Zhelin Sheng

Rochester, New York, 14627
(203) 768-3112
My Github
zhelinsheng@gmail.com

Education

University of Rochester — Rochester, NY
B.S. in Applied Mathematics, B.A. in Computer Science — Aug 2020 – May 2024
- GPA: 3.88

Research and teaching experience

VC-dimension and neural networks — Sept 2021 – 2022
University of Rochester, Math department — Rochester, NY
- Assisted in the development of a new tool, discrete s-energy that identifies the salient underlying fractal features of the data set.
- Implemented the new tool outperforming PCA in accessing fractional dimensional phenomena in large data sets with Python.

Neural networks, approximation, and geometric measure theory — 2022 – 2023
University of Rochester, Data Science department, NSF Tripods REU/STEM for All — Rochester, NY
- Applied neural network models on recognizing fractal behavior.
- Provided a deliberate construction of n-dimensional cantor sets which can be reduced to dimension one, with code implementation on testing the 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
University of Rochester, Data Science department, NSF Tripods REU/STEM for All — Rochester, NY
- Extended and validated the discrete s-energy's function in identifying the data sets' complexity, which is associated with the neural network models' accuracy in forecasting.

Project Advisor — June 2023 – Present
Project Advisor at Nanjing Forestry University — China
- Provided technical support for COVID-19 epidemic trend Prediction models.
- Analyzed the one-on-one relationship among energy consumption, carbon emissions, GDP, and forest cover rate in China with both OLS-based and LSTM-based Deep Learning models.

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

Schwartz Discover Scholar Showcase — Oct 2023
poster fair for University of Rochester 2023 Schwartz Discover scholars — Rochester, NY
- Presented the joint summer research group works with the poster entitled "A Novel Approach for Assessing the Predictability of Time-Series."

Research Paper and Preprints

Mengmeng Kong, Huilian Xu, Qurban Ali, Hairong Jing, **Zhelin Sheng**, Fuli Wang, Lixin Zhang, Yu Shen. "Epidemic Prediction and Analysis of Novel Coronavirus Pneumonia COVID-19." Submitted to Journal of Global Antimicrobial Resistance (2023).

Livia Betti, Ivan Chio, Julie Fleischman, Alex Iosevich, Filippo Iulianelli, Scott Kirila, Michele Martino, Azita Mayeli, Svetlana Pack, **Zhelin Sheng**, Conor Taliancic, Andrew M. Thomas, Nathan Whybra, Emmett Wyman, Ustun Yildirim, and Kaiyuan Zhao. "Fractal dimension, approximation, and data sets." Submitted to CANT 2022 conference proceedings. arXiv:2209.12079 (2022).

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

Skills

Programming Languages: Python, Java, R, Kotlin, JavaScript, HTML/CSS, PHP
Tools and Framework: LaTeX, Tensorflow, Pytorch

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.