Erwan Scornet

Curriculum Vitae

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Current Research

My research work focuses on statistical learning, in particular on non-parametric algorithms such as random forests. They exhibit good accuracy in practice but theoretical results do not entirely explain their good empirical properties. Therefore random forests theory is very exciting. Recently, I started to look at the connections between random forests and neural networks, which are also non-parametric algorithms with tremendous empirical performance.

Training

2009	**Admitted to École Normale Supérieure de Paris,** *by competitive examination based on mathematics and physics*.
2009-2010	**Bachelor in mathematics and physics,** *with honors (bien/très bien)*.
2010-2011	**Master thesis on Metropolis-Hasting algorithm on Riemanian varieties.** *Several other research topics were spherical black holes, modelling growing interface, introduction to statistical learning*.
2011-2012	**Master degree on *Random modelling* from university Paris 7,** *with honors (très bien)*.
Spring/Summer 2012	**Internship at Robert Debré Hospital (Paris) on glycemic variability for diabetic patients**.
2014	**Degree from École Normale Supérieure de Paris** *in mathematics (with a minor in physics)*.
2012-2015	**PhD in statistics** *on "Learning with random forests"* supervised by Gérard Biau (LSTA - University Paris 6) et de Jean-Philippe Vert (Mines - Institut Curie).
March-April 2016	**Visiting Professor Zaid Harchaoui to the Courant Institute (New-York),**.
2016 - ...	**Assistant professor in machine learning,** *at École Polytechnique in Paris* (CMAP).

Teaching

2013-2015	**Probability and Statistics course** *for second year Bachelor students in economy*.
2013-2014	**Tutorial sessions in mathematics** *for second year Bachelor students in Paris Sciences et Lettres (PSL)*.

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2016-2017	**Tutorial sessions in Machine Learning I** *for first year Graduate students in "Big data for business"* (X-HEC).
2016-2017	**Tutorial sessions in "The Art of Regression** *for third year engineering students*.
2016-2017	**Machine Learning Course** *for first year Graduate students in "Big data for business"* (X-HEC).
2016-2017	**Tutorial sessions for Machine Learning II Course** *for third year engineering students*.
2017-2018	**Machine Learning I course** *for first year Graduate students in "Data science for business"* (X-HEC).
2017-2018	**Learning Theory Course** *for third year engineering students*.
2017-2018	**Tutorial sessions for Machine Learning II Course** *for third year engineering students*.

Besides teaching courses, I gave oral tests to Bachelor students for two years in some preparatory class for the "grandes école". From 2009 to 2014, I also participated in a mentoring program directed towards high school students from Paris suburb in order to encourage them to go to the university. I co-organized a week of intensive classes for high school students in August 2013 and August 2014.

Administrative work

2013, 2014	**Co-organizer of a week of intensive classes,** *for high school students* taking place at École Normale Supérieure.
2013 - 2015	**Co-organizer of the PhD students seminar,** *at LSTA, University Paris 6*.
2016 - 2017	**Co-organizer of the "Café des statistiques" weekly seminar,** *at École Polytechnique*.
2017, 2018	**Co-organizer of the one-day conference Young Statistician and Probabilists,** *at Institut Henri Poincaré*.
2017 -	**In charge of data science third-year projects**.
2017 -	**Co-head of the third year of Applied Mathematics** *at École Polytechnique*.
2017 -	**Co-director of the new Graduate Degree "Artificial Intelligence and Advanced Visual Computing",** *starting in September 2018 at École Polytechnique*.
2017 -	**Co-organizer of the Data Science Summer School (DS3),** *August 2017* École Polytechnique.
2012 -	**Reviewer** *for the Journal of Machine Learning Research, The Annals of Statistics, International Conference on Machine Learning 2015, Neural Information Processing Systems 2015*.

