GEOFF PLEISS, CURRICULUM VITAE

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ACADEMIC POSITIONS AND EDUCATION

2023– UNIVERSITY OF BRITISH COLUMBIA (Vancouver, BC, Canada)
Assistant Professor, Department of Statistics (2023–)
Centre for Artificial Intelligence Decision-Making and Action (CAIDA)
Artificial Intelligence Methods for Scientific Impact (AIM-SI) Cluster

2023– VECTOR INSTITUTE (Toronto, ON, Canada)
Faculty Member

2020–2023 COLUMBIA UNIVERSITY (New York, NY, USA)
Postdoctoral Research Scientist, Zuckerman Institute
Supervisor: John P. Cunningham

2015–2020 CORNELL UNIVERSITY (Ithaca, NY, USA)
Ph.D., Computer Science (2020)
M.S., Computer Science (2018)
Committee: Kilian Q. Weinberger (chair), Andrew Gordon Wilson, Karthik Sridharan
Dissertation: A Scalable and Flexible Framework for Gaussian Processes via Matrix-Vector Multiplication

2009–2013 OLIN COLLEGE OF ENGINEERING (Needham, MA, USA)
B.Sc., Engineering (2013)
Concentration: Computing with Applied Mathematics

OTHER RELEVANT EXPERIENCE

2019–2020 ASAPP, INC. (Ithaca, NY, USA)
Research Intern

2018 MICROSOFT, INC. (Redmond, WA, USA)
Research Intern

2013–2015 PIVOTAL INC. (New York, NY, USA)
Software Engineer

HONORS AND AWARDS

2023	AISTATS Top Reviewer (top 10%)
2022	NeurIPS "I Can't Believe It's Not Better" Workshop – Most Surprising Result Award
2022	AISTATS Top Reviewer (top 10%)
2020	NeurIPS Top Reviewer (top 10%)
2019	NeurIPS Top Reviewer (top 50%)
2017	National Science Foundation Graduate Research Fellowship (honorable mention)
2016	National Science Foundation Graduate Research Fellowship (honorable mention)
2012	Barry M. Goldwater Scholarship (honorable mention)
2009–2013	Olin Merit Scholarship (full-tuition recipient)

PUBLICATIONS

Citation Statistics

All statistics are based on Google Scholar, with manual corrections for errors.

Total citations of all publications: 8000+

Total citations of top-three most cited publications: 5600+

Publications (including technical reports) with 100+ citations: 10

Publications (including technical reports) with 10+ citations: 24

Preprints Under Submission

[U1] Alexandre Capone, **Geoff Pleiss**, and Sandra Hirche. Sharp calibrated Gaussian processes. *arXiv preprint arXiv:2302.11961*, 2023.

[U2] Taiga Abe, E. Kelly Buchanan, **Geoff Pleiss**, and John P. Cunningham. Pathologies of predictive diversity in deep ensembles. *arXiv preprint arXiv:2302.00704*, 2023.

Refereed Conference Publications

* *denotes equal author contribution (shared first-authorship).*

[C1] Jonathan Wenger, **Geoff Pleiss**, Marvin Pförtner, Philipp Hennig, and John P. Cunningham. Posterior and computational uncertainty in Gaussian processes. In *Neural Information Processing Systems*, 2022.

[C2] Taiga Abe*, E. Kelly Buchanan*, **Geoff Pleiss**, Richard Zemel, and John P. Cunningham. Deep ensembles work, but are they necessary? In *Neural Information Processing Systems*, 2022.

[C3] Luhuan Wu, **Geoff Pleiss**, and John P. Cunningham. Variational nearest neighbor Gaussian processes. In *International Conference on Machine Learning*, 2022.

[C4] Jonathan Wenger, **Geoff Pleiss**, Philipp Hennig, John P. Cunningham, and Jacob R. Gardner. Preconditioning for scalable Gaussian process hyperparameter optimization. In *International Conference on Machine Learning*, 2022. [LONG ORAL PRESENTATION].

[C5] **Geoff Pleiss** and John P. Cunningham. The limitations of large width in neural networks: A deep Gaussian process perspective. In *Neural Information Processing Systems*, 2021.

[C6] Anthony L. Caterini*, Gabriel Loaiza-Ganem*, **Geoff Pleiss**, and John P. Cunningham. Rectangular flows for manifold learning. In *Neural Information Processing Systems*, 2021.

[C7] Andres Potapczynski*, Luhuan Wu*, Dan Biderman*, **Geoff Pleiss**, and John P. Cunningham. Bias-free scalable Gaussian processes via randomized truncations. In *International Conference on Machine Learning*, 2021.

