Zerun Niu

AI Research Engineer

Sydney, Australia
zerun.niu@sydney.edu.au
LinkedIn / GitHub / Scholar

PROFILE

MPhil researcher at the University of Sydney building reliable, efficient AI systems across federated learning, semantic communication, and trustworthy machine learning.

CURRENT RESEARCH AND TEACHING

Casual Academic

UNSW Sydney | Aug 2026 - present

Teaching and academic support in computing coursework.

- Facilitate classes and support students through technical concepts and practical problem solving.
- Apply rubric-aligned feedback and clear explanations to student work.

Casual Academic Tutor

The University of Sydney | Feb 2026 - present

Tutorial delivery and student learning support for university coursework.

- Deliver weekly tutorials, class activities, small-group discussions, and question sessions.
- Support academic communication, teamwork, technical problem solving, and professional practice.
- Coordinate with unit teams to deliver consistent, inclusive learning experiences.

Research Assistant

DUAL Group, The University of Sydney | Apr 2024 - present

Research engineering and experimentation for distributed learning and efficient AI systems.

- Build reproducible training and evaluation pipelines with explicit configs, seeds, logging, and reporting.
- Implement baselines, targeted ablations, and publication-quality figures and tables.
- Coordinate experiment ownership and artifact handoff across code, plots, and manuscripts.

SELECTED RESEARCH

Distributionally Robust Wireless Semantic Communication with Large AI Models

2025-2026 | published

Contributed modelling, experiment design, robust training simulations, and evaluation under constrained channels. Evidence: JSAC 2026 publication venue.

Federated Deep Equilibrium Learning over Resource-Constrained Edge Networks

2025-present | submitted

Implemented FeDEQ components, explored communication-efficient aggregation, and evaluated non-IID NLP and vision settings. Evidence: NLP + vision evaluation domains.

BRAVE: Block-wise Structural Regularization via Controlled Evidence Feedback for Reliable Label Aggregation under Sparse Crowdsourcing

2026 | under review

Zerun Niu - first author; led algorithm design, literature review, experimental design, code implementation, and experimental deployment. Evidence: 14 crowdsourcing benchmarks; 5/14 lowest NLL; 9/14 best or tied-best ECE; 11/14 within 0.03 accuracy of the strongest baseline.

Zerun Niu

AI Research Engineer

Sydney, Australia
zerun.niu@sydney.edu.au
LinkedIn / GitHub / Scholar

RESEARCH ENGINEERING CASEWORK

DUAL Group Research Website

2024-present | active

Designed, developed, deployed, and maintain the group's official web presence and research communication system. Evidence: Design -> deploy end-to-end ownership.

BRAVE - first-author evidence

Under review at TMLR

Designed controlled evidence feedback for sparse crowdsourcing and led the complete research pipeline.

- 14 benchmarks; lowest NLL on 5/14; best or tied-best ECE on 9/14.
- Accuracy within 0.03 of the strongest external baseline on 11/14.
- Completed downstream reward-model calibration transfer experiments.

TECHNICAL PRACTICE

Research methods	Algorithm design · Literature synthesis · Experimental design · Ablation studies · Calibration · Robustness evaluation
ML engineering	Python · PyTorch · Hugging Face · scikit-learn · Reproducible pipelines · Experiment tracking
Distributed systems	Federated learning · Ray · Dask · Spark · Airflow · FastAPI
GenAI	LLM and VLM orchestration · RAG · Agents · LoRA and PEFT · Evaluation · Safety guardrails
Web and research tooling	TypeScript · React · Astro · GitHub Actions · Data visualisation · Research communication

EDUCATION

Master of Philosophy in Computer Science

The University of Sydney | 2025 - present

Research in reliable and efficient AI systems, supervised within the DUAL Group.

- Research across federated learning, semantic communication, calibration, and resource-constrained AI.
- Build reproducible methods and experimental pipelines from literature review through analysis.

Bachelor of Advanced Computing, Data Science

The University of Sydney | 2021 - 2025

Graduated with Distinction; final-year work centred on machine learning and distributed systems.

- Undergraduate thesis in adaptive low-rank optimisation for federated learning, marked 85/100.
- Coursework included machine learning, deep learning, natural language processing, and distributed systems.