information  
*Etienne Perron, Suhas Diggavi, Emre Telatar*

Two Lossy Source Coding Problems with Causal Side-Information  
*Roy Timo, Badri Narayanan Vellambi Ravisankar*

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Tue 14:40-16:00

203B

### **TP1-4: Constrained Coding I**

Improved Lower Bounds on Capacities of Symmetric 2-Dimensional Constraints Using Rayleigh Quotients  
*Erez Loidor, Brian Marcus*

Approximate Enumerative Coding for 2-D Constraints through Ratios of Matrix Products  
*Erik Ordentlich, Ron Roth*

Extending Models for Two-Dimensional Constraints  
*Soren Forchhammer*

Concave Programming Upper Bounds on the Capacity of 2-D Constraints  
*Ido Tal, Ron Roth*



**TP1-5: Coded Modulation**

Protection Matching: A New Scheduling Rule for Improved Design of BICM-ID Systems

*Jian-Jia Weng, Chung-Hsuan Wang*

Quantization for Soft-Output Demodulators in Bit-Interleaved Coded Modulation Systems

*Clemens Novak, Peter Fertl, Gerald Matz*

Error Probability of BICM in Fading Channels: Uniform Interleaving Analysis

*Alfonso Martinez, Albert Guillen i Fabregas*

Analysis of 1-Bit Output Noncoherent Fading Channels in the Low SNR Regime

*Amine Mezghani, Josef Nossek*

**TP1-6: Precoding I**

On Optimal Precoding in Linear Vector Gaussian Channels with Arbitrary Input Distribution

*Miquel Payaro, Daniel Palomar*

Message Passing in Distributed Wireless Networks

*Vaneet Aggarwal, Youjian (Eugene) Liu, Ashutosh Sabharwal*

On the Ergodic Capacity and Precoder Design of Flat Fading MIMO Systems Equipped with MMSE Receivers

*Cedric Artigue, Philippe Loubaton*

On the Selection of Semi-Orthogonal Users for Zero-Forcing Beamforming

*Alessandro Tomasoni, Giuseppe Caire, Marco Ferrari, Sandro Bellini*

**TP1-7: Cryptographic Algorithms**

Authentication and Secrecy Codes for Equiprobable Source Probability Distributions

*Michael Huber*

On Improving Security of GPT Cryptosystems

*Bahram Honary, Ernst Gabidulin, Haitham Rashwan*

Another Look at Weak Feedback Polynomials in the Nonlinear Combiner

*Martin Hell, Lennart Brynielsson*

Extended Windmill Polynomials

*Cedric Lauradoux*

**TP1-8: Maximum Likelihood**

Small-Sample Distribution Estimation over Sticky Channels

*Farzad Farnoud, Olgica Milenkovic, Narayana Prasad Santhanam*

The Maximum Likelihood Probability of Skewed Patterns

*Shengjun Pan, Alon Orlitsky*

The Maximum Likelihood Probability of Unique-Singleton, Ternary, and Length-7 Patterns

Jayadev Acharya, Alon Orlitsky, Shengjun Pan

A Large-Deviation Analysis for the Maximum Likelihood Learning of Tree Structures  
Vincent Tan, Animashree Anandkumar, Lang Tong, Alan Willsky

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**Tuesday, June 30, 16:20-18:00**

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Tue 16:20-18:00

**101**

**TP2-1: Network Coding and Security**

The Quadratic Gaussian CEO Problem with Byzantine Agents  
Oliver Kosut, Lang Tong

Existence and Construction of Capacity-Achieving Network Codes for Distributed Storage  
Yunnan Wu

A General Security Condition for Multi-Source Linear Network Coding  
Zhixue Zhang, Raymond W. Yeung

An Algebraic Watchdog for Wireless Network Coding  
MinJi Kim, Muriel Medard, Joao Barros, Ralf Koetter

Byzantine Attacks against Network Coding in Peer to Peer Distributed Storage  
Luísa Lima, Joao Barros, Ralf Koetter

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Tue 16:20-18:00

**102**

**TP2-2: Impact of Channel State Information**

Compress-and-Forward Strategy for the Relay Channel with Non-Causal State Information  
Bahareh Akhbari, Mahtab Mirmohseni, Mohammad Reza Aref

Cooperative Relay-Broadcast Channels with Causal Channel State Information  
Reza Khosravi-Farsani, Bahareh Akhbari, Mahtab Mirmohseni, Mohammad Reza Aref

On the Simultaneous Relay Channel with Informed Receivers  
Arash Behboodi, Pablo Piantanida

Functional Forwarding of Channel State Information  
Jiening Zhan, Michael Gastpar

Secrecy Throughput of MANETs with Malicious Nodes  
Yingbin Liang, H. Vincent Poor, Lei Ying

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Tue 16:20-18:00

**203A**

**TP2-3: Distributed Source Coding**

An Outer Bound for Side-Information Scalable Source Coding with Partially Cooperating Decoders  
Shraga Bross, Tsachy Weissman

Cascade Multiterminal Source Coding  
Paul Cuff, Han-I Su, Abbas El Gamal

High-Resolution Predictive Wyner-Ziv Coding of Gaussian Sources  
Xuechen Chen, Ertem Tuncel

The Gray-Wyner Network with a Limited-Rate Helper to the Encoder and Decoders

*Lei Zhao, Haim Permuter*

Closed Forms of the Achievable Rate Region for Wyner's Source Coding Systems

*Tetsunao Matsuta, Tomohiko Uyematsu, Ryutaroh Matsumoto*

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Tue 16:20-18:00

203B

#### **TP2-4: Coding for Storage**

Universal Rewriting in Constrained Memories

*Anxiao Andrew Jiang, Michael Langberg, Moshe Schwartz, Jehoshua Bruck*

On the Lifetime of Multilevel Memories

*Luis Lastras-Montaña, Michele Franceschini, Thomas Mittelholzer, John Karidis, Mark Wegman*

Storage Coding for Wear Leveling in Flash Memories

*Anxiao Andrew Jiang, Robert Mateescu, Eitan Yaakobi, Jehoshua Bruck, Paul Siegel, Alexander Vardy, Jack Wolf*

On the Capacity of Bounded Rank Modulation for Flash Memories

*Zhiying Wang, Anxiao Andrew Jiang, Jehoshua Bruck*

A Nearly Optimal Construction of Flash Codes

*Hessam Mahdavifar, Paul Siegel, Alexander Vardy, Jack Wolf, Eitan Yaakobi*

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Tue 16:20-18:00

208A

#### **TP2-5: List Decoding**

New Asymptotic Bounds on the Size of List Codes on Euclidean Sphere

*Vladimir Blinovsky, Simon Litsyn*

Multiplicity Assignments for Algebraic Soft-Decoding of Reed-Solomon Codes Using the Method of Types

*Hirakendu Das, Alexander Vardy*

On Error Correction with Feedback under List Decoding

*Ofer Shayevitz*

Noisy Feedback Schemes and Rate-Error Tradeoffs from Stochastic Approximation

*Utsav Kumar, J. Nicholas Laneman, Vijay Gupta*

LR-Aided MMSE Lattice Decoding Is DMT Optimal for All Approximately Universal Codes

*Joakim Jalden, Petros Elia*

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Tue 16:20-18:00

208B

#### **TP2-6: Precoding II**

Design of Close to Optimal Euclidean Distance MIMO-Precoders

*Fredrik Rusek, Dzevdan Kapetanovic*

Optimal Natural Encoding Scheme for Discrete Multiplicative Degraded Broadcast Channels

