Abhiram Sanjay Dharme

abhiram.cse.iitd@gmail.com • +91 70585 00898 • github.com/abhiramDharme • linkedin.com/in/AbhiramDharme
B.Tech + M.Tech (Dual Degree), Computer Science & Engineering • Indian Institute of Technology Delhi

Education

Indian Institute of Technology Delhi *Expected 2027*
Dual Degree (B.Tech + M.Tech), Computer Science & Engineering | CGPA: 8.08/10.00

Research Experience

CycloFormer: A Rotation-Invariant Transformer for Wrist-sEMG Hand Pose Estimation
First author • IIT Delhi
Advisors: Prof. Chetan Arora (IIT Delhi) and Ankush Gupta (Research Scientist, Google DeepMind)

- Designed **CycloFormer**, a Transformer decoder with provable $\mathbb{Z}_{16}$ invariance to wristband donning rotation, built from a channel-shared TDS-CNN, circular rotary position embeddings (CRoPE), and permutation-invariant attention pooling over the 16 electrode channels.
- Established **state of the art** on the `emg2pose` benchmark: a 4M-parameter model surpasses the strongest prior baseline (*vemg2pose*, 6M) on all three generalization splits with 33% fewer parameters; a 48M variant widens the margin to 2.5°/3.3 mm on the Stage split.
- Derived a variance-corrected scaling law $L(N, D) = \varepsilon_\infty + aN^{-\alpha} + bD^{-\beta} + c(N/D)^\gamma$ for the data-limited regime where standard Chinchilla-style laws fail; fit across a 5×8 model–data grid (1.49M–85M parameters, 20–100% of data), explaining **98.8% of variance** with held-out-cell extrapolation within 0.21 mm.
- Conducted the **first controlled quantitative comparison** of sEMG and egocentric vision (HaMeR) under fingertip occlusion, identifying a consistent crossover where sEMG becomes the more reliable modality beyond two occluded fingertips.
- Manuscript *"Scaling Wrist sEMG for Hand Pose Estimation"* **submitted to NeurIPS 2026** (under review).

Publications

Under Review

- Abhiram Dharme, Ankush Gupta, Chetan Arora, Dhruv Malrana, Piyush Ahuja. "Scaling Wrist sEMG for Hand Pose Estimation." *Submitted to the 40th Conference on Neural Information Processing Systems (NeurIPS 2026).*

Internship Experience

Google *May 2026 – Jul 2026*
Software Engineering Intern • Bangalore, India

- Summer Software Engineering internship.

Coinbase *May 2025 – Jul 2025*
Machine Learning Engineering Intern, CBGPT Team • Bangalore, India

- Built a knowledge-gap classification pipeline for the CBGPT customer-support assistant, using LLM-based topic modeling (inspired by TopicGPT) to surface under-documented support areas at scale.
- Implemented a FAISS (IndexFlatL2) retrieval-and-ranking layer with asynchronous, batched LLM entailment to prioritize high-impact queries; integrated with the CBGPT API and reduced end-to-end pipeline latency.

Torch Investments *Jan 2024 – Mar 2024*
Machine Learning Engineering Intern • New Delhi, India

- Built LightGBM and CatBoost models for Fortune-500 equity return prediction within a live $3M+ strategy; a 2014–2024 backtest of the pipeline yielded 21% CAGR.

Selected Course Projects

- **Kernel Extensions in xv6** (Operating Systems): added login authentication, syscall-level access control, custom interrupt handling, a priority-boosted scheduler, and a disk-backed page-swapping subsystem. *[C]*

- **Reliable Transport over UDP** (Computer Networks): implemented application-layer reliability (ACK, retransmission, congestion control), including TCP Reno and CUBIC; evaluated fairness and efficiency on Mininet. *[C]*
- **Cache Hierarchy Simulator** (Computer Architecture): modeled direct-mapped, set-associative, and fully-associative caches with configurable replacement/write policies and cycle-accurate miss penalties. *[C++]*

Selected Coursework

Machine Learning & AI: Machine Learning, Deep Learning

Mathematics & Theory: Linear Algebra, Probability & Stochastic Processes, Design & Analysis of Algorithms, Discrete Mathematics

Systems & Computer Science: Data Structures, Operating Systems, Computer Networks, Computer Architecture

Technical Skills

Programming: Python, C++, C, OCaml, JavaScript

Machine Learning: PyTorch, TensorFlow, NumPy, Pandas, scikit-learn, FAISS

Tools: Git, Linux, LaTeX, Mininet

Awards & Honors

- **JEE Advanced 2022:** All India Rank 1055 among ∼250,000 candidates (top ∼0.5%).
- **JEE Main 2022:** All India Rank 1342 among ∼900,000 candidates.
- **Codeforces Expert:** peak rating 1672 (top ∼10% of competitive programmers globally).
- **Tower Research Capital Data Science Challenge:** selected among the top 50 teams institute-wide (2024, 2025).
- **Inter-IIT Tech Meet:** represented IIT Delhi in the Machine Learning problem statement (2024, 2025).

Leadership & Service

- **Founder, ARIES** – Artificial Intelligence Society, IIT Delhi (2024–Present): established the institute's first dedicated AI society; organized hackathons, workshops, and panel discussions on ML and generative AI.
- **Academic Mentor**, Introduction to Computer Programming (COL100), IIT Delhi (2024–Present): selected to mentor first-year students.