RUONAN (ELIZABETH) ZHAO
■ zhaoruonanw@gmail.com ■ LinkedIn Profile

TECHNICAL SKILLS/OTHER

Programming Languages: Python (numpy, pandas, scikit-learn, matplotlib), MATLAB, R (dplyr, ggplot2), SQL
Other Softwares: LaTex, Git, Microsoft office
Languages: English (fluent), Mandarin (native)

EDUCATION

NEW YORK UNIVERSITY New York, NY
The Courant Institute of Mathematical Sciences
MS in Mathematics 09/2017 - 01/2020

UNIVERSITY OF CALIFORNIA, IRVINE Irvine, CA
BS in Mathematics 09/2013 - 08/2017

EXPERIENCE

UNIVERSITY OF CALIFORNIA, IRVINE Irvine, CA
Research Assistant 04/2020 - Present
- Collaborated closely with research team to design, implement and test MATLAB programs for exploring properties of chromatin architectures
- Formally analyzed mathematical theories to prove experimented results
- Wrote and edited manuscript for publication

NEW YORK UNIVERSITY New York, NY
Teaching Assistant for Probability, Statistics, & Decision Making 09/2019 - 12/2019
- Prepared recitations on graph theory, probability, statistics, and game theory for 50 students
- Cooperated with course instructors to keep track of recitations
- Evaluated students' performance by grading quizzes and final exams

Teaching Assistant for Data to Discovery Lab Sessions 09/2018 - 12/2018
- Supervised 50 students to work on lab assignments on analyzing large datasets in R
- Resolved any inquiries made by students
- Assessed students by grading midterm and final exams

PROJECTS

Chromatin Remodeling Using Percolation Theory 04/2020 - Present
- Mathematically examined the numerical results given by chemical reaction networks of Histone Acetylation
- Tested percolation theory by using shortest-path algorithms in MATLAB to explain ultrasensitive transitions in chromatin remodeling
- Presented at Mathematics Association of America (MMA) So-Cal section

Class Notes English-to-Chinese Translation. 03/2020 - 06/2020
- Interpreted and translated deep learning concepts from text notes and lecture videos in topics of the architecture of LSTM, VAE, and the Truck Backer-Upper

A Theoretical Analysis of the Comparison Between LIME and SHAP (***Report Link***) 09/2019 - 12/2019
- Mathematically proved that LIME fails when width of Gaussian kernel is arbitrarily small
- Reproduced key results from LIME in Python utilizing open source code and data
- Researched different options of kernels to verify theoretical claims of SHAP in Python

Finding Optimal Conversion Rate From Reticulate Body to Elementary Body of C. Trachomatis in a Cell (***Report Link***) 06/2015 - 08/2015
- Developed logistic growth model of Chlaymydia to find optimal conversion rate and switch point between Chlaymidal states
- Applied calculus of variations to find critical points in the transition between Chlaymidal states
- Computed conversion rate of Chlaymydia applying numerical methods in MATLAB
- Verified optimal conversion rate exists is dependent on the optimal switch point