Aditya Sarkar | CV

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Undergraduate Student at IIT Mandi

Academic history

University of California Los Angeles — Los Angeles, CA
Junior Research Scientist — June 2022 – August 2022

- Hosted by Sriram Sankararaman [**Report**]
- Sponsored by UCLA CS Department.

Indian Institute of Technology (IIT) Mandi — Kamand, HP
Bachelor of Technology (Honors) in Electrical Engineering — July 2019 – May 2023

- Advised by Dileep A.D. [**Thesis**]
- CGPA of 9.1/10 (Inst. rank: 2, Dept. rank: 1)
- Supported by NTS Scholarship 2017-2023

Awards and Achievements

- Ranked first in the department (out of 60 students) with a CPI of 9.1/10.0 after 6th semester.
- Received IIT academic award for being department topper in Fall 2019 and Spring 2020.
- Awarded department change due to exceptional academic performance in the first year (9.8 CPI).
- Selected for attending the Winter School for Cognitive Modelling 2020 on Cognitive Modelling, organised by University of Waterloo, Canada and University of Groningen, Netherlands.
- Ranked in top 1% (amongst 2.2 Million students) in the entrance exam of Indian Institute of Technology (IIT-JEE) 2019 (99.3 percentile)
- Awarded National Talent Search Scholarship in 2017 by NCERT.

Publications and Preprints

Journal

2. Sarkar A., Joseph A.T., Muralikrishna H., A.D. Dileep **LA-PERC-NET: Gated Perceptron Network for reducing the complexity of spoken language identification systems.**, To be submitted in *Pattern Recognition Letters*.
1. Sarwal V, Niehus S, Ayyala R, Kim M*, Sarkar A*, Chang S, Lu A, Rajkumar N, Darfci-Maher N, Littman R, Chhugani K, Soylev A, Comarova Z, Wesel E, Castellanos J, Chikka R, Distler MG, Eskin E, Flint J, Mangul S., **A comprehensive benchmarking of WGS-based deletion structural variant callers.**, in *Briefings in Bioinformatics (IF=12)*. doi: 10.1093/bib/bbac221.

Conference

2. Sarkar A., Joseph A.T., Muralikrishna H., A.D. Dileep **MHA-NET: Multi-Head Attention Network for improving the performance of spoken language identification systems in Real-World conditions.**, Submitted to *IEEE Machine Learning for Signal Processing*.
1. Sarkar A., Bhavsar A., **Virtual Screening of Pharmaceutical Compounds with hERG inhibitory activity**, in *International Joint Conference on Biomedical Engineering Systems and Technologies*, doi: 10.5220/0010267701520159.

Teaching Experience

Served as undergraduate teaching assistant for certain courses, conducting weekly tutorial sessions, special doubt sessions, and grading answer sheets for the following courses:

- CS671 : Deep Learning and Applications (Prof. Dileep A.D.) — Summer 2023
- IC272 : Introduction to Machine Learning (Prof. Aditya Nigam) — Fall 2022
- IC252 : Probability and Statistics (Prof. Satyajit Thakur) — Summer 2022
- CXPT599 : Biomedical Data Science (Prof. Serghei Mangul) — Summer 2022

Selected Courses

Advanced Courses: Tensors*, Convex Optimization*, Statistical Learning, Deep Learning
Core EE courses: Digital Communication*, Control Systems*, Digital Systems Design*, Digital Image Processing.
Computer Science: Introduction to Machine Learning, Data Structures and Algorithms, Data Visualization, Data Science, Computer Networks, Computer Organization
Mathematics: Probability and Statistics, Calculus, Linear algebra, Matrix theory*

Older Research Projects

Deep Cross Modality Hashing using Cycle Consistent Transformer Sept '22 - Dec '22
Guide: Aditya Nigam IIT Mandi

- Developed a cyclic end-to-end transformers that can form text representations from image, and image representations from text so as to reduce the modality gap. Loss function used was L2-Norm.
- Used ArcFace loss function to perform unimodal hashing over image representations of both the images and text. Currently exploring the developed model over various datasets such as NUS-Wide, Mir-Flickr25K and MS-COCO, trying to get better results over a variety of metrics. **[Slides]**

Cell type decomposition using Expectation Maximization Jun '22 - Oct '22
Guide: Serghei Mangul University of Southern California

- Surveyed and implemented existing models on deconvoluting cell types proportions from gene expression data. Used GEDIT's feature selection process based on information content to select the most probable set.
- Developed an Expectation Maximization based algorithm for estimating the cell type proportion from bulk gene expression data and reference data. **[Report]**

Technical Skills

Languages: C++, Python, R, VHDL, MATLAB, Bash, HTML/CSS, Javascript
Deep Learning: Caffe, TensorFlow, Numpy, Pandas, OpenCV, Matplotlib, Keras, Pytorch
Software: Keil μ Vision, LaTeX, Git, Scilab, SolidWorks, Arduino, Raspberry Pi, Modelsim, UCLA Hoffman2 Cluster