

Harsh Bihany

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EDUCATION

Master in Computer Science, Department of Computer Science ETH Zürich GPA: 5.8/6	2025-2027* Zürich, Switzerland
Bachelor of Technology, Computer Science and Engineering Indian Institute of Technology Kanpur GPA: 9.5/10	2021 - 2025 Kanpur, India

PUBLICATIONS

LoRMA: Low-Rank Multiplicative Adaptation for LLMs Harsh Bihany, Shubham Patel, Ashutosh Modi Findings of the Association for Computational Linguistics: ACL 2025	[🔗]
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ONGOING RESEARCH PROJECTS

Statistical Benefits of Sequential Optimization

AI Center Projects for ML Research, ETH Zürich

- **Approach:** Modeling sequential optimization over overparameterized linear regression. Used as a tractable proxy for neural network training dynamics under the NTK regime.
- **Finding:** We observed a bias-variance tradeoff between the risks incurred under sequential v/s pooled/joint training. To our knowledge this tradeoff has not been characterized before, and offers statistical insights into the dynamics of continual/sequential learning.
- Towards a final step. Working on tighter bounds around classification of the two regimes of training. Targeting an appropriate upcoming deadline.

Social Debiasing of LLMs via Neuron Discovery

RycoLab, ETH Zürich

- **Data:** Constructed a culturally-aware, Multigroup intersentence extension of the StereoSet benchmark to measure social bias beyond the binary setting used in prior work.
- **Method:** Developed an information-theoretic neuron-attribution metric to localize neurons responsible for social bias. This is followed by a debiasing training objective.
- Targeting an appropriate upcoming deadline.

Distributed Multi-Agent Planning over Constrained Environments

IIT Kanpur | Prof. Sunil Simon, Prof. Subhajit Roy

- Studying agent trajectory planning under temporal-logic (LTL) specifications, generalizing existing single-agent techniques to a distributed setting with partial/complete knowledge.

SELECTED PROJECTS

Tinytorch 🔗

Self endeavour

Jun '23 – Ongoing

- Lightweight, CPU-only reimplement of PyTorch's core: a custom Tensor object and an autograd engine supporting backpropagation via a `loss.backward()` API.

Copy-on-Write for EXT4 🔗

Prof. Debadatta Mishra

Linux Kernel Programming

Jan '24 – May '24

- Modified EXT4's core read/write path to manage updates at extent-level granularity, laying groundwork for file snapshots; added support for the previously unsupported `-reflink` flag on cp.

Python Compiler 🔗

Prof. Swarnendu Biswas

Compiler Design

Jan '24 – May '24

- Statically-typed Python compiler supporting recursive functions and object-oriented constructs, emitting x86 assembly through a multi-stage IR pipeline (flex, bison, gcc); scored **100%** on final evaluation.

TEACHING & MENTORING

Teaching Assistant, Natural Language Processing

ETH Zürich

Sept '26 – Jan '27

Teaching Assistant, Algorithmic Game Theory

IIT Kanpur

Jan '25 – May '25

Teaching Assistant, Introduction to Machine Learning (E-Masters),

IIT Kanpur

Jan '25 – May '25

Academic Mentor

Institute Counselling Service, IIT Kanpur

Oct '22 – Jul '23

Volunteer

Prayas, IIT Kanpur

Jan '24 – May '24

- Provided primary and secondary education to children from under-privileged families near the IIT Kanpur campus.

AWARDS AND SCHOLARSHIPS

- **Aditya Birla Scholar 2021-25:** Was one of 17 candidates chosen nationwide for this prestigious scholarship awarded by the Aditya Birla Group.
- **Academic Excellence Awards** received thrice for excellent academic performance in 2021 – 22, 2022 – 23 and 2023 – 24 during my Bachelor's.

INDUSTRY EXPERIENCE

Software Developer (Part-time)

VetoAI, India

Sept '25 – Jan '26

- Building an agentic LLM pipeline for paralegal support, working alongside lawyers to encode legal-analysis workflows into the system's reasoning steps.

Quantitative Trading Intern

Optiver B.V., Amsterdam

May '24 – Jul '24

- Traded **ESX50 index options** on a live simulated European derivatives market, managing positions based on options theory, news, and market events.
- Quantified the correlation between large off-market intraday **ETF** trades and end-of-day auction price movements.

TECHNICAL SKILLS

- **Languages & Systems:** Python, C/C++, Linux Kernel, SQL, Bash, $\text{\LaTeX}$
- **Machine Learning:** PyTorch, Hugging Face (Transformers), TensorFlow, NLTK, NumPy, OpenAI Gymnasium
- **Web & Tooling:** ReactJS, Django, Git

RELEVANT COURSEWORK

* IIT KANPUR, ◦ ETH ZÜRICH

Natural Language Processing ◦

Linux Kernel Programming *

Algorithmic Game Theory *

Neural Network Theory ◦

Large Language Models ◦

Probabilistic Artificial Intelligence ◦

Design and Analysis of Algorithms *

Computational Complexity *