Angelina Roche

Assistant professor

General informations

— Born on August 26, 1988, in Montpellier.
— 2 children (born in 2016 and 2019).

Research Themes

— Functional Data.
— Dimensionality Reduction, Principal Component Analysis.
— Adaptive Estimation : Kernel Estimation, Model Selection.
— Regression : Inverse Problems, Sparse Estimation for Functional Data.

Education and Experience

2015– **Associate Professor**, *CEREMADE and MIDO Department*, University of Paris-Dauphine
  — 2023–2024 : Part-time teacher, Ecole Polytechnique.
  — Demi-délégation CNRS au LMRS (Univ. de Rouen) en 2023.
  — Demi-délégation CNRS au Ceremade en 2022.
  — CRCT en 2018–2019 (6 mois).

2014–2015 **Temporary Lecturer (ATER)**, *MAP5 Laboratory and IUT*, University of Paris Descartes

2011–2014 **Ph.D.**, *Institut de Mathématiques et de Modélisation de Montpellier (I3M)*, Université Montpellier II, Statistical Modeling for Functional Data : Non-asymptotic Approaches and Adaptive Methods, under the supervision of Élodie Brunel and André Mas
  Referees : Jan Johannes and Patricia Reynaud-Bouret.

Doctoral and Postdoctoral Supervision

— Since October 2022, co-supervision, with Franck Picard (ENS de Lyon) and Vincent Rivoirard (Paris-Dauphine), of Nassim Bourarach's Ph.D. thesis on *Functional PCA and Count Data*. Funding from Dauphine Graduate School (ED Dauphine).
— From April to September 2022, co-supervision, with Franck Picard (ENS de Lyon) and Vincent Rivoirard (Paris-Dauphine), of Nassim Bourarach's M2 internship on *Functional PCA and Count Data*.
— From September 2020 to September 2021, co-supervision, with Gaëlle Chagny (Univ. Rouen), of Anouar Meynaoui's postdoctoral research, funded by ANR SMILES.
— Co-supervision, with Franck Picard (Univ. Lyon I) and Vincent Rivoirard (Univ. Paris-Dauphine), of Ryad Belhakem's Ph.D. thesis on *Statistical Study of Functional Principal*

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Last update : 28 novembre 2023   1/8

Component Analysis in Univariate and Multivariate Settings, defended on June 10, 2022. Funding from DIM Math-Innov (Île-de-France region). Ryad is currently employed as a data scientist at Quantmetry.

List of publications and submitted works

Submitted works

[S1] Belhakem, R., Picard, F., Rivoirard, V., Roche A. Minimax estimation of Functional Principal Components from noisy discretized functional data, arXiv :2110.12739, in revision for *Scandinavian journal of Statistics.*

[S3] Chagny, G., Meynaoui, A., Roche, A. Adaptive nonparametric estimation in the functional linear model with functional output <hal-03579232>, submitted.

Accepted or published papers

[P10] Roche, A. (2023) Variable selection and estimation in multivariate functional linear regression via the Lasso, *Electronic Journal of Statistics*, **17** (2), 3357–3405.

[P9] Roche, A. (2022). New perspectives in smoothing : minimax estimation of the mean and principal components of discretized functional data.. *The Graduate Journal of Mathematics*, Special issue in Probability and Statistics (article commissioned by the editorial board), **7** (2), pp.95 - 107. ⟨hal-03779051⟩

[P8] Chagny, G., Channarond, A., Hoang, V.-H., Roche, A. (2022). Adaptive nonparametric estimation of a component density in a two-class mixture model <hal-02909601v1>, *Journal of Statistical Planning and Inference*, **216**, 51–69.

[P7] Bitseki-Penda, V. and Roche, A. (2020) Local bandwidth selection for kernel density estimation in bifurcating Markov chain model, *Journal of Nonparametric Statistics*, **32**(3), 535–562.

[P6] Roche, A. (2018) Local optimization of black-box functions with high or infinite-dimensional inputs. Application to nuclear safety. *Computational Statistics*, **33**(1), 467–485.

