

# Ran Liu

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## EDUCATION

### GEORGIA INSTITUTE OF TECHNOLOGY (GT)

Ph.D. in Machine Learning (GPA: 4/4) w/ minor in Statistics

Atlanta, GA  
Aug 2019 - Aug 2024

### FUDAN UNIVERSITY

B.S. in Physics (GPA: 3.6/4)

Shanghai, China  
Sep 2015 - Jun 2019

### UNIVERSITY OF CALIFORNIA, BERKELEY (UCB)

Exchange Student (GPA: 3.9/4)

Berkeley, CA  
Jan 2017 - May 2017

## SELECTED EXPERIENCES

### GT - NEURAL DATA SCIENCE LAB

Graduate Research Assistant

Atlanta, GA  
Jan 2020 - Present

- Applied **VAE** to perform **generative modeling** of brain imagery and developed a novel bidirectional approach to **interpret low-dimensional latent representation** of generative models from both the receptive and the projective field of a neural net
- Proposed a **multitask U-Net** to perform fine-scale segmentation of brain's microstructure and classification of brain areas
- Developed **latent alignment algorithm** to align sequential recordings of neural activity via contrastive learning technique

### GT - SOCIAL AND LANGUAGE TECHNOLOGIES LAB

Graduate Research Assistant

Atlanta, GA  
Aug 2019 - Jan 2020

- Applied state-of-the-art language model **BERT** on a classification task of discourse acts and achieved **record-high F1 score**
- Designed and extracted sequential features about controversy-causing posts and employed them on **early prediction task**
- Conducted **temporal modeling** of controversial posts' discussion structures with linguistic analysis of discourse acts

### FUDAN - THE INSTITUTE OF BIG DATA

Research Intern

Shanghai, China  
Jul 2018 - Jun 2019

- Constructed **hierarchical information graph** based on user connection and geo-location from a self-crawled Twitter dataset
- Conducted **community detection** based on a modified fast unfolding algorithm and designed a **heterogeneous recommendation system** via link prediction algorithms including Neural Collaborative Filtering and Factorization Machines
- Analytically derived the Laplacian spectrums of several scale-free complex networks with identical degree sequence

### CITIC SECURITIES

Market Analyst Summer Intern

Guangzhou, Guangdong, China  
Jun 2017 - Aug 2017

- Assisted in the compiling, analyzing, and modeling of market data to provide insights on new wealth management product
- Organized activities for clients to communicate about our investment strategies and solutions

## PUBLICATIONS

- R. Liu, C. Subakan, A. H. Balwani, J. Whitesell, J. Harris, S. Koyejo, E. Dyer. **A generative modeling approach for interpreting population-level variability in brain structure**. In International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2020) [Paper] [Webpage]
- C. Huang, B. Zhou, H. Zhang, B. Yang, R. Liu, et al. **Proximity-induced surface superconductivity in Dirac semimetal  $\text{Cd}_3\text{As}_2$** . In *Nature Communications* (May 2019) [Paper]
- C. Zhang, Y. Zhang, X. Yuan, S. Lu, J. Zhang, A. Narayan, Y. Liu, H. Zhang, Z. Ni, R. Liu, et al. **Quantum Hall effect based on Weyl orbits in  $\text{Cd}_3\text{As}_2$** . In *Nature* (Dec 2018) [Paper]
- C. Huang, A. Narayan, E. Zhang, Y. Liu, X. Yan, J. Wang, C. Zhang, W. Wang, T. Zhou, C. Yi, S. Liu, J. Ling, H. Zhang, R. Liu, et al. **Inducing Strong Superconductivity in  $\text{WTe}_2$  by Proximity Effect**. In *ACS nano* (Jun 2018) [Paper]

## SKILLS

- **Programming Languages:** Python, C/C++, MATLAB, SQL, LaTeX, CSS, JavaScript
- **Open Source Libraries:** PyTorch, TensorFlow, Keras, scikit-learn, OpenCV, Gensim

## LEADERSHIP AND HONORS

- GT - Cox Fellowship 2019 - 2020
- China National Scholarship (highest undergraduate scholarship nationally) 2018
- Outstanding Leadership Awards (honored to 10 student activity organizers per year) 2018