Bertille FOLLAIN

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CV updated on 07/11/2024

Education

Sep 2021– Nov 2024 **Ph.D. in Applied Mathematics/Computer Science**, Ecole Normale Superieure and INRIA Paris, Paris 13ème, France.

- **Ph.D. Thesis Title:** *Betting on Sparsity Leveraging Hidden Linear Features through Regularisation for Supervised Learning* supervised by **Francis Bach**, Sierra team

Sep 2020– Jun 2021 **MASt in Mathematical Statistics**, Distinction, University of Cambridge, Cambridge, UK.

- **Essay** "*Statistical Properties of Stochastic Gradient Descent*," under the supervision of **Prof. Richard Samworth**

Sep 2017– Aug 2021 **Diplôme d'ingénieur**, GPA: 3.96/4, Rank: 22/540, Ecole Polytechnique, Palaiseau, France.

- **Thesis** "*Partitioning of Data Structured in Graphs*", under the supervision of **Prof. Sébastien Gadat**
- **Group Project** "*Spotting Match-fixing in Tennis through Statistics and Machine Learning*", under the supervision of **Prof. Eric Moulines**
- **Project** "*Image In-painting with Convolutional Neural Networks*"

Sep 2015– Jun 2017 **Classe Préparatoire aux Grandes Ecoles MPSI-MP***, Lycée Louis-le-Grand, Paris 5ème, France.

- **Thesis:** "*Spectral Clustering on non-convex 2D data. Theory and implementation*"

Jul 2015 **Baccalauréat Scientifique Section Européenne**, Mention Très Bien, Félicitations du Jury, Lycée Guillaume-le-Conquérant, Lillebonne (Seine-Maritime), France.

Research & Work Experiences

Sep 2023– Nov 2023 **ML Engineer**, DGEX Solutions, SNCF Réseau.

- Embedded the French railway network from a graph structure to a d-dimensional Euclidean space for use by a delay prediction system
- Participated in the submission of an innovative project for the CORIFER 2023 call for proposals

Mar 2020–
Aug 2020

Visiting Research Student, Statistical Laboratory, University of Cambridge, under the supervision of Prof. Richard J. Samworth and Prof. Tengyao Wang.

- Developed a method and algorithm for the detection of multiple changepoints in high-dimensional data with heterogeneous missingness

Jun 2019–
Aug 20129

R&D Intern, CortAIx, Thales Digital, Montreal.

- Chose and implemented an Explainable AI method for Reinforcement Learning (based on DQN) for the LunarLander environment and the company's simulator

Publications

- Bertille Follain and Francis Bach, "Enhanced Feature Learning via Regularisation: Integrating Neural Networks and Kernel Methods", 2024, preprint. Available from `https://arxiv.org/abs/2407.17280`
- Bertille Follain and Francis Bach, "Nonparametric Linear Feature Learning in Regression Through Regularisation", 2024, Electronic Journal of Statistics, 18(2), 4075-4118. Available from `https://doi.org/10.1214/24-EJS2301`
- Bertille Follain, Tengyao Wang and Richard J. Samworth, "High-dimensional changepoint estimation with heterogeneous missingness", 2022, Journal of the Royal Statistical Society: Series B (Statistical Methodology), 84(3), 1023–1055. Available from `https://doi.org/10.1111/rssb.12540`

Awards & Prizes

- 2022 ICSDS Student Travel Awards, given by the Institute of Mathematical Statistics (800$)
- Prix junior Maryam Mirzakhani in Applied Mathematics, 2021, given by Fondation Mathématique Jacques Hadamard (1000€)
- Senior Scholar, 2021, given by Trinity College (250£)
- Examination Prize, 2021, given by Trinity College, (240£)
- Research Internship Prize, 2020, given by Ecole Polytechnique
- Knox Studentship for French Students, 2020, given by Trinity College (20k£)

Talks

Dec 2022 **International Conference on Statistics and Data Science, organised by the IMS in Florence**, "High-dimensional changepoint estimation with heterogeneous missingness".

Nov 2022 **Junior Seminar AI & Digital Healthcare, Heka, INRIA**, "High-dimensional changepoint estimation with heterogeneous missingness".

Oct 2022 **Seminar of the Centre for Statistics, University of Edinburgh**, "High-dimensional changepoint estimation with heterogeneous missingness".

Jul 2022 **3-day meeting of statisticians in Paris, organised by the University of Luxembourg**, "High-dimensional changepoint estimation with heterogeneous missingness".

May 2022 **International day of women mathematicians, Institut des Hautes Etudes scientifiques**, Presentation of the event.

Feb 2022 **Dyoegene's seminar, INRIA Paris**, "High-dimensional changepoint estimation with heterogeneous missingness".

Jan 2022 **Pr. Samworth's group meeting, Statistical Lab, University of Cambrige**, "High-dimensional changepoint estimation with heterogeneous missingness".

Attendence at Winter/Summer Schools and Conferences

Sep 2024 **Heidelberg Laureate Forum, Heidelberg**.

Jun 2024 **Learning and Optimisation in Luminy, Marseille**.

Jun-Jul 2023 **Climate Change AI Summer School, online**.

Apr 2023 **12th International Conference on Climate Informatics, Cambridge UK**.

Jan 2023 **Optimisation and Statistical Learning, Les Houches, France**.

Teaching Experiences

Feb 2023–May 2023 **Teaching Assistant**, Introduction to Machine Learning for Computer Science and Mathematics students in 1st year (L3), Ecole Normale Supérieure, Paris, France.

Sep 2022–Jan 2023 **Teaching Assistant**, Differential Equations and Probabilities for Engineering students in 1st year (L3), Ecole des Mines, Paris, France.

Sep 2021–Jan 2022 **Teaching Assistant**, Statistics and Probabilities for Economic students in 3rd year (L3), Sorbonne, Paris, France.

Sep 2018–Jun 2020 **Oral Examiner (Colleur)**, Mathematics for 1st year undergraduates, Lycée Fénelon, Paris 12ème, France.

Sep 2017–Mar 2018 **Support Professor**, Provided academic support to 95 undergraduates with issues in mathematics, Lycée d'Etat Jean Zay, Paris 16ème, France.

Other Experiences

2022-2023 **Femmes et Sciences program at PSL Research University**, participant.

2022 **Reviewer**, JMLR.

Sep 2021–Sep 2022 **GLUE, Environmental group of Inria Paris**, Founding Member, Co-organised a three events conference cycle with researchers from Institut Pierre-Simon Laplace (IPSL), co-organised Climate week at the Institute (Fresque du climat, Atelier 2tonnes, conferences)..

Oct 2022 **Rendez-vous des Jeunes Mathématiciennes et informaticiennes**, Co-organiser of a two-day event at INRIA Paris showcasing mathematics and informatics to high-school girls, `https://filles-et-maths.fr/rjmi/`.

Skills

- **Programming**
  Python (sklearn, numpy, pandas, pytorch...), R
- **Other**
  LaTeX, Git

Languages

- **French:** Native
- **English:** Fluent (TOEFL: 118/120)
- **Spanish:** Good notions, around B1/B2

Other Interests

Sport	Yoga, hiking, cyclo-tourism
Baking	Pies, crèmes brulées and british cakes
Piano	14 years, particularly film scores
Permaculture	Internship at "La ferme du Bec-Hellouin"