

2009 11th Canadian Workshop on Information Theory

(CWIT)

**Ottawa, ON, Canada
13 – 15 May 2009**



**IEEE Catalog Number: CFP0966B-PRT
ISBN: 978-1-4244-3400-8**

TABLE OF CONTENTS

WED1: NETWORK CODING

Minimizing Network Coding Nodes for Multicast	1
<i>Jean-Pierre Thibault, Mahdi Hajiaghayi</i>	
A Key-based Error Control Scheme for Network Coding	5
<i>Danilo Silva, Frank Kschischang</i>	
Projective Space Codes for the Injection Metric	9
<i>Azadeh Khaleghi, Frank Kschischang</i>	

WED2: COOPERATIVE COMMUNICATIONS

Precise MGF Performance Analysis of Amplify-and-forward Cooperative Diversity in Nakagami-m Fading	13
<i>Xianfu Lei, Norman Beaulieu, Pingzhi Fan</i>	
BER and Diversity Order Analysis of Distributed Alamouti???'s Code with CSI-Assisted Relays	17
<i>Zhihang Yi, Il-Min Kim</i>	
An Opportunistic-based Protocol for Bidirectional Cooperative Networks	21
<i>Zhihang Yi, Il-Min Kim</i>	
Collaborative Communications: Joint Relay and Protocol Selection	25
<i>Saeed Akhavan Aстанеh, Saeed Gazor</i>	

WED3: CHANNEL CODING

Dynamics of Analog Decoders for Different Message Representation Domains	29
<i>Saeed Hemati, Abbas Yongacoglu</i>	
Error Scrubbing Codes for Flash Memories	32
<i>Anxiao Andrew Jiang, Hao Li, Yue Wang</i>	
On the Correlation Between Error Weights and Syndrome Weights for Belief Propagation Decoding of LDPC Codes	36
<i>Irina Adjudeanu, Chouinard Jean-Yves, Paul Fortier</i>	
Interactive Encoding and Decoding Based on Syndrome Accumulation Over a Binary Regular LDPC Ensemble	42
<i>Jin Meng, En-hui Yang, Da-ke He</i>	

WED4: MIMO

On Rate-optimal Signalling for MIMO Systems with Mean and Covariance Feedback	46
<i>Ramy Gohary, Timothy Davidson</i>	
What is the Best Angular Density of Multipath in MIMO Channels?	51
<i>Georgy Levin, Sergey Loyka</i>	

Minimizing Outage Probability for a Class of MIMO Channels	55
<i>Ioanna Ioannou, Charalambos Charalambous</i>	
On the Role of the Input Power Constraint in the Beamforming Optimality Range in TIMO Channels	59
<i>Saad Al-Ahmadi, Halim Yanikomeroglu</i>	
Opportunistic Beamforming with Precoding for Spatially Correlated Channels	63
<i>Tareq Al-Naffouri, Mohammed Eltayeb</i>	

POSTERS: POSTER PRESENTATION

Channel Prediction and Feedback in Multiuser Broadcast Channels	67
<i>Adam Tenenbaum, Raviraj Adve, Youngsoo Yuk</i>	
Information Assessment for Polarimetric SAR Intensity Images	71
<i>Igor Zakharov, Thierry Toutin</i>	
On Information Leakage During Secure Verification of Compatibility Between Signals	75
<i>Wei Sun, Shantanu Rane</i>	
Distortion SNR Exponent for Vector Quantization on MIMO Channels	79
<i>Xiang Yu, Haiquan Wang, En-hui Yang, Murat Uysal</i>	
A Class of LDPC Codes Constructed from Elements of Finite Fields and Cyclotomic Cosets	83
<i>Salah A. Aly, Hussein Mazaar</i>	
Capacity of Constrained Sequence Codes Modelled by Two-dimensional Finite State Machines with Nearest-neighbour Connections	87
<i>Craig Jamieson, Ivan Fair</i>	
Robust Spectrum Sensing of OFDM Signal Without Noise Variance Knowledge	91
<i>Hao Li, Xianbin Wang, Cong Wang, Chouinard Jean-Yves</i>	
A Novel Adaptive Structure of the Energy Detector Applied to Cognitive Radio Networks	95
<i>Tarik Shehata, Mohamed El-tanany</i>	

