

# Jiaheng Chen

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## Education

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### Shanghai Jiao Tong University

*Undergraduate Student*

**Shanghai, China**

*Sep. 2018 - Now*

- Mathematics and Applied Mathematics, Zhiyuan College
- Cumulative Grade : 90.45/100 (Rank: 1/21)      GPA : 3.94/4.3 (Rank: 1/21)
- Advisors : Prof. Haizhao Yang (Purdue University), Prof. Lei Li (Shanghai Jiao Tong University)

## Research Interests

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My research interests lie in the general area of applied mathematics, particularly in mathematical theory of machine learning and deep learning, as well as their applications in scientific computing problems. Specifically, my research lies in the span of the following topics:

- Computational mathematics and numerical analysis
- Mathematical theory of deep learning, approximation, optimization and generalization
- Optimal transport theory, random matrix theory for deep learning

## Research Experiments

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### The Analysis of Multimodal Data in Accounting and Finance Using Deep Learning

Advisor: Prof. Yang Bao

*Aug. 2020 - Mar. 2021*

- Based on recent techniques in Natural Language Processing, predict stock price volatility by leveraging multimodal data in conference calls of listed companies.
- Proposed a novel framework and compared its performance with other baselines, our model outperforms the previous work in the mid-long term prediction task

### A Pharmacy Model for Patients with Chronic Diseases Based on Data Mining

Advisor: Prof. Xiaofeng Gao

*Oct. 2020 - Now*

- Use the methods of statistical learning, ensemble learning (Random Forest, XGBoost, etc.) and deep neural network to predict the dose of warfarin (a kind of anticoagulant).
- Aiming to predict the dose more accurately, developed the existing models and tried to handle the imbalance problem in our dataset.

### Mathematical theory of deep neural networks (approximation, optimization and generalization)

Advisor: Prof. Haizhao Yang

*Mar. 2021 - Now*

- Learn mathematical theories of neural networks, such as NTK, implicit regularizations of DNN, random matrix theory for deep learning
- Analyze the optimization and generalization theory of solving PDEs using DNN

### Optimal transport, flow models and deep learning

Advisor: Prof. Lei Li

*Jul. 2021 - Now*

- Exploiting optimal transport theory to construct and analyze flow-based generative models

## Honors and Awards

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- **SIAM Award** in MCM & ICM 2021
- **COMAP Scholarship Award** in MCM & ICM 2021
- **Outstanding Winner** (Top 0.1%), Mathematical Contest in Modeling and Interdisciplinary Contest in Modeling 2021
- **National Scholarship** (Top 2 students in Mathematics Department, Zhiyuan College), Ministry of Education of P.R.China 2020
- **Undergraduate Merit Scholarship of SJTU** (A, Top 10%) 2020
- **Zhiyuan College Honors Scholarship** (Top 5%), Shanghai Jiao Tong University 2018-2020
- China Mathematics Olympiad, **Silver Medal** 2017