*Bike Xie, Richard Wesel*

On Convergence Constrained Precoder Design for Iterative Frequency Domain MIMO Detector

*Juha Karjalainen, Antti Tolli, Tadashi Matsumoto, Markku Juntti*

On the Compound MIMO Broadcast Channels with Confidential Messages

*Mari Kobayashi, Shlomo Shamai, Yingbin Liang, Merouane Debbah*

Perfect Secrecy, Perfect Omniscience, and Steiner Tree Packing

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Tue 16:20-18:00

209

**TP2-7: Cryptographic Protocols**

Efficient Oblivious Transfer from Algebraic Signaling over the Gaussian Channel

*Motohiko Isaka*

Strongly Secure Privacy Amplification Cannot Be Obtained by Encoder of Slepian-Wolf Code

*Shun Watanabe, Tsuki Saitou, Ryutaroh Matsumoto, Tomohiko Uyematsu*

Bootstrapped Oblivious Transfer and Secure Two-Party Function Computation

*Ye Wang, Prakash Ishwar*

A Coding Theorem for Cheating-Detectable  $(2, 2)$ -Threshold Blockwise Secret Sharing Schemes

*Mitsugu Iwamoto, Hirosuke Yamamoto, Hiroki Koga*

Optimal Secure Message Transmission by Public Discussion

*Hongsong Shi, Shaoquan Jiang, Rei Safavi-Naini, Mohammed Ashraf Tuhin*

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Tue 16:20-18:00

210

**TP2-8: Statistical Learning**

Minimum Description Length for Clustering with Exemplars

*Po-Hsiang Lai, Joseph A. O'Sullivan, Robert Pless*

Deformed Statistics Formulation of the Information Bottleneck Method

*Ravi Venkatesan, Angelo Plastino*

Achievability Results for Statistical Learning under Communication Constraints

*Maxim Raginsky*

Structured Variational Methods for Distributed Inference: Convergence Analysis and Performance-Complexity Tradeoff

*Yanbing Zhang, Huaiyu Dai*

Sequential Probability Assignment via Online Convex Programming Using Exponential Families

*Maxim Raginsky, Roummel Marcia, Jorge Silva, Rebecca Willett*

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**Wednesday, July 1, 08:30-09:30**

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**Plenary 3 (Auditorium/ 301)**

Facets of Entropy

*Raymond W. Yeung, The Chinese University of Hong Kong*

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**Wednesday, July 1, 09:30-11:10**

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**Recent Results Poster Session (Lobby, 3rd Fl., The Outside of Auditorium/301)**

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**Wednesday, July 1, 09:50-10:50**

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**WA1-3: Lossless Distributed Source Coding**

On Networks with Side Information

*Asaf Cohen, Amir Avestimehr, Michelle Effros*

On Feedback in Network Source Coding

*Mayank Bakshi, Michelle Effros*

Feasible Alphabets for Communicating the Sum of Sources over a Network

*Brijesh Rai, Bikash Dey*

**WA1-4: Sequential Methods**

Searching for High-Rate Convolutional Codes via Binary Syndrome Trellises

*Florian Hug, Irina Bocharova, Rolf Johannesson, Boris Kudryashov*

Performance Evaluation of Viterbi Decoders by Multicanonical Monte Carlo Simulations

*Marco Secondini, Dario Fertonani, Giulio Colavolpe, Enrico Forestieri*

Design and Construction of Protocol Sequences: Shift Invariance and User Irrepressibility

*Kenneth Shum, Wing Wong, Chi Wan Sung, Chung Shue Chen*

**WA1-6: Frequency Domain Communication**

Cooperation in the MAC Channel Using Frequency Division Multiplexing

*Momin Uppal, Anders Host-Madsen, Zixiang Xiong*

On Cyclic Frequency Diversity for Single-Carrier Packet Retransmissions

*Abdel-Nasser Assimi, Charly Poulliat, Inbar Fijalkow*

A New Approach to Improve Multiplexing Gain in Decentralized Networks via Frequency Hopping and Repetition Coding

*Kamyar Moshksar, Amir K. Khandani*

**WA1-7: Algebraic Methods I**

An Algebraic Tool for Obtaining Conditional Non-Vanishing Determinants

*Camilla Hollanti, Hsiao-feng Lu, Roope Vehkalahti*

On Extended Forney-Kovalev GMD Decoding

*Vladimir Sidorenko, Anas Chaaban, Christian Senger, Martin Bossert*

Modified Euclidean Algorithms for Decoding Reed-Solomon Codes

*Dilip Sarwate, Zhiyuan Yan*

**Wednesday, July 1, 11:10-12:50**

## **WA2-1: Queuing and Delays**

Delay-Optimal Power Control and Performance Analysis in SDMA System with Limited Buffer Size via Stochastic Decomposition

*Steven Ruan, Vincent Lau*

On the Delay of Network Coding over Line Networks

*Theodoros Dikaliotis, Alex Dimakis, Tracey Ho, Michelle Effros*

Improved Delay Estimates for a Queueing Model for Random Linear Coding for Unicast

*Mohammad Ravanbakhsh, Angela Isabel Barbero Diez, Øyvind Ytrehus*

A Fundamental Characterization of Stability in Broadcast Queueing Systems

*Chan Zhou, Gerhard Wunder*

Random Linear Network Coding for Time-Division Duplexing: Queueing Analysis

*Daniel Lucani, Muriel Medard, Milica Stojanovic*

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Wed 11:10-12:50

102

## **WA2-2: Cooperative Diversity-Multiplexing Tradeoff**

Diversity-Multiplexing Tradeoff for the MIMO Static Half-Duplex Relay

*Olivier Leveque, Christophe Vignat, Melda Yuksel*

Secure Diversity-Multiplexing Tradeoffs in MIMO Relay Channels

*Kiran Gowda, Tony Q. S. Quek, Hyundong Shin*

Cooperative Multiplexing in the Multiple Antenna Half Duplex Relay Channel

*Vinayak Nagpal, Sameer Pawar, David Tse, Borivoje Nikolic*

Diversity-Multiplexing Tradeoff of the Dynamic Decode and Forward Protocol on a MIMO Half-Duplex Relay Channel

*Sanjay Karmakar, Mahesh Varanasi*

The MIMO Wireless Switch: Relaying Can Increase the Multiplexing Gain

*Hassan Ghozlan, Yahya Mohasseb, Hesham El Gamal, Gerhard Kramer*

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Wed 11:10-12:50

203A

## **WA2-3: Lossy Distributed Source Coding**

Distributed Lossy Averaging

*Han-I Su, Abbas El Gamal*

Code Design for Quadratic Gaussian Multiterminal Source Coding: The Symmetric Case

*Yifu Zhang, Yang Yang, Zixiang Xiong*

On the Minimum Sum Rate of Gaussian Multiterminal Source Coding: New Proofs

*Jia Wang, Jun Chen, Xiaolin Wu*

Approximating the Rate-Distortion Region of the Distributed Source Coding for Three Jointly Gaussian Tree-Structured Sources

*Mohammad Ali Maddah-Ali, David Tse*

Two-Way Source Coding with a Common Helper

*Haim Permuter, Yossef Steinberg, Tsachy Weissman*

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Wed 11:10-12:50

203B

#### **WA2-4: Channel Polarization**

A Class of Transformations that Polarize Binary-Input Memoryless Channels  
*Satish Babu Korada, Eren Sasoglu*

Polar Codes: Characterization of Exponent, Bounds, and Constructions  
*Satish Babu Korada, Eren Sasoglu, Ruediger Urbanke*

Performance of Polar Codes for Channel and Source Coding  
*Nadine Hussami, Satish Babu Korada, Ruediger Urbanke*

