Ishaan Saxena

+1 (765) 407-1886 | ishaansaxena98@gmail.com | 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.

Research & Projects

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.

Work Experience

Nomura Securities — *New York City, NY*

Risk Data Engineer — July 2020 - Present

- Worked on migration of Risk Data processing framework to cloud technologies.
- Developed improved extract processing models for risk analysis.
- Deployed Kafka Elasticsearch for data ingestion and analytics.

Intern, Risk Analyst — Summer 2019

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

Purdue University — *West Lafayette, IN*

Undergraduate Research Assistant — Spring 2019

- Worked as research assistant under Prof. Jean Honorio to develop algorithms for structured ML.
- 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.

Philips, Innovation Campus — *Bangalore, India*

Intern, Research Software Engineering — Summer 2018

- Assisted the Health Systems department to create modern 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.

Teaching Experience

Purdue University — *West Lafayette, IN*

Undergraduate Teaching Assistant — Multiple Semesters

- For *CS 240: Programming in C* (Spring 2018 under Prof. Gustavo Rodriguez-Rivera; Fall 2018 under Prof. Jeff Turkstra) and *CS 182: Discrete Mathematics* (Spring 2020 under Prof. Petros Drineas).
- Conducted labs and proctored lab exams for Programming in C (CS 240).
- Held office hours and problem-solving sessions for students of the courses.
- Collaborated with a team of eight other TAs to develop online resources for discrete mathematics (CS 182) as a part of the University's initiative to move coursework online through the COVID-19 pandemic.

Skills

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, MEAN Stack, MySQL, Postgres, git, bash, zsh, Adobe Creative Suite, and Logic Pro.

Extra-Curricular Involvement

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