

# Workshop on High-dimensional Stochastic Simulation and Optimisation in Image Processing

Bristol, 27-29 August, 2014

Organised by Marcelo Pereyra

## Preliminary conference programme



*“SuSTaIn is Statistics underpinning Science, Technology and Industry, a programme with the ambitious goal of strengthening the discipline of Statistics in the UK, by equipping it to face the challenges of future applications. Thus the focus is on rigorous and innovative new theory and methodology – core statistics for the 21st century – aimed at and stimulated by generic challenges raised by the ‘data revolution’, in areas as diverse as genomics, astronomy, telecommunications and finance.*

*It is funded principally by a 3.5million Science and Innovation award from EPSRC, and partly by the University of Bristol, and runs from 2006 to 2016.”*

*Guy Nason, Director.*

# Programme

Invited and contributed talks last for 50 and 30 minutes, respectively, including questions.

## Day 1: Wednesday 27th August 2014

- 09.00 – 10.35 Registration & Breakfast
- 10.35 – 10.50 Welcome session
- 10.50 – 11.40 Jean-Christophe Pesquet (University of Paris-Est)
- 11.40 – 11.50 Break
- 11.50 – 12.40 Christophe Andrieu (University of Bristol)
- 12.40 – 14.00 Lunch and coffee
- 14.00 – 14.50 Mario Figueiredo (Technical University of Lisbon)
- 14.50 – 15.00 Break
- 15.00 – 15.50 Rafael Molina (University of Granada)
- 15.50 – 16.20 Coffee break
- 16.20 – 17.10 Jose Bioucas-Dias (Technical University of Lisbon)
  
- 17.30 – 19.30 Wine reception & Poster session

## Day 2: Thursday 28th August 2014

- 09.00 – 09.50 Jean-Yves Tourneret (University of Toulouse)
- 09.50 – 10.00 Break
- 10.00 – 10.50 Steve McLaughlin (Heriot Watt University)
- 10.50 – 11.20 Coffee break
- 11.20 – 12.10 Florence Forbes (INRIA Alpes)
- 12.10 – 13.30 Lunch and coffee
- 13.30 – 14.20 TBC
- 14.20 – 14.30 Break
- 14.30 – 15.00 Yoann Altmann (Heriot Watt University)
- 15.00 – 15.30 Jean Lafond
- 15.30 – 16.00 Coffee break
- 16.00 – 16.30 Philippe Ciuciu (CEA/NeuroSpin - INRIA Saclay)
- 16.30 – 17.00 Susan Doshi (Cardiff University)
- 17.00 – 17.30 Xianghua Xie (Swansea University)
  
- 20.00 – Dinner (Riverstation)

## Day 3: Friday 29th August 2014

- 09.00 – 09.50 Christian Robert (University of Paris-Dauphine)
- 09.50 – 10.00 Break
- 10.00 – 10.50 Peter Green (University of Bristol - UT Sydney)
- 10.50 – 11.20 Coffee break
- 11.20 – 12.10 Jean-François Giovannelli (University of Bordeaux)
- 12.10 – 13.30 Lunch and coffee
- Special session on “Convex calculus and optimisation inspired Monte Carlo methods”*
- 13.30 – 14.00 François Orieux (Institut d’Astrophysique de Paris)
- 14.00 – 14.30 Saïd Moussaoui (Ecole Centrale de Nantes)

**14.30 – 14.40** Break

**14.40 – 15.10** Sylvain Lecorff (Universit Paris-Sud)

**15.10 – 15.40** Marcelo Pereyra (University of Bristol)

**15.40 – End of workshop & Pub**

## Titles of talks (in order of appearance)

**Jean-Christophe Pesquet:** *Stochastic block-coordinate fixed point iterations with applications to splitting.*

**Christophe Andrieu:** *Stability and stabilisation of controlled Markov chains and their applications in statistics..*

**Mario Figueiredo:** *TBA.*

**Rafael Molina:** *Bayesian Modelling and Inference with Applications to Image Recovery and Classification.*

**Jose Bioucas-Dias:** *A convex formulation to image segmentation using hidden fields.*

**Jean-Yves Tourneret:** *Non-linear unmixing of hyperspectral images: Myth or reality?.*

**Steve McLaughlin:** *Residual component analysis of hyperspectral images: Application to joint nonlinear unmixing and nonlinearity detection.*

**Florence Forbes:** *High-dimensional regression with a partially-latent variable model: Application to hyper-spectral image analysis.*

**Yoann Altmann:** *Collaborative sparse regression using correlated supports: Application to hyperspectral unmixing.*

**Jean Lafond:** *Adaptive one-bit matrix completion.*

**Philippe Ciuciu:** *An accelerated proximal gradient algorithm for gradient waveforms design in Magnetic Resonance Imaging.*

**Susan Doshi:** *Statistical image analysis in cone-beam computed tomography..*

**Xianghua Xie:** *Combinatorial optimisation for coronary arterial image segmentation.*

**Christian Robert:** *Approximate Bayesian Computing (ABC) for model choice: from statistical sufficiency to machine learning.*

**Peter Green:** *Emission tomography and Bayesian inverse problems.*

**Jean-François Giovannelli:** *Textured image deconvolution : Bayesian method and MCMC*

*algorithm.*

**François Orieux:** *Sampling high-dimensional Gaussian distributions for large scale inverses problems.*

**Sad Moussaoui:** *A self-tuning multivariate Gaussian sampler in high dimensions.*

**Sylvain Lecorff:** *A shrinkage-thresholding Metropolis adjusted Langevin algorithm for Bayesian variable selection.*

**Marcelo Pereyra:** *Proximal Markov chain Monte Carlo algorithms.*

### **Titles of posters**

**Philippe Ciuciu (CEA/NeuroSpin - INRIA Saclay):** *Physiologically informed Bayesian analysis of ASL functional MRI data using MCMC.*

**Susan Doshi (Cardiff University):** *Bayesian statistical analysis in advanced MR imaging.*

**Mohammed El Hassouni (University of Mohammed V -Agdal):** *Statistical modeling of natural images: Application to texture classification and quality assessment.*

**Yosra Marnissi (University of Paris-Est):** *A majorize-minimize adapted Metropolis-Hastings algorithm.*

**Konstantinos Themelis (National Observatory of Athens):** *A variational Bayes scheme for semi-supervised hyperspectral image unmixing.*