

Vidhi Lalchand

*Broad Institute of MIT and Harvard
Eric and Wendy Schmidt Center*

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Nationality: British

Education

University of Cambridge, UK
Christ's College

2023

PhD

Affiliation: Cavendish Laboratory (Physics) and Department of Engineering

Thesis title: On Hierarchical Gaussian Processes [🔗](#)

Supervisors: Prof. Carl E. Rasmussen [🔗](#), Prof. Neil D. Lawrence [🔗](#)

Research Focus: Probabilistic Generative Models, Kernel Design, Sparse Bayesian algorithms, Function-space inference and Gaussian Processes.

MPhil in Scientific Computing (Distinction)

Affiliation: Department of Physics

Notes: Cohort Rank 1

Research Focus: Calibrated probabilistic classification of rare events from the Large Hadron Collider.

University of London, UK
London School of Economics & Political Science

2011

MS in Applied Mathematics (Distinction)

Supervisor: Prof. Norman Biggs [🔗](#)

Research Focus: Cryptography

BSc (First Class Honors)

Major: Mathematics, Minor: Economics

Notes: University of London, External System

Fellowships & Awards

G-Research PhD thesis prize (Cambridge), Runner-up	2023
Eric & Wendy Schmidt Center Postdoctoral fellowship	2023-Current
NeurIPS Scholar Award (WiML)	2019, 2022, 2023
Qualcomm Innovation Fellowship (European Cohort)	2020-2021
Turing Doctoral Fellowship, The Alan Turing Institute, UK	2017-2020
University of London Award for Academic Excellence (Given to 3 external students worldwide)	2009

Academic Employment —

Broad Institute of MIT & Harvard

Eric & Wendy Schmidt Postdoctoral Fellow

Oct 2023 - Current

PI: Prof. Caroline Uhler

- Generative latent variable models and probabilistic methods for representation learning (VAEs, Diffusion, Flows).
- Manifold learning and geometric approaches to high-dimensional data.
- Applications to small molecules, drug modalities, and therapeutic discovery.

Massachusetts Institute of Technology (MIT)

Kavli Institute for Astrophysics and Space Research

March 2023

Visiting Research

Host: Prof. Anna-Christina Eilers

- Research focus: Development of scalable unsupervised probabilistic latent variable models for generative modelling of quasar spectra and simultaneous black-hole mass estimation.

University of Cambridge

Dept. of Computer Science

Feb 2022 - Oct 2023

Adjunct RA

PI: Prof. Neil D. Lawrence

- Research focus: Development of scalable algorithms for dimensionality reduction and representation learning on scRNA-seq.

Industry —

Adjunct ML Research Consulting:-

IMU Biosciences (Series A startup) — London, UK

2025

Sixfold Biosciences (Series B startup) — London, UK

2023-2024

Bespoke generative ML pipelines for multi-modal biomedical data.

Full-time:-

Citadel Securities, LLC — London, UK

Quantitative Strategies Group

Aug 2014 - Sep 2016

Non-Compete (Sep 2015 - Sep 2016)

- Proprietary trading and market making for pan-European equities.

Credit Suisse Securities (Europe) Limited — London, UK

Quantitative Research (Electronic FX and Options)

June 2012 - July 2014

- Developed statistical models for automated two-way FX market making and options pricing engine.

University College London (UCL)
Research Associate

Nov 2011 - June 2012

- Research focus: Simulation environments for multi-player games.

UBS, London
Quantitative Associate Internship Programme

June 2011 - Sept 2011

Publications

(available on [scholar profile](#))

Manuscripts under Review

Warped Latent Spaces and Traversal in Deep Chemical Generative Models
Vidhi Lalchand, Dave Lines, Caroline Uhler. Sept, 2025

