

## EDUCATION

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### Shanghai Jiao Tong University

*B.S. in Mathematics*

Shanghai, China

*Sept. 2016 – Present*

- **Major GPA:** 3.67/4.30 (86.7/100)
- **Overall GPA:** 3.65/4.30 (86.1/100)
- Selected to **Zhiyuan Honors Program**, an elite program for students in the top 5% in school
- **Research Assistant** in the Department of Computer Science at University of Illinois, Urbana-Champaign
- **Selected Awards:** Outstanding Winner in the Interdisciplinary Contest in Modeling (top 0.16% of over 20,000 teams), Merit Student (top 6% in school, awarded to those with comprehensive development)
- **Selected Course Grades:** *C++ Programming:* 95, *Computational Methods for Multi-scale Physical Problems:* 95, *Functional Analysis:* 95, *Algebraic Number Theory:* 93, *Abstract Algebra:* 91, *Partial Differential Equations:* 90

### Hertford College, University of Oxford

*Exchange Student in Math and Physics Program*

Oxford, UK

*June 2018 – July 2018*

- **Final Grade:** A (*Manifolds and Group Theory*)

## RESEARCH EXPERIENCE

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### Gradient-free Consensus-based Global Optimization Methods

*Institute of Natural Sciences, SJTU; Advised by Prof. Shi Jin and Prof. Xiaoqun Zhang*

Shanghai, China

*Sept. 2019 – Present*

- Studied the convergence of the consensus-based global optimization method from the aspect of stochastic analysis.
- Implemented relevant algorithms to solve the logistic regression and compressive sensing problems with  $l_0$  regularization. Currently conducting further numerical experiments on optimization problems in deep learning.
- Developing a relevant theoretically principled hybrid gradient method to improve the numerical performance and widen the gamut of practical use.

### Deep Generative Model for Molecular Graphs

*Department of Computer Science, UIUC; Advised by Prof. Jian Peng*

Urbana-Champaign, IL, USA

*July 2019 – Sept. 2019*

- Implemented the sequential generative model for molecular graphs (DGMG) proposed by DeepMind, using RDKit Cheminformatics toolkit and DGL python library by AWS Amazon.
- Deployed the batch-training and parallel-training logics to accelerate the auto-regressive generative model training.
- Improved the performance of the original DGMG model by designing an innovative generating process with node degree constraints and replacing atoms with chemical radical groups as generating tokens.
- Tested our generative model on the Molecular Sets Benchmarking Platform, and achieved high performance in similarity metrics comparable to recent SOTA algorithms with fewer parameters and more malleable architectures.

### Application of Deep Learning in Molecular Dynamics

*Institute of Natural Sciences, SJTU; Advised by Prof. Jinglai Li and Prof. Liang Hong*

Shanghai, China

*May 2018 – June 2019*

- Processed raw data collected from molecular dynamics (MD) data simulated with LAMMPS for deep neural network (DNN) modeling, using Python and the DeePMD toolkit.
- Designed and evaluated deep neural network architectures to predict force fields with processed data.
- Improved the current model by adopting active learning to interactively explore the conformation space.

### Application of Machine Learning in the Analysis of Alloy Phase Transition

*Department of Computer Science and Engineering, SJTU; Advised by Prof. Xiaotie Deng*

Shanghai, China

*May 2017 – Oct. 2017*

- Extracted features and labels from the raw data of alloy phase transition according to the knowledge of material science. Organized them into the form of DataFrame in Pandas to apply statistical learning models.
- Trained and validated machine learning regression models such as GBDT and RandomForest. Applied cross validation to optimize models, and most prediction accuracies reached above 80% to 90%.
- Wrote reports that explained the prediction methodology.

## COURSEWORK & CONTEST

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**Adaptive Moving Mesh Method for Blow-up Equations with  $e^\mu$  Nonlinearity** Shanghai, China  
*Coursework for “Numerical Methods for Ordinary and Partial Differential Equations”, SJTU* Apr. 2019 – June 2019

- Studied relevant papers and books to address the blow-up phenomenon of equations with  $e^\mu$  nonlinearity.
- Implemented the adaptive moving mesh method to solve the blow-up equation and reduce the numerical error compared with the results of fixed uniform mesh methods.
- Wrote reports to present the theoretical analysis and numerical results for  $e^\mu$ -nonlinear equations.

**Climate-based Fragility Measurement Model for Regions in the World** Shanghai, China  
*The Interdisciplinary Contest in Modeling, Comap* Feb. 2018

- Designed a SPEC index to evaluate regional fragility concerning effects of climate change, and derived a self-regulatory factor to model the tipping point of regional stability.
- Collected and cleaned relevant data of 178 countries worldwide to test our model. Our SPEC score corresponded to the traditional *Fragile State Index* but stressed the effects of climate change.
- Wrote reports to present our model and analysis of simulation results. Our team was designated as Outstanding Winner, the highest award in the contest (top 0.16% in over 20,000 teams in the world).

## EXTRACURRICULAR ACTIVITIES

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**Class Assistant of Mathematics Class, Grade 2017 of Zhiyuan College** Shanghai, China  
*Zhiyuan College, Shanghai Jiao Tong University* Sept. 2017 – Present

- Tutor students in various aspects, including academic study, daily life management, etc.

**International Youth Leadership Finance Summit, SAIF** Shanghai, China  
*Participant representing Shanghai Jiao Tong University* Jan. 2019

- Designed AI solutions for a real health company for its in vitro diagnostics and pharmaceutical business.
- Presented a roadshow to the investors in order to seek equity financing.

## AWARDS & SCHOLARSHIPS

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- **Outstanding Winner** | The Interdisciplinary Contest in Modeling, Comap (top 0.16% in over 20,000 teams) 2018
- **Xingcai Scholarship** | Shanghai Jiao Tong University (0.01% in Zhiyuan College) 2018
- **Merit Student** | Shanghai Jiao Tong University (6% in school) 2018
- **Academic Excellence Scholarship** | Shanghai Jiao Tong University (top 10% in school) 2017 & 2018 & 2019
- **Merit Scholarship of Zhiyuan Honors Program** | Shanghai Jiao Tong University 2016 & 2017 & 2018 & 2019
- **Kaiyuan Encouragement Scholarship** | Shanghai Jiao Tong University (0.05% in Zhiyuan College) 2017

## SKILLS

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**Technical:** C++, Python, Matlab, R, SQL, HTML,  $\text{\LaTeX}$

**Language:** English (advanced)