

2008 International Zurich Seminar on Communications

March 12-14, 2008
Zurich, Switzerland



PROCEEDINGS

Table of Contents

Keynote Talks

Wednesday 9:00 – 10:00

Ezio Biglieri, Univ. Pompeu Fabra, Barcelona

Applications of Random-Set Theory to Wireless Communications

Thursday 9:00 – 10:00

Michael Steele, Wharton Univ. of Pennsylvania

How a False Probability Model Changed the World: Birth, Death, and Reincarnation of Black-Scholes

Friday 9:00 – 10:00

John Tsitsiklis, MIT

Decentralized Detection over a Tree of Sensors

Session 1

Wed 10:30 – 12:10

Invited session organizers: Lizhong Zheng and Behnaam Aazhang

*Energy-Delay Trade-offs in Wireless Networks	10
<i>Randall Berry</i>	
*Opportunistic and Cooperative Wireless Networks	11
<i>Behnaam Aazhang, Ashutosh Sabharwal</i>	
*Communicating Bursty and Delay-sensitive Information over Outage Limited Channels.	12
<i>Somsak Kittipiyakul, Petros Elia, Tara Javidi</i>	
*Euclidean Information Theory	14
<i>Shashi Borade, Lizhong Zheng</i>	
*Repetition Protocols and Channel State Information in Block-fading Channels	18
<i>Daniela Tuninetti</i>	

Session 2

Wed 14:00 – 15:40

Invited session organizer: Matthias Grossglauser

*Wireless Social Community Networks: A Game-Theoretic Analysis	22
<i>Mohammad Hossein Manshaei, Julien Freudiger, Mark Félegyházi, Peter Marbach, Jean-Pierre Hubaux</i>	
*On Mobile User Behaviour Patterns	26
<i>Milan Vojnović</i>	
*Phase Transition in Opportunistic Mobile Networks	30
<i>Augustin Chaintreau, Laurent Massoulié</i>	

*Invited papers are marked by an asterisk.

*Fairness vs. Spatial Reuse in Wireless 802.11 Networks	34
<i>Mathilde Duroy, Olivier Dousse, Patrick Thiran</i>	
*Routing in Mobile Wireless Networks	38
<i>Dominique Tschopp, Suhas Diggavi, Matthias Grossglauser</i>	

Session 3

Wed 16:10 – 17:50

Peak-to-Average Power Ratio Reduction in OFDM using ReedSolomon Codes	40
<i>Robert F. H. Fischer, Christian Siegl</i>	
Client-Server Architecture Design based on Wiretap Codes	44
<i>Matthieu Bloch, Rajesh Narasimha, Steven W. McLaughlin</i>	
Electronic Equalization of Fiber Optic Links	48
<i>Andrew C. Singer, Naresh R. Shanbhag, Hyeon-Min Bae</i>	
Solving the Interaction Problem of Timing Synchronization and Equalization	52
<i>Dirk Daecke, Heinrich Schenk</i>	
Signal Reconstruction in Multidimensional Sensor Fields	56
<i>Alessandro Nordio, Carla-Fabiana Chiasserini, Emanuele Viterbo</i>	

Session 4

Thu 10:30 – 12:10

Axiomatic Characterization of Resource Allocation and Social Welfare Orderings for Centralized Wireless Communication	60
<i>Holger Boche, Siddharth Naik</i>	
Finite-Length Scaling of Repeat-Accumulate Codes on the BEC	64
<i>Iryna Andriyanova</i>	
Nonbinary Decoding of Structured LDPC Codes	68
<i>Daniele Capirone, Giacomo Como, Fabio Fagnani, Federica Garin</i>	
Information Indivisibility Results	72
<i>Jossy Sayir, Ingmar Land, Alex Grant</i>	
Generalized Modulation and Iterative Demodulation	76
<i>Christian Schlegel, Dmitri Truhachev</i>	

Session 5

Thu 14:00 – 15:40

Invited session organizer: Greg Wornell

*Lossy Source Coding via Markov Chain Monte Carlo	80
<i>Shirin Jalali, Tsachy Weissman</i>	
*Iterative Linear-Programming-Based Route Optimization for Cooperative Networks	84
<i>Stark C. Draper, Lingjia Liu, Andreas F. Molisch, Jonathan S. Yedidia</i>	
*An Efficient ARQ Scheme with SNR Feedback	88
<i>Uri Erez, Mitchell Trott, Gregory Wornell</i>	

*Information Flow over Compound Wireless Relay Networks	92
<i>Salman Avestimehr, Suhas N. Diggavi, David N. C. Tse</i>	
*On Universal Coding for Parallel Gaussian Channels	94
<i>Maryam Modir Shanechi, Uri Erez, Gregory Wornell</i>	

Session 6

Thu 16:10 – 17:50

Invited session organizer: Michael Gastpar

*Wireless Sensor Networks for Environmental Monitoring: The SensorScope Experience..	98
<i>Guillermo Barrenetxea, François Ingelrest, Gunnar Schaefer, Martin Vetterli</i>	
*Achievable Distortion/Rate Tradeoff in a Decentralized Gaussian Parameter Estimation Problem	102
<i>Anna Scaglione, Mehmet E. Yildiz, Tuncer C. Aysal</i>	
*Sentry Selection in Sensor Networks: A Sufficient Condition for k Single Covers.....	106
<i>Paul Balister, Béla Bollobás, Martin Haenggi, Amites Sarkar, Mark Walters</i>	
*On the Multiple-Access Channel with Common Rate-Limited Feedback	108
<i>Dor Shaviv, Yossef Steinberg</i>	
*Structured Random Codes and Sensor Network Coding Theorems	112
<i>Bobak Nazer, Michael Gastpar</i>	

Session 7

Fri 10:30 – 12:10

On Fast-Decodable Space-Time Block Codes.....	116
<i>Ezio Biglieri, Yi Hong, Emanuele Viterbo</i>	
Convex Precoding for Vector Channels in High Dimensions	120
<i>Rodrigo de Miguel, Ralf R. Müller</i>	
UEP Exploitation in MIMO-OFDM with Beamforming and Channel-Correlation Feedback	124
<i>Khaled Hassan, Werner Henkel</i>	
On the Impact of TDM in Estimation of MIMO Channel Capacity from Phase-Noise Impaired Measurements	128
<i>Troels Pedersen, Attaphongse Taparugssanagorn, Juha Ylitalo, Bernard H. Fleury</i>	
Distributed Space-Time Block Codes for the Non-Cooperative Multiple Access Channel ..	132
<i>Maya Badr, Jean-Claude Belfiore</i>	

Session 8

Fri 14:00 – 15:40

Rate-Delay Tradeoffs for Communicating a Bursty Source over an Erasure Channel with Feedback	136
<i>Brian P. Dunn, Nicholas J. Laneman</i>	
Diversity-Multiplexing Tradeoff for the Slow Fading Interference Channel.....	140
<i>Ekine Akuiyibo, Lévêque Olivier</i>	

Capacity Bounds for Two-Way Relay Channels	144
<i>Wooseok Nam, Sae-Young Chung, Yong H. Lee</i>	
Multi-Layer Broadcast Hybrid-ARQ Strategies	148
<i>Avi Steiner, Shlomo Shamai (Shitz)</i>	
Scaling Laws in Decentralized Processing of Interfered Gaussian Channels	152
<i>Amichai Sanderovich, Michael Peleg, Shlomo Shamai (Shitz)</i>	