

SWAGNIK ROYCHOUDHURY

CS + DS Double Major ~ NLP Researcher

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SUMMARY

I am currently double majoring in Computer Science and Data Science at New York University. I'm a fully funded researcher at the NYU Ensure Lab and NYU Marron Institute, and hold research positions at NJIT and UCI. My work is primarily focused on databases, natural language processing, and cybersecurity. I am also a fully trained Indian Classical musician and state level chess player.

EDUCATION

2022 - 2025	New York University, College of Art and Sciences @ Courant and CDS Double Majoring in Computer Science and Data Science with a Mathematics Minor. 3.96 GPA. NYU Robo-masters Robotics Competition Team Lead, NYU Chess Club. Fully Funded Researcher at NYU Ensure Group and Data Science Fellow at NYU Marron Institute.	University
2018 - 2022	Middlesex County Academy for Science, Mathematics, and Engineering Technologies Electrical and Computer Engineering Concentration. Member of the National Honor Society and Technology Student Association.	High School
2017 - 2021	Sarabharatiya Sangeet O Sanskriti Parishad Pursued my Visharad Degree (B.A Equivalent) in Indian Classical Music, with multiple performances in the US and abroad.	University

PUBLICATIONS

12/2022 – 2/2023	Applications of BadNets in Spam Filters • Author of a paper exploring applications of BadNets and backdoored models and their consequences beyond Image Recognition in the domain of natural language processing, such as Spam Filter Detection. Accepted at ICDE 23 Astride workshop.	Publication, NYU Ensure Lab
3/2022 – 3/2023	S^2 - Information-Theoretically Secure and Highly Efficient Search and Row Retrieval • Co-Author of a paper that focuses on creating homomorphic encryption algorithms to store data securely, in a manner more efficient than current state-of-the-art systems. Responsible for developing a suite of eighty programs to test, modify, and provide test results for the algorithms. They were implemented in an AWS EC2 environment. Accepted at the VLDB 23 conference.	Publication, NJIT

AWARDS

12/2023	Goldwater Scholarship Nominee • One of four students nominated by NYU for the Barry Goldwater Scholarship, one of the most prestigious undergraduate national scholarships. Currently going through the final selection stage.	NYU
12/2023	2x DURF Grant Recipient • Awarded two research grants by NYU CAS's Dean for my work in fairness and biases in language models, as well as my work in developing NLP architectures for Indian Classical Music.	NYU
2022-2023	NYU - Dean's List • Awarded Dean's List for the 2022-2023 year for exemplary academic achievement.	NYU

EXPERIENCE

1/2024 – Current	Data Science Intern • Developing visualizations to create info-graphics for de-notified tribes in India, particularly in explaining and raising awareness for labor exploitation and human trafficking in suburban areas.	NYU Marron Institute
10/2023 – Current	Data Science Student Fellow • Working on data collected by the Marron Institute regarding runaway and homeless youth in NYC in an attempt to disrupt the human trafficking industry. The goal of this project is to identify support services and resources to best aid youth at risk.	NYU Marron Institute

- 09/2023 – Current **S^2 - Demonstration Paper** Paper, NJIT (UNDER REVIEW)
- Working on a demonstration paper for a prior paper we submitted to VLDB 2023. We are working on generalizing the encryption system to any database with variable numbers of column and rows, as well as supporting string and date data types. Under submission in SIGMOD 2024.
- 08/2023 – Current **ICMLM, A Language Model for Indian Classical Music** Paper, NYU Ensure Lab (UNDER REVIEW)
- Focusing on using SOTA transformer architectures for generating Indian classical music using a hand-made, first-of-its-kind, dataset. Additionally, we compare the model's performance against in-context learning and fine tuning with GPT4, Claude 2, and LLAMA 2. Under submission in Stanford Undergraduate Research Conference 2024.
- 07/2023 – Current **Fairness and Bias Issues in Large Language Models** Paper, NYU Ensure Lab
- Using datasets with sensitive attributes (ie race, gender, age) we are testing various language models such as GPT, Claude, LLAMA, and Bard to tease out inherent biases that these language models may have.
- 06/2023 – Current **NSF REU Research Internship at University of California, Irvine** UCI
- Developing a powerful visualizer for databases that include spatial and temporal data. The tool is able to use wifi connectivity data to precisely estimate the occupancy of rooms, floors, and buildings within a campus, helpful for first responders when trying to evacuate a building during an emergency. I am currently working on expanding this tool to aid in wildfire visualization via interpolation of drone images of the fires.
- 09/2022 – Current **Competition Team Lead @ NYU Robomasters** NYU
- Manage a team of 11 members as Competition Team Lead at NYU's Robomasters Robotics team. Responsibilities include developing computer simulations of the competition, developing CV algorithms for our autonomous robots, working on CAD for the robots, training drivers for the competition, and smoke-testing embedded functionalities of our robots.
- 06/2022 – 1/2023 **Software Developer & Data Science Intern** INVIDI Technologies
- Worked on ETL (extract, transform, load) of advertisement impression data that INVIDI collects from its clients in India. Using AWS Redshift, Sagemaker, and S3, I developed RNNs for time series analysis to derive actionable insights from the data.

PROJECTS

- 10/2021 – 05/2022 **FREEHAND**
- FREEHAND was our high school Senior Capstone Project. The invention is a device that helps children with dysgraphia (writing disabilities) to learn writing. The device uses OpenCV to recognize air-writing and display it on a screen, creating an image to send to teachers/mentors.
- 01/2021 – 10/2022 **Kathak Saangi** iOS App Store Link | Google Play Store Link
- Creator of iOS/Android app Kathak Saangi, a companion app for Kathak Dancers. Available internationally, with over 1000 downloads. The iOS version was developed in XCode with Swift, and the Android version was developed in Android Studio with Dart/Flutter.