Eric Nalisnick

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Academic Employment

Assistant Professor, Tenure Track — Johns Hopkins University
Department of Computer Science — March 2024 - present

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 & Zelevinsky*
Advisor: Mark Skandera

Academic Honors and Awards

Outstanding Student Paper (as supervisor, 7 of 546 accepted papers), AISTATS 2024

Google Award for Inclusion Research 2024

Notable Paper (32 of 496 accepted papers), AISTATS 2023

Veni Laureate, Dutch Research Council 2021

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

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

Honorable Mention for Best Poster Award, SoCal ML Symposium 2017

Academic Supervision

Current 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 -

Former PhD Candidates

James Allingham (external advisor via ELLIS) University of Cambridge
Thesis: *Improving Deep Learning with Probabilistic Approaches* 2019 - 2024
First position after graduation: Research Scientist, Google DeepMind

Mrinank Sharma (with Tom Rainforth and Yee Whye Teh) University of Oxford
Thesis: *Uncertainty Estimation with Small and Large Models* 2020 - 2024
First position after graduation: Research Scientist, Anthropic

Masters Students

Johns Hopkins University: Yizirui Fang (2024), Runzhou Chen (2024)

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).

Visiting Students

University of Amsterdam: Rutger Hendrix (2023), Javier Antorán (2022), Daniel Barrejón (2022).

Teaching

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 / Leadership Roles

Advisory Committee on Data Science and AI, American Statistical Association	2024 - present
Tractable Probabilistic Modeling, UAI Workshop	2022 - 2023
Anomaly Detection for Scientific Discovery, Virtual Seminar Series	2021 - 2022
Bayesian Deep Learning, NeurIPS Workshop	2019, 2021
Bayesian Deep Learning, ELLIS Workshop / NeurIPS Meetup	2020

Area Chair / Senior Program Committee

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

Journal Reviewing

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

Advances in Statistical Analysis 2020

Neural Processing Letters 2019

Conference Reviewing

Conference on Computer Vision and Pattern Recognition (CVPR) 2024

Neural Information Processing Systems (NeurIPS) 2016 - 2021

International Conference on Learning Representations (ICLR) 2018 - 2020

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

Grant Reviewing

Johns Hopkins Discovery Awards 2024

U.S.-Israel Binational Science Foundation 2023

Institutional Service

Data science admissions committee, Johns Hopkins University 2024 - present

Computer science curriculum committee, Johns Hopkins University 2024 - present

AI education program committee, University of Amsterdam 2021 - 2024

Faculty hiring committee, Machine Learning Lab, University of Amsterdam 2021

Doctoral Committees

Federico Bergamin, Technical University of Denmark 2024
Advances in Deep Generative Models, Approximate Inference, and their Applications

Jakob Havtorn, Technical University of Denmark 2024
Uncertainty and the Medical Interview

Bertrand Charpentier, Technical University of Munich 2024
Uncertainty Estimation for Independent and Non-Independent Data

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. A. Timans, C.-N. Straehle, K. Sakmann, and **E. Nalisnick**. Adaptive Bounding Box Uncertainties via Two-Step Conformal Prediction. In *Proceedings of the 18th European Conference on Computer Vision* (ECCV), 2024.
4. M. Jazbec, P. Forré, S. Mandt, D. Zhang, and **E. Nalisnick**. Early-Exit Neural Networks with Nested Prediction Sets. In *Proceedings of the 40th Conference on Uncertainty in Artificial Intelligence* (UAI), 2024.
5. D. Tailor, A. Patra, R. Verma, P. Manggala, and **E. Nalisnick**. Learning to Defer to a Population: A Meta-Learning Approach. In *Proceedings of the 27th International Conference on Artificial Intelligence and Statistics* (AISTATS), 2024. *Oral presentation, outstanding student paper (1% of accepted papers).*
6. 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.
7. 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.
8. 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.
9. 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.

10. 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. *'Notable' oral presentation (6% of accepted papers).*

11. 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.

12. 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.

13. 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.

14. **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.

15. 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.

16. **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.

17. **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.

18. **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.

19. 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.

20. **E. Nalisnick** and P. Smyth. Learning Priors for Invariance. In *Proceedings of the 21st International Conference on Artificial Intelligence and Statistics* (AISTATS), 2018.

21. **E. Nalisnick** and P. Smyth. Learning Approximately Objective Priors. In *Proceedings of the 33rd Conference on Uncertainty in Artificial Intelligence* (UAI), 2017.

22. **E. Nalisnick** and P. Smyth. Stick-Breaking Variational Autoencoders. In *Proceedings of the 5th International Conference on Learning Representations* (ICLR), 2017.

23. **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.

24. **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.

25. **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)

26. R. Verma, V. Fischer, and **E. Nalisnick**. On the Calibration of Conditional-Value-at-Risk. *Next Generation of AI Safety*, ICML 2024.

27. N. Lehmann, N. M. Gottschling, S. Depeweg, and **E. Nalisnick**. Uncertainty Aware Tropical Cyclone Wind Speed Estimation from Satellite Data. *Machine Learning for Remote Sensing*, ICLR 2024. *Oral presentation.*

28. M. Schirmer, D. Zhang, and **E. Nalisnick**. Beyond Top-Class Agreement: Using Divergences to Forecast Performance under Distribution Shift. *Distribution Shifts*, NeurIPS 2023.

29. N. Lehmann, N. M. Gottschling, S. Depeweg, and **E. Nalisnick**. A Comparison of Uncertainty Quantification Methods for Earth Observation Image Regression Data. *Uncertainty Quantification for Computer Vision*, ICCV 2023.

