Rianna Santra

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Education

Massachusetts Institute of Technology Cambridge, MA
B.S. Computer Science and Engineering & Mathematics *2024 - 2028*

- **Courses**: Fundamentals of Programming, Discrete Mathematics, Probability and Random Variables, Multivariable Calculus, Linear Algebra.
- **Clubs**: MITech Consulting Club, AI @ MIT Permeate, VR/AR @ MIT, *The Tech* Newspaper, Sport Taekwondo

Massachusetts Academy of Math and Science at WPI Worcester, MA
Grades 11-12 *Aug. 2022 - May. 2024*

- **Courses**: Applied Statistics, Intro to Program Design, Ordinary Differential Equations, Object-Oriented Design Concepts, Systems Programming Concepts, Real Analysis, Introductory Microeconomics.
- **Extracurriculars**: Program in Mathematics for Young Scientists (PROMYS), MIT PRIMES, MIT BeaverWorks

Skills

- **Python**: HuggingFace API, OpenAI API, TensorFlow, Scikit-Learn, PyTorch, Keras, Pandas, NumPy
- **Deep Learning**: Completed Deep Learning Specialization by DeepLearning.ai in June 2023
- **R, Java, HTML/CSS, Git & GitHub, JavaScript (React, Node, Express), Flutter & Dart, Arduino**

Work Experience

MIT BeaverWorks Summer Institute (BWSI) Jul. 2024
Teaching Assistant at Serious Games with AI (SGAI) Course *Remote*

- Designed engaging puzzles and icebreaker activities to enhance student collaboration in designing simulations for **reinforcement learning** in **Python** and **Unity**, leading to 50% increased student engagement
- Guided 30 students on project structuring and assisted with defining achievable goals.

IOMICS Corporation Aug. 2023 - May. 2024
Research Intern *Remote*

- Evaluated and benchmarked multiple **Transformer** models, improving model selection accuracy by 20% and achieving up to 80% accuracy in generating symbolic representations for IOMICS' use-cases.
- Developed and fine-tuned artificial datasets in **Python** (1M+ data points), enhancing the **Regression Transformer**'s molecule generation accuracy to 75%, supporting simulation experiments for drug discovery.

Congressman McGovern's Worcester Office Sep. 2023 - Dec. 2023
Congressional Intern *Worcester, MA*

- Analyzed survey data from over 1,000 constituents in the Worcester area using **Microsoft Excel**, leveraging data visualization techniques to identify and prioritize individuals in need of relief funds.
- Synthesized insights from 500+ constituent phone calls using **Python pandas**, presenting data-driven recommendations to the Congressman, improving decision-making and shaping local policy.

Project Experience

WellnessGPT: A ChatBot to Help With Skin Wellness Jan. 2023 - May. 2024
MIT PRIMES Computational Biology Program *Remote*

- Compiled skin disease data and fine-tuned **OpenAI's ChatGPT-4o** model to develop an online diagnosis system based on gene expression IDs in **Python**, achieving 90% accuracy from 32,000+ rsIDs.
- Processed DNA microarray data through differential gene analysis from **R's Bioconductor** library, identifying influential genes for diagnosis with 90% precision and recall.

A Novel Camera Mount for Wheelchair Users Jan. 2023 - May. 2023

- Designed a cost-effective, app-controlled camera mount for wheelchair users using **Flutter**, **Dart**, and **Arduino**, enabling independent adjustment for improved accessibility of capturing photos and videos.

Modeling Gene Expression Data for Brain Cancer Subtypes Aug. 2022 - May. 2023

- Utilized DNA microarray data with Bioconductor in R and agent-based models in Python and NetLogo to identify influential genes linked to brain cancer subtypes, achieving 95% accuracy in classification.

Awards & Accomplishments

1st Place Platinum Division State Award in CyberPatriot: Open Division Jan. 2024
First Place at the 2023 Southern New England Junior Science and Humanities Symposium (JSHS) Mar. 2023
NCWIT AiC: National Honorable Mention & Massachusetts Affiliate Winner Feb. 2023, Feb. 2024
American Invitational Mathematics Examination (AIME) Qualifier Feb. 2021, Nov. 2021, Nov. 2022
Honors Award at the 2022 U.S. National Chemistry Olympiad (USNCO) May. 2022