On the Rate of Channel Polarization  
*Erdal Arıkan, Emre Telatar*

Performance and Construction of Polar Codes on Symmetric Binary-Input Memoryless Channels  
*Ryuhei Mori, Toshiyuki Tanaka*

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Wed 11:10-12:50

**208A**

#### **WA2-5: Channels with Feedback**

Noisy Feedback Improves the BSC Reliability Function  
*Marat Burnashev, Hirosuke Yamamoto*

Feedback Communication over Individual Channels  
*Yuval Lomnitz, Meir Feder*

Power Adaptive Feedback Communication over an Additive Individual Noise Sequence Channel  
*Yuval Lomnitz, Meir Feder*

Upper Bounds to Error Probability with Feedback  
*Baris Nakiboglu, Lizhong Zheng*

A Stochastic Control Approach to 'Posterior Matching'-Style Feedback Communication Schemes  
*Todd Coleman*

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Wed 11:10-12:50

**208B**

#### **WA2-6: Wireless Systems**

Infinite-Layer Codes for Single-User Slowly Fading Channels  
*Vahid Pourahmadi, Abolfazl Motahari, Amir K. Khandani*

Structured Superposition for Backhaul Constrained Cellular Uplink  
*Bobak Nazer, Amichai Sanderovich, Michael Gastpar, Shlomo Shamai*

On Destructive Superposition of Shaping Pulses in Band-Limited Linear Modulation Systems  
*Makoto Tanahashi, Hideki Ochiai*

Analysis of PAPR Reduction Performance of SLM Schemes with Correlated Phase Vectors  
*Seok-Joong Heo, Hyun-Seung Joo, Jong-Seon No, Daewoon Lim, Dong-Joon Shin*

Coded Modulation with a Constraint on the Minimum Channel Symbol Duration  
*Anil Mengi, Han Vinck*

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Wed 11:10-12:50

**209**

#### **WA2-7: Constrained Coding II**

Enumerative Maximum-Transition-Run Codes  
*Thomas Mittelholzer*

Simple Balanced Codes that Approach Capacity  
*Kees Immink, Jos Weber*

Insertion Rate and Optimization of Redundancy of Constrained Systems with Unconstrained Positions  
*Hiroshi Kamabe*

Efficient Balancing of q-ary Sequences with Parallel Decoding  
*Theo Swart, Jos Weber*

The Zeta Function of a Periodic-Finite-Type Shift  
*Akiko Manada, Navin Kashyap*

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Wed 11:10-12:50

210

**WA2-8: Applications**

Influence in a Large Society: Interplay Between Information Dynamics and Network Structure  
*Lara Dolecek, Devavrat Shah*

On Application of Nonparametric Regression Estimation to Options Pricing  
*Michael Kohler, Adam Krzyzak, Harro Walk*

Information Transfer by Energy-Efficient Neurons  
*Toby Berger, William Levy*

Spiking Neuron Channel  
*Shiro Ikeda, Jonathan Manton*

Coding Stimulus Information with Cooperative Neural Populations  
*Karim Oweiss, Mehdi Aghagolzadeh, Seif Eldawlatly*

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**Wednesday, July 1, 13:00-14:00**

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**Panel: “Women in Information Theory: A perspective from the Industry” (101)**

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**Thursday, July 2, 08:30-09:30**

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**Shannon Lecture (Auditorium/ 301)**

Optimal Estimation  
*Jorma Rissanen, Professor Emeritus, Technical University of Tampere*

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**Thursday, July 2, 09:50-11:10**

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Thu 09:50-11:10

101

**RA1-1: DMT and Feedback in the Interference Channel**

Diversity-Multiplexing Tradeoff of the Two-User Interference Channel  
*Adnan Raja, Pramod Viswanath*



On the Achievable Diversity-Multiplexing Tradeoff in Interference Channels  
*Cemal Akcaba, Helmut Boelcskei*

Symmetric Feedback Capacity of the Gaussian Interference Channel to within One Bit  
*Changho Suh, David Tse*

On Diversity-Multiplexing Tradeoff of the Interference Channel  
*Hamid Ebrahimzad, Amir K. Khandani*

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Thu 09:50-11:10

102

### **RA1-2: Multihop Wireless Networks**

Monotonic Convergence of Distributed Interference Pricing in Wireless Networks  
*Changxin Shi, Randall Berry, Michael Honig*

Opportunistic Scheduling in Large-Scale Wireless Networks  
*Mehdi Ansari Sadrabadi, Alireza Bayesteh, Eytan Modiano*

On An Information Theoretic Approach to Model Anonymous MANET Communications  
*Dijiang Huang*

Analysis of Multiple-Unicast Throughput in Finite-Buffer Delay-Tolerant Networks  
*Ramanan Subramanian, Faramarz Fekri*

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Thu 09:50-11:10

203A

### **RA1-3: Channel Coding**

On Fidelity per Unit Cost  
*Marius Kleiner, Bixio Rimoldi*

Coding Along Hermite Polynomials for Gaussian Noise Channels  
*Emmanuel Abbe, Lizhong Zheng*

Lower Bounds on the Information Rate of Intersymbol Interference Channels Based on the Ungerboeck Observation Model  
*Fredrik Rusek, Dario Fertonani*

Concavity of Mutual Information Rate for Input-Restricted Finite-State Memoryless Channels at High SNR  
*Guangyue Han, Brian Marcus*

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Thu 09:50-11:10

203B

### **RA1-4: LDPC Decoding II**

On the Convergence of Iterative Belief Propagation  
*Axel Heim, Ulrich Sorger*

New Group Shuffled BP Decoding Algorithms for LDPC Codes  
*Chi-Yuan Chang, Yu-Liang Chen, Chang-Ming Lee, Yu Ted Su*

Analysis of LDPC Decoding Schedules  
*Eran Sharon, Noam Presman, Simon Litsyn*

Fixing Convergence of Gaussian Belief Propagation  
*Jason Johnson, Danny Bickson, Danny Dolev*

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Thu 09:50-11:10

208A

### **RA1-5: Wireless Precoding**

Selective Mapping for Channel Inversion Precoding in Multiple-Antenna Broadcast Systems  
*Amin Mobasher, Mohammad-Ali Maddah-Ali, Amir K. Khandani*

Linear Precoded Cooperative Transmission Protocol for Wireless Broadcast Channels  
*Chee Yen (Bruce) Leow, Zhiguo Ding, Kin Leung*

Noisy Feedback Linear Precoding: A Bayesian Cramer-Rao Bound  
*Alon Shalev Housfater, Teng Joon Lim*

MISO Broadcast Channel with User-Cooperation and Limited Feedback  
*Hyukjoon Kwon, John Cioffi*

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Thu 09:50-11:10

208B

### **RA1-6: Capacity of Multiple Access Channels**

The Capacity Region of the Symbol-Asynchronous Gaussian Multiple-Access Channel with Orthogonal Signaling  
*Hon Fah Chong, Mehul Motani*

New Bounds on the Maximal Error Exponent for Multiple-Access Channels  
*Ali Nazari, Sandeep Pradhan, Achilleas Anastasopoulos*

The Error Exponent and Cutoff Rate of the Exclusive-Or Multiple-Access Channels  
*Jinho Kim, Wayne Stark*

Sum Capacity of Multi-Source Linear Finite-Field Relay Networks with Fading  
*Sang-Woon Jeon, Sae-Young Chung*

