

Technical Program

UCL-Duke U. Workshop on Sensing and Analysis of High-Dimensional Data

Thursday, 4 September 2014

08.00–08.45: Registration

Roberts Foyer, UCL Roberts Engineering Building

08.45–09.00: Welcome

Roberts G06 Sir Ambrose Fleming LT, UCL Roberts Engineering Building

Miguel Rodrigues and John Shawe-Taylor (UCL)

Robert Calderbank and Lawrence Carin (Duke U.)

09.00–10.30: Invited Talks I

Roberts G06 Sir Ambrose Fleming LT, UCL Roberts Engineering Building

Chair: David Dunson, Duke U.

*Conjugate gradient iterative hard thresholding for compressed sensing
and matrix completion*

Jared Tanner, University of Oxford

Breaking the coherence barrier – A new theory for compressed sensing

Anders Hansen, University of Cambridge

Optimal compressive imaging for Fourier data

Gitta Kutyniok, Technical University of Berlin

10.30–11.00: Coffee Break

Roberts Foyer, UCL Roberts Engineering Building

11.00–13.00: Invited Talks II

Roberts G06 Sir Ambrose Fleming LT, UCL Roberts Engineering Building

Chair: Petros Dellaportas, AUEB

Visual pattern encoding on the Poincaré sphere

Aleksandra Pizurica, Ghent University

Tracking dynamic point processes on networks

Rebecca Willett, University of Wisconsin-Madison

Deep Gaussian processes

Neil Lawrence, Sheffield University

*Mondrian forests: Efficient random forests for streaming data via
Bayesian nonparametrics*

Yee Whye Teh, University of Oxford

13.00–14.30: Lunch Break

14.30–15.30: Whiteboard Session I

Roberts Foyer, UCL Roberts Engineering Building

15.30–16.00: Coffee Break

Roberts Foyer, UCL Roberts Engineering Building

16.00–17.30: Poster Session

Roberts Foyer, UCL Roberts Engineering Building

17.30–18.30: Keynote Lecture

Roberts G06 Sir Ambrose Fleming LT, UCL Roberts Engineering Building

Chair: Guillermo Sapiro, Duke U.

TBA

Yann LeCun, Facebook and New York University

19.30–21.30: Workshop Dinner

South Cloisters, UCL

Friday, 5 September 2014

08.00–09.00: Registration

Roberts Foyer, UCL Roberts Engineering Building

09.00–10.30: Invited Talks III

Roberts G06 Sir Ambrose Fleming LT, UCL Roberts Engineering Building

Chair: Arthur Gretton, UCL

NuMax: A convex approach for learning near-isometric linear embeddings

Richard Baraniuk, Rice University

Beyond stochastic gradient descent for large-scale machine learning

Francis Bach, INRIA

Living on the edge: Phase transitions in convex programs with random data

Joel Tropp, California Institute of Technology

10.30–11.00: Coffee Break

Roberts Foyer, UCL Roberts Engineering Building

11.00–12.30: Invited Talks IV

Roberts G06 Sir Ambrose Fleming LT, UCL Roberts Engineering Building

Chair: Ingrid Daubechies, Duke U.

Building an automatic statistician

Zoubin Ghahramani, University of Cambridge

Variable selection in high dimensional convex regression

John Lafferty, University of Chicago

High-dimensional learning with deep network contractions

Stéphane Mallat, Ecole Normale Supérieure

12.30–14.30: Lunch Break

14.30–15.30: Whiteboard Session II

Roberts Foyer, UCL Roberts Engineering Building

15.30–16.00: Coffee Break

Roberts Foyer, UCL Roberts Engineering Building

16.00–17.30: Industry Session – Big Data: Challenges and Opportunities

Roberts G06 Sir Ambrose Fleming LT, UCL Roberts Engineering Building

Moderators: Robert Calderbank (Duke U.) and Patrick Wolfe (UCL)

Panelists: Christophe Bernard (Winton Capital), Christoph Best (Google), Thore Graepel (Microsoft Research), Gabriel Hughes (Elsevier), Yann LeCun (Facebook)

Whiteboard Session I

Hard thresholding pursuit algorithms: The greedy way

Jean-Luc Bouchot, Drexel University // RWTH Aachen University

Asymptotic independence of highly coupled very high dimensional data

Erol Gelenbe, Imperial College London

A new look at mean embeddings

Steffen Grunewalder, University College London

Breaking the coherence barrier – A new theory for compressed sensing

Anders Hansen, University of Cambridge

Compressed sensing with side information

João Mota, University College London

Visual pattern encoding on the Poincaré sphere

Aleksandra Pizurica, Ghent University

Stein shrinkage for cross-covariance operators and kernel independence testing

Aaditya Ramdas, Carnegie Mellon University

The distribution of restricted least squares with a Gaussian matrix (invited)

Galen Reeves, Duke University

Whiteboard Session II

Beyond stochastic gradient descent for large-scale machine learning

Francis Bach, INRIA

Designer Bayes factorizations: Applications to tensors & networks (invited)

David Dunson, Duke University

High-dimensional change-point detection with sparse alternatives (invited)

Farida Enikeeva, University of Poitiers

Bayesian models for social interactions (invited)

Katherine Heller, Duke University

Inference in high-dimensional varying coefficient models

Mladen Kolar, University of Chicago Booth School of Business

Damian Kozbur, ETH Zurich

Fast and robust multiscale methods for high-dimensional data (invited)