Selected Publications

- 1. Shared Stochastic Gaussian Process Latent Variable Models: A Multi-modal Generative Model for Quasar Spectra.**
Vidhi Lalchand, Anna-Christina Eilers
Transactions on Machine Learning Research (TMLR), Jan 2025.
- 2. Scalable Permutation Invariant Multi-Output Gaussian Processes for Cancer Drug Response.**
Leiv Rønneberg, Vidhi Lalchand
NeurIPS 2024 Workshop on Bayesian Decision-making and Uncertainty, Vancouver, 2024.
- 3. Recurrent VAE with Gaussian Process Decoders for De novo Molecular Generation.**
Vidhi Lalchand, Dave Lines, Neil D. Lawrence
ICML Workshop on Next Generation of Sequence Modeling Architectures, 2024, Vienna, Austria.
- 4. Scalable Amortized GPLVMs for Single Cell Transcriptomics Data.**
Sarah Zhao, Aditya Ravuri, Vidhi Lalchand, Neil D. Lawrence
ICLR Machine Learning for Genomics Explorations Workshop, Vienna, 2024.
- 5. Shared Stochastic Gaussian Process Decoders: A Probabilistic Generative Model for Quasar Spectra.**
Vidhi Lalchand, Anna-Christina Eilers
2nd ICML Workshop on Machine Learning for Astrophysics, Hawaii, 2023.
- 6. Dimensionality Reduction as Probabilistic Inference.**
Aditya Ravuri, Francisco Vargas, Vidhi Lalchand, Neil D. Lawrence
5th Symposium on Advances in Approximate Bayesian Inference (AABI), 2023.
- 7. Kernel Learning for Interpretable Climate Science.**
Vidhi Lalchand, Kenza Tazi, Talay M. Cheema, Richard E. Turner, Scott Hosking
16th Bayesian Modelling Applications Workshop, Uncertainty in Artificial Intelligence (UAI), 2022, Eindhoven, Netherlands..

8. **Sparse Gaussian Process Hyperparameters: Optimise or Integrate?.**
Vidhi Lalchand, Wessel Bruinsma, David R. Burt, Carl E. Rasmussen
 Advances in Neural Information Processing Systems (**NeurIPS**), New Orleans, 2022.
9. **Modelling Technical and Biological Effects in single-cell RNA-seq data with Scalable Gaussian Process Latent Variable Models (GPLVM).**
Vidhi Lalchand*, Aditya Ravuri*, Emma Dann*, Natsuhiko Kumasaka, Dinithi Sumanaweera, Rik G. H. Lindeboom, Shaista Madad, Neil D. Lawrence, Sarah A. Teichmann
 Machine Learning in Computational Biology (**MLCB**), 2022.
10. **Generalised GPLVM with Stochastic Variational Inference.**
Vidhi Lalchand, Aditya Ravuri, Neil D. Lawrence
 International Conference on Artificial Intelligence and Statistics (**AISTATS**), 2022.
11. **Marginalised Gaussian Processes with Nested Sampling.**
 Fergus Simpson*, **Vidhi Lalchand***, Carl E. Rasmussen
 Advances in Neural Information Processing Systems (**NeurIPS**), 2021.
12. **KITT: Kernel Identification Through Transformers.**
 Fergus Simpson, Ian Davies, **Vidhi Lalchand**, Alessandro Vuollo, Nicolas Durrande, Carl E. Rasmussen
 Advances in Neural Information Processing Systems (**NeurIPS**), 2021.
13. **Achieving Robustness to Aleatoric Uncertainty with Heteroscedastic Bayesian Optimisation.**
 Ryan-Rhys Griffiths, Alexander A. Aldrick, Miguel Garcia-Ortegon, **Vidhi R. Lalchand**, Alpha A. Lee
 In Machine Learning: Science and Technology (**MLST**), 2021.
14. **Physics model-informed Gaussian process for online optimization of particle accelerators.**
 A. Hanuka, X. Huang, J. Shtalenkova, D. Kennedy, A. Edelen, Z. Zhang, **Lalchand V. R.**, D. Ratner, J. Duris
 Physical Review Accelerators and Beams, 24(7):072802, 2021.
15. **Approximate Inference for Fully Bayesian Gaussian Process Regression.**
Vidhi Lalchand and Carl E. Rasmussen
 In Proceedings of the 2nd Symposium on Advances in Approximate Bayesian Inference, volume 118 of Proceedings of Machine Learning Research (**PMLR**), pages 1–12, 2020.
16. **Gaussian Process Latent Variable Flows for Massively Missing Data.**
Vidhi Lalchand, Aditya Ravuri, Neil D. Lawrence
 3rd Symposium on Advances in Approximate Bayesian Inference (**AABI**), 2020.
17. **Marginalised Gaussian Processes with Nested Sampling.**
 Fergus Simpson, **Vidhi Lalchand**, Carl E. Rasmussen
 3rd Symposium on Advances in Approximate Bayesian Inference (**AABI**), 2020.
18. **Extracting more from Boosted Decision Trees:A High Energy Physics case study.**
V. R. Lalchand.
 2nd Workshop on Machine Learning and the Physical Sciences (**NeurIPS**), Vancouver, 2019.

