

# EMMA ZOU

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Motivated Applied Math–CS student at Brown University. Experienced in SWE, geospatial statistics, data science, and AI/ML for both research and industry. Eager to create innovative technology impacting the environment, equity, human interaction, and more.

## EDUCATION

### Brown University

*Sc.B. in Applied Mathematics-Computer Science, A.B. in Music*

*Class of 2028*

- **Relevant Courses:** Data Structures & Algorithms, Software Engineering, Foundations of AI, Fundamentals of Computer Systems, Applied Ordinary/Partial Differential Equations, Linear Algebra, Statistical Inference

### Poolesville High School

*High School Diploma in the Global Ecology Program*

*Class of 2024*

- **GPA:** 4.91 | **SAT:** 1600

## PROFESSIONAL EXPERIENCE

### Software Engineering Intern — *Integral by Derivative LLC*

*July – October 2025*

- End-to-end engineered core UI/UX components and backend services, and performed data analytics on user data, for the education platform [Integral](#) serving 50,000+ active students using JavaScript and Dart/Flutter.

### Undergraduate Researcher — *Brown Data Science Institute*

*May – October 2025*

- Employed advanced geospatial statistics to uncover spatially varying relationships between social vulnerability and flood risk.
- Created scalable open-source code to statistically analyze 3D spatio-temporal hotspots, supporting 10+ configurable statistical and modeling parameters for flexible exploratory analysis.

### Student Researcher — *George Washington University Department of Statistics*

*May – June 2025*

- Applied statistics, ML, and NLP to projects examining health equity and environmental resilience through data science.
- Selected to present findings at a Public Interest Technology University Network (PIT-UN) research symposium.

## PROJECTS

### C@Bnet

*Typescript/HTML/CSS, React, Chrome Extensions*

*October 2025 – Present*

- Developing a Chrome extension to add integrated course ratings/warnings, a complex recommendation system, and degree pathway visualization to the current Courses@Brown website used by Brown students for course registration.
- Wrote and deployed complex scripts for parsing user data, intercepting web API calls, and altering client/server interactions.

### Go Agent

*Python, PyTorch, Tensorflow*

*November – December 2025*

- Built a hybrid Go Agent that achieved #2 in performance in the class using Monte-Carlo tree sampling, iterative alpha-beta pruning, and combined heuristics.

### Narrative Intelligence and Impact Signatures of Flash Flood Events in D.C., Maryland, and Virginia ([Link](#))

*Python (NLTK, GeoPandas, etc.), R, ArcGIS Pro*

*May – June 2025*

- Developed a ML algorithm to extract impact tags and Flood Impact Scores from 5k+ unstructured narrative datapoints.
- Visualized and interpreted spatio-temporal data distributions in a written report to improve understanding of flood impacts.

## EXTRACURRICULARS

### Full Stack at Brown

*Full-Stack Web Developer*

*September 2025 – Present*

- Develops full-stack pro-bono websites from scratch for non-profits, student organizations, and research groups.

### BUO Board Website Team

*Website Master*

*September 2025 – Present*

- Deploys page and information updates for the [orchestra website](#) and conducts maintenance, using JavaScript and React.

### Brown University Orchestra (BUO)

*Co-Principal Violist*

*September 2024 – Present*

- Leads the viola section in twice-a-week rehearsals, and coordinates with other orchestral leaders to plan events and concerts.

### Brown University Mathematics DRP

*Undergraduate Mentee*

*September 2024 – Present*

- Works with a PhD student mentor to research graph theory and present its applications, from Sudoku to street networks.

## AWARDS & CERTIFICATES

### Brown University Undergraduate Teaching and Research Award (2025)

*Awarded funding to research applications of geospatial machine learning techniques to relate social vulnerability and flood risk.*

### Stanford/DeepLearning.AI Certificate in Machine Learning (2025)

### Best Poster Award at the Brown Mathematics Directed Reading Program (DRP) Poster Session (2024)

*Awarded for the poster “Counting Sudoku Solutions”*

## SKILLS & INTERESTS

- **Languages/Tools:** Python, Java, R, HTML/CSS/JavaScript, Node.js, React, PyTorch, Tensorflow, Git/GitHub, Firebase, SQL
- **Methods:** Version control, CI/CD, full stack development, machine learning methods, AI-assisted workflows, technical writing
- **Soft Skills:** Creative problem-solving, organization, rapid learning adaptability, flexibility, effective teamwork
- **Interests:** Classical music, viola, puzzles, hiking, light pollution awareness, photography, journaling