

Vidhi Lalchand

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EDUCATION

University of Cambridge, Christ's College Dept. of Physics & Dept. of Engineering

Ph.D 2018-Current
Thesis title: On Hierarchical Gaussian Processes
Supervisors: Carl E. Rasmussen and Christopher Lester

M.Phil Scientific Computing (Distinction) 2017
Thesis: A meta-algorithm for classification using random recursive tree ensembles: A high energy physics application.
Supervisors: Anita C. Faul and Christopher Lester

London School of Economics and Political Science (LSE) Dept. of Mathematics

M.Sc. Applicable Mathematics (Distinction) 2008-2011
Thesis: Cryptographic Hash Functions.

B.Sc. (Hons)
Major: Mathematics (First)

Scientific Computing Proficiency

Probabilistic Programming Languages: pymc3, STAN, pyro
Machine Learning packages: pytorch, gpytorch, OS: Unix

FELLOWSHIPS & AWARDS

Qualcomm Innovation Fellowship (QIF, Europe) 2020-2021
Doctoral Fellowship for International Students, The Alan Turing Institute, UK 2017-2020
University of London Award for Academic Excellence for External Students 2008

PEER-REVIEWED PUBLICATIONS

(available at [scholar profile](#))

Conference Proceedings

- 2022 **Vidhi Lalchand**, Aditya Ravuri, Neil D. Lawrence. Generalised GPLVM with Stochastic Variational Inference. In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2022.
- 2021 Fergus Simpson*, **Vidhi Lalchand*** and Carl E. Rasmussen. Marginalised Gaussian Processes with Nested Sampling. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2021.
- 2021 Fergus Simpson, Ian Davies, **Vidhi Lalchand**, Alessandro Vuollo, Nicolas Durrande, Carl E. Rasmussen. KITT: Kernel Identification Through Transformers. In *Advances in Neural Information Processing Systems (NeurIPS)*, 2021.
- 2020 **Vidhi Lalchand** and Carl E. Rasmussen. Approximate inference for Fully Bayesian Gaussian process Regression. 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.

Journals

- 2021 Ryan-Rhys Griffiths, Alexander A. Aldrick, Miguel Garcia-Ortegon, **Vidhi R. Lalchand**, Alpha A. Lee. Achieving Robustness to Aleatoric Uncertainty with Heteroscedastic Bayesian Optimisation. In *Machine Learning: Science and Technology* (MLST), 2021.
- 2021 Hanuka A, Huang X, Shtalenkova J, Kennedy D, Edelen A, Zhang Z, **Lalchand VR**, Ratner D, Duris J. Physics model-informed Gaussian process for online optimization of particle accelerators. *Physical Review Accelerators and Beams*. 2021 Jul 8;24(7):072802.

Workshops

- 2020 **Vidhi Lalchand**, Aditya Ravuri, Neil D. Lawrence. Gaussian Process Latent Variable Flows for Massively Missing data. *3rd Symposium on Advances in Approximate Bayesian Inference* (AABI), 2020.
- 2020 Fergus Simpson, **Vidhi Lalchand** and Carl E Rasmussen. Marginalised Gaussian Processes with Nested Sampling. *3rd Symposium on Advances in Approximate Bayesian Inference* (AABI), 2020.
- 2019 **V. R. Lalchand**. Extracting more from Boosted Decision Trees: A High Energy Physics case study. *Second Workshop on Machine Learning and the Physical Sciences* (NeurIPS), 2019, Vancouver, Canada.
- 2018 **V. R. Lalchand**, A.C. Faul. A Fast and Greedy Subset-of-Data (SoD) Scheme for Sparsification in Gaussian processes. *38th International Workshop on Bayesian Inference and Maximum Entropy Methods in Science & Engineering*, (MaxEnt), 2018.

Review Articles

- 2013 P Treleavan, M Galas and **V Lalchand**. Algorithmic Trading Review. *Association of Applied Computing Machinery*, November 2013.

