Zhenya Liu

zhenya@uchicago.edu | Website

EDUCATION

UNIVERSITY OF CHICAGO

MS in computational and applied mathematics
September 2022- June 2024| Chicago,IL
GPA: 3.822

UNIVERSITY OF WISCONSIN -- MADISON

BS in Mathematics
Certificate in Computer Science
September 2018 - May 2021 | Madison,WI
Graduation with Distinction
GPA: 3.828

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 Difussion 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 to achieve faster sampling speed.
- Worked in progress on publishing the paper:

  Zhenya Liu, Chaoqi Wang, and Yuxin Chen. (2024) ***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 idea of using Bregman iteration and total variation method to solve image inpainting problem.

PROJECT | Project on Scientific Computing with Python

Oct 2022 – Dec 2022 | Chicago,IL

- Implemented DNN, RNN, and logistic regression models by Numpy to train Zalando's Fashion-MNIST dataset
- Reported on comparing performances of classification tasks with implemented models

RESEARCH | Research on a topic of Sylow Subgroup

Jun 2021 - Apr 2022 | Hefei,China

- Studied and researched on group theory advised by Professor **Guo Wenbin** at University of Science and Technology of China
- Publication: Zhenya Liu and Wenbin Guo (2022) ***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 reading topics from Singular Value Decomposition (SVD), such as an interpretation on SVD Algorithm by Golub and Reinsch
- Delivered one-hour presentation based on report and slides; demonstrated a solid understanding of SVD 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
- Prepared presentation with the topic: find Groebner basis to solve multivariable polynomials