Déborah Sulem

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Academic positions

July 2024 – present	**Assistant Professor (tenure-track) of Data Science, Università della Svizzera italiana**, *Faculty of Informatics*, Lugano, Switzerland.
Jan 2023 – June 2024	**Postdoctoral researcher, Pompeu Fabra University - Barcelona School of Economics**, *Department of Economics and Business, Center for Data Science*, Barcelona, Spain.

Visiting positions

Jan – Mar 2024 Aug – Sept 2023	**Visiting researcher, Okinawa Institute of Sciences and Technology**, *Machine Learning and Data Science Unit*, Okinawa, Japan.

Education

Sept 2018 – Dec 2022	**Ph.D. in Statistics and Machine Learning, University of Oxford**, *Oxford, UK*, Department of Statistics. *Supervisors:* Professors Mihai Cucuringu, Judith Rousseau, Xiaowen Dong, and Vincent Rivoirard. *Thesis title:* "Flexible estimation in temporal point processes and graphs" *Thesis examiners:* Professors Seth Flaxman and Subhashis Ghoshal
Sept 2015 – Sept 2018	**Diplôme d'ingénieur, Ecole Polytechnique**, Paris, France. Rank 1 in national entrance competitive exam in Physics. Specialisation in Theoretical Physics and Applied Mathematics.
Sept 2013 – July 2015	**Classes préparatoires aux Grandes Ecoles, Lycée Louis-le-Grand**, Paris, France. Coursework in Physics, Chemistry and Mathematics.
Sept 2010– July 2013	**Secondary high school, Lycée Louis-le-Grand**, Paris, France. Scientific *Baccalauréat*.

Work Experience

Sept – Dec 2022	**Visiting Ph.D. student, University of Chicago**, *Department of Statistics, Data Science Institute*, Chicago, USA.
Jul – Nov 2021	**Applied Scientist Intern, Amazon Research**, *Berlin, Germany*. Explainability for Machine Learning team.
Apr – Aug 2018	**Research Intern, New York University**, *Center for Data Science, Courant Institute of Mathematical Sciences*, New York City, USA. Master thesis on Hierarchical Graph Neural Networks under the supervision of Professor Joan Bruna.
Jun – Jul 2017	**Undergraduate Intern, TINE SA**, *Oslo, Norway*, Logistics, Supply Chain Department. Project on the prediction of safety stocks for perishable products.
Sept 2015 – Apr 2016	**Military Police Officer - Gendarmerie Nationale**, Le Havre, France. Chief-assistant of a unit in charge of the security of port facilities.

Teaching Experience

Sept – Dec 2023   **Master's Course Leader** - **Barcelona School of Economics**, Barcelona, Spain.
- "Foundations of Data Science" - Masters in Economics and Finance (40h/87 students).

2019 – 2022   **Teaching Assistant and Tutor** - **University of Oxford**, *Department of Statistics*, Oxford.
- "Advanced Topics in Statistical Machine Learning" - Masters/4th year students in Mathematics and Statistics (12h/10 to 20 students per year)

Oct – Dec 2020   **Tutor in Machine Learning** - **Advanced Studies in England**, Bath, UK.
- 20h-tutorial course for one undergraduate exchange student (online).

Publications, preprints, and working papers.

Journal articles

2024+   **Scalable Variational Bayes methods for Hawkes processes**, *D. Sulem, V. Rivoirard, J. Rousseau*, arXiv preprint arXiv:2212.00f293, Accepted for publication at JMLR.
https://arxiv.org/pdf/2212.00293.pdf

2022   **Graph similarity learning for change-point detection in dynamic networks**, *D. Sulem, H. Kenlay, M. Cucuringu, X. Dong*, Machine Learning (2023): 1-44.
https://link.springer.com/article/10.1007/s10994-023-06405-x

2021   **Bayesian estimation of nonlinear Hawkes process**, *D. Sulem, V. Rivoirard, J. Rousseau*, Bernoulli, $30(2):1257 - 1286$.
https://arxiv.org/pdf/2103.17164.pdf