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Thu 09:50-11:10

209

### **RA1-7: Algebraic Error Correcting Codes I**

Cyclic Codes over Ring  $F_2 + vF_2$   
*Minjia Shi, Shixin Zhu, Yu Wang*

Triple-Error-Correcting BCH-Like Codes  
*Tor Helleseth, Carl Bracken*

On the Weight Distribution of Some Cyclic Code  
*Jinquan Luo, Yuansheng Tang, Hongyu Wang*

Negacyclic MDS Codes over  $GR(2\alpha, m)$   
*Shixin Zhu, Xiaoshan Kai, Ping Li*

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Thu 09:50-11:10

210

### **RA1-8: Stochastic Processes**

An Impossibility Result for Process Discrimination  
*Daniil Ryabko*

Deinterleaving Markov Processes via Penalized ML  
*Gadiel Seroussi, Wojciech Szpankowski, Marcelo Weinberger*

On the Distribution of Indefinite Quadratic Forms in Gaussian Random Variables  
*Tareq Al-Naffouri, Babak Hassibi*

**Thursday, July 2, 11:30-12:50**

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Thu 11:30-12:50

**101**

**RA2-1: Interference Alignment**

Achieving Linear Scaling with Interference Alignment  
*Ayfer Ozgur, David Tse*

Interference Alignment with Limited Feedback  
*Jatin Thukral, Helmut Boelcskei*

Relay-Aided Interference Alignment for the Quasi-Static X Channel  
*Behzad Nourani, Abolfazl Motahari, Amir K. Khandani*

Ergodic Interference Alignment  
*Bobak Nazer, Michael Gastpar, Syed Jafar, Sriram Vishwanath*

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Thu 11:30-12:50

**102**

**RA2-2: Heterogeneous Wireless Networks**

Generalized Results of Transmission Capacities for Overlaid Wireless Networks  
*Changchuan Yin, Tie Liu, Shuguang Cui*

To Code or Not to Code: Rate Optimality in Node-Capacitated Networks  
*Ziyu Shao, Sidharth Jaggi, Shuo-Yen Robert Li*

Coding Improves the Throughput-Delay Trade-off in Mobile Wireless Networks  
*Zhenning Kong, Edmund Yeh, Emina Soljanin*

Cooperation above the Physical Layer: the Case of a Simple Network  
*Beiyu Rong, Anthony Ephremides*

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Thu 11:30-12:50

**203A**

**RA2-3: Capacity Bounds**

Capacity of Channels with Action-Dependent States  
*Tsachy Weissman*

Capacity and Error Exponent Analysis of Multilevel Coding with Multistage Decoding  
*Amir Ingber, Meir Feder*

Simple Channel Coding Bounds  
*Ligong Wang, Roger Colbeck, Renato Renner*

On the Heat Channel and Its Capacity  
*Edwin Hammerich*

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Thu 11:30-12:50

**203B**

**RA2-4: Analysis of LDPC Codes II**

Stopping Set Analysis of Repeat Multiple-Accumulate Codes

*Alexandre Graell, Eirik Rosnes*

Trapping Set Enumerators for Repeat Multiple Accumulate Code Ensembles  
*Christian Koller, Alexandre Graell i Amat, Joerg Kliewer, Daniel Costello*

On Unequal Error Protection of Finite-Length LDPC Codes over BECs: A Scaling Approach  
*Amir Djahanshahi, Paul Siegel, Laurence Milstein*

Generating Functional Analysis of LDGM Channel Coding with Many Short Loops  
*Kazushi Mimura, A. Coolen*

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Thu 11:30-12:50

208A

### **RA2-5: Wireless Capacities**

Latent Capacity Region: A Case Study on Symmetric Broadcast with Common Messages  
*Chao Tian*

Capacity Regions of Two New Classes of 2-Receiver Broadcast Channels  
*Chandra Nair*

On 3-Receiver Broadcast Channels with 2-Degraded Message Sets  
*Chandra Nair, Zizhou Vincent Wang*

3-Receiver Broadcast Channels with Common and Confidential Messages  
*Yeow-Khiang Chia, Abbas El Gamal*

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Thu 11:30-12:50

208B

### **RA2-6: Coding for Multiple Access Channels**

Coset Codes for Compound Multiple Access Channels with Common Information  
*Hideki Yagi, H. Vincent Poor*

Coding for Two-User Gaussian MAC with PSK and PAM Signal Sets  
*J. Harshan, B. Sundar Rajan*

Diversity-Multiplexing Tradeoff-Optimal Code Constructions for Symmetric MIMO Multiple Access Channels  
*Hsiao-feng Lu, Camilla Hollanti*

On Multiple Access Random Medium Access Control  
*Tao Cui, Tracey Ho*

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Thu 11:30-12:50

209

### **RA2-7: Quantum Channels and Systems**

Information Rate Loss from Radiation Decoherence  
*Alfonso Martinez*

Efficient Reconciliation Protocol for Discrete-Variable Quantum Key Distribution  
*David Elkouss, Anthony Leverrier, Roamin Alleaume, Joseph Jean Boutros*

Optimal Axis Compensation in Quantum Key Distribution Protocols over Unital Channels  
*Shun Watanabe, Ryutaroh Matsumoto, Tomohiko Uyematsu*

Entanglement Transmission Capacity of Compound Channels  
*Igor Bjelakovic, Holger Boche, Janis Noetzel*

**RA2-8: Statistics**

Fisher Information Determinant and Stochastic Complexity for Markov Models  
*Jun'ichi Takeuchi*

A Criterion for the Compound Poisson Distribution to Be Maximum Entropy  
*Oliver Johnson, Ioannis Kontoyiannis, Mokshay Madiman*

Embedding Maximum Entropy Models in Algebraic Varieties by Grobner Bases Methods  
*Ambedkar Dukkipati*

Maximum Likelihood Time-of-Arrival Estimation of Optical Pulses via Photon-Counting Photodetectors  
*Bruce Moision, Baris Erkmen*

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**Thursday, July 2, 12:50-14:40**

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**Round Table Research Discussion (Students only/ 105)**


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**Thursday, July 2, 14:40-16:00**

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**RP1-1: Degrees of Freedom for the Interference Channel**

On the Degrees of Freedom of the 3-User Gaussian Interference Channel: the Symmetric Case  
*Abolfazl Motahari, Shahab Oveis Gharan, Amir K. Khandani*

On the Degrees-of-Freedom of the K-User Gaussian Interference Channel  
*Raul Etkin, Erik Ordentlich*

Capacity of a Class of Symmetric SIMO Gaussian Interference Channels within  $O(1)$   
*Tiangao Gou, Syed Jafar*

Interference Alignment and the Generalized Degrees of Freedom of the X Channel  
*Chiachi Huang, Viveck Cadambe, Syed Jafar*

**RP1-2: Wiretap Channels**

Invertible Extractors and Wiretap Protocols  
*Mahdi Cheraghchi, Frédéric Didier, Amin Shokrollahi*

Tandem Coding and Cryptography on Wiretap Channels: EXIT Chart Analysis  
*Willie Harrison, Steven McLaughlin*

Wiretap Channel Type II with an Active Eavesdropper  
*Vaneet Aggarwal, Lifeng Lai, Robert Calderbank, H. Vincent Poor*

The Shannon Cipher System with a Guessing Wiretapper: General Sources  
*Manjesh Hanawal, Rajesh Sundaresan*

### **RP1-3: The Gelfand-Pinsker Channel**

The Gelfand-Pinsker Channel: Strong Converse and Upper Bound for the Reliability Function  
*Himanshu Tyagi, Prakash Narayan*

