

Eric Nalisnick

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Academic Employment

Assistant Professor, Tenure Track
Department of Computer Science

Johns Hopkins University
March 2024 - present

Assistant Professor, Tenure Track
Amsterdam Machine Learning Lab

University of Amsterdam
September 2020 - February 2024

Postdoctoral Research Associate
Computational and Biological Learning Laboratory

University of Cambridge
September 2018 to September 2020

Industrial Employment

Research Scientist
Part time, one day per week (20% FTE)

Google DeepMind
February 2019 to January 2020

Research Scientist Intern
Supervisor: Balaji Lakshminarayanan

Google DeepMind
Summer 2018

Applied Scientist Intern
Supervisors: Vijai Mohan, Eiman Elnahrawy

Amazon
Fall 2016

Research Intern
Supervisor: Hugo Larochelle

Twitter
Summer 2016

Research Intern
Supervisors: Rich Caruana, Nick Craswell

Microsoft
Summer 2015

Research Scientist Intern
Supervisors: Vijai Mohan, Rahul Bhagat

Amazon
Summer 2014

Education

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

2013 - 2018

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

2012 - 2013

B.S. Computer Science & English Literature

2008 - 2012

Lehigh UniversityHonors 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: <i>Improving Deep Learning with Probabilistic Approaches</i>	2019 - 2024
First position after graduation: Research Scientist, Google DeepMind	
Mrinank Sharma (with Tom Rainforth and Yee Whye Teh)	University of Oxford
Thesis: <i>Uncertainty Estimation with Small and Large Models</i>	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

<i>Human-in-the-Loop Machine Learning</i> (Graduate)	Johns Hopkins University, 2024
<i>Human-in-the-Loop Machine Learning</i> (Graduate)	University of Amsterdam, 2023
<i>Machine Learning I</i> (Graduate)	University of Amsterdam, 2023
<i>Introduction to Machine Learning</i> (Undergraduate)	University of Amsterdam, 2020 - 2022
<i>Bayesian Deep Learning</i> Module, <i>Deep Learning II</i> (Graduate)	University of Amsterdam, 2022 - 2023
<i>Project in AI</i> (Graduate)	University of Amsterdam, 2021

Professional Service

ORGANIZATION / LEADERSHIP ROLES

<i>Advisory Committee on Data Science and AI</i> , American Statistical Association	2024 - present
<i>Tractable Probabilistic Modeling</i> , UAI Workshop	2022 - 2023
<i>Anomaly Detection for Scientific Discovery</i> , Virtual Seminar Series	2021 - 2022
<i>Bayesian Deep Learning</i> , NeurIPS Workshop	2019, 2021
<i>Bayesian Deep Learning</i> , 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	
US Army Research Office	2024
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 <i>Advances in Deep Generative Models, Approximate Inference, and their Applications</i>	2024
Jakob Havtorn, Technical University of Denmark <i>Uncertainty and the Medical Interview</i>	2024
Bertrand Charpentier, Technical University of Munich <i>Uncertainty Estimation for Independent and Non-Independent Data</i>	2024

Kamil Deja, Warsaw University of Technology <i>Data Representations in Generative Modelling</i>	2023
ChangYong Oh, University of Amsterdam <i>Bayesian Optimization on Non-Conventional Search Spaces</i>	2023
Emiel Hoogeboom, University of Amsterdam <i>Normalizing Flows and Diffusion Models for Discrete and Geometric Data</i>	2023
Shi Hu, University of Amsterdam <i>Uncertainty, Robustness and Safety in Artificial Intelligence</i>	2022

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. U. Khurana, **E. Nalisnick**, A. Fokkens, and S. Swayamdipta. Crowd-Calibrator: Can Annotator Disagreement Inform Calibration in Subjective Tasks? In *Proceedings of the 1st Conference on Language Modeling (COLM)*, 2024.
4. 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.
5. 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.
6. 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).*
7. 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.
8. 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.
9. 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.

10. 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.
11. 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).*
12. 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.
13. 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.
14. 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.
15. **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.
16. 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.
17. **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.
18. **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.
19. **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.
20. 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.
21. **E. Nalisnick** and P. Smyth. Learning Priors for Invariance. In *Proceedings of the 21st International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018.
22. **E. Nalisnick** and P. Smyth. Learning Approximately Objective Priors. In *Proceedings of the 33rd Conference on Uncertainty in Artificial Intelligence (UAI)*, 2017.
23. **E. Nalisnick** and P. Smyth. Stick-Breaking Variational Autoencoders. In *Proceedings of the 5th International Conference on Learning Representations (ICLR)*, 2017.