2021   **Regularized spectral methods for clustering signed networks**, *H. Tyagi, M. Cucuringu, A. Singh, D. Sulem*, JMLR 22(264):179.
https://www.jmlr.org/papers/volume22/20-1289/20-1289.pdf

2020   **Simple discrete-time self-exciting models can describe complex dynamic processes: a case study of COVID-19**, *R. Browning, D. Sulem, K. Mengersen, V. Rivoirard, J. Rousseau*, PLOS ONE 16(4): e0250015.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0250015

Preprints

2024+   **Estimating the history of a random recursive tree**, *S. Briend, C. Giraud, G.Lugosi, D. Sulem*, arXiv preprint arXiv:2403.09755, Under review at Bernoulli.
https://arxiv.org/abs/2403.09755

2022   **Diverse Counterfactual Explanations for Anomaly Detection in Time Series**, *D. Sulem, M. Donini, M. B. Zafar, F.-X. Aubet, J. Gasthaus, T. Januschowski, S. Das, K. Kenthapadi, C. Archambeau*, arXiv preprint arXiv:2203.11103.
https://arxiv.org/pdf/2203.11103.pdf

Working papers

2024+   **Bayesian computation for high-dimensional Gaussian Graphical Models with spike-and-slab prior**, *J. Jewson, D. Rossell, D. Sulem*.

2024+   **Heterogeneous network regression**, *C. Brownlees, L. Cappello, D. Rossell, D. Sulem*.

2024+   **Adaptive estimators and minimax rates of estimation for nonlinear Hawkes processes**, *V. Rivoirard, D. Sulem*.

Funding and awards

July 2024   **Best poster award**, *ISBA World Meeting 2024*.

Jan 2023 – June 2024   **Post-doctoral fellowship**, *Huawei Technologies, CSTT Research and Development grant on* High-dimensional statistics for network analysis.

Sept 2018 – Dec 2022   **Fully-funded Ph.D. EPSRC Studentship**, *grant EP/L016710/1*, as part of the Oxford-Warwick Statistics Programme (OxWaSP).

October 2022	**Junior Travel Award**, *13th Conference on Bayesian Nonparametric Statistics*, International Society of Bayesian Analysis.
April 2022	**Junior Travel Award**, *Bayesian Nonparametric Networking workshop*, International Society of Bayesian Analysis.

International conference presentations

Invited talks

- CMO-BIRS workshop Frontiers of Bayesian Inference and Data Science, Oaxaca, Mexico, September 2024.

- International Symposium of Nonparametric Statistics 2024, Braga, Portugal, June 2024.

- Conference ANR HAPPY, Institute of Mathematics, Toulouse, France, April 2024

- CMStatistics 2023, Berlin, Germany, December 2023.

- EcoSta 2023, Tokyo, Japan, August 2023.

- 34th European Meeting of Statisticians, Warsaw, Poland, July 2023.

- Mathematical and Statistical Challenges in Uncertainty Quantification conference, Cambridge, UK, July 2020 (online).

Contributed talks

- Bernoulli-IMS 11th World Congress in Probability and Statistics 2024, Bochum, Germany, August 2024.

- International Society of Bayesian Analysis (ISBA) World Meeting 2024, Venice, Italy, July 2024.

- Bayesian Young Statistical Meeting, Venice, Italy, June 2024.

- Approximation Methods in Bayesian Analysis conference, Luminy, France, June 2023.

- 13th conference on *Bayesian Inference for Stochastic Processes* (BISP13), Madrid, Spain, May 2023.

- Meeting in Mathematical Statistics, Luminy, France, December 2022.

- 13th International Conference on Bayesian Nonparametrics (BNP 13), Puerto Varas, Chile, October 2022.

- Network Science (NetSci) satellite symposium on Higher-Order Topology Dynamics in Complex Networks, Shanghai, China, July 2022 (online).