19. A Fast and Greedy Subset-of-Data (SoD) Scheme for Sparsification in Gaussian Processes.

V. R. Lalchand, A. C. Faul

38th International Workshop on Bayesian Inference and Maximum Entropy Methods in Science & Engineering (MaxEnt), 2018.

20. Algorithmic Trading Review.

P. Treleavan, M. Galas, V. Lalchand

Association of Applied Computing Machinery (ACM), November 2013.

Academic Service

Reviewer for ICLR (2025), JMLR (2023, 2024), ICML (2022, top 10%), AISTATS (2022, 2023), NeurIPS (2021, 2022, 2023, 2025), Advances in Approximate Bayesian Inference Symposium (2023).

Teaching and Mentorship

- 2024 MIT Undergraduate Research Opportunities Program
 - Jue Gong, Candidate for Bachelor of Science in Physics and in Computer Science
 - Khizer Shahid, Candidate for Bachelor of Science in Computer Science and Mathematics
- 2022-23 Part III Computer Science / M.Phil Advanced Computer Science (Research Supervision):
 - Kushagr Ahuja (Distinction)
 - Sarah Zhao (Distinction)
- 2022 Supervised 20+ undergraduates for 3F8: Inference (Part II, Engineering Tripos)
- 2021 TA for Module 4F13: Probabilistic Machine Learning (MPhil, Department of Engineering)

Invited Talks

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| Stanford University, USA
<i>Probabilistic Latent Variable Models for Astronomy</i> | Apr 2025 |
| Princeton University, USA
<i>Chemical Generative Models for De Novo Drug Design</i> | Apr 2025 |
| University of Cambridge, UK
<i>Generative Models for Astronomy</i> | Mar 2025 |
| University of Oxford, UK
<i>Gaussian Processes, Generative Models and Kernel Design</i> | Feb 2025 |
| Broad Institute of MIT and Harvard, Cambridge, USA
<i>Bayesian Optimisation in the Latent Space of Generative Models</i> | Sept 2024 |

Harvard School of Engineering and Applied Sciences, Cambridge, USA	Mar 2023
<i>Can we scale Gaussian process latent variable models to big data?</i>	
MIT Kavli Institute for Astrophysics, Cambridge, USA	Mar 2023
<i>Scalable Gaussian process latent variable models for Quasar Spectra reconstruction</i>	
High Performance Computing Seminar, Cambridge, UK	Sep 2022
<i>Machine Learning & Modern Science</i>	
UAI 16th Bayesian Modelling Applications Workshop, Netherlands	Aug 2022
<i>Kernel learning for Interpretable Climate Science</i>	
GirlsWhoML Workshop, Cambridge, UK	June 2022
<i>Introduction to Deep Learning</i>	
21st Cambridge PyData Meet-up, Cambridge, UK	July 2020
<i>Modelling with Gaussian Processes</i> (link)	
Jump Trading, London	Dec 2019
<i>Advances in Gaussian Processes</i>	
ML Meets Particle Physics Workshop, Weizmann Institute, Israel	Aug 2019
<i>Hierarchical Probabilistic Mixture Models for density estimation in HEP</i>	
Cavendish Laboratory Graduate Conference, University of Cambridge	Nov 2018
<i>Bayesian Machine Learning in High Energy Physics</i>	
38th International Workshop on Bayesian Inference and Maximum Entropy Methods in Science & Engineering	July 2018
<i>A progressive framework for Gaussian Process Regression</i>	
CogX 2018, Research Stage	June 2018
<i>Deconstructing Gaussian Processes.</i> (link)	

Distractions ---

YouTube podcast on AI Research (link).	April 2025
Organiser of Machine Learning Winter School for Scientists .	Feb 2021
Cambridge University: Women In STEM Interview (link)	Nov 2019
The Cambridge Union: Immigrant Identities Panel.	
Asian Voice - An Unconventional Journey from Banking to Science .	Aug 2017

Twitter: [@VRLalchand](#)

USA Visa Status: Currently hold a J-1 visa as a Research Scholar until October 2028