

Vidhi R. Lalchand

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EDUCATION

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

Ph.D 2017-Current
Supervisors: Carl E. Rasmussen and Christopher Lester
Thesis title: Hierarchical Gaussian Processes for Kernel Learning and Latent Variable Modelling.

M.Phil Scientific Computing (Distinction) 2016
Supervisors: Anita C. Faul and Christopher Lester
Thesis: *A meta-algorithm for classification using random recursive tree ensembles: A high energy physics application.*

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

M.Sc. Applicable Mathematics (Distinction) 2010
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

ACADEMIC GRANTS

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

WORK EXPERIENCE

Citadel Securities, LLC
Quantitative Strategies Group Aug 2014 - Sep 2015

- 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

- 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.

PUBLICATIONS

 (available at [scholar profile](#))

Conference Proceedings

- 2021 Fergus Simpson, Ian Davies, **Vidhi Lalchand**, Alessandro Vuollo, Nicolas Durrande, Carl E. Rasmussen. *KITT: Kernel Identification Through Transformers*. (Accepted at NeurIPS, 2021)
- 2021 Fergus Simpson, **Vidhi Lalchand** and Carl E. Rasmussen. *Marginalised Gaussian Processes with Nested Sampling*. (Accepted at NeurIPS, 2021)
- 2021 **Vidhi Lalchand**, Aditya Ravuri, Neil D. Lawrence. *Generalised GPLVM with Stochastic Variational Inference*. (Rejected at 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, pages 1–12. PMLR, 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*. Machine Learning: Science and Technology (MLST).
- 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 **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.

Reports

(available on my website)

- 2016 *A meta-algorithm for classification using random recursive tree ensembles*. MPhil Thesis (University of Cambridge).
- 2016 *Probabilistic Decision Trees for binary classification on the Higgs dataset*. Technical Report (University of Cambridge).
- 2016 *Analyzing the Higgs signal using Support Vector Machines*. Technical Report.
- 2010 *Cryptographic Hash Functions*. M.Sc. Thesis.

TALKS & SEMINARS

Invited Speaker @ 21st Cambridge PyData Meet-up
Cambridge, UK

July 2020

Modelling with Gaussian Processes ([link](#))

Jump Trading, London

Dec 2019

Advances in Gaussian Processes

Machine Learning Meets Particle Physics Workshop
Weizmann Institute of Science, Israel Aug 2019
Hierarchical Probabilistic Mixture Models for density estimation in HEP

Cavendish Laboratory Graduate Student Conference
University of Cambridge Nov 2018
Bayesian Machine Learning in High Energy Physics

38th International Workshop on Bayesian Inference and Maximum Entropy
Methods in Science & Engineering July 2018
A progressive framework for Gaussian Process Regression

CogX 2018, Research Stage June 2018
Deconstructing Gaussian Processes. ([link](#))

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.

Algorithms for rare event classification in High Energy Physics. June 2018

Asian Voice - *An Unconventional Journey from Banking to Science.* ([link](#)) Aug 2017

Twitter: [@VRLalchand](#)