[P5] Chagny, G., Comte, F. and Roche, A (2017). Adaptive estimation of the hazard rate with multiplicative censoring, *Journal of Statistical Planning and Inference*, **184**, pp. 27–47.

[P4] Brunel, É., Mas. A. and Roche, A. (2016). Non-asymptotic Adaptive Prediction in Functional Linear Models, *Journal of Multivariate Analysis*, **143**, pp. 208–232.

[P3] Chagny, G. and Roche, A. (2016). Adaptive estimation in the functional nonparametric regression model, *Journal of Multivariate Analysis*, **146**, pp. 105–118.

[P2] Brunel, E. and Roche, A. (2015). Penalized contrast estimation in functional linear models with circular data. *Statistics*, **6**, pp. 1298–1321.

[P1] Chagny, G. and Roche, A. (2014). Adaptive and minimax estimation of the cumulative distribution function given a functional covariate. *Electronic Journal of Statistics*, **8**, pp. 2352–2404.

Communications accepted in conferences with proceedings

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Last update : 28 novembre 2023 2/8

[C6] Belhakem, R., Picard, F., Rivoirard, V. et Roche, A. Vitesses de convergence minimax en ACP pour données fonctionnelles discrétisées et bruitées. Journées de Statistique, 2023, Bruxelles, Belgique.

[C5] Mula, O., Roche, A., Ryder, R., Saccaro, L., Sambattaro, G. Forecasting with ABC credible intervals in agent-based dynamical systems, ISBA 2022, Montréal, Canada.

[C4] Chagny, G., Meynaoui A, et Roche, A. Minimax estimation in the functional regression model with a functional output, 5th International Workshop on Functional and Operatorial Statistics, initialement prévu à Brno République Tchèque en 2020, reportée en ligne en 2021.

[C3] Roche, A. Variable selection in multivariate functional linear model via the Lasso, 5th International Workshop on Functional and Operatorial Statistics, IWFOS 2021, initialement prévu à Brno République Tchèque en 2020, reportée en ligne en 2021.

[C2] Mathilde Sautreuil, Caroline Bérard, Gaëlle Chagny, Antoine Channarond, Angelina Roche, et Nicolas Vergne. Modèle de mélange binomial négatif bivarié pour l'analyse de données RNA-Seq. Journées de Statistique, 2018, Paris, France.

[C1] Chagny, G. et Roche, A. Adaptive and Minimax estimation of the cumulative distribution function given a functional covariate. In *Contributions in infinite dimensional statistics and related topics*, pp. 79–94, 3rd International Workshop on Functional and Operatorial Statistics, 2014, Stresa, Italie.

Editorial Activity/vulgarisation

Member of the editorial committee of Tangente special issue no. 86, May 2023, *Les nouveaux défis de la statistique*.

Expertise and Scientific Engagement

Thesis Juries and Monitoring Committees

— Member of the thesis jury for Elvire Roblin's thesis on *Developments of Neural Networks for Censored Data : Survival Prediction with Uncertainty Measurement and Treatment Recommendation*, defended on March 31, 2023 at the Institut Gustave Roussy (supervised by Paul-Henry Cournède and Stefan Michiels).

— Member of the thesis jury for Ahmed Zaoui's thesis on *Estimation of the Variance Function in Regression and Its Applications*, defended on December 8, 2022 at the Université Gustave Eiffel (supervised by Christophe Denis and Mohamed Hebiri).

— Member of the thesis jury for Mathilde Sautreuil's thesis on *Contributions to Marker Detection and Survival Analysis in Oncology*, defended on April 12, 2021 at Centrale Supelec (supervised by Paul-Henry Cournède and Sarah Lemler).

— Member of the monitoring committee for Laetitia Della Maestra's thesis (supervised by Marc Hoffman).

— Member of the monitoring committee for Marion Naveau's thesis (supervised by Maud Delattre and Laure Sansonnet).

Selection Committees

— Member of the selection committee for a permanent position (CDI) and a fixed-term position (CDD) without research mission in *Mathematics* at Paris-Dauphine in 2023.

