Puneesh Deora

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Education

University of British Columbia

Ph.D. in Electrical and Computer Engineering — 2024 - Present
M.A.Sc in Electrical and Computer Engineering — 2022 - 2024
Thesis: On the optimization and generalization of self-attention models: a stability and implicit bias perspective
Advisor: Prof. Christos Thrampoulidis

Indian Institute of Technology Roorkee

B. Tech. in Electronics and Communication Engineering — 2016 - 2020
Thesis: Compressive Sensing MRI Reconstruction using GANs
Advisors: Prof. Saumik Bhattacharya & Prof. P. M. Pradhan

Research Interests

Science of LLMs, Deep Learning Theory, Optimization

Publications and Preprints

In-Context Occam's Razor: How Transformers Prefer Simpler Hypotheses on the Fly — COLM 2025
P. Deora, B. Vasudeva, T. Behnia, C. Thrampoulidis — MOSS@ICML'25 (**Oral**); SCSL@ICLR'25

How Muon's Spectral Design Benefits Generalization: A Study on Imbalanced Data — Submitted
B. Vasudeva*, **P. Deora***, C. Thrampoulidis — HiLD@ICML'25

Stats or Facts: Decomposing Generalization in Language Models with Small-Scale Models — Submitted
T. Behnia, **P. Deora**, C. Thrampoulidis — MOSS@ICML'25 (**Oral**)

Implicit Bias and Fast Convergence Rates for Self-attention — TMLR 2025
B. Vasudeva*, **P. Deora***, C. Thrampoulidis — BGPT@ICLR'24

On the Training and Generalization of Multi-head Attention — Presented at ICLR 2025; TMLR 2024
P. Deora*, R. Ghaderi*, H. Taheri*, C. Thrampoulidis — HiLD@ICML 2023

Fast Test Error Rates for Gradient Methods on Separable Data
P. Deora*, B. Vasudeva*, V. Sharan, C. Thrampoulidis — HiLD@ICML 2023; ICASSP 2024

On weighted cross-entropy for label-imbalanced separable data: An algorithmic-stability study
P. Deora, C. Thrampoulidis — ICASSP 2023

Compressed Sensing MRI Reconstruction with Co-VeGAN: Complex-Valued Generative Adversarial Network
B. Vasudeva*, **P. Deora***, S. Bhattacharya, P. M. Pradhan — WACV 2022

LoOp: Looking for Optimal Hard Negative Embeddings for Deep Metric Learning
B. Vasudeva*, **P. Deora***, S. Bhattacharya, U. Pal, S. Chanda — ICCV 2021

Structure Preserving Compressive Sensing MRI Reconstruction using Generative Adversarial Networks
P. Deora*, B. Vasudeva*, S. Bhattacharya, P. M. Pradhan — CVPR Workshops 2020

(*equal contribution)

Experience

UBC | Graduate Research Assistant *2022-Present*
Advisor: Prof. Christos Thrampoulidis

ISI Kolkata | Visiting Researcher, CVPR Unit *June'20 - June'21*
Advisors: Prof. Saumik Bhattacharya & Prof. Umapada Pal

IIT Roorkee | Undergraduate Researcher *June'19 - July'20*
Advisors: Prof. Saumik Bhattacharya & Prof. P. M. Pradhan
Thesis: Compressive Sensing MRI Reconstruction using GANs

Awards and Academic Achievements

· UBC Graduate Support Initiative Award *2025*
· Top Reviewer ICML *2025*
· UBC Four Year Doctoral Fellowship (4YF) *2024*
· Selected for EEML Summer School *2021*
· Singhal's Tech. for Society Award for **best undergraduate thesis** at institute level *2020*
· 3AI Pinnacle Student of the Year Award for **undergraduate thesis** *2020*
· Finalist INAE Innovative Student Projects Award for **undergraduate thesis**, 30 national nominees *2020*
· Secured IIT JEE Advanced **All India Rank 1123**, 99.4 percentile *2016*

Service

· **Reviewer**: ICLR 2024-, NeurIPS 2023-, ICML 2025-, COLM 2025-, TMLR
· **Volunteer**: ICML 2021, ICLR 2021

Teaching Experience

· TA for ELEC221: Signals and Systems, Spring'23 at UBC

Other Projects

· Invariant Risk Minimization and its failure cases; CPSC532S, UBC [Report]
· Low-light Image Enhancement; IIT Roorkee [Code, Report]