# Eric Nalisnick

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## Academic Employment

**Assistant Professor, Tenure Track** — University of Amsterdam
*Amsterdam Machine Learning Lab* — September 2020 - February 2024

**Postdoctoral Research Associate** — University of Cambridge
*Computational and Biological Learning Laboratory* — September 2018 to September 2020

## Industrial Employment

**Research Scientist** — Google DeepMind
Part time, one day per week (20% FTE) — February 2019 to January 2020

**Research Scientist Intern** — Google DeepMind
Supervisor: Balaji Lakshminarayanan — Summer 2018

**Applied Scientist Intern** — Amazon
Supervisors: Vijai Mohan, Eiman Elnahrawy — Fall 2016

**Research Intern** — Twitter
Supervisor: Hugo Larochelle — Summer 2016

**Research Intern** — Microsoft
Supervisors: Rich Caruana, Nick Craswell — Summer 2015

**Research Scientist Intern** — Amazon
Supervisors: Vijai Mohan, Rahul Bhagat — Summer 2014

## Education

**Ph.D.** Computer Science — 2013 - 2018
**University of California, Irvine**
Dissertation: *On Priors for Bayesian Neural Networks*
Advisor: Padhraic Smyth

**M.S.** Computer Science — 2012 - 2013
**Lehigh University**
Thesis: *Automatic Methods for Tracking Sentiment Dynamics in Plays*
Advisor: Henry S. Baird

**B.S.** Computer Science & English Literature — 2008 - 2012
**Lehigh University**
Honors Thesis: *A Combinatorial Explanation for a Conjecture of Fomin and Zelevinsky*

## Academic Honors and Awards

Veni Laureate, Dutch Research Council (NWO) 2021

ELLIS Scholar, *European Lab for Learning and Intelligent Systems Society* 2021

Top / Best Reviewer NeurIPS 2017, ICML 2019, ICML 2020

## Research Funding

Principal Investigator

*Continual Learning under Human Guidance* June 2022 - 2026
€280,000
Veni, Talent Programme, Dutch Research Council (NWO): Science Domain
Single Principal Investigator, Acceptance Rate: 16%.

Co-Investigator

*UvA-Bosch Delta Lab* November 2021 - 2026
Gift funding for 10 PhD students from the Bosch Group.
Role: Supervisor for 4 PhD students.
PIs: Theo Gevers, Jan-Willem van de Meent.

*Hybrid Intelligence Centre* January 2020 - 2030
Gravitation Programme, Dutch Research Council (NWO)
Role: Co-supervisor for 2 PhD students.
PIs: F. v. Harmelen, C. Jonker, M. d. Rijke, R. Verbrugge, P. Vossen, M. Welling.

## Academic Supervision

PhD Candidates

Rajeev Verma University of Amsterdam, 2023 -

Alexander Timans University of Amsterdam, 2022 -

Metod Jazbec University of Amsterdam, 2022 -

Mona Schirmer University of Amsterdam, 2022 -

Dharmesh Tailor University of Amsterdam, 2021 -

Saba Amiri (with Adam Belloum and Sander Klous) University of Amsterdam, 2021 -

Putra Manggala (with Holger Hoos) University of Amsterdam, 2021 -

Urja Khurana (with Antske Fokkens) Vrije University Amsterdam, 2020 -

Mrinank Sharma (with Tom Rainforth and Yee Whye Teh) University of Oxford, 2020 -

### Masters Students

University of Amsterdam: Jaap Stefels (2023), Thomas Jurriaans (2023), Mark Fokkema (2023), Arsen Sheverdin (2023), Nils Lehmann (2022), Shuai Wang (2022), Rajeev Verma (2022), Daniël Nobbe (2021).

## Teaching

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|---|---|
| *Human-in-the-Loop Machine Learning* (Graduate) | University of Amsterdam, 2023 |
| *Machine Learning* I (Graduate) | University of Amsterdam, 2023 |
| *Introduction to Machine Learning* (Undergraduate) | University of Amsterdam, 2020 - 2022 |
| *Bayesian Deep Learning* Module, Deep Learning II (Graduate) | University of Amsterdam, 2022 - 2023 |
| *Project in AI* (Graduate) | University of Amsterdam, 2021 |

## Professional Service

### Organization

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|---|---|
| Tractable Probabilistic Modeling, UAI Workshop | 2022 - 2023 |
| Anomaly Detection for Scientific Discovery | 2021 - 2022 |
| Bayesian Deep Learning, NeurIPS Workshop | 2021 |
| Bayesian Deep Learning, ELLIS Workshop / NeurIPS Meetup | 2020 |
| Bayesian Deep Learning, NeurIPS Workshop | 2019 |