30. 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.

31. S. Wang and **E. Nalisnick**. Active Learning for Multilingual Fingerspelling Corpora. *Adaptive Experimental Design and Active Learning in the Real World*, ICML 2022.

32. J. U. Allingham and **E. Nalisnick**. A Product of Experts Approach to Early-Exit Ensembles. *Dynamic Neural Networks*, ICML 2022.

33. P. Manggala, H. Hoos, and **E. Nalisnick**. Bayesian Weak Supervision via an Optimal Transport Approach. *Human-Machine Collaboration and Teaming*, ICML 2022.

34. 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.

35. 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.

36. 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.

37. P. Manggala, H. Hoos, and **E. Nalisnick**. Bayesian Regression from Multiple Sources of Weak Supervision. *Machine Learning for Data*, ICML 2021.

38. Y. Zhang and **E. Nalisnick**. On the Inconsistency of Bayesian Inference for Misspecified Neural Networks. *Symposium on Advances in Approximate Bayesian Inference*, 2021.

39. **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.

40. **E. Nalisnick** and J. M. Hernández-Lobato. Automatic Depth Determination for Bayesian ResNets. *Bayesian Deep Learning*, NeurIPS 2018.
41. 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.
42. D. Ji, **E. Nalisnick**, and P. Smyth. Mondrian Processes for Flow Cytometry Analysis. *Machine Learning for Health*, NeurIPS 2017.
43. **E. Nalisnick** and P. Smyth. Variational Inference with Stein Mixtures. *Advances in Approximate Bayesian Inference*, NIPS 2017.
44. **E. Nalisnick** and P. Smyth. The Amortized Bootstrap. *Implicit Models*, ICML 2017. *Oral presentation.*
45. **E. Nalisnick**, L. Hertel, and P. Smyth. Approximate Inference for Deep Latent Gaussian Mixtures. *Bayesian Deep Learning*, NeurIPS 2016.
46. 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, Large National Venues, Keynotes

1. The Boons of Being Less Bayesian: a study of partially stochastic neural networks — 2024
   Invited Session on *Advances in Inference and Theory for Bayesian Neural Networks*
   Joint Statistical Meetings (JSM) — Portland, USA
2. Detecting Distribution Shift with Deep Generative Models — 2023
   Dutch Society of Pattern Recognition and Image Processing — Amsterdam, Netherlands
3. Towards Anytime Uncertainty Estimation in Early-Exit Neural Networks — 2023
   Workshop on *Uncertainty Quantification for Computer Vision*
   International Conference on Computer Vision (ICCV) — Paris, France
4. Learning to Defer to One, Multiple, or a Population of Expert(s) — 2023
   ELLIS Workshop on Robust Machine Learning (RobustML) — Helsinki, Finland
5. Bayesian Learning & Uncertainty Quantification — 2023
   Mediterranean Machine Learning Summer School — Thessaloniki, Greece
6. Towards Anytime Computation in Deep Architectures — 2023
   Dagstuhl Seminar on Deep Generative Models — Wadern, Germany
7. Towards Informative Priors for Bayesian Deep Learning — 2022
   Dagstuhl Seminar on Tractable Probabilistic Models — Wadern, Germany

8. Predictive Complexity Priors 2021
   GenU Workshop: Gen. Models and Uncertainty Quantification Copenhagen, Denmark

9. Detecting Distribution Shift with Deep Generative Models 2020
   Workshop on *Invertible Neural Nets, Normalizing Flows, and Explicit Likelihood Models* (INNF+)
   International Conference on Machine Learning (ICML) Virtual

10. Normalizing Flows for Tractable Probabilistic Modeling and Inference 2019
    T-Prime, NeurIPS Social Vancouver, Canada

Department Seminars, Companies, Local Events

1. Learning to Defer to One, Multiple, or a Population of Expert(s) 2023 - 2024
   Amazon, Johns Hopkins Applied Physics Laboratory

2. Efficient Collection of Sign Language Data 2024
   Gallaudet University

3. AI Risks: From Today to Doomsday — An Academic Panel Discussion 2023
   Amsterdam ELLIS Unit

4. 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

5. On the Calibration of Learning-to-Defer Systems 2022
   Univ. of California, Riverside: Computer Science, Univ. of Manchester: Statistics

6. Predictive Complexity Priors 2021
   Univ. of Edinburgh: ANC Seminar, Imperial College: Statistics, Alan Turing Institute

7. Detecting Distribution Shift with Deep Generative Models 2020
   Sydney Machine Learning Meetup

8. 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

9. Deep Learning & Statistics: Bridging the Gap with Prob. Structure 2020
   Univ. of California, Santa Barbara: Statistics

10. Deep Learning Under Covariate Shift 2019
    Univ. of California, Irvine: AI/ML Seminar

11. Deep Learning: A Synthesis from Probabilistic Foundations 2018 - 2019
    RAND Corporation: Statistics, Univ. of California, Irvine: Statistics

12. Evaluating Deep Generative Models on Out-of-Distribution Inputs 2019
    Univ. of Oxford: Statistics, CamAIML (MSR Cambridge), Univ. of Cambridge: LTL Seminar

13. Structured Shrinkage Priors for Neural Networks 2018
    Imperial College: Statistics

14. Approximate Inference for Frequentist Uncertainty Estimation 2017
    SoCal ML Symposium
15. Deep Generative Models with Stick-Breaking Priors 2017
    Univ. of California, Irvine: AI/ML Seminar, OpenAI

General Audience, Outreach

1. AI Risks: From Today to Doomsday — An Academic Panel Discussion 2023
   Amsterdam ELLIS Unit