# Zhelin Sheng

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My Github
zhelinsheng@gmail.com

*Education*

**University of Rochester** August 2020 – Present
*BS in Applied Mathematics and BA in Computer Science* *Rochester, New York*
- GPA: 3.88

*Research and teaching Experience*

**VC-dimension and neural networks** 2021-2022
*UofR, Math department* *Rochester*
- Assisted in Developing a high dimensional reduction tool that identifies the salient underlying fractal features of the data set.
- Have been exploring the universal approximation in the case when more complicated functions replace Lipschitz functions.

**Neural networks, approximation and geometric measure theory** 2022-2023
*UofR, Data Science department, NSF Tripods REU/STEM for All* *Rochester*
- Applied neural network on recognizing fractal behavior
- Proved a deliberate construction of n dimensional cantor sets which can be reduced to dimension one, with code implemented on testing neural network's ability to retrieve the original data
- Explored several quantities that potentially determines the quality of neural network's prediction on time series data

**Fractal structures in large data sets** 2023-Present
*UofR, Data Science department, NSF Tripods REU/STEM for All* *Rochester*
- Further developing the theory presented in the paper "Fractal dimension, approximation and data sets" and creating synthetic data sets to test the results

**Research Assistant** 2023-Present
*Remote work at Nanjing Forestry University* *China*
- General technical support for Covid-19 epidemic trend Prediction models
- Assisted in analysis of energy consumption and economic growth with forest cover rate taken into consideration

**Teaching Assistant** 2022 Fall
*UofR, CS department* *Rochester*
- Assisted in teaching data structures and algorithms (adversarial search, Bayesian network, multilayer perceptron) in Java. CSC242, Artificial Intelligence

*Research Papper and Preprints*

Betti et al. (2022) Fractal dimension, approximation and data sets, arXiv.
Kong et al. (2023) Epidemic Prediction and Analysis of Novel Coronavirus Pneumonia COVID-19, arXiv.

*Awards and Honors*

**Dean's List**
*University of Rochester* *2023*

**SOUTHBURY MIDDLEBURY SCHOLARSHIP**
*SMSF grants, $3000 per year* *2020 & 2022*

*Conference and Seminars attended*

**ag-conference** Topics in microlocal analysis, harmonic analysis, and inverse problems, August 15-17, 2022

*Specialized Skills*

**Programming Languages** Proficient: Python, Java, LaTeX
Familiar: R, Kotlin

*Sample course work*

**Including ongoing course:** Discrete Mathematics, The Mathematical Experience (Putnam competition training course), Intro to Probability, Numerical Analysis, Intro to Complex Var With App (Complex Analysis), Functions of Real Variable (Real Analysis)
Combinatorial Analysis, Honors sequence Math: Honors Calculus I, II, III and IV,
Data Structures & Algorithms, Artificial Intelligence, Machine Learning, Computer Models of Perception & Cognition, Design & Analysis Efficient Algorithms