

# YUHAN QIAO

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## RESEARCH STATEMENT

My research interests lie in graph representation learning, self-supervised learning, and semi-supervised learning, particularly their applications to misinformation detection on social media. My master's research focused on developing self-supervised and semi-supervised frameworks for rumor detection using Graph Neural Networks (GNNs), which sparked my interest in how learning algorithms can generalize from limited supervision. I look forward to extending this line of work toward integrating graph-based methods with large language models (LLMs) to advance misinformation detection and related domains in a PhD program.

## EDUCATION

**Beijing JiaoTong University, Beijing, China**

*Sep 2020 - Jun 2024*

M.Eng. in Computer Science & Technology

Average Score: **87.6/100**, GPA: **3.65/4.00**

**China University of Mining & Technology-Beijing, Beijing, China**

*Sep 2016 - Jun 2020*

B.Eng. in Information Engineering

Average Score: **90.5/100**, GPA: **3.82/4.00**

## LANGUAGE PROFICIENCY

- **English:** TOEFL iBT: 106/120 (R:30/30, L:26, S:23, W:27)

*Test Date: Jun 2025*

- **Mandarin:** Native

## PUBLICATION

- A Debaised Self-Training Framework with Graph Self-Supervised Pre-training Aided for Semi-Supervised Rumor Detection.

**Yuhan Qiao**, Chaoqun Cui, Yiyang Wang, Caiyan Jia.

*Neurocomputing*, Aug 2024. (SCI, IF = 6.5, JCR **Q1**).

[doi:10.1016/j.neucom.2024.128314](https://doi.org/10.1016/j.neucom.2024.128314)

- Rumor Detection on Social Media based on Graph Contrastive Self-Supervised Learning (**in Chinese**).

**Yuhan Qiao**, Caiyan Jia.

*Journal of Nanjing University (Natural Sciences)*, Sep 2023.

(Originally presented orally at the 19th China Conference on Machine Learning (*CCML 2023*), later recommended for journal publication)

[doi:10.13232/j.cnki.jnju.2023.05.010](https://doi.org/10.13232/j.cnki.jnju.2023.05.010)

## RESEARCH EXPERIENCE

**Master's Thesis** | Supervisor: Prof. Caiyan Jia

*Jul 2021 - Jun 2024*

**Research on Rumor Detection Methods based on Graph Representation Learning**

Beijing Key Lab of Traffic Data Analysis and Mining, Beijing Jiaotong University

Beijing, China

- **Summary:** Existing rumor detection models achieve high accuracy with abundant labeled data but tend to overfit when labeled samples are scarce, as rumor annotation is time-consuming and labor-intensive. This research investigates rumor detection through the lens of graph representation learning. By representing rumor propagation as graphs, it develops self-supervised and semi-supervised frameworks that improve the expressiveness and generalization of Graph Neural Networks (GNNs), addressing overfitting issues caused by limited labeled data in real-world rumor scenarios.
- **Research Focus 1:** Rumor Detection with Graph Self-Supervised Contrastive Learning

- Modeled rumor propagation structures as graphs and proposed a self-supervised contrastive framework to enhance representation learning and generalization of Graph Neural Networks (GNNs).
- Designed three graph-level augmentation strategies based on rumor propagation patterns and integrated the contrastive and supervised classification tasks into a single end-to-end framework.
- Achieved consistent performance gains across three public rumor datasets and three baseline rumor detection models, demonstrating that the proposed contrastive framework can serve as a general add-on to enhance model generalization.
- This work was accepted by *CCML 2023* and recommended for publication in the *Journal of Nanjing University (Natural Sciences)*.
- **Research Focus 2:** Debaised Self-Training with Graph Self-Supervision for Semi-Supervised Rumor Detection
  - Proposed a debaised self-training framework with graph self-supervised pre-training to alleviate confirmation bias in semi-supervised rumor detection.
  - Leveraged both contrastive (mutual information maximization) and generative (masked autoencoder) graph self-supervised methods to enhance the robustness and generalization of the initial model for self-training.
  - Designed a pseudo-labeling strategy inspired by curriculum learning, featuring self-adaptive global and class-specific thresholds to improve pseudo-label quality during iterative self-training.
  - Conducted extensive experiments on four public rumor datasets under semi-supervised settings, showing consistently superior performance, especially on Weibo. The framework maintained strong accuracy even with very limited labeled samples, and a detailed parameter analysis was performed on pseudo-label thresholds and other key settings.
  - Published this work in *Neurocomputing* and identified promising directions for future study, including handling class imbalance and developing consistency-regularization-based approaches for semi-supervised rumor detection.

## AWARDS AND HONORS

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- 2020–2022: 1st-Class Academic Scholarship, Beijing Jiaotong University (BJTU)
- 2019: Outstanding Participant, BJTU National Summer Camp (led to Direct M.Eng. Admission)
- 2016–2019: Outstanding Student Scholarship, China University of Mining & Technology-Beijing
  - 2018–2019: 3rd-Class
  - 2016–2018: 2nd-Class
- 2017: Second Prize, "FLTRP CUP" English Reading Contest (Preliminary Round)

## SKILLS

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- **Programming & Tools:** Python (PyTorch, NumPy, Scikit-learn, PyTorch Geometric, Matplotlib), C/C++ (basic), Linux (basic command-line), LaTeX (Overleaf), Markdown (for blogging)
- **Research Methods:** Representation learning on graphs, including self-supervised (contrastive and generative) and semi-supervised (self-training and pseudo-labeling) frameworks
- **Experimental & Analytical Skills:** Data Preprocessing, Model Implementation, Model Evaluation, Ablation Studies, Parameter Sensitivity Analysis, Data Visualization

## REFERENCES

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### Professor Caiyan Jia

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Beijing JiaoTong University  
Email: cyjia@bjtu.edu.cn  
Relationship: Master's Thesis Supervisor

### Associate Professor Lei Jiang

School of Artificial Intelligence  
China University of Mining & Technology-Beijing  
Email: leijiang@cumtb.edu.cn  
Relationship: Course Instructor