Technical Program
Duke University Workshop on Sensing and Analysis of High-Dimensional Data
July 27 - 29, 2015
Monday, July 27

09:15–09:30: Welcome
Lawrence Carin, Duke University

09:30–11:30: Invited Talks I
Chair: Katherine Heller, Duke University
How sparsity and L1 optimization impacts “continuous” applied mathematics, physics and engineering
Stan Osher, University of California, Los Angeles

Iteratively reweighted L1 approaches to sparse composite regularization
Phil Schniter, The Ohio State University

A universal primal-dual convex optimization framework
Volkan Cevher, École Polytechnique Fédérale de Lausanne

Solving random quadratic systems of equations is nearly as easy as solving linear systems
Yuxin Chen, Stanford University

11:30–12:30: Whiteboard Session I
Washington Duke Presidents Gallery

12:30–13:30: Lunch
Washington Duke Presidents I

13:30–15:30: Invited Talks II
Chair: Robert Calderbank, Duke University

Parallel-L0, a fully parallel algorithm for combinatorial compressed sensing
Jared Tanner, University of Oxford

LASSO with nonlinear measurements
Babak Hassibi, California Institute of Technology

Applied random matrix theory
Joel Tropp, California Institute of Technology

Sub-Nyquist sampling without sparsity
Yonina Eldar, Technion

15:30–17:00: Poster Session I
Washington Duke Presidents Gallery
Tuesday, July 28

09:00–10:30: Invited Talks III
Chair: Rebecca Willett, University of Wisconsin-Madison

Sparse if-then rule models
Cynthia Rudin, Massachusetts Institute of Technology

Non-Convex, Bayesian-inspired algorithms for sparse and low-rank estimation
David Wipf, Microsoft Research

Scalable Bayesian nonparametric dictionary learning
John Paisley, Columbia University

10:30–11:00: Coffee Break
Washington Duke Rotunda

11:00–12:00: Invited Talks IV
Chair: Miguel Rodrigues, University College London

Graph matching: relax or not?
Alex Bronstein, Tel Aviv University

The Latent Variable - Autoregressive Latent Trajectory (LV-ALT) model: a general framework for longitudinal data analysis
Ken Bollen, University of North Carolina, Chapel Hill

12:00–13:00: Whiteboard Session II
Washington Duke Presidents Gallery

12:30–13:30: Lunch
Washington Duke Presidents I

13:30–15:30: Invited Talks V
Chair: Galen Reeves, Duke University

Network analysis and nonparametric statistics
Patrick Wolfe, University College London

Elementary estimators for “big-p” statistical models
Pradeep Ravikumar, University of Texas, Austin

High-dimensional biological sequences through simple models and posterior diagnostics
Marc Suchard, University of California, Los Angeles

False discovery rate smoothing
James Scott, University of Texas, Austin

15:30–17:00: Poster Session II
Washington Duke Presidents Gallery

19:00–22:00: Workshop Banquet
Nasher Museum of Art
Wednesday, July 29

09:00–10:30: Invited Talks VI
Chair: Henry Pfister, Duke University

Semidefinite programming relaxations for graph estimation
Andrea Montanari, Stanford University

Correlation mining from massive data: high dimensional sampling regimes
Alfred Hero, University of Michigan

Modeling ordered data by counting inversions
Marina Meila, University of Washington

10:30–11:00: Coffee Break
Washington Duke Rotunda

11:00–12:00: Invited Talks VII
Chair: Sayan Mukherjee, Duke University

Graphical modeling with the Bethe approximation
Tony Jebara, Columbia University

A theory of neural dimensionality, dynamics, and measurement
Surya Ganguli, Stanford University
Whiteboard Session I

Model Selection in High-Dimensional Misspecified Models
Pallavi Basu, University of Southern California

Compressed Sensing without Sparsity Assumptions
Miles Lopes, University of California, Davis

Connections Between Coding and Compressed Sensing
Henry Pfister, Duke University

Efficient PCA for large high-dimensional datasets via Randomized Sketching
Farhad Pourkamali-Anaraki, University of Colorado, Boulder

Scalable Approximations of Marginal Posteriors in Variable Selection
Galen Reeves, Duke University

Learning Single Index Models in High Dimensions
Rebecca Willett, University of Wisconsin-Madison

Whiteboard Session II

ConceFT: Concentration in Frequency and Time
Ingrid Daubechies, Duke University

Hierarchical Graph-Coupled HMMs for Heterogeneous Personalized Health Data
Kai Fan, Duke University

