Kartik Srinivas

Personal Webpage & Scholar
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EDUCATION

Carnegie Mellon University, School of Computer Science Pittsburgh,PA
Master of Science in Machine Learning December 2025

Indian Institute of Technology, Hyderabad Hyderabad, TG
Bachelor of Technology in Computer Science and Engineering (Honors) & Engineering Sciences July 2024
Minor - Artificial Intelligence
GPA - 9.56/10.00
CS Coursework- Computability theory, Networks, Compilers & OS, Algorithms, Machine Learning & Deep RL,
Math coursework - Probability & Statistics, Learning theory & Optimization, Matrix theory & Information theory
Physics coursework - Fluid Mechanics, Thermodynamics, Classical Mechanics, Mathematical Physics (All A+)
Activities - Teaching (Programming, Deep Learning, Tensor Techniques), Machine Learning Club & Math club
Awards - Institute Silver Medalist, Academic Excellence & Dean's List (2022, 2023, 2024)

SKILLS

Programming Languages: Python, C++, C, LaTeX, SQL, Java, MATLAB, RISC V Assembly, Julia, JavaScript
Frameworks: Linux, Shell scripting, Pytorch, Matplotlib, Numpy, Pandas, Scikit, Wandb, React JS, Node.js

EXPERIENCE

University of British Columbia, Vancouver & Vector Institute for AI Vancouver, BC
Research Intern Summer 2023
- Discovered and theoretically formulated a new practical ML setting that involved learning in a decentralized, distributed setup in a public-data free and privacy preserving way
- Developed & presented an algorithm to handle decentralized Federated Learning (FL) with no access to public data beating state of the art classification accuracies of other FL Algorithms by an average of 8%
- Collaborated with *Meta AI* to conduct experiments and write a paper which was **accepted to ICML 2024**

Government of India's National Education Portal (NPTEL) Remote
Teaching Instructor Spring 2022&23
- Developed over 200 questions based on Computability theory which were split into test and assignment questions for the course CS231 - on the NPTEL portal
- Held doubt sessions for over 4068 enrolled students and developed a static website to host course material and videos on youtube for easy access to the public

PROJECTS

Stochastic Approximation for convergence of adaptive methods Spring 2024
Mentor:- Dr. M Vidyasagar FRS
- Studied the use of measure theory and Stochastic processes in proving the convergence of the Stochastic Approximation algorithm under biased noise and unbounded variance
- Extended the proof to provide a convergence result and rate for the ADAM optimization algorithm under biased noise and unbounded variance, which is not tackled by previous works in Optimization

Accelerating Proximal Stochastic Mirror Descent Fall 2023
Mentor:- Dr. Saketha Nath Jagarlapudi (Microsoft Research & IIT Hyderabad)
- Implemented efficient optimization algorithms in Pytorch to train Deep NN's using Proximal Mirror Descent
- Improved convergence rates and losses by ~20% after utilizing Nesterov acceleration for specific potential functions showing that certain classes of smooth non-convex problems can be solved using Prox-SMD

Nabla: A new language for Automatic Differentiation Fall 2022
Mentor:- Dr. Ramakrishna Upadrasta (INRIA & IIT Hyderabad)
- Led a team of 7 members on a 4 Month project to create a new programming language and trans-compiler which would build computational graphs internally during compilation by traversing the Abstract Syntax Tree
- Developed a Conflict-free grammar and LALR parser with Lex and Yacc; Wrote base classes in C++ that contained tensor-algebraic rules for backprop using BOOST libraries, creating a 30% improvement in speed of computation

Randomized Tensor Decompositions Fall 2022
Mentor:-Dr. Rameshwar Pratap
- Investigated the speeds of various PARAFAC decomposition algorithms like the Candecomp Parafac(CP) decomposition for tensors by implementing them from scratch with parallelized operations in python
- Validated the correlation graph of the sparsity of the tensor vs the computation time for CP, CP-RAND and CP-RAND mix by matching the plot with the original research findings