

Zerun Niu

MPhil Student in Computer Science

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Summary

MPhil student at The University of Sydney working on federated learning, semantic communication, and efficient AI systems. Research interests include distributed optimization, edge intelligence, parameter-efficient tuning, GenAI systems, and ML systems for resource-constrained environments.

Education

Master of Computer Science - **The University of Sydney**, Computer Science Sydney, Australia
 • Supervisor: Nguyen Tran Oct 2025 – present

PhD - **The University of Sydney**, Data Science Sydney, Australia
 • Research focus: Federated Learning, Semantic Communication, and Efficient AI Systems 2025

Advanced Bachelor of Computing - **The University of Sydney**, Data Science Sydney, Australia
 • Graduated with Distinction. 2025
 Final years WAM: 77/100

Relevant coursework: Machine Learning, Deep Learning, Natural Language Processing, Distributed Systems

Experience

Casual Academic Tutor - **The University of Sydney** Sydney, Australia
 Tutorial delivery and student learning support for university coursework. Feb 2026 – present
 5 months

- Delivered weekly tutorials, class activities, small-group discussions, and Q&A on course content and university learning platforms.
- Supported students in developing academic communication, teamwork, and professionalism skills through guided exercises and feedback.
- Created an inclusive tutorial environment to help students transition into university study and participate confidently.
- Coordinated with unit staff and followed teaching guides to run tutorials consistently and effectively.

Research Assistant - **DUAL Group, The University of Sydney** Sydney, Australia
 Research engineering and experimentation for distributed learning and efficient AI systems. Apr 2024 – present
 2 years 3 months

- Built reproducible training and evaluation pipelines with configs, seeds, logging, and automated reporting.
- Supported submission and revision cycles by implementing baselines, targeted ablations, and publication-quality figures and tables.
- Addressed reviewer feedback through additional experiments and clarity edits in method and experiment sections.
- Coordinated experiment ownership, timelines, and artifact handoff across code, plots, and tables to reduce duplicated effort.
- Designed and deployed the official DUAL Group website for members, publications, and research projects.

Publications

- Distributionally Robust Wireless Semantic Communication with Large AI Models** 2026
L. T. Le, S. H. Wanasekara, *Zerun Niu*, et al.
[10.48550/arXiv.2506.03167](https://arxiv.org/abs/10.48550/arXiv.2506.03167) (IEEE Journal on Selected Areas in Communications)
- Federated Deep Equilibrium Learning over Resource-Constrained Edge Networks** 2025
L. T. Le, *Zerun Niu*, T. D. Nguyen, et al.
(Submitted to IEEE Internet of Things Journal)

Projects

- Adaptive Low-Rank Optimization for Federated Learning** 2025
Undergraduate thesis integrating DyLoRA into a federated learning pipeline.
 - Reduced communication cost by 80% without loss of accuracy.
 - Improved training stability across clients with reproducible PyTorch experiments.
 - Result: 85/100, High Distinction.
- DUAL Group Website** 2024-2025
Designed and deployed the official website for the Distributed compUting, optimizAtion, and Learning group.
 - Introduced group members, publications, and research projects.
 - Website: <https://dual-grp.github.io/website-dual/>

Teaching

- Casual Academic Tutor** 2026-02 to present
University of Sydney tutorial delivery and student learning support.
 - Tutorial delivery: weekly tutorials, class activities, small-group discussions, and student Q&A.
 - Subjects: Algorithms and Data Structures, Computer Systems, Machine Learning, Deep Learning, NLP, Data Science Foundations, Distributed Systems.
 - Assessment: assignments, coding practicals, project reports, oral demos, rubric-aligned marking.
 - Student support: consultations, Ed discussion, code reviews, debugging practices, academic integrity and citation support.

Skills

- GenAI and Multimodal:** LLM/VLM orchestration, agents, tool use, multimodal adapters, LoRA, alignment, safety guardrails, jailbreak defense, RAG, automated evaluation, and human-in-the-loop evaluation.
- Efficient Tuning:** LoRA, DyLoRA, PEFT workflows, quantization, distillation, and efficient adaptation under constrained compute budgets.
- ML Engineering:** PyTorch, Hugging Face Transformers, PEFT, scikit-learn, reproducible training pipelines, experiment tracking, modular pipeline design, and API development.
- Distributed and Data Systems:** Ray, Dask, Databricks, Spark, Hadoop, Airflow, FastAPI, latency and performance optimization, tracing, and observability.
- Programming:** Python, SQL, Java, C/C++, Git/GitHub, Linux, Jupyter, PostgreSQL, MySQL, MongoDB, Pandas, and NumPy.

Awards

- Undergraduate Thesis High Distinction** 2025
Adaptive Low-Rank Optimization for Federated Learning, score 85/100.