TH1: SHANNON THEORY & QUANTUM INFORMATION THEORY

Does Analog Transmission Achieve OPTA in an Asymmetric Gaussian Sensor Network?	99
<i>Hamid Behroozi, Fady Alajaji, Tamas Linder</i>	
On the Feedback Capacity of a Discrete Non-binary Noise Channel with Memory	104
<i>Nevroz Sen, Fady Alajaji, Serdar Yuksel</i>	
AEP of Output When Rate is Above Capacity	108
<i>Xiugang Wu, Liang-Liang Xie</i>	
Relay-assisted Free-space Quantum-key Distribution	112
<i>Majid Safari, Murat Uysal</i>	
Eigenstate Preparation by Phase Decoherence	118
<i>Rolando Somma</i>	

TH2: MODULATION AND CODING

Quasi-gray Labelling for Grassmannian Constellations	122
<i>Ramy Gohary, Geoffrey Colman, Mohamed El-Azizy, Tricia Willink, Timothy Davidson</i>	
Adaptive Demodulation Using Raptor Codes: Analytical Results and Extension to Fading Channels.....	126
<i>Kandasamy Illanko, Alagan Anpalagan, Dimitri Androutsos</i>	
Cross-layer Raptor Coding for Broadcasting Over Wireless Channels with Memory	130
<i>Yu Cao, Steven Blostein</i>	
Convolutional Codes for Channels with Deletion Errors	136
<i>Hugues Mercier, Vijay Bhargava</i>	

TH3: COMMUNICATION SYSTEMS

Optical Communication Through Time-varying Turbulent Atmosphere Using Compressive Sensing.....	140
<i>Mohamed Mohamed, Steve Hranilovic</i>	
Improving the Capacity of OFDM Via Frequency-domain Oversampling	144
<i>Qinghua Shi</i>	
Performance of UWB Receivers Using Stored Channel Responses.....	148
<i>Ada Chow, Mohamed El-tanany, Yingzhi Chen</i>	
($\epsilon, 0$) Secure Message Transmission.....	152
<i>Mohammed Tuhin, Hongsong Shi, Rei Safavi-Naini</i>	

FR1: DETECTION AND CHANNEL ESTIMATION

A Technique to Improve MMSE Performance of PACE in Time-selective Rayleigh Fading Channels.....	157
<i>Rauf Iqbal, Thushara Abhayapala, Parastoo Sadeghi</i>	
Optimal Bit Error Rate Linear Rake Receiver for Signal Detection in Highly Impulsive Symmetric Alpha-stable Noise	161
<i>Somasundaram Niranjayan, Norman Beaulieu</i>	
Joint Iterative Detection and Phase Noise Estimation Algorithms Using Kalman Filtering.....	165
<i>Tarik Shehata, Mohamed El-tanany</i>	
Soft Output Detector for Parity Bit Selected CDMA System.....	169
<i>Alireza Mirzaee, Claude D'Amours</i>	
A Channel Estimation Technique for OFDM Systems in Dispersive Time-varying Channels.....	173
<i>Zheng Du, Xuegui Song, Julian Cheng, Norman Beaulieu</i>	

FR2: WATERMARKING AND SOURCE CODING

Hybrid Watermarking Algorithm Based on SVD and Lifting Wavelet Transform for Ownership Verification.....	177
<i>Khaled Loukhaoukha, Jean-Yves Chouinard</i>	

Joint Robust Watermarking and Compression Using Variable-rate Scalar Quantization	183
<i>Yuhan Zhou, En-hui Yang</i>	

FR3: WIRELESS NETWORKS

Adaptive Power Loading for OFDM Cooperative Networks	187
<i>Osama Amin, Murat Uysal</i>	
The Impact of Fading and Interference Cancellation on Node Density ??? Outage Probability Tradeoff in Wireless Networks	192
<i>Vladimir Mordachev, Sergey Loyka</i>	
A Greedy Omnidirectional Relay Scheme	198
<i>Liang-Liang Xie</i>	
On the Achievable Throughput of Multi-bands Decentralized Wireless Networks	201
<i>Soroush Akhlaghi, Akbari</i>	

FR4: COMMUNICATION SYSTEMS 2

Blind Bit-rate Detectors for Variable-gain Multiple-access Systems in Unknown Gaussian Channel	205
<i>Ali A. Tadaion, Mostafa Derakhtian, Saeed Gazor</i>	
Fast Spectrum Search and Detection for BPSK Signals in a Cognitive Network.....	209
<i>Sayed Jalal Zahabi, Ali A. Tadaion, Saeed Gazor</i>	
Novel Rotation Angle for Quasi-orthogonal Space-time Block Codes.....	213
<i>Jian-Kang Zhang</i>	
Asymptotic Error Rates of EGC and SC on Rician Channels with Arbitrary Correlation	217
<i>Shuo Liu, Julian Cheng, Norman Beaulieu</i>	

Author Index