

# Zitao Wang

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## CONTACT INFORMATION

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[zwangab91.github.io](https://zwangab91.github.io)

[LinkedIn](#)

## EDUCATION

### California Institute of Technology

Sep. 2013 - Present

Ph.D. Candidate in Physics, Minor in Computer Science, GPA: 4.21/4.3

- Courses: Probability and Statistics, Stochastic Processes, Machine Learning and Data Mining

### Hong Kong University of Science and Technology

Sep. 2009 - June 2013

B.Sc. in Physics (Physics and Mathematics Option), GPA: 3.79/4.3

- First Class Honors
- Courses: OOP and Data Structures, Algorithms, Discrete Mathematics, PDE

### Northwestern University

Jan. 2012 - June 2012

Exchange Student, GPA: 4.0/4.3

## SKILLS

- Languages: Mandarin (native), English (fluent), Cantonese (intermediate)
- Programming Languages: Python, C++, R, Matlab, Mathematica
- Libraries: NumPy, Pandas, PyTorch, Scikit-learn

## EXPERIENCE

California Institute of Technology  
Pasadena, CA

Research Assistant  
Sep. 2013 - Present

- Constructed the first exactly solvable model of a 2D topological superconductor, applicable to both the weakly and strongly interacting regimes. Resolved a long-standing puzzle regarding time-reversal symmetry in such materials.
- Proposed a new description of 3D discrete gauge theories and their twisted versions, providing a different physical picture of these theories dual to the existing one. Proposed a way to detect their topological order based on 3D modular transformations.
- Proposed a complete classification of gapped phases of fermions with short-range entanglement. List of publications and citation statistics available at [Google Scholar](#).

RabbitPre Intelligent Technology Co., Ltd.  
Shenzhen, CN

Machine Learning Intern  
June 2018 - Sep. 2018

- Experiment with different deep learning techniques in OCR to detect and recognize Chinese characters in posters. Achieved mAP of 71.0% with a character-based model based on YOLOv2 and Inception-v4.

Hong Kong University of Science and Technology  
Hong Kong

Undergraduate Researcher  
Sep. 2010 - June 2012

- Numerically study the network reliability subject to random edge failures. Established a novel relation between the network reliability and the spectral gap of the adjacency matrix.

## PROJECTS

- **Netflix Challenge:** Implemented a movie recommender system based on matrix factorization models and autoencoder. Achieved RMSE of 0.8677. Ranked 2<sup>nd</sup> out of 20 teams in the course.
- **Sonnet Generator:** Implemented HMM and LSTM to generate Shakespeare sonnets.
- **Sentiment Analysis:** Implemented logistic regression, SVMs, random forests, and AdaBoost models to predict sentiment of comments on Amazon.