



# 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, shiny), **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, Shiny 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<sup>th</sup> 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 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	<b>13th place(0.06%) out of 19506 teams</b> , Kaggle Data Science Competition	<i>U.S.A</i>
Dec, 2019	<b>Top 9</b> , The Mathematical Association of America-North Central Section(MAA-NCS) Team Contest	<i>U.S.A</i>
Feb, 2018	<b>Top 5%</b> , American Mathematics Competition(AMC12)	<i>U.S.A</i>
Nov, 2017	<b>Honorable Mention</b> , Mathematical Contest in Modeling	<i>U.S.A</i>
Sep, 2017	<b>First Prize</b> , Chinese Mathematics League	<i>China</i>