

# Zheyuan Liu

## PERSONAL INFORMATION

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Zheyuan Liu  
Brandeis University  
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Website: <https://zheyuanliu.netlify.app/>  
TOEFL: 110/120 (R: 27, L: 30, S: 25, W: 28)  
GRE: 324/340 (V: 154, Q:170, W:4.0)

## EDUCATION

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09/2019–05/2023 **B.S Computer Science, Applied Mathematics** (double-major)  
Brandeis University, Waltham, MA, USA  
**Cumulative GPA:** 3.88  
**Advisor:** Prof. [Chuxu Zhang](#)

## RELEVANT COURSES:

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Deep Learning (A), Principles of Mathematical Modeling (A), Fundamentals of Software Engineering (A+), Statistical Machine Learning (A), Operating System (A-), Linear Algebra (A), Multi-variable Calculus (B+), Differential Equations (A), Probability (A), Fundamentals of Natural Language Processing I (In-process)

## RESEARCH INTEREST

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Efficient Machine Learning, Deep Learning  
Graph Mining/Data Mining, Data-efficient AI, Trustworthy AI  
Cybersecurity, HCI, software systems

## PUBLICATIONS

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1. WANG, Y., PENG, H. M., SHA, L., **LIU, ZHEYUAN**, AND HONG, P. State-level covid-19 trend forecasting using mobility and policy data. *medRxiv* (2021)
2. WU, J., ZHANG, C., **LIU, ZHEYUAN**, ZHANG, E., WILSON, S., AND ZHANG, C. Graph-BERT: Bridging graph and text for malicious behavior detection on social media. In *ICDM* (2022)
3. **FIRST AUTHOR**. G-FAME: Fair graph representation learning via diverse mixture of experts

## RESEARCH EXPERIENCE

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- 06/2022–Current    **Improving Fairness of GNN Representation by diversity discovery**  
*Research Assistant*    Advised by Prof. Chuxu Zhang
- Analyzed the unique property of graph fairness data.
  - Aimed to boost the performance of GNN model on fairness graph data while alleviating the oversmoothing problem.
  - Enriched the representation diversity of model from three perspectives: the node embedding of fairness graph data, learned representation across different experts in *Mixed of Expert* (MOE), and learned representation across different-depth layers.
  - Analyzed loss landscape of the model to empirically and theoretically explain the effectiveness of diversity learning.
  - Successfully improved the accuracy of a newly designed GNN based model under fairness setting while restraining the oversmooth problem from happening.
- 12/2021–06/2022    **GraphBERT: Bridging Graph and Text for Malicious Behavior Detection on Social Media**  
*Research Assistant*    Advised by Prof. Chuxu Zhang
- Signified harmful posts/comments manually from more than 60k tweets to serve as positive/negative samples during the training process.
  - Collected project related information (e.g. BERT, GNN and contrastive learning), and helped run experiments on baseline models.
  - Helped run the experiments on new designed model over two tasks: malicious user detection and malicious tweet detection.
  - Assisted the first author to draft a manuscript of the work and submitted to ICDM conference.
- 05/2021–08/2021    **Network-based virus-host interaction prediction with application to SARS-CoV-2**  
*Research Assistant*    Advised by Prof. Pengyu Hong
- Designed the [website](#) through front end languages (HTML, CSS, Javascript, AJAX, etc.) to display the relationship between the protein groups of different types of coronavirus with different hosts.
  - Imported the previous work data of the paper from [github](#) to construct website, which can be used to identify potential infected host groups based on similar structure of the protein groups. (Simple version of the [website](#))
  - Updated website based on the most recent result given by the algorithm.

08/2020–12/2020 **Visualizing the COVID-19 Trend Prediction**

*Research Assistant*

Advised by Prof. Pengyu Hong

- Designed a [website](#) to hold data of a machine learning algorithm that predicted the COVID-19 trend based on the ground truth using front end languages (Javascript, HTML, CSS, etc. ) and python.
- Pulled data from Airtable and transferred it using Python to make it compatible with the website.
- Modified the website to be user-friendly, which also serves as a platform to compare the groundtruth/predicted cases of each state.
- Co-published the [work](#) to medRxiv.

WORK EXPERIENCE

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09/2021–Current **Brandeis University**, Waltham, MA

*Teaching Assistant*

- Acted as teaching assistant for Python, JAVA and Operating System class, held office hours each week helping students with programming assignments and questions about the content from the lecture.
- Assisted Professor grade assignments, exams and gave feedback to students.

06/2020–08/2020 **VeryEngine**, Hangzhou, China

*Software development intern*

- Utilized TypeScript and JavaScript to develop online VR showroom for different companies.
- Tested compatibility of VR Device (HTC Vive) with computers with different CPU and GPU and gave feedback on device configuration and setup.

HONORS, AWARDS & SCHOLARSHIPS

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06/2022– 08/2022 Provost's Research Fellowship (5000 dollars)

12/2019– 05/2022 Dean's List

09/2017– Current [Patent](#) of a new type of packing tool

SKILLS:

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Python, Pytorch, Deep Learning, Java, JavaScript, HTML, CSS, SQL, Linux command, Typescript

SERVICE

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IEEE Transactions on Big Data Reviewer

IEEE Transactions on Neural Networks and Learning Systems (TNNLS) Reviewer