

# Ishaan Saxena

+1 (765) 407-1886 | [ishaansaxena98@gmail.com](mailto:ishaansaxena98@gmail.com) | [ishaansaxena.github.io](https://ishaansaxena.github.io)

## Education

Purdue University, *West Lafayette, IN*

August 2016 - May 2020

**Bachelor of Science in Computer Science (Honors; with Highest Distinction) GPA: 3.96/4.0**

- Minors in Mathematics & Philosophy
- Dean's List & Semester Honors in all semesters

Selected Coursework: Data Mining & Machine Learning, Computational Optimization, Artificial Intelligence, Randomized Algorithms, Natural Language Processing, Graph Theory, Advanced Regression Analysis, Linguistics.

## Work Experience

Clarity Solutions Group (d/b/a KANERAI)

*New York City, NY*

**Quantitative Strategist & Software Engineer**

**November 2021 - Present**

- Collect and analyze real-time structured credit product data with statistical methods.
- Interpret market information, implement statistical models, and generate trading and hedging strategies within a grid computing environment.
- Work as the primary developer on *CLO Insight*, a software platform for portfolio management and market data analysis that is provided to the firm's clients on a subscription basis.

Nomura Securities

*New York City, NY*

**Software Engineer**

**July 2020 - October 2021**

- Developed and possessed ownership of several data processing components and micro-services.
- Developed improved batch extract processing models for risk analysis.
- Worked on migration of Risk Data processing framework to cloud technologies.
- Improved data-transfer speeds in the ETL layer by a factor of 4-6 times using the Arrow Flight protocol. Further improvements seen in multiple threads.

**Intern, Software Engineer**

**Summer 2019**

- Transitioned data-exchanges in ETL layers to follow columnar memory structure through pyarrow.
- Phased out the use of ODBC and JDBC in favor of modern tools in the data pipeline.

Purdue University

*West Lafayette, IN*

**Undergraduate Research Assistant (with Prof. Jean Honorio)**

**Spring 2019**

- Conducted research on randomized greedy algorithms and feature propagation through DAGs.
- Implemented Prof. Honorio's model in C++ and applied it to a Gene Ontology annotation task.
- Obtained average F1 scores of around 42.00, close to the specialized tools for the task.

**Undergraduate Teaching Assistant**

**Multiple Semesters**

- For *CS 240: Programming in C* (Spring 2018; Fall 2018) and *CS 182: Discrete Mathematics* (Spring 2020).
- Conducted labs and proctored lab exams for Programming in C (CS 240).
- Held office hours and problem-solving sessions for students of the courses.

Philips, Innovation Campus

*Bangalore, India*

**Intern, Software Engineering**

**Summer 2018**

- Assisted the Health Systems department to create and deploy tools & solutions for the healthcare in India.
- Utilized publicly available machine learning pipelines in Tensorflow to perform computer aided diagnosis.
- Integrated WebRTC to the Health Systems platform to enable remote diagnostics.

## Research & Projects

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### More Expressive Graph Substructure Representations with Embedding Samples

#### *Machine Learning & Algebraic Graph Theory*

**January 2020 - June 2020**

- Extended the structural representation framework described by Srinivasan, B. & Ribeiro, B. (2019) in collaboration with the authors to improve expressiveness and structural awareness of node subset structural representations.
- Developed and tested computational techniques on toy problems, and on datasets such as cora, citeseer.
- Performed tests on various learning tasks such as node classification, link/triad prediction.
- Constructed theoretical formalisms for techniques to improve expressiveness of structural representations.

### Identifying Gender Bias in Film through Power Differentials

#### *Natural Language Processing*

**January 2020 - May 2020**

- Research task for *CS 577: Natural Language Processing* at Purdue University with Nikita Rajaneesh.
- Implemented Relationship Modeling Network (Iyyer, M., 2016) to analyze the nature and trajectory of character relationships throughout a film.
- Studied the evolution of character agency and power levels (Sap, M., 2017) and agency/power differentials in relationships within the context of a film's theme.
- Identified gender bias manifesting through use of language in film scripts in distinct kinds of relationships. For example, in corporate/professional male-female relationships, female film characters were observed to have less agency/power than their male counterparts.

### A Survey of Path-Following Primal-Dual Interior-Point Methods

#### *Computational Optimization & Numerical Methods*

**February 2019 - May 2019**

- Project for *CS 520: Computational Methods in Optimization* at Purdue University.
- Presented discussion on the theory behind interior-point methods for linear programming and examined multiple theoretic and practical aspects of various path-following interior-point methods.
- Discussed decomposition techniques for large, sparse Jacobian matrices to solve underlying linear systems.
- Wrote implementations of two predictor-corrector path-following algorithms in Julia with robustness and computational speed as primary goals respectively. Tested the performance on several LP tasks from MatrixDepot.

## Skills

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### Programming Languages & Tools

- Over 50,000 lines: Python, C++, Java
- Over 20,000 lines: JavaScript, R, Julia
- Familiar tools: Tensorflow, PyTorch, Pandas, Numpy, Scipy, Scikit-Learn, CvxOpt, Django, FastAPI, MEAN/MERN Stack, MySQL, Postgres, git, bash/zsh.

### Extra-Curricular Involvement

- Purdue Undergraduate Philosophy Society
- Purdue Music Production Club
- Purdue Hackers (Hackathon Club)