

SHREYAS PADHY

PhD Student | Machine Learning Group | University of Cambridge
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EDUCATION

- University of Cambridge** October 2021 - present
PhD in Engineering
Supervised by Dr. José Miguel Hernández-Lobato
- Johns Hopkins University** August 2017 - May 2019
MSE in Biomedical Engineering
Overall GPA: 4.0/4.0
- Indian Institute of Technology Delhi** July 2013 - May 2017
B.Tech in Engineering Physics
Overall GPA: 8.871/10 (Department Rank 4)




RESEARCH EXPERIENCE

- AI Resident, Google Brain, Cambridge** August 2019 - August 2021
Under mentorship of Balaji Lakshminarayanan and Jasper Snoek, Google Brain
- Worked on distance-based loss functions for improved uncertainty and robustness in deep learning methods under distribution shift and on out-of-distribution data.
 - Worked on Spectral-normalized Neural Gaussian Process (SNGP), a competitive single-model approach on prediction, calibration and out-of-domain detection that encodes input distance awareness.
- Graduate Research Assistant, Center for Imaging Science** December 2017 - February 2019
Under supervision of Dr. Michael Miller, Center for Imaging Science, Johns Hopkins University
- Implemented Siamese networks on the Biocard and ADNI Datasets for the detection of Alzheimer's disease.
 - Performed longitudinal shape analysis on sub-cortical structures in the human brain involved with schizophrenia



PUBLICATIONS

Preprints

Conferences





- Javier Antoran*, Shreyas Padhy*, Riccardo Barbano, Eric Nalisnick, David Janz, and José Miguel Hernández-Lobato. “**Sampling-based inference for large linear models, with application to linearised Laplace**”, *ArXiv preprint, submitted to ICLR 2022*. [arXiv](#) 
- Ben Adlam, Jaehoon Lee, Shreyas Padhy, Zachary Nado, Jasper Snoek. “**Kernel Regression with Infinite-Width Neural Networks on Millions of Examples**”, *submitted to ICLR 2022*. 
- Jeremiah Zhe Liu, Zi Lin, Shreyas Padhy, Dustin Tran, Tania Bedrax-Weiss, and Balaji Lakshminarayanan, “**Simple and principled uncertainty estimation with deterministic deep learning via distance awareness.**”, *Advances in Neural Information Processing Systems 33 (NeurIPS 2020)* 

Journals


- Jeremiah Liu*, Shreyas Padhy*, Jie Ren*, Zi Lin, Yeming Wen, Ghassen Jerfel, Zack Nado, Jasper Snoek, Dustin Tran, and Balaji Lakshminarayanan. “**A Simple Approach to Improve Single-Model Deep Uncertainty via Distance-Awareness.**” *submitted to Journal of Machine Learning Research, 2022*. [arXiv](#)
- Chin-fu Liu*, Shreyas Padhy* et. al, “**Using Deep Siamese Neural Networks for Detection of Brain Asymmetries Associated with Alzheimer’s Disease and Mild Cognitive Impairment**”, *Magnetic resonance imaging 64 (2019): 190-199.*, 2019. [JMIR](#) 
- Uday K. Khankhoje and Shreyas Padhy, “**Stochastic Solutions to Rough Surface Scattering using the finite element method**”, *IEEE Transactions on Antennas and Propagation*, (Vol 65, No 08), 2017. DOI: 10.1109/TAP.2017.2715366 [IEEE](#) 

* denotes equal contribution

Workshops

- James Allingham, Javier Antoran, [Shreyas Padhy](#), Eric Nalisnick, and José Miguel Hernández-Lobato, “**Learning Generative Models with Invariance to Symmetries**”, *NeurReps Workshop at NeurIPS 2022*.
- Jie Ren, Stanislav Fort, Jeremiah Liu, Abhijit Guha Roy, [Shreyas Padhy](#), and Balaji Lakshminarayanan, “**A Simple Fix to Mahalanobis Distance for Improving Near-OOD Detection.**”, *ICML 2021 Workshop on Uncertainty and Robustness in Deep Learning*. 
- Zachary Nado, [Shreyas Padhy](#), D. Sculley, Alexander D’Amour, Balaji Lakshminarayanan, and Jasper Snoek, “**Evaluating prediction-time batch normalization for robustness under covariate shift.**”, *ICML 2020 Workshop on Uncertainty and Robustness in Deep Learning*. 
- [Shreyas Padhy](#), Zachary Nado, Jie Ren, Jeremiah Liu, Jasper Snoek, and Balaji Lakshminarayanan, “**Revisiting One-vs-All Classifiers for Predictive Uncertainty and Out-of-Distribution Detection in Neural Networks.**”, *ICML 2020 Workshop on Uncertainty and Robustness in Deep Learning*. 
- Zachary Nado et. al., “**Uncertainty Baselines: Benchmarks for Uncertainty & Robustness in Deep Learning**”, *Bayesian Deep Learning Workshop, 2021*. [arXiv](#) 

TECHNICAL PROJECTS

Uncertainty Baselines 
Core contributor, Google Brain

August. 2020 - August 2021

TEACHING ASSISTANTSHIPS

Machine Learning for Signal Processing, Fall 2018 : Graduate Course, by Dr. Najim Dehak, JHU
Developing weekly assignments and homeworks, and grading for 50+ students.

Intro. to Computational Medicine, Fall 2018 : Graduate Course, by Dr. Michael Miller, JHU
Developing homeworks and course notes, extended codebase to Python, and grading for 60+ students.

Gateway Computing: Python, Spring 2019 : Undergraduate Course, by Dr. Kwame Kutten, JHU
Developing homeworks, weekly assignments and programming assignments in Python.

AWARDS AND ACHIEVEMENTS

Trinity-Henry Barlow Scholarship 2021: Awarded by Trinity College, University of Cambridge.


Harding Distinguished Postgraduate Scholars Programme (HDPSP) 2021: Awarded full overseas funding for the duration of the PhD Program at the University of Cambridge.

Summer Undergraduate Research Award 2015: For undergraduate research in adaptive meshing techniques for microwave imaging.

Top 7% GPA Merit Scholarship: In 2013, 2014, 2015, and 2016 Fall Semesters for exceptional performance at the Indian Institute of Technology Delhi.

PROFESSIONAL ENGAGEMENTS

Talks & Reviewing

- **Optimal Transport Metrics**, presented at the Cambridge MLG Reading Group, *February 2022*. 
- Reviewer for NeurIPS (2022, 2021), ICML (2022), AISTATS (2023), AAAI (2023).
- **Outstanding Reviewer Award** at ICML 2022.

TECHNICAL STRENGTHS

DL Frameworks	Jax (Flax, Optax, Haiku, NumPyro, Blackjax), Tensorflow, PyTorch (Pyro), Keras
Computer Languages	Python, C++, Verilog
Medical Imaging	TOAST++, FSL, SPM, Freesurfer