Strong Converse for Gelfand-Pinsker Channel  
*Pierre Moulin*

On the Rate-Limited Gelfand-Pinsker Problem  
*Ravi Tandon, Sennur Ulukus*

Capacity of Compound State-Dependent Channels with States Known at the Transmitter  
*Pablo Piantanida, Shlomo Shamai*

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Thu 14:40-16:00

**203B**

### **RP1-4: LDPC Code Design**

Variable Length Lossy Coding Using an LDPC Code  
*Junya Honda, Hirosuke Yamamoto*

Efficient LDPC Codes over GF (q) for Lossy Data Compression  
*Farbod Kayhan, Alfredo Braunstein, Riccardo Zecchina*

On a Class of Doubly-Generalized LDPC Codes with Single Parity-Check Variable Nodes  
*Enrico Paolini, Mark Flanagan, Marco Chiani, Marc Fossorier*

Design of Multi-Edge Type Bilayer-Expurgated LDPC Codes  
*Marwan Azmi, Jinhong Yuan*

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Thu 14:40-16:00

**208A**

### **RP1-5: Space-Time Coding III**

Low-Complexity Near-ML Decoding of Large Non-Orthogonal STBCs Using Reactive Tabu Search  
*Nagaraja Srinidhi, Saif Mohammed, A. Chockalingam, B. Sundar Rajan*

Low-Complexity Near-MAP Decoding of Large Non-Orthogonal STBCs Using PDA  
*Saif Mohammed, A. Chockalingam, B. Sundar Rajan*

Belief Propagation Based Decoding of Large Non-Orthogonal STBCs  
*Suneel Madhekar, Pritam Som, A. Chockalingam, B. Sundar Rajan*

High-Rate, 2-Group ML-Decodable STBCs for 2m Transmit Antennas  
*Pavan Koteswarar, B. Sundar Rajan*

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Thu 14:40-16:00

**208B**

### **RP1-6: Bi-Directional Communications**

Coding for the Bidirectional Broadcast Channel with Random States Known at the Encoder  
*Tobias Oechtering, Mikael Skoglund*

Approximate Capacity Region of the Two-Pair Bidirectional Gaussian Relay Network  
*Aydin Sezgin, Amin Khajehnejad, Amir Avestimehr, Babak Hassibi*

Interference Channel Aided by an Infrastructure Relay  
*Onur Sahin, Osvaldo Simeone, Elza Erkip*

**RP1-7: Spherical Codes**

Spherical Codes on Torus Layers  
*Cristiano Torezzan, Sueli Costa, Vinay Vaishampayan*

On Concentric Spherical Codes and Permutation Codes with Multiple Initial Codewords  
*Ha Nguyen, Vivek Goyal, Lav Varshney*

The Expected Complexity of Sphere Decoding Algorithm in Spatial Correlated MIMO Channels  
*Lan Xing, Wei Ji-bo*

Generalization of Plotkin Bound to Multiple Packing  
*Vladimir Blinovsky*

**RP1-8: Algorithms and Circuits**

An Iterative Algorithm for Trust and Reputation Management  
*Erman Ayday, Hanseung Lee, Faramarz Fekri*

Entropy of the Induced Transformations Associated with the Interval Algorithm  
*Hiroshi Fujisaki*

On the Expressibility of Stochastic Switching Circuits  
*Hongchao Zhou, Jehoshua Bruck*

The Robustness of Stochastic Switching Networks  
*Po-Ling Loh, Jehoshua Bruck, Hongchao Zhou*

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**Thursday, July 2, 16:20-18:00**

**RP2-1: Interference Cooperation and Secrecy**

Interference Management through Cooperation  
*Vinod Prabhakaran, Pramod Viswanath*

Opportunistic Interference Management  
*Nilesh Khude, Vinod Prabhakaran, Pramod Viswanath*

Capacity Bounds of Half-Duplex Gaussian Cooperative Interference Channel  
*Yong Peng, Dinesh Rajan*

The Gaussian Many-to-One Interference Channel with Confidential Messages  
*He Xiang, Aylin Yener*

On the Secrecy Rate of Interference Networks Using Structured Codes  
*Shweta Agarwal, Sriram Vishwanath*

## **RP2-2: Network Resilience**

Secure Communication with a Byzantine Relay  
*He Xiang, Aylin Yener*

A Soft Decision Helper Data Algorithm for SRAM PUFs  
*Roel Maes, Pim Tuyls, Ingrid Verbauwhede*

Robust Key Agreement Schemes  
*Terence Chan, Ning Cai, Alex Grant*

Caching in Wireless Networks  
*Urs Niesen, Devavrat Shah, Gregory Wornell*

Secure Coding over Networks  
*Jin Xu, Biao Chen*

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Thu 16:20-18:00

203A

## **RP2-3: Source-Channel Coding**

Communicating the Sum of Sources in a 3-Sources/3-Terminals Network  
*Michael Langberg, Aditya Ramamoorthy*

Joint Source-Channel Coding at the Application Layer for Parallel Gaussian Sources  
*Ozgun Bursalioglu, Maria Fresia, Giuseppe Caire, H. Vincent Poor*

Optimized Concatenated LDPC Codes for Joint Source-Channel Coding  
*Maria Fresia, Fernando Perez-Cruz, H. Vincent Poor*

Joint Source-Channel Coding via Statistical Mechanics: Thermal Equilibrium between the Source and the Channel  
*Neri Merhav*

A Computation Approach to the Minimum Total Rate Problem of Causal Video Coding  
*En-hui Yang, Lin Zheng, Zhen Zhang, Da-ke He*

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Thu 16:20-18:00

203B

## **RP2-4: LDPC Decoding III**

Adaptive Decoding of LDPC Codes with Binary Messages  
*Ingmar Land, Gottfried Lechner, Lars K. Rasmussen*

Multi-Stage Decoding of LDPC Codes  
*Yige Wang, Jonathan Yedidia, Stark Draper*

Two-Bit Message Passing Decoders for LDPC Codes over the Binary Symmetric Channel  
*Lucile Sassatelli, Shashi Kiran Chilappagari, Bane Vasic, David Declercq*

LDPC Decoding and Code Design on Extrinsic Trees  
*Eric Psota, Lance Perez*

Candidate Bit Based Bit-Flipping Decoding Algorithm for Low-Density Parity-Check Codes  
*Guiqiang Dong, Yanan Li, Ningde Xie, Tong Zhang, Huaping Liu*

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Thu 16:20-18:00

208A

## **RP2-5: Channel Variations**

Coded Modulation with Mismatched Power Control over Block-Fading Channels



*Tung Kim, Albert Guillen i Fabregas*

On the Sensitivity of Noncoherent Capacity to the Channel Model

*Giuseppe Durisi, Veniamin Morgenshtern, Helmut Boelcskei*

Physical Modeling of Communication Systems in Information Theory

*Michel Ivrlac, Josef Nosssek*

Pilot Contamination Problem in Multi-Cell TDD Systems

*Jubin Jose, Alexei Ashikhmin, Tom Marzetta, Sriram Vishwanath*

What Is the Value of Joint Processing of Pilots and Data in Block-Fading Channels?