[C8] Luhuan Wu*, Andrew Miller*, Lauren Anderson, **Geoff Pleiss**, David Blei, and John P. Cunningham. Hierarchical inducing point Gaussian process for inter-domain observations. In *Artificial Intelligence and Statistics*, 2021.

[C9] **Geoff Pleiss**, Martin Jankowiak, David Eriksson, Anil Damle, and Jacob R. Gardner. Fast matrix square roots with applications to Gaussian processes and Bayesian optimization. In *Neural Information Processing Systems*, 2020.

[C10] **Geoff Pleiss**, Tianyi Zhang, Ethan Elenberg, and Kilian Q. Weinberger. Identifying mislabeled data using the area under the margin ranking. In *Neural Information Processing Systems*, 2020.

[C11] Martin Jankowiak, **Geoff Pleiss**, and Jacob R. Gardner. Deep sigma point processes. In *Uncertainty in Artificial Intelligence*, 2020.

[C12] Martin Jankowiak, **Geoff Pleiss**, and Jacob R. Gardner. Parametric Gaussian process regressors. In *International Conference on Machine Learning*, 2020.

[C13] Yurong You*, Yan Wang*, Wei-Lun Chao*, Divyansh Garg, **Geoff Pleiss**, Bharath Hariharan, Mark Campbell, and Kilian Q. Weinberger. Pseudo-lidar++: Accurate depth for 3d object detection in autonomous driving. In *International Conference on Learning Representations*, 2020.

[C14] Ke Wang*, **Geoff Pleiss***, Jacob R. Gardner, Stephen Tyree, Kilian Q. Weinberger, and Andrew Gordon Wilson. Exact Gaussian processes on a million data points. In *Neural Information Processing Systems*, 2019.

[C15] Jacob R. Gardner*, **Geoff Pleiss***, David Bindel, Kilian Q. Weinberger, and Andrew Gordon Wilson. GPyTorch: Blackbox matrix-matrix Gaussian process inference with GPU acceleration. In *Neural Information Processing Systems*, 2018. [SPOTLIGHT PRESENTATION].

[C16] **Geoff Pleiss**, Jacob R. Gardner, Andrew Gordon Wilson, and Kilian Q. Weinberger. Constant time predictive distributions for Gaussian processes. In *International Conference on Machine Learning*, 2018.

[C17] Jacob R. Gardner, **Geoff Pleiss**, Ruihan Wu, Andrew Gordon Wilson, and Kilian Q. Weinberger. Product kernel interpolation for scalable Gaussian processes. In *Artificial Intelligence and Statistics*, 2018.

[C18] **Geoff Pleiss***, Manish Raghavan*, Felix Wu, Jon Kleinberg, and Kilian Q. Weinberger. On fairness and calibration. In *Neural Information Processing Systems*, 2017.

[C19] Chuan Guo*, **Geoff Pleiss***, Yu Sun*, and Kilian Q. Weinberg. On calibration of modern neural networks. In *International Conference on Machine Learning*, 2017.

[C20] Paul Upchurch*, Jacob Gardner*, **Geoff Pleiss**, Kavita Bala, Robert Pless, Noah Snavely, and Kilian Q. Weinberger. Deep feature interpolation for image content changes. In *Computer Vision and Pattern Recognition*, 2017.

[C21] Gao Huang*, Yixuan Li*, **Geoff Pleiss**, Zhuang Liu, John E. Hopcroft, and Kilian Q. Weinberger. Snapshot ensembles: Train 1, get M for free. In *International Conference on Learning Representations*, 2017.

Journal Publications

[J1] Jordan Venderley, Michael Matty, Krishnanand Mallayya, Matthew Krogstad, Jacob Ruff, **Geoff Pleiss**, Varsha Kishore, David Mandrus, Daniel Phelan, Lekhanath Poudel, and others. Harnessing interpretable and unsupervised machine learning to address big data from modern x-ray diffraction. *Proceedings of the National Academy of Sciences*, 119(24), 2022.

[J2] Gao Huang*, Zhuang Liu*, **Geoff Pleiss**, Laurens van der Maaten, and Kilian Q. Weinberger. Convolutional networks with dense connectivity. *Transactions on Pattern Analysis and Machine Intelligence*, 2019.

[J3] James Knighton, **Geoff Pleiss**, Elizabeth Carter, Steven Lyon, M. Todd Walter, and Scott Steinschneider. Potential predictability of regional precipitation and discharge extremes using synoptic-scale climate information via machine learning: An evaluation for the eastern continental United States. *Journal of Hydrometeorology*, 20(5):883–900, 2019.

