Charles Zhang

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Education

Macalester College, Saint Pual, MN *B.A. Expected May 2023*

Major GPA 4.0/4.0 *Mathematics, Computer Science*

- Charles J. Turck Presidential Honor Scholarship(Four-year scholarship)
- **Relevant Coursework**: applied multivariable calculus, linear algebra, intro to the data science, object-oriented programming and abstraction, data structure, computational linear algebra(numerical analysis), machine learning, digital ethics, differential equation

Skills

Programming **R**(ggplot, ggmap, plotly, leaflet, gganimate, rvest, shinny), **Python**(numpy, pandas, easygui, matplotlib, xgboost, OpenCV, tensorflow), **Java, MATLAB, SQL, HTML, CSS, Markdown, TEX, COMSOL**

Experience

Teaching Assistant *St. Paul, MN*

Mathematics, Statistics and Computer Science Department, Macalester College *Jan. 2020 - PRESENT*

- Teaching Assistant(Preceptor) in STAT/COMP 112 Intro to the Data Science at Macalester College
- Help 48 students in two class sessions with realize multivariate visualization, data wrangling, interactivity, Leaflet, scraping data, Shinny APP, SQL, and machine learning by *R*(RStudio)

Math Tutor *Jinan, China*

Self-employed *Jun. 2019 - Aug. 2019*

- Designed one-to-one study programs based on high school curriculum to help students excel in learning mathematics everyday in summer holiday in China
- Developed a class timing and scheduling system by *Python* for students having classes in record

Conference Member *Beijing, China*

the First BRICS Mathematics Conference *Jul, 2017 - Aug. 2017*

- Was invited to attend and listen series of worldwide cutting-edge mathematical lectures from the conference at Chinese Academy of Sciences
- Consulted mathematicians from five BRICS(Brazil, Russia, India, China and South Africa) countries and made a manuscript

Projects

Kaggle: House Price Prediction

13^{th} placs(0.06%) out of 19506 teams *Jan. 2020 - Feb. 2020*

- Using Ridge, Lasso, LGBM, XGB, and Stacking CV Regressor, and series of data visualization and analytical techniques to reach 0.10643 root mean squared logarithmic error and 12449.19063 mean absolute error, got 13^{th} place, 0.06% out of 10506 teams(individual)

R for Data Science: Pizza Party

Final Project for Data Science course at Macalester College *Oct. 2019 - Dec. 2019*

- Using some data from TidyTuesday's Pizza Party data-set, analyzed and created methods and visualizations for a pizzeria that everyone would like in New York by R

Mathematical Modeling for Drone Light Show

Honorable Mention out of 938 teams in Mathematical Contest in Modeling *Jan. 2018 - Feb. 2018*

- Using *MATLAB*, I built models to determine the required number of drones and every drone's initial location during the process.
- Any simple pictures or icons could be designed for the drone show by my *MATLAB* program.

Design and Optimization of Comb Drive Accelerator for High Frequency Oscillation

Published in Modern Mechanical Engineering Vol.8 No.1, February, 2018 *Apr. 2017 - Feb. 2018*

- This project is mentored by a doctor at UCLA and the final paper was published. In this work, using *COMSOL* and *MATLAB*, a finite element code was used for the design, optimization, and visualization of a comb drive accelerator.

Generalizations of Locus about Fixed Point and Fixed Line Moving to Magnify and Shrink

Published in Mathematical Study and Research Vol 19, 2017 *Sep. 2016 - Feb. 2017*

- This Chinese geometrical paper is for mathematical Olympics competitions, generalized series of problems of locus by an elegant method and visualized by *Geometer Sketchpad*

Honors

Jan, 2020 **13th place(0.06%) out of 19506 teams,** Kaggle Data Science Competition *U.S.A*

Dec, 2019 **Top 9,** The Mathematical Association of America-North Central Section(MAA-NCS) Team Contest *U.S.A*

Feb, 2018 **Top 5%,** American Mathematics Competition(AMC12) *U.S.A.*

Nov, 2017 **Honorable Mention,** Mathematical Contest in Modeling *U.S.A*

Sep, 2017 **First Prize,** Chinese Mathematics League *China*