*Nihar Jindal, Angel Lozano, Tom Marzetta*

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Thu 16:20-18:00

208B

### **RP2-6: Channel Capacity**

On the Capacity of the Discrete-Time Channel with Uniform Output Quantization

*Yiyue Wu, Linda Davis, Robert Calderbank*

On Block Noncoherent Communication with Low-Precision Phase Quantization at the Receiver

*Jaspreet Singh, Upamanyu Madhow*

Dispersion of Gaussian Channels

*Yury Polyanskiy, H. Vincent Poor, Sergio Verdu*

Dispersion of the Gilbert-Elliott Channel

*Yury Polyanskiy, H. Vincent Poor, Sergio Verdu*

A Lower Bound for the Capacity of the Discrete-Time Poisson Channel

*Alfonso Martinez*

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Thu 16:20-18:00

209

### **RP2-7: Codes and Bands**

Valid Inequalities for Binary Linear Codes

*Akin Tanatmis, Stefan Ruzika, Horst Hamacher, Mayur Punekar, Frank Kienle, Norbert Wehn*

Construction and Covering Properties of Constant-Dimension Codes

*Maximilien Gadouleau, Zhiyuan Yan*

Decoder Error Probability of Bounded Distance Decoders for Constant-Dimension Codes

*Maximilien Gadouleau, Zhiyuan Yan*

Some Fundamental Coding Theoretic Limits of Unequal Error Protection

*Shashi Borade, Sujay Sanghavi*

The Optimum Distance Profiles of the Second Order Reed-Muller Codes

*Yanling Chen, Han Vinck*

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Thu 16:20-18:00

210

### **RP2-8: Biometric Identification and Fingerprinting**

Searching Methods for Biometrical Identification Systems: Fundamental Limits

*Frans Willems*

Combinatorial Data Reduction Algorithm and Its Applications to Biometric Verification

*Vladimir Balakirsky, Han Vinck*

Secret Rate-Privacy Leakage in Biometric Systems

*Tanya Ignatenko, Frans Willems*

Saddle-Point Solution of the Fingerprinting Capacity Game under the Marking Assumption

*Yen-Wei Huang, Pierre Moulin*

Two-Level Fingerprinting Codes

*N. Prasanth Anthapadmanabhan, Alexander Barg*

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**Thursday, July 2, 18:30 ~**

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**Conference Banquet (103~105)**

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**Friday, July 3, 08:30-09:30**

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**Plenary 4 (Auditorium/ 301)**

Combinatorial Reasoning in Information Theory

*Noga Alon, Tel Aviv University*

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**Friday, July 3, 09:50-11:10**

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Fri 09:50-11:10

**101**

**FA1-1: Interference and System Performance**

Optimal Spectrum Management in Multiuser Interference Channels

*Yue Zhao, Gregory Pottie*

A Novel Graph-Based Soft Interference Cancellation Algorithm for FDM-CPM Satellite Systems

*Amina Piemontese, Giulio Colavolpe*

Reducing Repair Traffic for Erasure Coding-Based Storage via Interference Alignment

*Yunnan Wu, Alex Dimakis*

Resource Management in Interference Channels with Asynchronous Users

*Kamyar Moshksar, Amir K. Khandani*

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Fri 09:50-11:10

**102**

**FA1-2: Generation and Cost of Secrecy**

Secret Key Agreement Using Asymmetry in Channel State Knowledge

*Ashish Khisti, Suhas Diggavi, Gregory Wornell*

Secure Communication in the Low-SNR Regime: A Characterization of the Energy-Secrecy Tradeoff

*Mustafa Cenk Gursoy*

Minimum Energy per Bit for Secret Key Acquisition over Multipath Wireless Channels

*Tzu-Han Chou, Akbar Sayeed, Stark Draper*

On Secrecy Capacity per Unit Cost

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Fri 09:50-11:10

203A

**FA1-3: Network Information Theory**

Information-Theoretic Bounds for Multiround Function Computation in Collocated Networks

*Nan Ma, Prakash Ishwar, Piyush Gupta*

Identification over Multiple Databases

*Deniz Gunduz, Ertem Tuncel, Andrea Goldsmith, H. Vincent Poor*

A Strong Converse for a Collection of Network Source Coding Problems

*Weihsin Gu, Michelle Effros*

Relaying Simultaneous Multicasts via Structured Codes

*Deniz Gunduz, Osvaldo Simeone, Andrea Goldsmith, H. Vincent Poor, Shlomo Shamai*

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Fri 09:50-11:10

203B

**FA1-4: Rateless Codes**

Analysis of the Second Moment of the LT Decoder

*Ghid Maatouk, Amin Shokrollahi*

Quasi-Systematic Doped LT Codes

*Xiaojun Yuan, Li Ping*

Raptor Packets: A Packet-Centric Approach to Distributed Raptor Code Design

*Dejan Vukobratovic, Cedomir Stefanovic, Milos Stojakovic, Vladimir Stankovic*

Concatenated Fountain Codes

*Zheng Wang, Jie Luo*

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Fri 09:50-11:10

208A

**FA1-5: Feedback in Wireless Communication II**

Upper Bounds on the Capacities of Non-Controllable Finite-State Channels Using Dynamic Programming Methods

*Xiujie Huang, Aleksandar Kavcic, Xiao Ma, Danilo Mandic*

On the Impact of Quantized Channel Feedback in Guaranteeing Secrecy with Artificial Noise

*Ya-Lan Liang, Yung-Shun Wang, Tsung-Hui Chang, Yao-Win Peter Hong, Chong-Yung Chi*

A New Sum-Rate Outer Bound for Gaussian Interference Channels with Generalized Feedback

*Shuang Yang, Daniela Tuninetti*

Channel State Feedback over the MIMO-MAC

*K. Raj Kumar, Giuseppe Caire*

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Fri 09:50-11:10

208B

**FA1-6: Multiple-Access Channels**

Delay Minimization in Multiple Access Channels

*Jing Yang, Sennur Ulukus*

A New Achievable Rate Region for the Discrete Memoryless Multiple-Access Channel with Feedback

*Ramji Venkataramanan, Sandeep Pradhan*

Multiaccess Channels with State Known to One Encoder: Another Case of Degraded Message Sets  
*Abdellatif Zaidi, Shiva Prasad Kotagiri, J. Nicholas Laneman, Luc Vandendorpe*

On Capacity Computation for the Two-User Binary Multiple-Access Channel  
*Jörg Böhler, Gerhard Wunder*

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Fri 09:50-11:10

209

### **FA1-7: Algebraic Error-Correcting Codes II**

Cross Twisted Xate Pairing with Barreto-Naehrig Curve for Multi-Pairing Technique  
*Yumi Sakemi, Yasuyuki Nogami, Hidehiro Kato, Yoshitaka Morikawa*

Elliptic Curves with a Pre-Determined Embedding Degree  
*Shoujirou Hirasawa, Atsuko Miyaji*

Construction of Cubic Self-Dual Codes  
*Sunghyu Han, Jon-Lark Kim, Heisook Lee, Yoonjin Lee*

Self-Dual Codes Using the Building-up Construction  
*Yoonjin Lee, Jon-Lark Kim*

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Fri 09:50-11:10

210

### **FA1-8: Statistics II**

Connectivity Results for Random Key Graphs  
*Osman Yagan, Armand Makowski*

Decentralized Two-Sided Sequential Tests for a Normal Mean  
*Yan Wang, Yajun Mei*

Estimation of the Distribution of Randomly Deployed Wireless Sensors  
*Babar Khan, Merouane Debbah, Øyvind Ryan, Tareq Al-Naffouri*

A Note on BSD Codes Constructed from T-Codes  
*Ulrich Speidel*

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## **Friday, July 3, 11:30-12:50**

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Fri 11:30-12:50

101

### **FA2-1: Interference and Capacity**

Bounds and Capacity Results for the Cognitive Z-Interference Channel  
*Nan Liu, Ivana Maric, Andrea Goldsmith, Shlomo Shamai*

A New Achievable Rate Region for the Discrete Memoryless X Channel  
*Onur Ozan Koyluoglu, Mohammad Shahmohammadi, Hesham El Gamal*