- International Society of Bayesian Analysis (ISBA) World Meeting 2022, Montreal, Canada, June 2022.

- Bayesian Association of Young Statisticians Meeting (BAYSM) 2022, Montreal, Canada, June 2022.

- Bayesian nonparametric (BNP) Networking conference, Nicosia, Cyprus, April 2022.

- International Society of Bayesian Analysis (ISBA) World Meeting 2020, Kunming, China, June 2021 (online).

- Bernoulli-International Mathematical Society (IMS) One World Symposium, August 2020 (online).

- 52emes Journées de Statistique de la Société Française de Statistique, June 2021 (online) event.

Posters

- International Society of Bayesian Analysis (ISBA) World Meeting 2024, Venice, Italy, June 2022.

- Machine Learning Summer School, Okinawa, Japan, March 2024.

- Approximation Methods in Bayesian Analysis conference, Luminy, France, June 2023.

- Network Science (NetSci) 2022 conference, Shanghai, China, July 2022 (online).

- Network Science (NetSci) 2020 conference, Rome, Italy, September 2020 (online).

- Mathematical Methods of Modern Statistics conference, Luminy, France, June 2020 (online).

Seminars and additional meetings

- Institut de Mathématiques de Toulouse, Statistics and Optimisation team, January 2023.

- INRIA center of Grenoble Alpes University, Grenoble, France, December 2023.

- Sorbonne Université, Laboratoire de Probabilités, Statistique et Modélisation, Paris, France, November 2023.

- INRIA center of Paris, Paris, France, October 2023.

- Machine Learning and Data Science Seminar, Okinawa Institute of Science and Techonology, Okinawa, Japan, September 2023,

- Université Paris 1-Pantheon-Sorbonne, Laboratoire de Statistique, Analyse, et Modélisation Multidisciplinaire, Paris, France, May 2023.

- Séminaire Parisien de Statistique, Paris, France, April 2023.

- University of Edinburgh, School of Mathematics, Edinburgh, UK, February 2023.

- University of Wisconsin-Madison, Department of Statistics, Madison, USA, December 2022.

- University of Illinois at Chicago, Epidemiology and Biostatistics department, Chicago, USA, December 2022.

- StatMathAppli Summer School, Frejus, France, August 2022.

- Winter School on Bayesian End-to-End Learning, Luminy, France, October 2021.

Professional services

Supervision

Jan - June 2023   Victor Thiébot, Master student at Keio University (Tokyo, Japan).

Reviews

Journals   SIAM Journal on Mathematics of Data Science (1 paper), ESAIM: Probability and Statistics (1 paper), Physica A: Statistical Mechanics and its Applications (1 paper), Bayesian Analysis (1 paper), Journal of Computational and Graphical Statistics (1 paper), STAT (1 paper), Statistics and Computing (1 paper), TMLR (4 papers), IEEE Transactions on Signal and Information Processing over Networks (1 paper).

Conferences   ACM Conference on Knowledge Discovery and Data Mining (2 papers).

Organisation

2020 - 2023   Committee member of ED&I discussion group, Department of Statistics, University of Oxford.

Jan - Sept 2021   Co-organiser of the Bayesian Nonparametric reading group, Department of Statistics, Oxford.

Coordination

2023 - 2024   Master thesis and *Practicum* coordinator, Master of Data Science Methodology, BSE.

Outreach

Sept. 2016 – June 2017   Volunteer tutor at *Une Grande Ecole Pourquoi Pas Moi*, a French association targeted at under-privileged pupils to enhance their chances of entering leading universities.

Skills and miscellanea

Languages   French (Native speaker), English (Fluent), Spanish (Beginner).

Programming **Advanced:** Python (Pytorch, Scikit-Learn, Pandas, NetworkX, PyMC4), LaTeX, GitHub.
Intermediate: R. **Basic** HTML, CUDA, Java, C++.

Hobbies Taekwondo (blue belt), Ashtanga Mysore Yoga.