Programming skills

LaTeX, R, Python

Communications orales

December 2012	**PhD students seminar, LSTA** *Paris 6.*
March 2013	**Computational Biology team seminar** *Institut Curie.*
June 2013	**Journées de statistique** *Toulouse.*
December 2013	**NIPS, workshop MLCB** *Reno, Nevada.*
March 2014	**PhD students seminar, MAP5** *Paris 5.*
March 2014	**Poster at the colloquium "Digital: Big scale and complexity"** *Institut Mines-Télécom.*
April 2014	**"Random modelling and applications" seminar** *Caen.*
April 2014	**SMILE seminar** *ENS Ulm.*
June 2014	**Journées de statistique** *Rennes.*
January 2015	**Maths & companies week, organized by AMIES** *Paris.*
January 2015	**Young Statisticians and Probabilists conference** *Institut Henri Poincaré.*
February 2015	**Probability and statistics seminar** *Institut de Mathématiques et de Modélisation de Montpellier.*
June 2015	**Journées de statistique** *Lille.*
September 2015	**MODAL seminar** *INRIA Lille.*
October 2015	**Statistic seminar** *Université de Strasbourg.*
November 2015	**STA seminar** *Telecom ParisTech.*
January 2016	**Statistic seminar** *Université de Toulouse.*
June 2016	**Journées de statistique** *Montpellier.*
August 2016	**MAS conference** *Grenoble.*
September 2016	**Statistic seminar** *Compiègne.*
January 2017	**Statistic seminar** *Agro ParisTech.*
May 2017	**Statistic seminar** *MAP5.*
May 2017	**Statistic seminar** *École des ponts.*
July 2017	**Joint Statistical Meetings (JSM 2017)** *Baltimore.*
January 2018	**Workshop on the Interface of Machine Learning and Statistical Inference** *Banff, Canada.*
March 2018	**Conference to prepare high school students to a conference by Yann LeCun** *Bourg La Reine.*
April 2018	**Statistic seminar** *Rennes.*
April 2018	**Statistic seminar** *Versailles.*
May 2018	**Statistic seminar** *Telecom ParisTech.*

Award and distinctions

April 2016 **Grant from the Pierre Ledoux Foundation** *to fund a visit to the Courant Institute(New-York)* .

April 2016 **Recipient of the Jacques Neveu 2016 Prize,** *rewarding a PhD thesis in probability or statistics, received during the MAS conference* (Grenoble, août 2016).

Supervision

July 2013 **Co-supervision of the internship of Nelly Alandou, Clément Benesse et Pablo Le Henaff,** *first-year students in Paris Sciences et Lettres*.

Spring 2014 **Supervision of the internship of Arthur Pajot,** *third-year student at University Paris 6*.

Avril 2015 **Encadrement du stage de découverte du monde de la recherche de Charlotte Rougier,** *lycéenne en première S*.

2016 **Supervision of the internship of Jurriaan Parie,** *third-year student at University Paris 6*.

2016 - **Supervision of several third-year projects in data science,** *at École Polytechnique*.

2016 - **Co-supervision with Stéphane Gaïffas (University Paris 7) of the PhD thesis of Jaouad Mourtada**.

Publications

2015 **Consistency of random forests,** *E. Scornet, G. Biau, and J.-P. Vert* The Annals of Statistics, Vol. 43, pp. 1716-1741.

2016 **On the asymptotics of random forests,** *E. Scornet* Journal of Multivariate Analysis, Vol. 146, pp. 72–83.

2016 **Random forests and kernel methods,** *E. Scornet* IEEE Transactions on Information Theory, Vol. 62, pp. 1485-1500.

2016 **A Random Forest Guided Tour,** *G. Biau and E. Scornet* TEST, Vol. 25, pp. 197-227, with Discussion.

2016 **Promenade en forêts aléatoires,** *E. Scornet* MATAPLI, Vol. 111.

2017 **Kernel multitask regression for toxicogenetics,** *E. Bernard, Y. Jiao, E. Scornet, V. Stoven, T. Walter and J.-P. Vert* Molecular Informatics, Vol. 36.

2017 **Universal consistency and minimax rates for online Mondrian Forest,** *J. Mourtada, S. Gaïffas, E. Scornet* NIPS 2017.

2017 **Tuning parameters in random forests,** *E. Scornet* ESAIM Procs, Vol. 60 pp. 144-162.

2018 **Impact of subsampling and tree depth on random forests,** *R. Duroux, E. Scornet* ESAIM (accepted for publication).

2018 **Neural Random Forests,** *G. Biau, E. Scornet, J. Welbl,* (Submitted).

2018 **Minimax optimal rates for Mondrian trees and forests,** *J. Mourtada, S. Gaïffas, E. Scornet,* (Submitted).

Hobbies

- Stage and lighting director of the musical *Bloody Monday* and *Doré Mirador*.
- Tennis, badminton