

(+91) 8619554470  
Mumbai, Maharashtra

# 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,  $\text{\LaTeX}$   
**Research Interests** Convex Optimization with a particular interest in computational modelling via conic programming, Distributed Optimization, Control Theory, Large-Scale Optimization

## PAST RESEARCH/INTERNS

**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 its semidefinite approximation suggested in the [paper](#), *Semidefinite Approximations of the Matrix Logarithm*
- Implementing subdifferential support from scratch within CVXPY via the introduction of a new `ConvexSet` class.

**Student Developer @ CVXPY**

JUNE 2023 — SEP 2023

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 — SEP 2023

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)
- Helped draft a serialization spec for the `UHI-interface` (which is implemented by popular histogramming libraries, including `hist` and `boost::histogram`. The serialization spec is planned to be implemented within HDF5 and ROOT formats moving forward.
- 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 Gabriel*

- 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  $\rightarrow$  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](#)

- 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](#)

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 a 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

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## REFERENCES:

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