### Area Chair / Senior Program Committee

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|---|---|
| Neural Information Processing Systems (NeurIPS) | 2021 - present |
| International Conference on Machine Learning (ICML) | 2021 - present |
| Uncertainty in Artificial Intelligence (UAI) | 2021 - 2022 |
| Artificial Intelligence and Statistics (AIStats) | 2022 |
| International Conference on Learning Representations (ICLR) | 2021 |

### Editorial Board

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|---|---|
| Editor, Probabilistic Methods for Deep Learning, Special Issue of *Entropy* | 2021 |

### Journal Reviewing

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|---|---|
| American Statistical Association (JASA) | 2020 - present |
| Machine Learning Research (JMLR) | 2018 - present |
| Journal of Econometrics | 2022 |
| Advances in Statistical Analysis | 2020 |

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|---|---|
| Neural Processing Letters | 2019 |

Conference Reviewing

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|---|---|
| Neural Information Processing Systems (NeurIPS) | 2016 - 2021 |
| International Conference on Learning Representations (ICLR) | 2018 - present |
| International Conference on Machine Learning (ICML) | 2018 - 2021 |
| Artificial Intelligence and Statistics (AIStats) | 2019 - 2021 |
| Uncertainty in Artificial Intelligence (UAI) | 2019 - 2020 |
| Hybrid Human-Artificial Intelligence (HHAI) | 2022 |
| Association for the Advancement of Artificial Intelligence (AAAI) | 2020 - 2021 |
| International Joint Conference on Artificial Intelligence (IJCAI) | 2019 |

## Departmental / Institute Service

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| Education program committee for Bachelors and Masters of AI | 2021 - present |
| Hiring committee for one AMLab / ELLIS unit faculty position | 2021 |
| Hiring committee for two AMLab faculty positions | 2021 |

## Doctoral Committees

Kamil Deja, Warsaw University of Technology 2023
*Data Representations in Generative Modelling*

ChangYong Oh, University of Amsterdam 2023
*Bayesian Optimization on Non-Conventional Search Spaces*

Emiel Hoogeboom, University of Amsterdam 2023
*Normalizing Flows and Diffusion Models for Discrete and Geometric Data*

Shi Hu, University of Amsterdam 2022
*Uncertainty, Robustness and Safety in Artificial Intelligence*

## Publications

* Denotes equal contribution

Journal Articles

1. **E. Nalisnick**, P. Smyth, and D. Tran. A Brief Tour of Deep Learning from a Statistical Perspective. *Annual Review of Statistics and Its Application*, 2023.

2. G. Papamakarios*, **E. Nalisnick***, D. J. Rezende, S. Mohamed, and B. Lakshminarayanan. Normalizing Flows for Probabilistic Modeling and Inference. *Journal of Machine Learning Research* (JMLR), 2021.

Conference Articles

3. M. Jazbec, J. U. Allingham, D. Zhang, and **E. Nalisnick**. Towards Anytime Classification in Early-Exit Architectures by Enforcing Conditional Monotonicity. In *Advances in Neural Information Processing Systems* (NeurIPS), 2023.
4. D. Tailor, M. E. Khan, and **E. Nalisnick**. Exploiting Inferential Structure in Neural Processes. In *Proceedings of the 39th Conference on Uncertainty in Artificial Intelligence* (UAI), 2023.
5. J. Antoran*, S. Padhy*, R. Barbano, **E. Nalisnick**, D. Janz, and J. M. Hernández-Lobato. Sampling-Based Inference for Large Linear Models, with Application to Linearised Laplace. In *Proceedings of the 11th International Conference on Learning Representations* (ICLR), 2023.
6. R. Verma*, D. Barrejón*, and **E. Nalisnick**. Learning to Defer to Multiple Experts: Consistent Surrogate Losses, Confidence Calibration, and Conformal Ensembles. In *Proceedings of the 26th International Conference on Artificial Intelligence and Statistics* (AISTATS), 2023.
7. M. Sharma, S. Farquhar, **E. Nalisnick**, and T. Rainforth. Do Bayesian Neural Networks Need To Be Fully Stochastic? In *Proceedings of the 26th International Conference on Artificial Intelligence and Statistics* (AISTATS), 2023.
8. R. Verma and **E. Nalisnick**. Calibrated Learning to Defer with One-vs-All Classifiers. In *Proceedings of the 39th International Conference on Machine Learning* (ICML), 2022.
9. J. Antoran, D. Janz, J. U. Allingham, E. Daxberger, R. Barbano, **E. Nalisnick**, and J. M. Hernández-Lobato. Adapting the Linearised Laplace Model Evidence for Modern Deep Learning. In *Proceedings of the 39th International Conference on Machine Learning* (ICML), 2022.
10. E. Daxberger, **E. Nalisnick***, J. U. Allingham*, J. Antoran*, and J. M. Hernández-Lobato. Expressive yet Tractable Bayesian Deep Learning via Subnetwork Inference. In *Proceedings of the 38th International Conference on Machine Learning* (ICML), 2021.
11. **E. Nalisnick**, J. Gordon, and J. M. Hernández-Lobato. Predictive Complexity Priors. In *Proceedings of the 24th International Conference on Artificial Intelligence and Statistics* (AISTATS), 2021.
12. R. Pinsler, J. Gordon, **E. Nalisnick**, and J. M. Hernández-Lobato. Bayesian Batch Active Learning as Sparse Subset Approximation. In *Advances in Neural Information Processing Systems* (NeurIPS), 2019.
13. **E. Nalisnick**, J. M. Hernández-Lobato, and P. Smyth. Dropout as a Structured Shrinkage Prior. In *Proceedings of the 36th International Conference on Machine Learning* (ICML), 2019.
14. **E. Nalisnick***, A. Matsukawa*, Y. W. Teh, D. Gorur, and B. Lakshminarayanan. Hybrid Models with Deep and Invertible Features. In *Proceedings of the 36th International Conference on Machine Learning* (ICML), 2019.
15. **E. Nalisnick**, A. Matsukawa, Y. W. Teh, D. Gorur, and B. Lakshminarayanan. Do Deep Generative Models Know What They Don't Know? In *Proceedings of the 7th International Conference on Learning*