Preprints

- 2022 **Vidhi Lalchand**, Kenza Tazi, Talay M. Cheema, Richard E. Turner, Scott Hosking. Kernel Learning for Interpretable Climate Science. (In submission)
- 2022 **Vidhi Lalchand**, Aditya Ravuri, Emma Dann, Dinithi Sumanaweera, Natsuhiko Kumasaka, Shaista Madad, Neil D. Lawrence. Modelling Technical and Biological Effects in single-cell RNA-seq data with Scalable Gaussian Process Latent Variable Models (GPLVM) (In submission)
- 2022 **Vidhi Lalchand**, Talay M. Cheema, Laurence Aitchison, Carl E. Rasmussen. Gaussian process parameterised Covariance Kernels for Non-Stationary Modelling. (In submission)
- 2022 **Vidhi Lalchand**, Wessel Bruinsma, David R. Burt, Carl E. Rasmussen. Sparse Gaussian Process Hyperparameters: Optimise or Integrate? (In submission)

PROFESSIONAL ACTIVITIES

Reviewer for ICML (2022), AISTATS (2022) and NeurIPS (2021, 2022).

TEACHING & SUPERVISION

- 2021 TA for Module 4F13: Probabilistic Machine Learning (MPhil, Department of Engineering)
- 2022 Supervisor for Module 3F8: Inference (Part II, Department of Engineering)
- 2022 Part III Computer Science (Thesis Supervision)
Student: Kushagr Ahuja (Distinction)

INVITED TALKS

GirlsWhoML Workshop Cambridge, UK <i>Introduction to Deep Learning</i>	June 2022
Invited Speaker @ 21st Cambridge PyData Meet-up Cambridge, UK <i>Modelling with Gaussian Processes</i> (link)	July 2020
Jump Trading, London <i>Advances in Gaussian Processes</i>	Dec 2019
Machine Learning Meets Particle Physics Workshop Weizmann Institute of Science, Israel <i>Hierarchical Probabilistic Mixture Models for density estimation in HEP</i>	Aug 2019
Cavendish Laboratory Graduate Student Conference University of Cambridge <i>Bayesian Machine Learning in High Energy Physics</i>	Nov 2018
38th International Workshop on Bayesian Inference and Maximum Entropy Methods in Science & Engineering <i>A progressive framework for Gaussian Process Regression</i>	July 2018
CogX 2018, Research Stage <i>Deconstructing Gaussian Processes.</i> (link)	June 2018

WORK EXPERIENCE

Citadel Securities, LLC Quantitative Strategies Group Non-Compete (Sep 2015 - Sep 2016)	Aug 2014 - Sep 2016
<ul style="list-style-type: none">• Proprietary trading and market making for pan-European equities.	
Credit Suisse Securities (Europe) Limited, London Quantitative Research Analyst (Electronic FX and Options)	June 2012 - July 2014
<ul style="list-style-type: none">• Developed statistical models for automated two-way FX market making and options pricing engine.	
University College London (UCL) Research Associate	Nov 2011 - June 2012
<ul style="list-style-type: none">• Research focus: Simulation environments for multi-player games.	
UBS, London Quantitative Associate Internship Programme	June 2011 - Sept 2011

DISTRACTIONS

Instructor at Machine Learning Winter School for Scientists .	Feb 2021
Organiser of the Information Engineering conference (Dept. of Engineering, University of Cambridge)	
Cambridge University: Women In STEM Interview (link)	Nov 2019
The Cambridge Union: Immigrant Identities Panel	
Presentation to the Scientific Advisory Board, The Alan Turing Institute, London. <i>Algorithms for rare event classification in High Energy Physics.</i>	June 2018
Asian Voice - <i>An Unconventional Journey from Banking to Science.</i> (link)	Aug 2017

Twitter: [@VRLalchand](#)