

Chengru (Eric) Zou

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Education

Emory University, Atlanta, Georgia

May 2026

Bachelor of Science in Applied Math and Statistics

GPA: 3.96/4.0; Dean's List for 2023, 2024, 2025 Spring

Relevant Coursework: Analysis (graduate level), Numerical Linear Algebra (graduate level), PDE, Numerical PDE, Machine Learning, Deep Learning, Reinforcement Learning, Optimization, Iterative Method (graduate level)

Technical Skills

Software Skills: MATLAB, Python, LaTeX, R, SQL, JAVA, C

ML/DL Skills: Pytorch, Tensorflow, JAX, FEniCS, Cloud Computing

Visualization Skills: Paraview, Freefem Tableau, LaTeX, Notion

Soft Skills: Group Communication, Coordination, Leadership

Experience

Emory University Math Department REU

May 2025 – Present

- Enhanced reconstructed image resolution by developing a joint algorithm using data from both X-ray Ptychography and X-ray Fluorescence
- Implemented numerical experiment on non-linear and non-convex optimization for joint reconstruction and explained the theory behind the optimization.
- Guided by Prof. Yuezhe Xi (Emory University) and Dr. Wendy Di (Argonne National Laboratory); funded by NSF

MIT AI Watson Lab, Boston, MA

June 2024 – Present

- Developed an optimization Adapter method based on LORA (Low Rank Adaptation) using Kronecker Matrix products and Multigrid concepts under the guidance of Dr. Chen Jie.
- Reduced trainable parameters in Roberta_{base} and GPT2 model from 0.3M to 10K and improved computation speed by 30% while maintaining accuracy.

Directed Research and Reading, Emory University

Jan 2024 – Present

- Studied the Implementation of deep learning neural network such as RNN, SSD, GAN through reading *Dive into Deep Learning* by Mu Li.

- Approached to machine learning in theoretical way through reading *Probabilistic Machine Learning* by Kevin Murphy under the guidance of Prof. Yuanzhe Xi
- Learned the implementation of reinforcement learning algorithm through reading *Hands on Reinforcement Learning* by Mu Li

AI.XExperience Research, Atlanta, GA

June – Aug 2024

- Built a Vector RAG LLM agent for Emory student course selection using Neo4j graphical database and LangChain prompt engineering under the guidance of Prof. Kevin Mcalister and Prof. Wen Gu.
- Improved query accuracy for graphical data, benefiting hundreds of Emory students
- published the report in Emory QTM department symposium.

DataThink Project (Affordable Housing Group), Atlanta, GA *Sep 2023 – Jan 2024*

- Collaborate with group leader and members to address housing complaints in partnership with the City of Decatur, GA, using Human-Centered Design principles.
- Utilize Geocoding and GIS to model racial and housing rate distributions in Decatur.
- Presented findings using Tableau, aiding over 100 local residents in making informed housing decisions.

Conference and Social Service

Atlanta Precondition 2024

Attendee

Represented Emory Mathematics students at academic conference

Atlanta Mathematics of Data Science Bootcamp

Attendee

Explore a new algorithm (Lipschitz-regualrized χ^2 -GAN) by combining χ^2 -GAN and WGAN under the guidance of Prof. Wei Zhu.

Atlanta Science Festival – Exploration Exposition

Volunteer

Promoted mathematical knowledge to the public on behalf of the Emory Mathematics Department

Honors and Competitions

Mathematical Contest in Modeling (MCM), Meritorious Award

May 2025

Analyzed the age of stair by using mathematical model on erosion lead by Prof. Alessandro Veneziani. Ranked top 5% among over 20000 participate teams.

Emory Pathway Global Internship Award

May 2024

Awarded \$4,000 for outstanding summer internship performance

DataFest Competition, Finalist

April 2024

Analyzed real-life raw data from CourseKata Company; provided consulting advice that increased study efficiency for over 1,000 students.

Emory Phi Sigma, Member

May 2023

Recognition for outstanding academic achievement