*Representations* (ICLR), 2019.

16. D. Ji, **E. Nalisnick**, Y. Qian, R. Scheuermann, and P. Smyth. Bayesian Trees for Automated Cytometry Data Analysis. In *Proceedings of Machine Learning for Healthcare* (MLHC), 2018.
17. **E. Nalisnick** and P. Smyth. Learning Priors for Invariance. In *Proceedings of the 21st International Conference on Artificial Intelligence and Statistics* (AISTATS), 2018.
18. **E. Nalisnick** and P. Smyth. Learning Approximately Objective Priors. In *Proceedings of the 33rd Conference on Uncertainty in Artificial Intelligence* (UAI), 2017.
19. **E. Nalisnick** and P. Smyth. Stick-Breaking Variational Autoencoders. In *Proceedings of the 5th International Conference on Learning Representations* (ICLR), 2017.
20. **E. Nalisnick**, B. Mitra, N. Craswell, and R. Caruana. Improving Document Ranking with Dual Word Embeddings. In *Proceedings of the 25th World Wide Web Conference* (WWW), 2016.
21. **E. Nalisnick** and H. Baird. Character-to-Character Sentiment Analysis in Shakespeare's Plays. In *Proceedings of the 51st Annual Meeting of the Association for Computational Linguistics* (ACL), 2013.
22. **E. Nalisnick** and H. Baird. Extracting Sentiment Networks from Shakespeare's Plays. In *Proceedings of the 12th International Conference on Document Analysis and Recognition* (ICDAR), 2013.

Peer-Reviewed Workshop Articles (Without Conference Version)

23. J. U. Allingham, J. Antoran, S. Padhy, **E. Nalisnick**, and J. M. Hernández-Lobato. Learning Generative Models with Invariance to Symmetries. *Symmetry and Geometry in Neural Representations*, NeurIPS 2022.
24. S. Wang and **E. Nalisnick**. Active Learning for Multilingual Fingerspelling Corpora. *Adaptive Experimental Design and Active Learning in the Real World*, ICML 2022.
25. J. U. Allingham and **E. Nalisnick**. A Product of Experts Approach to Early-Exit Ensembles. *Dynamic Neural Networks*, ICML 2022.
26. P. Manggala, H. Hoos, and **E. Nalisnick**. Bayesian Weak Supervision via an Optimal Transport Approach. *Human-Machine Collaboration and Teaming*, ICML 2022.
27. U. Khurana, I. Vermeulen, **E. Nalisnick**, M. van Noorloos, and A. Fokkens. Hate Speech Criteria: A Modular Approach to Task-Specific Hate Speech Definitions. *Online Abuse and Harms*, NAACL 2022.
28. S. Amiri, A. Belloum, **E. Nalisnick**, S. Klous, and L. Gommans. On the Impact of Non-IID Data on the Performance and Fairness of Differentially Private Federated Learning. *Dependable and Secure Machine Learning*, DSN 2022.
29. U. Khurana, **E. Nalisnick**, and A. Fokkens. How Emotionally Stable is ALBERT? Testing Robustness with Stochastic Weight Averaging on a Sentiment Analysis Task. *Evaluation and Comparison of NLP Systems*, EMNLP 2021.
30. P. Manggala, H. Hoos, and **E. Nalisnick**. Bayesian Regression from Multiple Sources of Weak Supervision. *Machine Learning for Data*, ICML 2021.

