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(CWIT 2013)

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Program

Opening Reception

Welcoming Remarks

P1: Plenary Talk 1

From Information Theory to Statistics: A few modern vignettes

Abstract: While information theory has shared close connections with statistics since its inception, the modern era of "big data" has raised a number of new challenges at this interface. In this talk, we provide an overview of some statistical problems in which information theory has an important role to play. Examples include the problem of inferring the structure of large-scale networks from data, the minimization of convex functions based on noisy gradients, and trade-offs between individual privacy and statistical utility. In each of these settings, information-theoretic methods can be brought to bear in interesting and powerful ways.

S1: Coding I

Energy of Decoding Algorithms

Christopher Blake (University of Toronto, Canada); Frank R. Kschischang (University of Toronto, Canada)
pp. 1-5

Using Bit Recycling to Reduce Knuth's Balanced Codes Redundancy

Ahmad Al-rababa'a (Université Laval, Canada); Danny Dubé (Université Laval, Canada); Jean-Yves Chouinard (Laval University, Canada)
pp. 6-11

When are Maximum Likelihood and Minimum Distance Decoding Equivalent for Binary Contagion Channels?

Ghady Azar (Queen's University, Canada); Fady Alajaji (Queen's University, Canada)
pp. 12-16

On Selection of Optimal Parameters for the WG Stream Cipher Family

Kalikinkar Mandal (University of Waterloo, Canada); Guang Gong (University of Waterloo, Canada); Xinxin Fan (University of Waterloo, Canada); Mark D Aagaard (University of Waterloo, Canada)
pp. 17-21

Properties of the Polarization Transformations for the Likelihood Ratios of Symmetric B-DMCs

Mine Alsan (EPFL, Switzerland)
pp. 22-27

S2: Wireless I

On Optimal Detection Ordering for Coded V-BLAST

Alain Toboso (University of Ottawa, Canada); Sergey Loyka (University of Ottawa, Canada); Francois Gagnon (Ecole de Technologie Superieure, Canada)
pp. 28-32

Practical Theory of Two-Way (True Full-duplex) Wireless: Does More than Doubling the Rate!

Amir K. Khandani (University of Waterloo, Canada)
pp. 33-38

Asymptotic Error Rate Analysis of H-S/EGC Over Arbitrarily Correlated Rician Channels

Xuegui Song (University of British Columbia, Canada); Julian Cheng (University of British Columbia, Canada); Norman Beaulieu (University of Alberta, Canada)
pp. 39-43

An Enhanced Cross-Layer Authentication Mechanism for Wireless Communications Based on PER and RSSI

Peng Hao (The University of Western Ontario, Canada); Xianbin Wang (The University of Western Ontario, Canada); Ahmed Refaey (University of Western Ontario, Canada)
pp. 44-48

S3: Source and Source/Channel Coding

Distortion Bounds for Broadcasting a Binary Source over Binary Erasure Channels

Louis Tan (University of Toronto, Canada); Ashish Khisti (University of Toronto, Canada); Emina Soljanin (Bell Labs, Alcatel - Lucent, USA)
pp. 49-54

Index Assignment Capable of Detecting One Bit Errors for Multiple Description Scalar Quantizers

Yinghan Wan (McMaster University, Canada); Sorina Dumitrescu (McMaster University, Canada)
pp. 55-60

Low and High-Delay Source-Channel Coding with Bandwidth Expansion and Correlated Interference

Ahmad Abou Saleh (Queen's University, Canada); Wai-Yip Geoffrey Chan (Queen's University, Canada); Fady Alajaji (Queen's University, Canada)
pp. 61-65

An Achievability Proof for the Lossy Coding of Markov Sources with Feed-Forward

Shahab Asoodeh (Queen's University, Canada); Fady Alajaji (Queen's University, Canada); Tamas Linder (Queen's University, Canada)
pp. 66-70

Turbo Code using Adaptive Puncturing for Transform Domain Wyner-Ziv Video Coding

Mohamed Haj Taieb (Laval University, Canada); Jean-Yves Chouinard (Laval University, Canada); Demin Wang (Communications Research Center, Canada)
pp. 71-75

CSIT Directors' Meeting

P2: Plenary Talk 2

Realizing Quantum Information Processors

Abstract: Quantum mechanics is the ultimate law of nature and when we can build a device that behaves uniquely quantum mechanically then we may achieve the highest efficiencies allowed by nature. One of the most compelling applications of quantum devices is for information processing. I will describe laboratory scale, small quantum processors: including a bit about how they work and what they are useful for. I will discuss some near term quantum devices, sensors and actuators that are emerging from laboratories. Finally I will include a brief perspective of where we are on the path to building a general-purpose quantum computer.

S4: Shannon Theory

Informational Divergence Approximations to Product Distributions

Jie Hou (Technische Universität München, Germany); Gerhard Kramer (Technische Universität München, Germany)
pp. 76-81

A Unified Relay Framework with both D-F and C-F Relay Nodes

Xiugang Wu (University of Waterloo, Canada); Liang-Liang Xie (University of Waterloo, Canada)
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On the achievability of the Degrees of Freedom for the three-cell MIMO interfering broadcast channel with minimum spatial dimensions

Ahmed Medra (McMaster University, Canada); Timothy N. Davidson (McMaster University, Canada)

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On Separation of Source and Channel Coding in the Finite Block Length Regime

James Ho (University of Waterloo, Canada); Jin Meng (University of Waterloo, Canada); En-hui Yang (University of Waterloo, Canada)
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S5: Wireless II

Cluster Based Coordinated Beamforming and Power Allocation for MIMO Heterogeneous Networks