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Last update : 28 novembre 2023   *3/8*

— Member of the selection commission for the M1 Applied Mathematics program at the University of Paris-Dauphine for 2 years.
— Member of selection committees for Assistant Professor (MCF) positions in *Statistics* at the University of Aix-Marseille in 2023, *Mathematical Statistics, Applied Statistics* at INSA Toulouse, and *Data Science, Statistical Learning, Random Models, Actuarial Science, Numerical Methods* at the University of Le Mans in 2021.
— Member of the selection committee for a permanent position in *Quantitative Finance* at Centrale Supélec in 2020.
— Member of the selection committee for the Assistant Professor (MCF) position in section 26 *Statistics and Probability* at Paris-Dauphine in 2017.
— Reviewer for various journals, including *Annals of Statistics*, *JRSSC* (Journal of the Royal Statistical Society : Series C), *Metrika*, *Annales de l'IHP* (Annals of the Institut Henri Poincaré), *Journal of Multivariate Analysis*, *Computational Statistics*, *Bernoulli*, *ESAIM P&S* (Probability and Statistics), *Statistics*, *Scandinavian Journal of Statistics*, *Statistics and Probability Letters*, *Electronic Journal of Statistics*, *Journal of the Korean Statistical Society*, and *Journal de la Société Française de Statistique* (Journal of the French Statistical Society).
— Reports for MathSciNet (from 2014 to 2019).

Fundings

— PI of an ANR project (PRC) *Mathematical Statistics for Functional Data* submitted under the AAPG 2023 (16 participants including 1 foreign researcher, two partner laboratories)
— ANR Project *SingleStatOmics - Statistics and Machine Learning for Single Cell Genomics* (Project Leader : Franck Picard)
— ANR Project *ABSint - Approximate Bayesian Solutions for Inference in Large Datasets and Complex Models* (Project Leader : Christian Robert).
— ANR Project *SMILES - Statistical Modeling and Inference for Unsupervised Learning from Massive Data* (Project Leader : Faicel Chamroukhi).
— Emergences M&M's Project *Measures and Models* (Project Leader : Olga Mula).
— PEPS Young Researchers Project *MESAnGe - Modeling and Statistical Estimation for Genome Analysis* (Project Leader : Gaëlle Chagny).

National Responsibilities

— Since June 2021 : Elected member of the National University Council (CNU) in section 26 (Applied Mathematics).
— Since July 2020 : Elected member of the board of the Mathematical Statistics Group of the *French Statistical Society* (SFdS), served as Vice-President of the group in 2021, and President of the group since September 2022.
— June 2016–June 2019 : Elected member of the board of the *Young Statisticians* group of the SFdS, appointed as Secretary and then President of the group between June 2018 and June 2019.

Local Responsibilities

— Since September 2023 : Elected as an external member of the Research Commission at the Université Paris-Cité.

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Last update : 28 novembre 2023   *4/8*

— Since November 2021 : Member of the Mathematics CCR (Research Commission).
— Since December 2020 : Elected to the Academic Senate of Paris Sciences et Lettres (PSL Comue).
— From November 2017 to November 2020 : Elected to the scientific council of the University of Paris-Dauphine.

Organization of Conferences and Seminars

— Since September 2022 : Co-organizer, with Robin Ryder, of the Statistical Meetings at Ceremade, a statistics seminar (1 presentation per month).
— August 2022 : Organizer of the session on *Penalization Methods* at the MAS 2022 conference in Rouen.
— January 2022 : Member of the organizing committee for the Stat-Math Group's conference day.
— October 2021 : Member of the organizing committee for the international conference on *End-to-end Bayesian Learning* at CIRM, Marseille.
— From October 2017 to March 2020 : Co-organizer, with Olga Mula and Robin Ryder, the STAT-NUM working group at Ceremade.
— January 2019 : Co-organizer, with Valérie Robert and Geneviève Robin, of the 7th YSP (Young Statisticians and Probabilists) day at the Institut Henri Poincaré (Paris).
— August 2018 : Organizer of the session on *Kernel Estimation : New Approaches for Bandwidth Selection* at the MAS 2018 conference in Dijon.
— June 2017 : Co-organizer, with Vincent Brault and Soufiane Kharbach, of the Young Statisticians and Invited Speakers Meeting at JdS 2017 (Avignon).