31. Y. Zhang and **E. Nalisnick**. On the Inconsistency of Bayesian Inference for Misspecified Neural Networks. *Symposium on Advances in Approximate Bayesian Inference*, 2021.
32. **E. Nalisnick**, A. Matsukawa, Y. W. Teh, and B. Lakshminarayanan. Detecting Out-of-Distribution Inputs to Deep Generative Models Using Typicality. *Bayesian Deep Learning*, NeurIPS 2019.
33. **E. Nalisnick** and J. M. Hernández-Lobato. Automatic Depth Determination for Bayesian ResNets. *Bayesian Deep Learning*, NeurIPS 2018.
34. O. Rybakov, V. Mohan, A. Misra, S. LeGrand, R. Joseph, K. Chung, S. Singh, Q. You, **E. Nalisnick**, L. Dirac, and R. Luo. The Effectiveness of a Two-Layer Neural Network for Recommendations. Workshop Track, ICLR 2018.
35. D. Ji, **E. Nalisnick**, and P. Smyth. Mondrian Processes for Flow Cytometry Analysis. *Machine Learning for Health*, NeurIPS 2017.
36. **E. Nalisnick** and P. Smyth. Variational Inference with Stein Mixtures. *Advances in Approximate Bayesian Inference*, NIPS 2017.
37. **E. Nalisnick** and P. Smyth. The Amortized Bootstrap. *Implicit Models*, ICML 2017.
38. **E. Nalisnick**, L. Hertel, and P. Smyth. Approximate Inference for Deep Latent Gaussian Mixtures. *Bayesian Deep Learning*, NeurIPS 2016.
39. J. Park, M. Blume-Kohout, R. Krestel, **E. Nalisnick**, and P. Smyth. Analyzing NIH Funding Patterns over Time with Statistical Text Analysis. *Scholarly Big Data*, AAAI 2016.

Patents

1. E. M. H. Elnahrawy, V. Mohan, and **E. Nalisnick**. Generation and Use of Model Parameters in Cold-Start Scenarios. U.S. Patent Number 10,726,334. 28 July 2020.

## Invited Talks

International Venues

1. Bayesian Learning & Uncertainty Quantification — 2023
   Mediterranean Machine Learning Summer School — Thessaloniki, Greece
2. Towards Anytime Computation in Deep Architectures — 2023
   Dagstuhl Seminar on Deep Generative Models — Wadern, Germany
3. Towards Informative Priors for Bayesian Deep Learning — 2022
   Dagstuhl Seminar on Tractable Probabilistic Models — Wadern, Germany
4. Predictive Complexity Priors — 2021
   GenU Workshop: Gen. Models and Uncertainty Quantification — Copenhagen, Denmark
5. Detecting Distribution Shift with Deep Generative Models — 2020
   INNF+, ICML Workshop — Virtual
6. Normalizing Flows for Tractable Probabilistic Modeling and Inference — 2019
   T-Prime, NeurIPS Social — Vancouver, Canada

Department Seminars, Companies, etc.

1. Towards a Statistical Foundation for Human-AI Collaboration 2023
   Univ. of Tübingen / Bosch AI, Oregon State Univ.: Computer Science, Johns Hopkins Univ.: Computer Science, George Washington Univ.: Computer Science
2. On the Calibration of Learning-to-Defer Systems 2022
   Univ. of California, Riverside: Computer Science, Univ. of Manchester: Statistics
3. Predictive Complexity Priors 2021
   Univ. of Edinburgh: ANC Seminar, Imperial College: Statistics, Alan Turing Institute
4. Detecting Distribution Shift with Deep Generative Models 2020
   Sydney Machine Learning Meetup
5. Building and Critiquing Models for Probabilistic Deep Learning 2020
   University College London: Gatsby Unit, Carnegie Mellon Univ.: Statistics, Univ. of North Carolina: Computer Science, Univ. of Amsterdam: Informatics
6. Deep Learning & Statistics: Bridging the Gap with Prob. Structure 2020
   Univ. of California, Santa Barbara: Statistics
7. Deep Learning Under Covariate Shift 2019
   Univ. of California, Irvine: AI/ML Seminar
8. Deep Learning: A Synthesis from Probabilistic Foundations 2018 - 2019
   RAND Corporation: Statistics, Univ. of California, Irvine: Statistics
9. Evaluating Deep Generative Models on Out-of-Distribution Inputs 2019
   Univ. of Oxford: Statistics, CamAIML (MSR Cambridge), Univ. of Cambridge: LTL Seminar
10. Structured Shrinkage Priors for Neural Networks 2018
    Imperial College: Statistics 2018
11. Approximate Inference for Frequentist Uncertainty Estimation 2017
    SoCal ML Symposium
12. Deep Generative Models with Stick-Breaking Priors 2017
    Univ. of California, Irvine: AI/ML Seminar, OpenAI