Zhelin Sheng

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My Github

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 Sep 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.
- Explored the universal approximation 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 determine 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

Cooperator at Nanjing Forestry University *China*

- General technical support for Covid-19 epidemic trend Prediction models

- Assisted in the analysis of energy consumption and economic growth with forest cover rate taken into consideration

Teaching Assistant 2022 Fall
UofR, CS department. CSC242, Artificial Intelligence *Rochester*

- Assisted in teaching data structures and algorithms (adversarial search, Bayesian network, multilayer perceptron) in Java.

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

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