

# Rui Li

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## Education

### Northeastern University

*PhD. Student in Computer Science*

Sep. 2022 – Present

Boston, MA

### Tsinghua University

*Master of Science in Computer Science and Technology*

Sep. 2016 – Jul. 2019

Beijing, China

### Nankai University

*Bachelor of Engineering in Computer Science and Technology*

Aug. 2012 – Jul. 2016

Tianjin, China

## Professional and Research Experience

### Seed-Infrastructure-Training, Bytedance Seed

Bellevue, WA

*Research Intern*

Jan. 2025 – Present

- Designed algorithms to detect training stragglers in MoE and RL training on FSDP and Megatron-LM architectures.
- Reduced cold-start time of large LLM training tasks by 50% through system-level optimizations.
- Gained extensive hands-on experience in debugging and performance tuning of production-scale training jobs on clusters with 10,000+ GPUs.

### HPC Lab, Khoury College of Computer Science, Northeastern University

Boston, MA

*Research Assistant*

Sep. 2022 – Present

- Working with Prof. Gene Cooperman and Prof. Devesh Tiwari to research and implement innovative solutions for expediting Serverless cold-start issues. Leveraged transparent Checkpoint/Restore technologies to enhance the performance of Serverless systems.

### DC-Brain Lab, Alibaba Infrastructure Service, Alibaba Cloud

Hangzhou, China

*Algorithm Engineer II*

Sep. 2021 – Aug. 2022

- Engaged in the *Anomaly Detection for Network and System logs* project, applying machine learning techniques to analyze logs from extensive data centers and networks. Collaborated closely with Network teams to deliver effective log alerts and took a lead role in developing AI algorithms.
- Spearheaded the 'Intelligent Tickets' project, directing the design and construction of AI systems to assess user tickets at Alibaba Cloud for risk identification and business opportunities. Led efforts in Algorithm Design, Data Processing, and the development of a production platform to support sales and global services teams.

### DC-Brain Lab, Alibaba Infrastructure Service, Alibaba Cloud

Hangzhou, China

*Algorithm Engineer I*

Sep. 2019 – Aug. 2021

- Headed the 'Intelligent Auto Healing Clusters' project, employing machine learning algorithms to intelligently repair server failures within clusters. Launched the system, overseeing the repair of over 800,000 servers in Alibaba Cloud. Achieved a remarkable 92.4% success rate in resolving 33.7 million production failures over seven months. Additionally, authored a paper as the first author, which was published at SRDS'21.
- Led the exploration of 'Log Analysis', integrating advanced Natural Language Processing algorithms for text log data analysis. Applied these techniques across various projects, including intelligent monitoring, anomaly detection, and fault diagnosis.

### DC-Brain Lab, Alibaba Infrastructure Service, Alibaba Group

Hangzhou, China

*Intern Algorithm Engineer*

Nov. 2018 – Feb. 2019

- Contributed to team projects focused on disk failure prediction and memory failure prediction, actively participating in research, analysis, and assisting in the development of an academic paper.

### Wechat, Tencent Inc

Shenzhen, China

*Intern Algorithm Engineer*

Apr. 2018 – Aug. 2018

- Explored a novel optimization model for enhancing the recommendation system in WeChat. Utilized a neural network model that incorporates both static and dynamic browsing data to learn and adapt to users' browsing habits.

### Department of Computer Science and Technology, Tsinghua University

Beijing, China

*Student Researcher*

Nov. 2017 – May. 2019

- Conducted research on Network Traffic Classification under the guidance of Prof. Shu-Tao Xia and Prof. Xi Xiao. Designed cutting-edge Machine Learning and Deep Learning algorithms to classify network traffic at the application level. Achieved publication as the first or first student author in IWQoS'18 and Information Sciences, as well as co-authorship on two additional papers.

## Publications

**BootSeer: Analyzing and Mitigating Initialization Bottlenecks in Large-Scale LLM Training.** arXiv preprint arXiv:2507.12619 2025  
**Li, R.**, Zhi, X., Chi, J., Yu, M., Huang, L., Zhu, J., Zhang, W., Ma, X., Liu, W., Zhu, Z., Luo, D., Song, Z., Yin, X., Xiang, C., Wang, S., Xiao, W., Cooperman, G.  
**HotSwap: Enabling Live Dependency Sharing in Serverless Computing.** In Proceedings of the IEEE International Conference on Cloud Computing, CLOUD 2025  
**Li, R.**, Cooperman, G., Devesh, T.  
**Automated intelligent healing in cloud-scale data centers.** In Proceedings of the 40th International Symposium on Reliable Distributed System (SRDS), 2021.  
**Li, R.**, Cheng, Z., Lee, P., Wang, P., Qiang, Y., Lan, L., He, C., Lu, J., Wang, M., & Ding, X.  
**EBSNN: Extended Byte Segment Neural Network for Network Traffic Classification.** IEEE Transactions on Dependable and Secure Computing, 2021.  
Xiao, X., Xiao, W., **Li, R.**, Luo, X., Zheng, H. & Xia, S.  
**Byte segment neural network for network traffic classification.** IEEE/ACM 26th International Symposium on Quality of Service (IWQoS), 2018.  
**Li, R.**, Xiao, X., Ni, S., Zheng, H., & Xia, S.  
**Novel dynamic multiple classification system for network traffic.** Information Sciences, 2019.  
Xiao, X., **Li, R.**, Zheng, H. T., Ye, R., KumarSangaiah, A., & Xia, S.  
**SAM: Self-Attention based Deep Learning Method for Online Traffic Classification.** In Proceedings of the Workshop on Network Meets AI & ML, 2020.  
Xie, G., Li, Q., Jiang, Y., Dai, T., Shen, G., **Li, R.**, Sinnott, R. & Xia, S.  
**Robust data preprocessing for machine-learning-based disk failure prediction in cloud production environments.** arXiv preprint arXiv:1912.09722, 2019.  
Han, S., Wu, J., Xu, E., He, C., Lee, P., Qiang, Y., Zheng, Q., Huang, T., Huang, Z., & **Li, R.**  
**LogFold: Enhancing Log Anomaly Detection through Sequence Folding and Reconstruction.** 30th Asia-Pacific Software Engineering Conference (APSEC), 2023.  
Shi, X., **Li, R.**, Du, Q., He, C., Tian, F.

## Honors and Awards

Best Newcomer Award of the Alibaba Infrastructure Service	May, 2020
Excellent Graduate in Beijing City (Top 2%)	Jul, 2019
Excellent Graduate of the CS Department, Tsinghua (Top 10%)	Jul, 2019
Second-Class Scholarship, Tsinghua University (Top 5%)	Sep, 2018
Excellent Student of Nankai University	Oct, 2015; Jun, 2016
Gongneng Scholarship, Nankai University (Top 10%)	Oct, 2015; Nov, 2014

## Technical Skills, Language Skills, and Interests

**Languages:** Chinese (Native), English (Fluent), Japanese (Fluent, JLPT N2)  
**Programming:** Python, C/C++, Java, SQL  
**Frameworks & Tools:** PyTorch, Megatron-LM, CUDA, CRIU, NCCL  
**Interests:** Classical music, Piano, Cycling (2025 STP one-day finisher)