Institut Henri Poincaré

Thematic program of the Centre Émile Borel

«The Mathematics of Imaging»
Paris, January 7th – April 5th, 2019

Workshop «Imaging and Machine Learning»
Paris, April 1st – 5th, 2019
Amphitheater Hermite

All lectures will be videotaped

Organizers: Jean-François Aujol (Université de Bordeaux & IUF), **Julie Delon** (Université Paris Descartes & IUF), **Agnès Desolneux** (CNRS and ENS Cachan), **Jalal Fadili** (ENSICAEN), **Bruno Galerne** (Université d'Orléans), **Gabriel Peyré** (CNRS and ENS)

Invited Speakers:

Chloé-Agathe Azencott (Mines-Paristech)
Francis Bach (INRIA)
Marta Betcke (University College London)
Christoph Brune (University of Twente)
Matthieu Cord (UPMC)
Romain Couillet (Université de Grenoble)
Daniel Cremers (TU Munich)
Marco Cuturi (ENSAE and Google)
Remco Duits (Eindhoven Univ. of Tech.)
Cédric Févotte (CNRS, Toulouse)
Alexandre Gramfort (INRIA)
Hervé Jégou (Facebook)
José Lezama (Universidad de la Republica)
Julien Mairal (INRIA)
Stéphane Mallat (Collège de France)
Naila Murray (Naver)
Alasdair Newson (Télécom ParisTech)
Guillaume Obozinski (Swiss Data Science Center)
Ozan Öktem (KTH)
Patrick Pérez (Valeo)
Valerio Perrone (Amazon)
Alessandro Rudi (INRIA)
Lorenzo Rosasco (MIT-IIT)
Guillermo Sapiro (Duke University)
Mahdi Soltanolkotabi (USC)
Bertrand Thirion (INRIA)
Claire Vernade (Google Deepmind)
Jean-Philippe Vert (Mines ParisTech, Google)
Silvia Villa (Università di Genova)
Irène Waldspurger (CNRS and Paris-Dauphine)
Christian Wolf (Lyon)

PROGRAM

Monday April 1st		
10.30 am – 11.00 am	**Registration and welcome coffee – IHP ground floor**	
11.00 am – 11.45 am	**Alessandro Rudi**	Structured prediction via implicit embeddings.
11.45 am – 12.30 pm	**Julien Mairal**	A Kernel Perspective for Regularizing Deep Neural Networks.
12.30 pm – 02.00 pm	**Lunch break**	
02.00 pm – 02.45 pm	**Romain Couillet**	Random Matrix Advances in Machine Learning.
02.45 pm – 03.30 pm	**Alexandre Gramfort**	Optimization meets machine learning for neuroimaging.
03.30 pm – 04.00 pm	Coffee break	IHP ground floor
04.00 pm – 04.45 pm	**Silvia Villa**	Iterative regularization via dual diagonal descent.
04.45 pm – 05.30 pm	**Valerio Perrone**	Scalable hyperparameter transfer learning.

Tuesday April 2nd		
09.30 am – 10.15 am	**Chloé-Agathe Azencott**	Using structure to select features in high dimension.
10.15 am – 10.45 am	Coffee break	IHP ground floor
10.45 am – 11.30 am	**Naila Murray**	Predicting aesthetic appreciation of images.
11.30 am – 12.15 pm	**Guillermo Sapiro**	Learning Representations for Information Obfuscation and Inference.
12.15 pm – 02.00 pm	**Lunch break**	
02.00 pm – 02.45 pm	**Guillaume Obozinski**	Convex unmixing and learning the effect of latent variables in Gaussian Graphical models with unobserved.
02.45 pm – 03.30 pm	**José Lezama**	Revisiting non-linear PCA with progressively grown autoencoders**.**
03.30 pm – 04.00 pm	Coffee break	IHP ground floor
04.00 pm – 04.45pm	**Daniel Cremers**	Combinatorial Solutions to Elastic Shape Matching.
04.45 pm – 05.30 pm	**Marco Cuturi**	On the several ways to regularize optimal transport.
06.00 pm – 07.30 pm	**Stéphane Mallat**	**Conférence Grand public en français : « L'intelligence Artificielle est-elle Logique ou Géométrique ? » Outreach plenary conferences (in French)**

Wednesday April 3rd		
09.30 am – 10.15 am	**Irène Waldspurger**	Rank optimality for the Burer-Monteiro factorization
10.15 am – 10.45 am	Coffee break	IHP ground floor
10.45 am – 11.30 am	**Ozan Öktem**	Bayesian inversion for tomography through machine learning.
11.30 am – 12.15 pm	**Alasdair Newson**	Understanding geometric attributes with autoencoders.
12.15 pm – 02.00 pm	**Lunch break**	
02.00 pm – 02.45 pm	**Bertrand Thirion**	Statistical inference in high-dimension and application to medical imaging.
02.45 pm – 03.30 pm	**Hervé Jegou**	Multigrain: a unified image embedding for classes and instances.

03.30 pm – 04.00 pm	Coffee break	IHP ground floor
04.00 pm – 04.45pm	**Christoph Brune**	Deep Inversion, Autoencoders for Learned Regularization of Inverse Problems.
04.45 pm – 05.30 pm	**Lorenzo Rosasco**	Optimal machine learning with stochastic projections and regularization.

Thursday April 4th

~~09.30 am – 10.15 am~~	~~**Christian Wolf**~~	~~Learning high-level reasoning in and from images.~~ **CANCELLED!!!**
10.15 am – 10.45 am	Coffee break	IHP ground floor
10.45 am – 11.30 am	**Remco Duits**	Roto-Translation Covariant Convolutional Networks for Medical Image Analysis.
11.30 am – 12.15 pm	**Patrick Pérez**	Unsupervised domain adaptation with application to urban scene analysis.
12.15 pm – 02.00 pm	**Lunch break**	
02.00 pm – 02.45 pm	**Matthieu Cord**	Designing multimodal deep architectures for Visual Question Answering.
02.45 pm – 03.30 pm	**Mahdi Soltanolkotabi**	Towards demystifying over-parameterization in deep learning.
03.30 pm – 04.00 pm	Coffee break	IHP ground floor
04.00 pm – 04.45 pm	**Cédric Févotte**	Nonnegative matrix factorisation with the beta-divergence for robust hyperspectral unmixing
04.45 pm – 05.30 pm	**Stéphane Mallat**	Autoencoder Image Generation with Multiscale Sparse Deconvolutions.
06.30 pm – 10.00 pm	**Cocktail Reception**	**Sorbonne Université**
Registration starting at 06.00 pm		**Tower Zamansky – 24th floor**
		4 place Jussieu – 75005 Paris
		Subway line 7 – Station: Jussieu
		Note: Bring your ID card or Passport

Friday April 5th

09.30 am – 10.15 am	**Jean-Philippe Vert**	Learning from permutations.
10.15 am – 11.00 am	**Marta Betcke**	Learned image reconstruction for high-resolution tomographic imaging.
11.00 am – 11.30 am	Coffee break	IHP ground floor
11.30 am – 12.15 pm	**Claire Vernade**	Contextual Bandit: from Theory to Applications.
12.15 pm – 01.00 pm	**Francis Bach**	On the Global Convergence of Gradient Descent for Over-parameterized Models using Optimal Transport.
Lunch break – end of the workshop		

More information of the trimester «The Mathematics of Imaging»: https://imaging-in-paris.github.io/semester2019/workshop3