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, Intro to Algorithms, Intro to Machine Learning, Computation Structures, Multivariable Calculus, Linear Algebra.
- **Clubs**: MITech Consulting Club, AI @ MIT Permeate, VR/AR @ MIT

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

A Healthier Democracy Jan. 2025
Link Health Technology Intern *Remote*

- Developed a **Tampermonkey** script and **Chrome extension** to streamline data entry for healthcare navigators, enabling automatic transfer of information from government forms to the LinkHealth dashboard through real-time keystroke recording.
- Designed and implemented an AI-powered ideation assistant using multi-agent interaction, where two agents iteratively refine initial concepts to enhance idea generation and problem-solving efficiency.

DINaMo Group at MIT AeroAstro Sep. 2024 - Dec. 2024
Researcher *Cambridge, MA*

- Researching fairness in multi-agent systems, focusing on trade-offs between fairness, efficiency, and computational cost in dynamic environments with adversarial dynamic obstacles and high agent density.
- Developing and validating realistic simulations with fairness constraints for multi-agent reinforcement learning (MARL) algorithms and investigating existing codebases and literature.

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.

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