Communications

Seminars

2023

— Mathematics of decision making and statistics seminar, Toulouse School of Economics (TSE), September 28.
— Statistics Working Group at LMRS, University of Rouen, May 11.
— Probability and Statistics Seminar at IMAG, University of Montpellier, March 13.

2022

— Statistics Seminar at the Ecole Polytechnique Fédérale de Lausanne, May 6.

2021

— CoVeille Day, UTC Compiègne, November 26.
— Parisian Statistics Seminar, IHP, September 20.

2020

— Statistics Seminar, AgroParisTech, February 3.
— PSPP Seminar, EDF Chatou, March 12.

2019

— MAP5 Statistics Seminar, Paris Descartes, June 21.

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Last update : 28 novembre 2023   5/8

— Big Data Working Group, LEDa, Dauphine, "Introduction to Random Forests," June 20.
— Probability and Statistics Seminar, Orsay, May 16.

2018

— I2M Statistics Seminar, Marseille, January 29.

2017

— STAT-NUM Working Group, Paris-Dauphine, November 6.
— Probability and Statistics Seminar at IMAG, Montpellier, October 9.
— IMT Statistics Seminar, Toulouse, June 6.
— LMV Probability and Statistics Seminar, University of Versailles-St Quentin, April 25.
— Modal'X Seminar, University Paris Nanterre, April 20.

2016

— Parisian Statistics Seminar, September 12, IHP.
— APSPP Seminar, EDF R&D, May 3, Chatou.
— Statistics Seminar, University Lille 3, January 28.
— SPOC Seminar, University of Dijon, January 13.

2015

— Statistics Seminar, KU Leuven, December 10, 2015.
— University of Heidelberg, Research Group "Inverse Problems Statistics," November 12.
— Seminar "Random Models and Applications," June 23, University of Caen.
— Statistics Working Group, June 18, University of Rouen.
— Statistics and Imaging Working Group, March 9, University Paris Dauphine.
— Probability and Statistics Seminar, January 28, University Lille I.
— Parisian Statistics Seminar, January 12, IHP.

2014

— ENSAI Statistics Seminar, December 19, Rennes.
— LMAC Seminar, November 4, Compiègne.
— IMT Statistics Seminar, October 21, Toulouse.
— Probability and Statistics Seminar, April 28, Montpellier.

2013

— LSTA Doctoral Seminar, November 19, Paris.
— Seminar in Applied Mathematics and Statistics, November 13, Copenhagen.
— Image Group Lunch Meeting, Computer Science Department, University of Copenhagen, November 11.
— Statistics Seminar, MAP5 Laboratory, June 14, Paris.
— Probability and Statistics Seminar, June 5, Dijon.

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Last update : 28 novembre 2023   *6/8*

— I3M Doctoral Seminar.

Conference and Workshop Presentations

— 54th Journées de Statistique, July 3-7, 2023, Brussels.

— Conference on Statistical Estimation, June 12-14, 2023, Saint-Étienne (invited).

— CoVeille Project Closing Day, November 26, 2021, Compiègne (invited).

— HCM Workshop : High-Dimensionality and Data Analysis, September 17, 2021, Bonn, Germany (invited).

— CEMRACS 2021, CIRM, Marseille (invited).

— IWFOS 2021 Conference, held online, originally scheduled in Brno, Czech Republic in 2020.

— Emergences Mesures et Modèles Project Launch Day, January 10, 2019, Paris-Dauphine.

— Workshop – Advances in Functional Data Analysis : Cluster, location and shape, October 24-26, 2018, Rennes (invited).

— S4D 2018 : Research summer school on statistics and data science, June 18-22, 2018, Caen.

— 50th Journées de Statistique, May 28 - June 1, 2018, Saclay.

