

Zhenya Liu

zhenya@uchicago.edu

EDUCATION

UNIVERSITY OF WISCONSIN MADISON
BS IN MATHEMATICS
CERTIFICATE IN COMPUTER SCIENCE
September 2018 - May 2021 |
Madison, WI
Graduation with Distinction
GPA: 3.828

UNIVERSITY OF CHICAGO
MS IN COMPUTATIONAL AND APPLIED
MATHEMATICS
September 2022- June 2024 |
Chicago, IL
Department of Statistics
GPA: 3.822

COURSEWORK

GRADUATE

Applied Real Analysis
Matrix Computation
Nonlinear Optimization
Scientific Computing with Python
Functional Analysis
Algorithm
Machine Learning
Computational Geometry
Image Processing with Total Variation
Stochastic Process
Fundamentals of Deep Learning (Audit)
Deep Generative Models

UNDERGRADUATE

Calculus
Linear Algebra
Real Analysis
Abstract Algebra
Probability
Combinatorics
Discrete Mathematics

AWARDS

Dean's Lists during UW-Madison

SKILLS

PROGRAMMING

Python • Java • Matlab • \LaTeX

LANGUAGES

Chinese (native)
English (fluent)
Japanese (proficient)

EXPERIENCE

RESEARCH | RESEARCH ON DIFFUSION MODELS

July 2023 - Now | Chicago, IL

- Studied and researched with Professor Chen Yuxin at University of Chicago
- Learned and applied Reinforcement Learning to design and implement a new architecture for diffusion models with more efficiency
- worked in progress on the paper *Training Diffusion Models via Optimal Goal Reaching*

PROJECT | PROJECT ON DEEP GENERATIVE MODELS

Sep 2023 - Dec 2023 | Chicago, IL

- read contemporary articles on different kinds of deep generative models
- presented theories and experiments' results for classical models of VAE and Flow-based models.

PROJECT | PROJECT ON IMAGE PROCESSING

Mar 2023 - May 2023 | Chicago, IL

- Started independent reading on papers relevant with image inpainting
- Wrote the project's report *Image Inpainting with Total Variation Using Split Bregman Techniques*, which introduces the image inpainting problem and idea of Bregman iteration to solve it by applying total variation method
- Presented ideas and examples from the report in 40 minutes

PROJECT

| PROJECT ON SCIENTIFIC COMPUTING WITH PYTHON

Oct 2022 - Dec 2022 | Chicago, IL

- Implemented CNN, RNN, and logistic regression models and trained with Zalando's Fashion-MNIST dataset
- Reported on performances of different models over Fashion-MNIST dataset

RESEARCH | RESEARCH ON A TOPIC OF SYLOW SUBGROUP IN GROUP THEORY

Jun 2021 - Apr 2022 | Hefei, China

- Studied and researched with Professor Guo Wenbin at University of Science and Technology
- Wrote one research paper in finite group theory: *The permutability of σ_i -sylowizers of some σ_i -subgroups in finite groups* [Preprint].

PROJECT | PROJECT ON ADVANCED LINEAR ALGEBRA

Mar 2021 - May 2021 | Madison, WI

- Concluded topics from reading materials, such as an interpretation on SVD Algorithm by Golub and Reinsch
- Delivered one-hour presentation based on essay and slides; demonstrated a solid understanding of singular value decomposition and an ability to impart knowledge and ideas

PROJECT | DIRECTED READING PROGRAM

Feb 2020 - May 2020 | Madison, WI

- Attended weekly meetings with other group members and the advisor, and discussed the contents read from *Ideals, Varieties, and Algorithms* by Cox et al
- Prepare one final presentation introducing topics such as applying Groebner basis to solve multivariable polynomials