Kianoush Hosseini (University of Toronto, Canada); Wei Yu (University of Toronto, Canada); Raviraj Adve (University of Toronto, Canada)
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Distributed Resource Allocation in Femtocell Networks

Oleg Petelin (University of Waterloo, Canada); Raviraj Adve (University of Toronto, Canada)
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On Achieving Optimal Degrees of Freedom of MIMO Cellular Networks Using Decomposition

Gokul Sridharan (University of Toronto, Canada); Wei Yu (University of Toronto, Canada)
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Approximate Bounds for Limited Backhaul Uplink Multicell Processing with Single-User Compression

Yuhan Zhou (University of Toronto, Canada); Wei Yu (University of Toronto, Canada)
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Effective Capacity of MIMO MRC System with Constant and Variable Power Loading

Xiaobo Guo (Xidian University, P.R. China); Lei Dong (Xidian University, P.R. China); Ying Li (China Electronic System Engineering Company, P.R. China); Lifeng Wang (China Electronic System Engineering Company, P.R. China)
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S6: Relaying

Power Allocation Schemes For Relay-Based Heterogeneous Networks

Rajiv Devarajan (University of British Columbia, Canada); Shankhanaad Mallick (University of British Columbia, Canada); Vijay Bhargava (University of British Columbia, Canada)
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Two-way Lossy Communication of Correlated Gaussian Sources with Amplify-and-Forward Relaying

Hamidreza Ebrahimzadeh Saffar (University of Waterloo, Canada); Masoud Badiel Khuzani (University of Waterloo, Canada); Patrick Mitran (University of Waterloo, Canada)
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Differential Dual-Hop Relaying over Time-Varying Rayleigh-Fading Channels

M R. Avendi (University of Saskatchewan, Canada); Ha Nguyen (University of Saskatchewan, Canada)
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Scheduling in Omnidirectional Relay Networks

Shuning Wang (University of Waterloo, Canada); Liang-Liang Xie (University of Waterloo, Canada)
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On the Asymptotic Performance of Multiuser Opportunistic DF Cooperative Systems over Frequency Selective Fading Channels Using MMSE SC-FDE

Saed Daoud (Concordia University, Canada); Ali Ghayeb (Texas A&M University at Qatar, Qatar)
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Workshop Banquet

S7: Coding II

Improved Systematic Fountain Codes in AWGN Channel

Khaled F. Hayajneh (Queen's University, Canada); Shahram Yousefi (Queen's University, Canada)
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Streaming Erasure Codes under Mismatched Source-Channel Frame Rates

Pratik Patil (University of Toronto, Canada); Ahmed Badr (University of Toronto, Canada); Ashish Khisti (University of Toronto, Canada)
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Robust Streaming Erasure Codes using MDS Constituent Codes

Ahmed Badr (University of Toronto, Canada); Ashish Khisti (University of Toronto, Canada); Waitian Tan (Hewlett-Packard, USA); John Apostolopoulos (Cisco Systems, USA)
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An efficient Soliton-like network coding protocol for the resource-constrained Y-network

Andrew Liao (Queen's University, Canada); Il-Min Kim (Queen's University, Canada); Shahram Yousefi (Queen's University, Canada)
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Iterative Decoding and Multiuser Communication Using Sparse Space Codes for MIMO Channels

Sagar Dhakal (BlackBerry, USA); Thomas Sexton (Research In Motion, USA); Steve Hranilovic (McMaster University, Canada)
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S8: Optical communication

Optical Communication Using Coherent Detection with Space-Time Coding in the Presence of Atmospheric Turbulence

Mingbo Niu (University of British Columbia, Canada); Julian Cheng (University of British Columbia, Canada); Jonathan F Holzman (University of British Columbia (UBC) Okanagan, Canada)
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Binary Faster than Nyquist Optical Transmission via Non-uniform Power Allocation

Yong Jin Daniel Kim (McGill University, Canada); Jan Bajcsy (McGill University, Canada)
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Electrical-SNR-Optimized Detection Threshold for OOK IM/DD Optical Wireless Communications

Luanxia Yang (The University of British Columbia, Canada); Julian Cheng (University of British Columbia, Canada); Jonathan F Holzman (University of British Columbia (UBC) Okanagan, Canada)
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Systematic Raptor Codes for Atmospheric Optical Channels

Linyan Liu (McMaster University, Canada); Majid Safari (McMaster University, Canada); Steve Hranilovic (McMaster University, Canada)
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Performance of MIMO Adaptive Subcarrier QAM Intensity Modulation in Gamma-Gamma Turbulence

Md. Zoheb Hassan (School of Engineering, University of British Columbia, Canada); Md. Jahangir Hossain (University of British Columbia, Okanagan, Canada); Julian Cheng (University of British Columbia, Canada)
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S9: Communication Theory

Translation Schemes and LP Bounds

Ali Al-Bashabsheh (University of Ottawa, Canada); Yongyi Mao (University of Ottawa, Canada);
Terence H. Chan (University of South Australia, Australia)
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Integrating prior knowledge in time series alignment: Prior optimized time warping

Xiaoguang Yan (York University, Canada); William Gage (York University, Canada); Andrew Eckford
(York University, Canada)
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On the Reserved Sub-Carrier Approach to Achieving N-Continuity for Side-Lobe Reduction in OFDM

Jesse Haber-Kucharsky (University of Waterloo, Canada); Ehsan Haj Mirza Alian (University of
Waterloo, Canada); Patrick Mitran (University of Waterloo, Canada)
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Security Enhancement in Cooperative Jamming Using Compromised Secrecy Region Minimization

Hao Li (The University of Western Ontario, Canada); Xianbin Wang (The University of Western
Ontario, Canada); Weikun Hou (The University of Western Ontario, Canada)
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