(+91) 8619554470
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Aryaman Jeendgar

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A final-year undergraduate from BITS Pilani, double majoring in Physics and Electronics and Communications Engineering with a keen interest in Applied Mathematics and engineering robust ML systems.
Personal webpage: https://aryamanjeendgar.github.io/

Education

Masters in Physics and Bachelors of Engineering in Electronics and Communications Engineering, *Birla Institute of Technology and Science* AUG 2019 — PRESENT

Skills

Tools and Languages Python, C++, Numpy, CVXPY, scikit-learn, Pytorch, Git, Emacs, LaTeX
Research Interests Convex Optimization, Theoretical machine learning, Control Theory, Large-Scale Optimization

Past Research/Intern(s)

Research Intern **SEPT 2023 — PRESENT**

TCS Research, Division of Data & Division Sciences *Mumbai, Maharashtra*

Manager: Prof. Mayank Baranwal

- Ideating new optimizers for large-scale deep learning models (like LLM's). We are largely interested in exploring variations of update rules leveraging second-order information to some degree so as to adapt to the multi-modality of such large-scale architectures.

Undergraduate Thesis* **AUG 2023 — PRESENT**

Sandia National Laboratories *Remote*

Host: Riley J. Murray

- Working on a variety of problems centered around the *Operator Relative Entropy Cone* and it's semidefinite approximation suggested in the paper, Semidefinite Approximations of the Matrix Logarithm

Student Developer @ CVXPY **JUNE 2023 — SEP 2023**

Google Summer of Code *Remote*

Mentor(s):Riley J. Murray,Steven Diamond

- Implemented new functionality within CVXPY to allow users to verify optimality conditions (such as the *KKT conditions*) for solutions output by CVXPY.
- Changes made will eventually introduce sweeping altercations to the CVXPY public API.

Summer Research Software Engineer Fellow **JUNE 2023 — SEP 2023**

Princeton Research Computing *Hybrid*

Mentor:Henry Schreiner

- Worked on tools that are a part of the ongoing `scikit-HEP` project (an effort to port tools and functionalities from the `ROOT` project in C++ to python)
- Helped draft a serialization spec for the `UHI-interface` (which is implemented by popular histogramming libraries, including `hist` and `boost::histogram`. Implemented the serialization spec within HDF5.
- Wrote a complete `textual` powered TUI for the `copier` and `cookiecutter` projects, with a special focus on support for the `scientific-python/cookie` template

Graduate Technical Intern **JUNE 2022 — SEP 2022**

Intel Labs, Cloud Systems Research Lab *Bangalore, Karnataka*

Manager: Nilesh Jain and collaboration with Sameh Gobriel

- Worked on *linearly* scaling out all the queries supported by the VDMS database.
- Wrote a `shard` mode of operation for VDMS that linearly scales out the `Add` queries
- Worked on the problem of optimizing Approximate Nearest Neighbor queries (as performed by `FAISS` and the `FLINNG` libraries) in this 'scaled-out' setting.
- Framed the problem of the above query optimization as an online algorithm, and researched the use of online clustering algorithms for "smarter" splitting of feature vector across different machines → was able to observe linear scalability of *Similarity Searches* (with the number of servers) with this solution.

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Student Developer @ CVXPY **MAY 2022 — OCTOBER 2022**

Google Summer of Code *Remote*

*Mentor: Riley J. Murray, Blog for the project, **Final Report***

- Implemented a series of powerful approximation methods for Relative-Entropy Conic constraints which were suggested in this paper within CVXPY
- One of the first (efficient) implementations of the *Operator Relative Entropy* (and associated constraints and functions) within a mainstream convex modelling language

LogGENE: A smooth alternative to the check loss **AUG 2021 — FEB 2022**

BITS Pilani *Goa Campus, Dept. of CS*

Code, Pre-Print
With Prof. Snehanshu Saha & Mr. Soma S. Dhavala

- Developed a novel Quantile Regression based framework around our proposed loss function in the Deep Learning setting
- Used the Gene Expression problem as as test-bed for validating our theory
- Rigorously adapted our proposed regression loss to the binary classification setting, and saw favourable results against baseline (Binary) Cross-Entropy.
- End-to-end planned and wrote the code for most of the experiments that we conducted (used PyTorch as our major driver), and contributed significantly to the theoretical framework and proofs.

NLP intern @ Swecha **MAY 2021 — JULY 2021**

Swecha *Gachibowli, Telangana*

Code

- Came up with and implemented a heuristic-based NLP system for fake news detection.
- Partially constructed a fake news dataset for the same by scraping large volumes of data from relevantly tagged websites

References:

- **Riley J. Murray**, *Sandia National Laboratories*
  WebPage: https://rileyjmurray.wordpress.com/
  Contact:rjmurray@berkeley.edu
- **Steven Diamond**, *Gridmatic*
  WebPage: https://stevendiamond.me/
  Contact: diamond@cs.stanford.edu