Technical Reports and Workshop Proceedings

[R1] Taiga Abe*, E. Kelly Buchanan*, **Geoff Pleiss**, and John P. Cunningham. The best deep ensembles sacrifice predictive diversity. In *NeurIPS "I Can't Believe It's Not Better!" Workshop*, 2022. [ORAL PRESENTATION].

[R2] Martin Jankowiak and **Geoff Pleiss**. Scalable cross validation losses for Gaussian process models. *arXiv preprint arXiv:2105.11535*, 2021.

[R3] Elliott Gordon-Rodriguez, Gabriel Loaiza-Ganem, **Geoff Pleiss**, and John P. Cunningham. Uses and abuses of the cross-entropy loss: Case studies in modern deep learning. In *NeurIPS "I Can't Believe It's Not Better!" Workshop*, 2020. [ORAL PRESENTATION].

[R4] **Geoff Pleiss***, Danlu Chen*, Gao Huang, Tongcheng Li, Laurens van der Maaten, and Kilian Q. Weinberger. Memory-efficient implementation of DenseNets. *arXiv preprint arXiv:1707.06990*, 2017.

INVITED TALKS

Bridging The Gap Between Deep Learning and Probabilistic Modeling

Spring 2022	Job talk, various universities

Understanding Neural Networks through Gaussian Processes, and Vice Versa

Nov. 2021	New York University (New York, NY, USA)
Oct. 2021	Artificial Intelligence Seminar, University College London (Virtual)

GPyTorch: A Scalable and Flexible Framework for Gaussian Processes via Matrix-Vector Multiplication

Dec. 2020	Machine Learning for Nuclear Data Workshop (Virtual)
May 2020	Columbia University (Virtual)
Sept. 2019	Bill and Melinda Gates Foundation (Virtual)

From $N = 1{,}000$ to $N = 1{,}000{,}000$: Scaling Gaussian Process Inference with Matrix Multiplication and GPU Acceleration

Nov. 2019	Computer Science Colloquium, Cornell University (Ithaca, NY, USA)
May 2019	Symposium on Bayesian Optimization, Uber AI (San Francisco, CA, USA)

Selected Open Source

2018–	GPyTorch https://gpytorch.ai
2022–	LinearOperator https://linear-operator.readthedocs.io
2017	Memory Efficient DenseNets https://github.com/gpleiss/efficient_densenet_pytorch

Professional Service

Area Chair

International Conference on Machine Learning (2022–2023)

Neural Information Processing Systems (2022–2023)

International Joint Conference on Artificial Intelligence (2023)

Conference Reviewer

AAAI Conference on Artificial Intelligence (2017)

Artificial Intelligence and Statistics (2019–2023)

International Conference on Learning Representations (2022)

International Conference on Machine Learning (2019–2021)

Neural Information Processing Systems (2018–2021)

Uncertainty in Artificial Intelligence (2018)

Journal Reviewer

Bernoulli (2022)

Journal of Machine Learning Research (2019–2022)

Transactions on Machine Learning Research (2022–2023)

Transactions on Pattern Analysis and Machine Intelligence (2020–2021)

Organizing Committee Member

NeurIPS Workshop on Gaussian Processes, Spatiotemporal Modeling, and Decision-Making Systems (2022)

Virtual Seminar on Gaussian Processes, Spatiotemporal Modeling, and Decision-Making Systems (2022–2023)

Panelist

Scientific Software Development Panel: Dagstuhl Seminar on Probabilistic Numerical Methods (2021)

TEACHING

University of British Columbia

Fall 2023	STAT 520P — Topics in Bayesian Analysis and Decision Theory: Bayesian Optimization

TEACHING ASSISTANTSHIPS

Cornell University

Fall 2017	CS6780 — Advanced Topics in Machine Learning (asst. for Prof. Kilian Weinberger)
Fall 2016	CS4786 — Machine Learning for Data Science (asst. for Prof. Karthik Sridharan)
Fall 2015	CS4700 — Foundations of Artificial Intelligence (asst. for Prof. Bart Selman)

Olin College of Engineering

Spring 2013	SCI3130 — Advanced Classical Mechanics (asst. for Prof. Yevgeniya V. Zastavker)
Spring 2011	SCI1121 — Computational Electricity and Magnetism (asst. for Prof. Mark Somerville)

OUTREACH

Fall 2020	LatinX in AI NeurIPS mentorship program
Spring 2018	Cornell "Expand Your Horizons" (STEM workshop for middle school girls)
Spring 2017	Cornell "GRASSHOPR" (After-school CS class at local middle school)
Spring 2016	Cornell "Expand Your Horizons"
Spring 2016	"Code4Kids" (After-school CS class at local elementary school)