— Journées JSTAR, Rennes, April 12, 2018 (invited).

— XIIIème colloque Franco-Roumain de mathématiques appliquées, August 25-29, 2016, Iaşi, Romania (invited).

— 48th Journées de Statistique, May 30 - June 3, 2016, Montpellier.

— ISNPS III, June 11-16, 2016, Avignon.

— ANR Calibration Final Conference, April 4-6, 2016, Nice (invited).

— 46th Journées de Statistique, June 1-5, 2015, Lille.

— ANR Calibration Conference, February 18-20, 2015, Nice (invited).

— Third International Workshop on Functional and Operatorial Statistics (IWFOS 2014), June 19-21, 2014, Stresa, Italy.

— Functional and Complex Structure Data Analysis, 14th course in the ECAS Programme, September 17-21, 2013, Castro Urdiales, Spain (with poster).

— Seminar "Mathematical Statistics and Applications," September 2-6, 2013, Fréjus.

— 45th Journées de Statistiques, May 27-31, 2013, Toulouse.

— I3M Doctoral Day, February 2013.

— 7th Functional and Operatorial Statistics Days, June 28-29, 2012, Montpellier.

— 44th Journées de Statistiques, May 21-25, 2012, Brussels.

— Doctiss, doctoral school conference (with poster), May 2012.

Invitations

— EPFL, Lausanne, May 2022 (2 days), collaboration with Victor Panaretos.

— Jesus College, Oxford, November 2018 (2 days), collaboration with Judith Rousseau.

— Institut de Mathématiques de Bourgogne, University of Burgundy, Dijon, January 2016 (2 days), collaboration with Valère Bitseki-Penda.

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Last update : 28 novembre 2023   7/8

— Institut für Angewandte Mathematik (Research Group : Inverse Problems Statistics), Ruprecht-Karls-Universität Heidelberg, November 2015 (4 days), invitation by Jan Johannes.
— LMRS, University of Rouen, April 2014 (4 days), June 2015 (3 days), September 2015 (3 days), collaboration with Gaëlle Chagny.
— Department of Mathematical Sciences, University of Copenhagen, Denmark, November 2013 (10 days), February-March 2014 (2 months).
— Laboratoire MAP5, Université Paris Descartes, June 2013 (3 days), collaboration with Gaëlle Chagny.

Teaching and teaching responsibilities

Teaching as an associate professor at Paris-Dauphine

— Lectures, tutorials, and labs for *Linear Models and Generalizations*, M1 Applied Mathematics.
— Lecture series on *Non-parametric Statistics*, M2 Statistical and Financial Engineering.
— Lecture series on *Statistical Learning*, M2 Statistical and Financial Engineering.
— Lecture series on *Data Analysis*, Executive Master in Statistics and Big Data.
— Lecture series on *Statistics*, L3 Economics.
— Tutorials for *Statistical Modelling*, L3 Mathematics.
— Lectures, tutorials, and labs for *Statistical Learning and High Dimension*, M1 Applied Mathematics.
— Lecture series on *Time Series*, Executive Master in Statistics and Big Data.
— Supervision of student dissertations in M2 Actuarial Science and research initiation projects in L3 CPES.
— Lectures and tutorials for *Time Series*, M1 Applied Mathematics.
— Tutorials for *Introduction to Non-parametric Statistics*, M1 Applied Mathematics.
— Tutorials and labs for *Multidimensional Probability* and *Linear Algebra*, L2 Mathematics/Computer Science.
— Participation in the supervision of the "Statistics and Journalism" workshops at IPJ (Institut Pratique de Journalisme).

Teaching responsibilities

— Since June 2023 : Co-responsible, along with Pierre Cardaliaguet, for the M1 Mathematics and Applications program at the University of Paris-Dauphine.
— Since June 2023 : Member of the jury for the M2 ISF program.
— From October 2017 to March 2022 : Elected to the council of the MIDO teaching department.
— Member of the selection commission for the M1 Applied Mathematics program at the University of Paris-Dauphine for 2 years.

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Last update : 28 novembre 2023 8/8