Louis Raynal

Doctor in biostatistics

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Born on September 1st, 1993

Positions

October 2019 –	**Postdoctoral researcher**, *Onnela lab, Harvard School of Public Health, Boston, United-States*.
2016 - 2019	**Ph.D. candidate in biostatistics with complementary teaching missions**, *Institut Montpelliérain Alexander Grothendieck (IMAG), University of Montpellier, France*, supervised by Jean-Michel Marin.

Education

2016 – 2019	**Ph.D. in biostatistics**, *Institut Montpelliérain Alexander Grothendieck (IMAG), University of Montpellier*, supervised by Jean-Michel Marin, Title: Statistical inference for intractable likelihood models. Thesis defended on September 10th, 2019.
2014 – 2016	**Master in biostatistics**, *University of Montpellier*.
2011 – 2014	**Bachelor in mathematics - computer science**, *University of Perpignan*. Specialization mathematics.
2011	**High-school degree**, *Jean-Lurçat high school, Perpignan*. Scientific series, specialization Mathematics.

Training

March to June 2016	**Research training**, *supervised by Jean-Michel Marin*. Development of a statistical method to estimate parameters of intractable likelihood models.
July to August 2015	**Research training**, *supervised by Pierre Pudlo and Jean-Michel Marin*. Use of machine learning algorithms and ABC methods to predict demographic parameters in population genetics.
February to June 2015	**Research project**, *supervised by Pierre Pudlo and Paul-Marie Grollemund*. Lasso and Bayesian lasso.

Teaching

2016 – 2018	**Mathematics and statistics for ecology**, *University of Montpellier*, second year biology, lectures/tutorials (108h) and R practical work (45h).
2016 – 2017	**Biostatistics**, *University of Montpellier*, second year biology, tutorials (40.5h).

Research interests

Bayesian statistics • Approximate Bayesian computation • Monte Carlo methods • Random forests • Local approaches • Network data • Mechanistic network models • Agent-based models • Feature selection • Applications to population genetics.

Oral presentations

April 2021	**ABC in Svalvard**, *online.*
March 2021	**Onnela lab seminar**, *online.*
December 2020	**Onnela lab seminar**, *online.*
November 2020	**Bayesian Young Statisticians Meeting**, *online.*
January 2020	**Bayes Comp**, *Gainesville.*
November 2019	**Onnela lab seminar**, *Boston.*
July 2019	**Joint Statistical Meetings**, *Denver.*
June 2019	**51èmes Journées de Statistique**, *Nancy.*
February 2019	**IMAG Ph.D. Students' Day**, *Montpellier.*
May 2018	**50èmes Journées de Statistique**, *EDF Lab Paris Saclay.*
January 2018	**Statistical Methods for Post Genomic Data (SMPGD)**, *Montpellier.*
June 2017	**49èmes Journées de Statistique**, *Avignon.*
April 2017	**Septièmes rencontres des jeunes statisticiens**, *Porquerolles.*
October 2016	**Seminar for IMAG Ph.D. students**, *Montpellier.*

Invited stay

July 10 to 17, 2019   **Invited by Antonietta Mira at the Università della Svizzera italiana, Lugano, Switzerland**, to teach during a week dedicated to approximate Bayesian computation methods (ABC), and to discuss research perspectives linking ABC and network models.

Reviewing work

Journal of Computational and Graphical Statistics.

Contributions

Packages

R	`abcrf` - Approximate Bayesian Computation via Random Forests
Python	`cost_based_selection` - Implementation of cost-based feature selection methods for network classification `https://github.com/LouisRaynal/cost_based_selection`

Publications

Raynal L., Marin J.-M., Pudlo P., Ribatet M., Robert C. P., Estoup A. (2019) **ABC Random Forests for Bayesian Parameter Inference**, *Bioinformatics*, 35(10), 1720–1728.

Estoup A., Raynal L., Verdu P., Marin J.-M. (2018) **Model choice using Approximate Bayesian Computation and Random Forests: analyses based on model grouping to make inferences about the genetic history of Pygmy human populations**, *Journal de la Société Française de Statistique*, 159(3), 167–190.

Chapuis M.-P., Raynal L., Plantamp C., Blodin L., Marin J.-M., Estoup A. (2020) **A young age of subspecific divergence in the desert locust *Schistocerca gregaria***, *Molecular Ecology. Accepted Author Manuscript. doi:10.1111/mec.15663.*

Raynal L., Marin J.-M., Cleynen A. **Local Tree Methods for Classification**, *in revision.*

Raynal L., Chen S., Mira A., Onnela J.-P. (2020) **Scalable Approximate Bayesian Computation for Growing Network Models via Extrapolated and Sampled Summaries**, *Bayesian Analysis*.

Raynal L., Onnela J.-P. (2020) **Summary Statistic Selection for Classification of Networks with Approximate Bayesian Computation**, *submitted to Statistics and Computing*.

Collin F.-D., Durif G., Raynal L., Lombaert E., Gautier M., Vitalis R., Marin J.-M., Estoup A. (2021) **Extending approximate Bayesian computation with supervised machine learning to infer demographic history from genetic polymorphisms using DIYABC Random Forest** *Molecular Ecology Resources*.

Ph.D. thesis manuscript

Raynal L. (2019) **Bayesian Statistical Inference for Intractable Likelihood Models**, *University of Montpellier*.

Computing

Programming	Advanced: R, Python. Basic: C/C++, SAS, MATLAB.
Probabilistic	STAN.
Data base	SQL.
Parallel computing	Parallel High-Performance Computing with Slurm.
Versioning	Git(Hub).
Web	Basic: HTML, CSS.
Scientific writing	LaTeX.
Software	Words processing, spreadsheets, presentations.

Languages

French	Native.
English	Good.