

# Shenghao Qiu

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🔗 <https://eps.leeds.ac.uk/computing/pgt/8738/shenghao-qiu>

## Summary

My research lies at the intersection of high-performance deep learning systems and trustworthy artificial intelligence. It spans two complementary directions:

- **Acceleration of Deep Learning Workloads.** I focus on optimizing distributed communication and computation kernels to improve the scalability and efficiency of large-scale deep learning training. My work explores techniques in machine learning compilers, Graph Neural Networks (GNNs), and sparse tensor computation, with an emphasis on optimizing sparse matrix multiplications - one of the dominant computational bottlenecks in state-of-the-art models such as GNNs and Transformers.
- **Explainable AI for Model Testing.** I investigate the use of explainable AI (XAI) methods to enhance the trustworthiness and robustness of deep learning models. Specifically, I employ white-box testing approaches based on attribution techniques to systematically analyze internal neuron behavior, identify model weaknesses, and improve interpretability in complex neural architectures.

## Experience

<b>Alibaba (Beijing) Software Service Co. LTD</b>	<b>August 2021 - October 2021</b>	<b>Nubificus LTD</b>	<b>July 2022 - Present</b>
China		Software Engineer (Intern)	United Kingdom
Software Engineer (Intern)		🔗 <a href="https://nubificus.co.uk/">https://nubificus.co.uk/</a>	

## Education

<b>Foshan University</b>	<b>September 2015 - June 2019</b>	<b>University of Leeds</b>	<b>September 2019 - November 2020</b>
China	Bachelor of Engineering	United Kingdom	Master of Science
GPA: 3.4/4		Distinction	
Thesis: "Research on Gait Recognition Based on Human Key Points and Long Short-Term Memory"		Thesis: "Deep learning classification of ECG signals to diagnose heart disease"	
<b>University of Leeds</b>	<b>October 2020 - March 2025</b>	<b>University of York</b>	<b>July 2024 - Present</b>
United Kingdom	PhD	Trustworthy and Explainable AI	Research Fellow

## Projects

<b>SOPRANO (Horizon Europe project) on Socially-Acceptable and Trustworthy Human-Robot Teaming for Agile Industries</b>	<b>July 2024 - Present</b>
Socially-Acceptable and Trustworthy Human-Robot Teaming for Agile Industries	
🔗 <a href="https://cordis.europa.eu/project/id/101120990">https://cordis.europa.eu/project/id/101120990</a>	
<b>AI4Work (Horizon Europe project) on Human-centric Digital Twin Approaches to Trustworthy AI and Robotics for Improved Working Conditions</b>	<b>July 2024 - Present</b>
Human-centric Digital Twin Approaches to Trustworthy AI and Robotics for Improved Working Conditions	
🔗 <a href="https://cordis.europa.eu/project/id/101135990">https://cordis.europa.eu/project/id/101135990</a>	

Teaching Experience		
School of Computing, University of Leeds		2021 - 2023
Teaching Assistant		
<ul style="list-style-type: none"> <li>Module COMP3611 Machine Learning Teaching (Master and Undergraduate Level) Assistant. Supported both the lab session and tutorial. (September 2020 - December 2021, 2 semester)</li> <li>Module COMP1211 Computer Architecture Teaching Assistant (Undergraduate Level). Supported both the lab session and tutorial. (September 2022 - December 2023, 2 semester)</li> </ul>		
Awards		
Industry PhD studentship		2020
Publications		
Design of Mobile Environment Monitoring and Analysis System Based on GPRS		2018
IOP Conference Series. Materials Science and Engineering		
Shenghao Qiu, Yangqing Zhu and Dingyao Liang		
Optimizing Sparse Matrix Multiplications for Graph Neural Networks		2020
The 34th International Workshop on Languages and Compilers for Parallel Computing		
Shenghao Qiu, Liang You, Zheng Wang		
AIACC-Training: Optimizing Distributed Deep Learning Training through Multi-streamed and Concurrent Gradient Communications		2022
42nd IEEE International Conference on Distributed Computing Systems (ICDCS)		
Lixiang Lin, Shenghao Qiu, Ziqi Yu, Liang You, Long Xin, Xiaoyang Sun, Jie Xu, Zheng Wang		
STRONGHOLD: Fast and Affordable Billion-scale Deep Learning Model Training		2022
The International Conference for High Performance Computing, Networking, Storage, and Analysis (Super Computing 2022)		
Xiaoyang Sun, Wei Wang, Shenghao Qiu, Renyu Yang, Songfang Huang, Jie Xu, Zheng Wang		
Unleashing the Potential of Acquisition Functions in High-Dimensional Bayesian Optimization		2024
Transactions on Machine Learning Research		
Jiayu Zhao, Renyu Yang, Shenghao Qiu, Zheng Wang		
GraphCube: Interconnection Hierarchy-aware Graph Processing		2024
Principles and Practice of Parallel Programming (PPoPP 2024)		
Xinbiao Gan, Guang Wu, Shenghao Qiu, Feng Xiong, Jiaqi Si, Jianbin Fang, Dezun Dong, Chunye Gong, Tiejun Li, Zheng Wang		
Accelerating Tensor-train Decomposition on Graph Neural Networks		2025
Proceedings of 39th IEEE International Parallel & Distributed Processing Symposium		
Shenghao Qiu, Chunwei Xia, Zheng Wang		

Skills		
Python	C/C++	LLVM/MLIR
● ● ● ● ● ○	● ● ● ● ● ○	● ● ● ● ● ○
ML/DL Framework	CUDA	LaTeX
PyTorch/TensorFlow/PyG/DGL/MXNet/TVM	● ● ● ● ● ○	● ● ● ● ● ○
● ● ● ● ● ○		