Theoretical Limits in Sparsity and Deep Learning
Raja Giryes, Duke University

Learning mixtures of subspaces
Sayan Mukherjee, Duke University

Abstract Algebraic Subspace Clustering
Manolis Tsakiris, Johns Hopkins University

Randomized blocked algorithms for efficiently computing rank-revealing factorizations of matrices
Sergey Voronin, University of Colorado Boulder
Poster Session I

*Universal Denoising in Approximate Message Passing*
Yanting Ma, North Carolina State University

*Information geometry and model reduction*
Sorin Mitran, University of North Carolina, Chapel Hill

*Spectrally Grouped Edge-Preserving Reconstruction*
Ikenna Odinaka, Duke University

*Random Forests Can Hash*
Qiang Qiu, Duke University

*Complete Dictionary Learning Over the Sphere*
Qing Qu, Columbia University

*Learning Program Attributes in Control Flow Graphs*
Akshay Rangamani, Johns Hopkins University

*Fluorescence Modeling for OB-CD Raman Spectroscopy*
Owen Rehrauer, Purdue University

*Bayesian Nonparametric Higher Order Markov Chains*
Abhra Sarkar, Duke University

*The performance of differentially private PCA*
Anand Sarwate, Rutgers University

*Linear Systems with Sparse Inputs*
Shahin Sefati, Johns Hopkins University

*Computational statistics for CLARITY volumes*
Anish Simhal, Duke University

*Signal processing approaches for genomic data*
Catherine Stamoulis, Harvard Medical School

*Reduced Stochastic Models of Permeable Medium Flow*
Charles Talbot, University of North Carolina, Chapel Hill

*Compressed NMF is Fast and Accurate*
Mariano Tepper, Duke University

*Abstract Algebraic Subspace Clustering*
Manolis Tsakiris, Johns Hopkins University

*Gaussian Process Kernels for Cross-Spectrum Analysis*
Kyle Ulrich, Duke University

*An efficient algorithm for computing a CUR factorization*
Sergey Voronin, University of Colorado Boulder

*Bayesian Or’s of And’s for Interpretable Classification*
Tong Wang, Massachusetts Institute of Technology

*Spatial dependent deep factor model*
Yizhe Zhang, Duke University
Analysis & Simulation Framework: X-ray Threat Detection
Amit Ashok, University of Arizona

Extreme Compressive Sampling for Covariance Estim.
Martin Azizyan, Carnegie Mellon University

Image Reconstruction in Radio Astronomy
Dror Baron, North Carolina State University

Sparse Multinomial Logistic Regression via AMP
Evan Byrne, The Ohio State University

Learning a Personalized CDSS From EHR Data
Dan Coroian, Duke University

Bayesian Cluster Detection for Rare Variants
Jyotishka Datta, Duke University

Burst Deblurring
Mauricio Delbracio, Duke University

Efficient variance estimation for high-dimensional linear models
Lee Dicker, Rutgers University

Model reduction of stochastic biomechanical system
Yan Feng, Duke University

Deep Neural Networks with Random Gaussian Weights: A Universal Classification Strategy?
Raja Giryes, Duke University

Coding and compression in snapshot XRD imaging
Joel Greenberg, Duke University

Compressive Parameter Estimation via AMP
Shermin Hamzehei, University of Massachusetts Amherst

Pose-invariant cross-modality facial expression
Jordan Hashemi, Duke University

On the sample complexity of correlation mining
Alfred Hero, University of Michigan

Minimax Rates for Photon Limited Image Reconstruction
Xin Jiang, University of Wisconsin-Madison

Locating Rare and Weak Material Anomalies by Convex Demixing of Propagating Wavefield Data
Mojtaba Kadkhodaie, University of Minnesota

Variational Automatic Relevance Determination
Yan Kaganovsky, Duke University

NMR structural calculation via semidefinite programming
Yuehaw Khoo, Princeton University

Robust Prediction of DBS targeting structures
Jinyoung Kim, Duke University
Reed-Muller Codes Achieve Capacity on Erasure Channels
Santhosh Kumar, Texas A & M University

Stable Super-Resolution of Mixture Models
Yuanxin Li, The Ohio State University

Belief-Propagation Reconstruction for Compressed Sensing: Quantization vs. Gaussian Approximation
Mengke Lian, Duke University

Partial Face Recognition
Luoluo Liu, Johns Hopkins University

Compressed Sensing without Sparsity Assumptions
Miles Lopes, University of California, Davis

Optical imaging for forensics
John Lu, National Institute of Standards and Technology

Randomized Kaczmarz Algorithm and its Cousins: Exact MSE Analysis and Asymptotically Sharp Bounds
Yue Lu, Harvard John A. Paulson School of Engineering and Applied Sciences