Rank-Constrained Separable Semidefinite Programming for Optimal Beamforming Design  
*Yongwei Huang, Daniel Palomar*

Performance Analysis of RVQ-Based Limited Feedback Beamforming Codebooks  
*Vasanthan Raghavan, Michael Honig, Venugopal Veeravalli*

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Fri 11:30-12:50

102

## **FA2-2: Physical Layer Security**

Wireless Physical-Layer Security: The Case of Colluding Eavesdroppers  
*Pedro Pinto, Joao Barros, Moe Win*

Secrecy Generation for Multiple Input Multiple Output Channel Models  
*Imre Csiszar, Prakash Narayan*

Channel Scrambling for Secrecy  
*Matthieu Bloch*

Secure Communication Using an Untrusted Relay via Sources and Channels  
*Nebojsa Milosavljevic, Michael Gastpar, Kannan Ramchandran*

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Fri 11:30-12:50

**203A**

## **FA2-3: Broadcast Channels**

Evaluation of Marton's Inner Bound for the General Broadcast Channel  
*Amin Gohari, Venkat Anantharam*

On the Tightness of Marton's Regions for Semi-Additive Broadcast Channels  
*Eli Haim, Ram Zamir*

Gaussian Broadcast Channels with Receiver Message Side Information  
*Jae Won Yoo, Tie Liu, Feng Xue*

Approximate Characterizations for the Gaussian Broadcasting Distortion Region  
*Chao Tian, Suhas Diggavi, Shlomo Shamai*

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Fri 11:30-12:50

**203B**

## **FA2-4: Analysis of LDPC Codes III**

On the Number of Errors Correctable with Codes on Graphs  
*Alexander Barg, Arya Mazumdar*

Decoding Algorithms for Binary Raptor Codes over Nonbinary Channels  
*Harm Cronie, Bertrand Ndzana Ndzana, Amin Shokrollahi*

LT Codes Decoding: Design and Analysis  
*Feng Lu, Chuan Heng Foh, Jianfei Cai, Liang-Tien Chia*

Finite-Length Analysis of Irregular Expurgated LDPC Codes under Finite Number of Iterations  
*Ryuhei Mori, Toshiyuki Tanaka, Kenta Kasai, Kohichi Sakaniwa*

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Fri 11:30-12:50

**208A**

## **FA2-5: Wireless Broadcast**

On Gaussian MIMO BC-MAC Duality with Multiple Transmit Covariance Constraints  
*Lan Zhang, Rui Zhang, Ying-Chang Liang, Yan Xin, H. Vincent Poor*

Error Exponents of Optimum Decoding for the Degraded Broadcast Channel Using Moments of Type Class Enumerators  
*Yonatan Kaspri, Neri Merhav*

On Multiple-Input Multiple-Output Gaussian Channels with Arbitrary Inputs Subject to Jamming

*Miguel Rodrigues*

Time-Division Multiplexing for Green Broadcasting

*Pulkit Grover, Anant Sahai*

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Fri 11:30-12:50

208B

**FA2-6: Cognitive Radio Systems**

Mixed Anti-Jamming Strategies in Fixed-Rate Wireless Systems over Fast Fading Channels

*George Amariuca, Shuangqing Wei*

Optimal Threshold Adaptation with Radio Environment Map for Cognitive Radio Networks

*Dae-Young Seol, Hyoung-Jin Lim, Gi-Hong Im*

Dirty Paper Coding for the MIMO Cognitive Radio Channel with Imperfect CSIT

*Chinmay Vaze, Mahesh Varanasi*

Optimal Design of Learning Based MIMO Cognitive Radio Systems

*Feifei Gao, Rui Zhang, Ying-Chang Liang, Xiaodong Wang*

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Fri 11:30-12:50

209

**FA2-7: Codes and Applications I**

Distance-Increasing Mappings from Binary Vectors to Constant Composition Vectors

*Hsin-Lung Wu, Jen-Chun Chang*

An Optimal Result for Codes Identifying Sets of Words

*Svante Janson, Tero Laihonen*

Novel Bounds on the Capacity of Binary Channels with Deletions and Substitutions

*Dario Fertonani, Tolga Duman*

A Subsequence-Histogram Method for Generic Vocabulary Recognition over Deletion Channels

*Majid Fozunbal*

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Fri 11:30-12:50

210

**FA2-8: Wireless Network Coding**

Design of Network Codes for Multiple-User Multiple-Relay Wireless Networks

*Ming Xiao, Mikael Skoglund*

On the Energy Benefit of Network Coding for Wireless Multiple Unicast

*Jasper Goseling, Ryutaroh Matsumoto, Tomohiko Uyematsu, Jos Weber*

Capacity Analysis of Two-User Opportunistic Scheduling for Wireless Network Coding

*Poramate Tarasak, Ubolthip Sethakaset, Sumei Sun*

Adaptive Network Coded Retransmission Scheme for Wireless Multicast

*Sameh Sorour, Shahrokh Valaee*

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**Friday, July 3, 14:40-16:00**

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Fri 14:40-16:00

101

**FP1-1: Gaussian Interference Channels**

New Sum-Rate Upper Bound for the Two-User Gaussian Interference Channel

*Raul Etkin*

On the Totally Asynchronous Interference Channel with Single-User Receivers

*Eduard Calvo, Javier Fonollosa, Josep Vidal*

On the Separability of Parallel Gaussian Interference Channels

*Sang Won Choi, Sae-Young Chung*

Noisy-Interference Sum-Rate Capacity of Parallel Gaussian Interference Channels

*Xiaohu Shang, Biao Chen, Gerhard Kramer, H. Vincent Poor*

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Fri 14:40-16:00

102

### **FP1-2: Wireless Security**

An MMSE Approach to the Secrecy Capacity of the MIMO Gaussian Wiretap Channel

*Ronit Bustin, Shlomo Shamai, H. Vincent Poor, Ruoheng Liu*

Information Secrecy from Multiple Eavesdroppers in Orthogonal Relay Channels

*Vaneet Aggarwal, Lalitha Sankar, Robert Calderbank, H. Vincent Poor*

Secrecy Capacity Region of the Gaussian Multi-Receiver Wiretap Channel

*Ersen Ekrem, Sennur Ulukus*

On the Delay Limited Secrecy Capacity of Fading Channels

*Karim Khalil, Moustafa Youssef, Onur Ozan Koyluoglu, Hesham El Gamal*

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Fri 14:40-16:00

203A

### **FP1-3: Multiuser Information Theory**

On the Sum Capacity of a Class of Cyclically Symmetric Deterministic Interference Channels

*Bernd Bandemer, Gonzalo Vazquez-Vilar, Abbas El Gamal*

Multicasting in Large Random Wireless Networks: Bounds on the Minimum Energy per Bit

*Aman Jain, Sanjeev Kulkarni, Sergio Verdu*

Average Entropy Functions

*Qi Chen, Chen He, Lingge Jiang, Qing-Chuan Wang*

The Capacity Region of a Class of Deterministic Z Channels

*Viveck Cadambe, Syed Jafar, Sriram Vishwanath*

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Fri 14:40-16:00

203B

### **FP1-4: Analysis of LDPC Codes IV**

Capacity Achieving Codes from Randomness Conductors

*Mahdi Cheraghchi*

Waterfall Region Performance of Punctured LDPC Codes over the Binary Erasure Channel

