Kartik Srinivas

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Education

- **Indian Institute of Technology, Hyderabad** — Hyderabad, India
  B.Tech - Computer Science (Hons) & Engineering Sciences & Minor AI; **GPA: 9.56** — *July 2020 - June 2024*
  Relevant Courses: *Reinforcement Learning (A), Theory of learning and Kernel methods (A+), Convex Optimization (1 and 2)(A+), Theoretical Foundations of Machine Learning (A+) ,Theory of Computation (A), Data Structures and Algorithms (A), Discrete Mathematics (A), Matrix Theory(A+), Tensor Techniques (A+)*

Honors and Awards

- **Institute Academic Excellence (Thrice)**
  SGPA :- 9.80 — *2021 - 2022, 2022-2023, 2023-2024*
  - **Rank**: **Department Rank 1**
- **Honors Programme**
  SGPA :- 9.80 — *2021 - 2022*
  - **Honors in CSE**: Accepted into the Computer Science Honors Programme

Publications

- **Overcoming Data and Model Heterogeneities in Decentralized federated learning** — **ICML - 2024**
  Kartik Srinivas, Chun-Yin Huang*, Xiaoxiao Li, Xin Zhang* — *2023*

Research Experience

- **TEA Lab, University of British Columbia, Vancouver**
  Undergraduate Researcher — *May 2023 - Present*
  - **Under**: Dr.Xiaoxiao Li
  - **Research Problem 1**: Theoretical analysis of Federated Learning with Neural Tangent Kernels
  - **Research Problem 2**: Federated learning with Heteregeneous datasets and Models
- **Machine Learning and Vision Group - IIT Hyderabad**
  Undergraduate Researcher — *Aug 2022 - Present*
  - **Under**: Dr.Vineeth Balasubramanian
  - **Research Problem 1**: Developed Standard PAC bounds on Domain incremental Learning.
  - **Research Problem 2**: Using Machine Unlearning for Class decremental Domain Adaptation

Teaching

- **Tensor Techniques - CS6070**
  Undergraduate Teaching Assistant — *Dec 2021 - Feb 2022*
  - **Doubt Clearing Sessions**: Held doubt clearing sessions for nearly 80 students on Linear Algebra and Tensor decompositions
  - **Evaluations**: Corrected Exam sheets and Assignments
- **Theory of Computation**
  Undergraduate Teaching Assistant — *Sep 2022 - Feb 2023, Sep 2023 - Feb 2024*
  - **Under:**: Dr.Subrahmanyam Kalyanasundaram
  - **Assignments**: Developing weekly assignments for students taking the course on the NPTEL Platform (Government of India's National Education Portal on Computability theory and solving doubts that the students may face
- **Deep Learning - AI5000**
  Undergraduate Teaching Assistant — *Sep 2023 - Present*
  - **Under:**: Dr.Konda Reddy Mopuri
  - **Assignments**: Developing weekly assignments for students taking the course, and doing paper corrections and invigilation
- **Introduction to Programming - ID1063**
  Undergraduate Teaching Assistant — *Sep 2021 - Feb 2021, Sep 2023 - Feb 2024*
  - **Under:**: Dr.Ramakrishna Upadrasta, Dr Karteek Sreenivasiah, Dr Vineeth Balasubramanian
  - **Assignments**: Developing weekly assignments for students taking the course, and doing paper corrections and invigilation

Projects

- **Accelerated Mirror Descent Methods**: Analysis of Optimization aglrotihsm like Mirror descent, Proximal Gradient Descent, Proximal Mirror descent and their Accelerated versions
- **NABLA**: NABLA is a Domain specific programming language that my team and I have built that supports Tensor operations and automatic differentiation. The language is more user friendly and after compilaton calls C - procedures to perform back prop on the Computational graph. This was done under Dr.Ramakrishna Upadrasta
- **Collaborative Filtering - Microsoft Engage**: Built a Movie Recommendation Engine using Flask and Scikit using Nearest Neighbour methods and Collaborative filtering, was given an SDE offer post-completion.
- **Support Vector Machines**: Theoretical Analysis of SVM's. Analyzed VC Dimensions of Kernel based SVM's and programmed the Dual and primal forms of the Problem using Convex Solvers like CVXPY. This was a **team** project under Dr.Aditya Siripuram
- **Randomized Tensor Decompositons**: Involved programming PARAFAC decompositions of tensors, and using random sampling methods to make them more efficient. Done under CS6070 - Tensor Analysis under the guidance of Dr.Rameshwar Pratap
- **Visual Cryptography**: Implemented the following **Research Paper** in C++, it creates 2 out of n secret sharing using scrambling of images to conceal a hidden key.This was done under Dr. NR Aravind
- **Separating Strings Using Finite Automata**: Worked on a problem involving finding the smallest possible automata(DFA) that can accept one string, but reject the other. (both being of size n) under Dr.Subrahmanyam Kalyanasundaram

Extra-Curricular Activities

- **Machine Learning Club - IIT Hyderabad** — IITH
  Core Member - Built wesbite and Gave 3 Lectures — *June 2022 - Present*
- **IITH Basketball** — Hyderabad, India
  Part of the Inter IIT Basketball team, and NSO Basketball post injury — *2021 - 2024*
- **Elan Organizing Team** — Hyderabad, India
  Organizer for Ethical hacking workshop — *2021 - 2022*
- **Elan Publicity Team** — Hyderabad, India
  Volunteer for the Publicity Domain — *2021 - 2022*