2013 13th Canadian Workshop on Information Theory

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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

S2: Wireless I

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)

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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)

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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)

pp. 82-86

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)

S5: Wireless II

S6: Relaying

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); Wai-tian Tan (Hewlett-Packard, USA); John Apostolopoulos (Cisco Systems, USA)
pp. 158-163

An efficient Soliton-like network coding protocol for the resource-constrained Y-network
Andrew Liau (Queen's University, Canada); Il-Min Kim (Queen's University, Canada); Shahram Yousefi (Queen's University, Canada)
pp. 164-168

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)
pp. 169-174

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)
pp. 190-194

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 (Universtiy of British Columbia, Okanagan, Canada); Julian Cheng (University of British Columbia, Canada)
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S9: Communication Theory