*Iryna Andriyanova, Ruediger Urbanke*

Analytical Solution of Covariance Evolution for Regular LDPC Codes

*Takayuki Nozaki, Kenta Kasai, Kohichi Sakaniwa*

Decay of Correlations in Low Density Parity Check Codes: Low Noise Regime

**FP1-5: Optimization of Wireless Systems**

Achievable Throughput of Multi-Mode Multiuser MIMO with Imperfect CSI Constraints

*Jun Zhang, Marios Kountouris, Jeffrey Andrews, Robert Heath*

MIMO Broadcast Channel Optimization under General Linear Constraints

*Hoon Huh, Haralabos Papadopoulos, Giuseppe Caire*

Maximizing Sum Rate and Minimizing MSE on Multiuser Downlink: Optimality, Fast Algorithms and Equivalence via Max-Min SIR

*Chee Wei Tan, Mung Chiang, R. Srikant*

Achievable Rate and Optimal Physical Layer Rate Allocation in Interference-Free Wireless Networks

*Tao Cui, Tracey Ho, Joerg Kliewer*

**FP1-6: Network Detection**

Iterative Spectrum Shaping with Opportunistic Multiuser Detection

*Rui Zhang, John Cioffi*

Optimized Rate Allocation for State Estimation over Noisy Channels

*Lei Bao, Mikael Skoglund, Carlo Fischione, Karl-Henrik Johansson*

Iterative Channel and Data Estimation: Framework and Analysis via Replica Method

*Mikko Vehkaperä, Keigo Takeuchi, Ralf Mueller, Toshiyuki Tanaka*

Optimal Code Length for Bursty Sources with Deadlines

*Raghava Swamy, Tara Javidi*

**FP1-7: Combinatorial Codes**

On Linear Balancing Sets

*Arya Mazumdar, Ron Roth, Pascal Vontobel*

Optimal, Systematic q-ary Codes Correcting All Asymmetric Errors of Limited Magnitude

*Bella Bose, Noha Elarief*

On Systematic Variable Length Unordered Codes

*Laura Pezza, Luca Tallini, Bella Bose*

Decoding Frequency Permutation Arrays under Infinite Norm

*Min-Zheng Shieh, Shi-Chun Tsai*

**FP1-8: Security**

Differential Privacy with Compression

*Shuheng Zhou, Katrina Ligett, Larry Wasserman*

Binary Causal-Adversary Channels



*Michael Langberg, Sidharth Jaggi, Bikash Dey*

Information Embedding with Reversible Stegotext

*Orna Sumszyk, Yossef Steinberg*

Using Kolmogorov Complexity for Understanding Some Limitations on Steganography

*Boris Ryabko, Daniil Ryabko*

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**Friday, July 3, 16:20-18:00**

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Fri 16:20-18:00

**101**

**FP2-1: Wireless Network Broadcast and Access**

Recovering a Code's Length and Synchronization from a Noisy Intercepted Bitstream

*Mathieu Cluzeau, Matthieu Finiasz*

Throughput Enhancements in Point-to-Multipoint Cognitive Systems

*Nadia Jamal, Hamidreza Ebrahimzadeh Saffar, Patrick Mitran*

A Characterization of Max-Min SIR-Balanced Power Allocation with Applications

*Slawomir Stanczak, Michal Kaliszan, Nicholas Bambos, Marcin Wiczanowski*

On the Design of PN Codes in Decentralized Networks

*Kamyar Moshksar, Amir K. Khandani*

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**FP2-2: Broadcast Channels and Secrecy**

MIMO Gaussian Broadcast Channels with Confidential Messages

*Ruoheng Liu, Tie Liu, H. Vincent Poor, Shlomo Shamai*

Secret-Key Sharing Based on Layered Broadcast Coding over Fading Channels

*Xiaojun Tang, Ruoheng Liu, Predrag Spasojevic, H. Vincent Poor*

The Secrecy Capacity of the Semi-Deterministic Broadcast Channel

*Wei Kang, Nan Liu*

The Secrecy Capacity Region of the Degraded Vector Gaussian Broadcast Channel

*Ghadamali Bagheri-Karam, Abolfazl Motahari, Amir K. Khandani*

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**FP2-3: Broadcasting Correlated Sources**

Comments on "Broadcast Channels with Arbitrarily Correlated Sources"

*Gerhard Kramer, Chandra Nair*

Correlated Sources over Broadcast Channels

*Paolo Minero, Young-Han Kim*

Hybrid Digital-Analog Joint Source-Channel Coding for Broadcasting Correlated Gaussian Sources

*Hamid Behroozi, Fady Alajaji, Tamas Linder*

Hybrid Coding for Gaussian Broadcast Channels with Gaussian Sources

*Rajiv Soundararajan, Sriram Vishwanath*

**FP2-4: Algebraic Methods II**

Fast Computation of Grobner Bases of Ideals of  $F[x, y]$   
*Yindong Chen, Peizhong Lu*

Rank  $q$ -Cyclic and Pseudo- $q$ -Cyclic Codes  
*Ernst Gabidulin*

On Jacket Transforms over Finite Fields  
*Moon Ho Lee, Yuri Borissov*

An SDP Primal-Dual Algorithm for Approximating the Lovasz-Theta Function  
*Hubert Chan, Kevin Chang, Rajiv Raman*

**FP2-5: Space-Time Coding IV**

Space-Time Codes That Are Approximately Universal for the Parallel, Multi-Block and Cooperative DDF Channels  
*P. Vijay Kumar, Petros Elia*

Ideal Structure of the Silver Code  
*Avik Ray, K. Vinodh, Ghaya Rekaya, P. Vijay Kumar*

The Aladdin-Pythagoras Space-Time Code  
*Joseph Jean Boutros, Hugues Randriam*

Distributed Differential Space-Time Codes Based on Weyl's Reciprocity  
*Haiquan Wang, Zhijin Zhao*

**FP2-6: Operation of Ad Hoc Networks**

Delay-Throughput Tradeoff for Supportive Two-Tier Networks  
*Long Gao, Rui Zhang, Changchuan Yin, Shuguang Cui*

An Adaptive Opportunistic Routing Scheme for Wireless Ad-Hoc Networks  
*Abhijeet Bhorkar, Mohammad Naghshvar, Tara Javidi, Bhaskar Rao*

Delay-Throughput Tradeoff for Overlaid Wireless Networks of Different Priorities  
*Changchuan Yin, Long Gao, Shuguang Cui*

MIMO Compute-and-Forward  
*Jiening Zhan, Bobak Nazer, Michael Gastpar, Uri Erez*

Nonlinear Network Code for High Throughput Broadcasting with Retransmissions  
*Qiang Li, See Ho Ting, Chin Keong Ho*

**FP2-7: Network Codes**

Fast Encoding and Decoding of Gabidulin Codes  
*Danilo Silva, Frank Kschischang*

A Family of Algebraic Codes for Network Coding  
*Martin Bossert, Ernst Gabidulin*

Packing and Covering Properties of Subspace Codes

*Maximilien Gadouneau, Zhiyuan Yan*

A New Construction Method for Networks from Matroids

*Salim El Rouayheb, Alex Sprintson, Costas Georghiades*

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**FP2-8: Sensors and Network Coding**

Distributed Least Square for Consensus Building in Sensor Networks

*Fernando Perez-Cruz, Sanjeev Kulkarni*

Detection Error Exponent for Spatially Dependent Samples in Random Networks

*Animashree Anandkumar, Joseph Yukich, Lang Tong, Alan Willsky*

On Multicasting with Streaming Burst-Erasure Codes

*Ashish Khisti, Jatinder Singh*

A Novel Signaling for Communication on MIMO Y Channel: Signal Space Alignment for Network Coding

*Namyoon Lee, Jong Bu Lim*