# Aryaman Jeendgar

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Research Engineer Fellow @ Princeton University
and Student Developer @ CVXPY

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A Fourth-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, Statistical Learning Theory, Causal Inference, Bayesian analysis |

## Past Research/Intern(s)

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

*Google Summer of Code* *Remote*

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

- Implementing new functionality within CVXPY to allow users to verify optimality conditions (such as the *KKT conditions*) for solutions output by CVXPY.
- Will eventually delve into implementing *subgradient* support (via a `ConvexSet` class) and *Fenchel Duality* for allowing easy computation of dual problems

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

*Princeton Research Computing* *Hybrid*

*Mentor:Henry Schreiner*

- Working 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)

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

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

*Manager: Nilesh Jain and collaboration with Sameh Gobriel*

- Working 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.

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

*Google Summer of Code* *Remote*

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

- Implementing 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, Currently under review in IEEE Transactions on Artificial Intelligence*
*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.

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**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**, *Berkeley*
  WebPage: https://rileyjmurray.wordpress.com/
  Contact: rjmurray@berkeley.edu
- **Steven Diamond**, *Gridmatic*
  WebPage: https://stevendiamond.me/
  Contact: diamond@cs.stanford.edu