Mauro Magionni, Duke University

Kernel MMD, the median heuristic and distance correlation in high dimensions

Aaditya Ramdas, Carnegie Mellon University

Poster Presentations

Sparse inverse covariance estimation with hierarchical matrices

Jonas Ballani, EPFL

On the absence of the RIP in practical CS and the RIP in levels

Alexander Bastounis, University of Cambridge

Efficient inference for joint models of LPF and spiking data

David Carlson, Duke University

Shrinkage mappings and their induced penalty functions

Rick Chartrand, Los Alamos National Laboratory

Deep networks with adapted Haar scattering

Xiuyuan Cheng, Ecole Normale Supérieure

Dictionary designs for compressive sensing and distributed compressive sensing

Wei Chen, University of Cambridge

Unlocking energy neutrality in energy harvesting wireless sensor networks: An approach based on distributed compressed sensing

Wei Chen, University of Cambridge

Mathematically grounded methods for analysing time series data on animal movement

Sarah Chisholm, University College London

Orthogonal matching pursuit (OMP) to reconstruct optical coherence tomography (OCT) image

Yue Dong, University of Liverpool

Refined analysis of sparse MIMO radar

Dominik Dorsch, RWTH Aachen University

Recovery of wavelet expansion from nonuniform Fourier samples via weighted iterative hard thresholding

Jonathan Fell, RWTH Aachen University

Sparsistent additive modeling in multi-task learning

Madalina Fiterau, Carnegie Mellon University

Mladen Kolar, University of Chicago Booth School of Business

Low-complexity compressive sensing detection for spatial modulation in large-scale multiple access channels

Adrian Garcia-Rodriguez, University College London

A multiscale approach to discrete optimal transport

Sam Gerber, Duke University

Multichannel adaptive filtering in compressive domains

Karim Helwani, Huawei European Research Center

Modulator design for binary classification of Poisson measurements

Jiaji Huang, Duke University

Robert Calderbank, Duke University

Analyzing the structure of multidimensional compressed sensing problems through local coherence

Alex Jones, University of Cambridge

Robust uniform recovery of low-rank matrices from Gaussian measurements

Maryia Kabanava, RWTH Aachen University

Matrix completion on graphs

Vassilis Kalofolias, EPFL

Tensor low-rank and sparse light field photography

Mahdad Hosseini Kamal, EPFL

Coherence and sufficient sampling densities for reconstruction in compressed sensing

Franz Kiraly, University College London

Learning with cross-kernels and ideal PCA

Franz Kiraly, University College London

Modeling correlated arrival events with latent semi-Markov processes

Wenzhao Lian, Duke University

MUSIC for single-snapshot spectral estimation: Stability and super-resolution

Wenjing Liao, Duke University

Albert Fannjiang, University of California, Davis

Terahertz imaging via block based compressive sensing

Lin Liu, University of Liverpool

Sparse recovery conditions and realistic forward modeling in EEG/MEG source reconstruction

Felix Lucka, University of Munster

Fast and robust multiscale dictionary learning

Mauro Maggioni, Duke University

Distributed compressed sensing algorithms: Completing the Puzzle

João Mota, University College London

A unified algorithmic approach to distributed optimization

João Mota, University College London

Learning from negative examples for machine translation

Tsuyoshi Okita, Dublin City University

Finite dimensional FRI for reconstruction of sparse signals

Jon Onativia, Imperial College London

Pier Luigi Dragotti, Imperial College London

Supervised learning on an unsupervised atlas
Nikolaos Pitelis, University College London

Compressive classification of a mixture of Gaussians: Analysis, designs and applications
Hugo Reberdo, University of Porto–Instituto de Telecomunicações

Reconstruction of high-dimensional GMM data from low-dimensional features
Francesco Renna, University of Porto-Instituto de Telecomunicações

Classification of high-dimensional data from low-dimensional features in the presence of side information
Francesco Renna, University of Porto-Instituto de Telecomunicações

Order statistics of exponential random variables with imperfect measurement and unknown Gaussian disturbance for resource allocation compression models
Ramiro Samano Robles, Instituto de Telecomunicações/Research Centre of Real Time and Embedded Computer Systems

On asymptotic sparsity in compressed sensing
Bogdan Roman, University of Cambridge

Variational Bayesian inference for sparse matrix factorization
Evangelos Roussos, University of Oxford

Sparse estimation with generalized Beta mixture and the Horseshoe prior
Zahra Sabetsarvestani, Amirkabir University of Technology

Portfolio optimization via manifold learning
Alireza Samani, Duke University

Adaptive MCMC with kernel embeddings
Dino Sejdinovic, Gatsby Unit, University College London

Learning features for classification
Jure Sokolic, University College London

Classification of signals with mismatched MAP classifier
Jure Sokolic, University College London

Achieving compressed sensing physical system via random demodulation
Pingfan Song, Harbin Institute of Technology

Low-rank tensor recovery via Theta bodies
Zeljka Stojanac, University of Bonn

Simple consistent distribution regression on compact metric domains
Zoltan Szabo, Gatsby Unit, University College London

Analysis of brain states from multi-region LFP time-series
Kyle Ulrich, Duke University

Nonlinear information-theoretic compressive measurement design
Liming Wang, Duke University

Semi-deterministic sensing matrices by partial randomly phase modulated unit-norm tight frames
Peng Zhang, Imperial College London

Compressed sensing non-uniformly sparse signals: An asymptotically optimal power allocation
Xiaochen Zhao, Imperial College London
Wei Dai, Imperial College London

Block-structured sparse tensor decomposition for classification of multi-dimensional data
Syed Zubair , University of Surrey
Wenwu Wang, University of Surrey
Jonathon Chambers, Loughborough University