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 Gradient Boosting, XGBoost, stackingCVR, and series of data visualization and analytical techniques to reach 0.10643 root mean squared logarithmic error and 12449.19063 mean absolute error, got top 13, 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

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*