Emile Mathieu

Personal Data

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Research Interests

My current research centres around deep probabilistic machine learning, geometry and invariance.

Work Experience

Since Sept 2021 | EPSRC Postdoctoral Research Associate at **Department of Statistics**, Oxford
Collaborating with Prof. Arnaud Doucet.

Sept-Dec 2019 | Research Intern at **Facebook Artificial Intelligence Research**, New York
Developed normalizing flows on manifolds (4), with climate science application, supervised by Maximilian Nickel.

May-Sep 2017 | Research Intern at **Department of Statistics**, Oxford
Studied sampling methods for discrete random probability measures in probabilistic programs (8). Contributed to the open source probabilistic program Turing.jl.

Jan-Jul 2016 | Machine Learning Intern at **Criteo**, Paris
In the context of online auctions, improved predictive bidding models accuracy in the presence of perturbative and periodical events such as sales.

Jul-Dec 2015 | Software Engineer Intern at **BAM Lab**, Paris
Worked as a full-stack developer, using leading technologies to develop mobile and website applications, and their associated backend services.

May-Jul 2014 | Data Scientist Intern at **IFSTTAR Research Institute**, Paris
Applied unsupervised probabilistic models such as LDA, to transportation's data in order to better understand commuters behaviour.

Education

Oct 2017 - Sept 2021 PhD in Machine Learning with Prof. Yee Whye TEH
at **University of Oxford**, Department of Statistics.

2016 - 2017 Master of Science (II) in Machine Learning & Computer Vision (MVA)
at **Ecole Normale Supérieure** Paris-Saclay, Paris, passed with honours | Gpa: 4/4

2014 - 2015 Master of Science (I) in Mathematics & Computer Science
at **École des Ponts ParisTech**, Paris | Gpa: 3.94/4

2011 - 2014 Bachelor's Degree in Science (Mathematics, Computer Science & Physics),
at **École des Ponts ParisTech**, Paris | Gpa: 3.86/4

July 2011 Baccalauréat (French secondary school diploma)
Nantes, Science major, Mathematics major, passed with honours.

Languages

French: Mothertongue, English: Fluent (TOEIC: 930, TOEFL: 103, GRE VR: 157), Spanish: Moderate

Computer Skills

Advanced Knowledge:	Python, PyTorch, Lightning, Hydra, Bash, Slurm, LaTeX
Intermediate Knowledge:	Julia, TensorFlow, Matlab, C++, JavaScript

Publications

[1] R. Oyanedel, S. Gelcich, E. Mathieu, and E. J. Milner-Gulland. A dynamic simulation model to support reduction in illegal trade within legal wildlife markets. *Conservation Biology*, Aug. 2021.

[2] N. Miao, E. Mathieu, N. Siddharth, Y. W. Teh, and T. Rainforth. On incorporating inductive biases into vaes. 2021.

[3] E. Mathieu, A. Foster, and Y. W. Teh. On contrastive representations of stochastic processes. In *Advances in Neural Information Processing Systems 33*. Curran Associates, Inc., 2021.

[4] E. Mathieu and M. Nickel. Riemannian continuous normalizing flows. In *Advances in Neural Information Processing Systems 33*, pages 2503–2515. Curran Associates, Inc., 2020.

[5] E. Mathieu, T. Rainforth, N. Siddharth, and Y. W. Teh. Disentangling disentanglement in variational autoencoders. In *Proceedings of the 36th International Conference on Machine Learning*, volume 97 of *Proceedings of Machine Learning Research*, pages 4402–4412, Long Beach, California, USA, 09–15 Jun 2019. PMLR.

[6] E. Mathieu, C. Le Lan, C. J. Maddison, R. Tomioka, and Y. W. Teh. Continuous hierarchical representations with poincaré variational auto-encoders. In *Advances in Neural Information Processing Systems 32*, pages 12565–12576. Curran Associates, Inc., 2019.

[7] B. Bloem-Reddy, A. Foster, E. Mathieu, and Y. W. Teh. Sampling and inference for beta neutral-to-the-left models of sparse networks. In *Conference on Uncertainty in Artificial Intelligence*, August 2018.

[8] B. Bloem-Reddy, E. Mathieu, A. Foster, T. Rainforth, H. Ge, M. Lomelí, Z. Ghahramani, and Y. W. Teh. Sampling and inference for discrete random probability measures in probabilistic programs. 2017.

Teaching

Winter 2022	Tutor, SC4 Advanced Topics in Statistical Machine Learning, Dpt of Statistics.
Autumn 2021	Tutor, SB2.1 Foundations of Statistical Inference (3rd year), Dpt of Statistics.
Winter 2020	Tutor & Teaching Assistant, SC4 Advanced Topics in Statistical Machine Learning (4th year / MSc students), Dpt of Statistics.
Winter 2019	Teaching Assistant, Bayesian Inference, MPLS Doctoral Training Centre.
Autumn 2018	Teaching Assistant, SB3.1 Applied Probability (3rd year students), Dpt of Statistics.

Conference participation

Dec 2020	Co-organized the Differential Geometry meets Deep Learning workshop at Neurips.
Reviewing	2022: ICLR, 2021: NeurIPS, DGMs @ NeurIPS2020: Neurips, AABI 2019: ICML, Neurips 2018: AABI, BDL @ NeurIPS2018.