24. **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.
25. **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.
26. **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)

27. R. Verma, V. Fischer, and **E. Nalisnick**. On the Calibration of Conditional-Value-at-Risk. *Next Generation of AI Safety*, ICML 2024.
28. 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*.
29. M. Schirmer, D. Zhang, and **E. Nalisnick**. Beyond Top-Class Agreement: Using Divergences to Forecast Performance under Distribution Shift. *Distribution Shifts*, NeurIPS 2023.
30. 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.
31. 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.
32. S. Wang and **E. Nalisnick**. Active Learning for Multilingual Fingerspelling Corpora. *Adaptive Experimental Design and Active Learning in the Real World*, ICML 2022.
33. J. U. Allingham and **E. Nalisnick**. A Product of Experts Approach to Early-Exit Ensembles. *Dynamic Neural Networks*, ICML 2022.
34. P. Manggala, H. Hoos, and **E. Nalisnick**. Bayesian Weak Supervision via an Optimal Transport Approach. *Human-Machine Collaboration and Teaming*, ICML 2022.
35. 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.
36. 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.
37. 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.
38. P. Manggala, H. Hoos, and **E. Nalisnick**. Bayesian Regression from Multiple Sources of Weak Supervision. *Machine Learning for Data*, ICML 2021.

39. Y. Zhang and **E. Nalisnick**. On the Inconsistency of Bayesian Inference for Misspecified Neural Networks. *Symposium on Advances in Approximate Bayesian Inference*, 2021.
40. **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.
41. **E. Nalisnick** and J. M. Hernández-Lobato. Automatic Depth Determination for Bayesian ResNets. *Bayesian Deep Learning*, NeurIPS 2018.
42. 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.
43. D. Ji, **E. Nalisnick**, and P. Smyth. Mondrian Processes for Flow Cytometry Analysis. *Machine Learning for Health*, NeurIPS 2017.
44. **E. Nalisnick** and P. Smyth. Variational Inference with Stein Mixtures. *Advances in Approximate Bayesian Inference*, NIPS 2017.
45. **E. Nalisnick** and P. Smyth. The Amortized Bootstrap. *Implicit Models*, ICML 2017. *Oral presentation.*
46. **E. Nalisnick**, L. Hertel, and P. Smyth. Approximate Inference for Deep Latent Gaussian Mixtures. *Bayesian Deep Learning*, NeurIPS 2016.
47. 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
Invited Session on <i>Advances in Inference and Theory for Bayesian Neural Networks</i>
JOINT STATISTICAL MEETINGS (JSM) | 2024

Portland, USA |
| 2. Detecting Distribution Shift with Deep Generative Models
DUTCH SOCIETY OF PATTERN RECOGNITION AND IMAGE PROCESSING | 2023

Amsterdam, Netherlands |
| 3. Towards Anytime Uncertainty Estimation in Early-Exit Neural Networks
Workshop on <i>Uncertainty Quantification for Computer Vision</i>
INTERNATIONAL CONFERENCE ON COMPUTER VISION (ICCV) | 2023

Paris, France |
| 4. Learning to Defer to One, Multiple, or a Population of Expert(s)
ELLIS WORKSHOP ON ROBUST MACHINE LEARNING (ROBUSTML) | 2023

Helsinki, Finland |
| 5. Bayesian Learning & Uncertainty Quantification
MEDITERRANEAN MACHINE LEARNING SUMMER SCHOOL | 2023

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. 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
4. On the Calibration of Learning-to-Defer Systems 2022
UNIV. OF CALIFORNIA, RIVERSIDE: COMPUTER SCIENCE, UNIV. OF MANCHESTER: STATISTICS
5. Predictive Complexity Priors 2021
UNIV. OF EDINBURGH: ANC SEMINAR, IMPERIAL COLLEGE: STATISTICS, ALAN TURING INSTITUTE
6. Detecting Distribution Shift with Deep Generative Models 2020
SYDNEY MACHINE LEARNING MEETUP
7. 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
8. Deep Learning & Statistics: Bridging the Gap with Prob. Structure 2020
UNIV. OF CALIFORNIA, SANTA BARBARA: STATISTICS
9. Deep Learning Under Covariate Shift 2019
UNIV. OF CALIFORNIA, IRVINE: AI/ML SEMINAR
10. Deep Learning: A Synthesis from Probabilistic Foundations 2018 - 2019
RAND CORPORATION: STATISTICS, UNIV. OF CALIFORNIA, IRVINE: STATISTICS
11. Evaluating Deep Generative Models on Out-of-Distribution Inputs 2019
UNIV. OF OXFORD: STATISTICS, CAMAIML (MSR CAMBRIDGE), UNIV. OF CAMBRIDGE: LTL SEMINAR

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|---|------|
| 12. Structured Shrinkage Priors for Neural Networks
IMPERIAL COLLEGE: STATISTICS | 2018 |
| 13. Approximate Inference for Frequentist Uncertainty Estimation
SoCAL ML SYMPOSIUM | 2017 |
| 14. Deep Generative Models with Stick-Breaking Priors
UNIV. OF CALIFORNIA, IRVINE: AI/ML SEMINAR, OPENAI | 2017 |
| GENERAL AUDIENCE, OUTREACH | |
| 1. Discussed Human-AI Collaboration on the <i>Faculty Factory Podcast</i> | 2024 |
| 2. AI Risks: From Today to Doomsday — An Academic Panel Discussion
AMSTERDAM ELLIS UNIT | 2023 |