LIRUI GUO

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PROFILE

PhD candidate in Civil and Environmental Engineering at Monash University with a research focus on intelligent transport systems, business analytics, and human–AI interaction. Experienced in interdisciplinary research, high-quality teaching, and industry-relevant applications of AI and analytics. Strong publication record (Q1 journals and conferences), with expertise in machine learning, LLMs, and user experience in mobility systems.

EDUCATION

- **Ph.D.** in Civil and Environmental Engineering — Monash University, Clayton, VIC — 2022 – Present
- **B.Eng. (Honours)** in Civil Engineering — Monash University, Clayton, VIC — 2022
- **B.Com.** in Business Analytics — Monash University, Clayton, VIC — 2022

RESEARCH EXPERIENCE

Graduate Researcher (Ph.D. candidate), with Dr. Wynita Griggs and Dr. Michael Burke — 2022 – Present
Civil and Environmental Engineering, Monash University, Clayton, VIC
Thesis title: *From perception to interaction: Psychological drivers and adaptive conversational agents for shared autonomous vehicles (SAVs)*

- Proposed a framework to predict and visualize technology acceptance.
- Explored the role and triggering mechanisms of psychological ownership in autonomous mobilities.
- Evaluated different prompting strategies in designing Large Language Model (LLM)-powered SAV agents.
- Designing a control framework to regulate users' perceived user experience in human-SAV interactions.
- **Research outputs**: 1 published Q1 journal article (*Technological Forecasting & Social Change, IF=13.3*), 1 journal article under review, 1 accepted international conference paper (*IEEE ITSC 2025*), and 1 manuscript in preparation (*Automatica*).

Researcher Collaborator, with Associate Professor Nan Zheng and Dr. Linxin Hua — 2024 – Present
Civil and Environmental Engineering, Monash University, Clayton, VIC

- Explored the applications of LLM in Engineering Education and designed LLM-powered Learning Assistant
- Proposed a novel proactive evaluation framework for Retrieval-Augmented Generation (RAG)-based learning assistants
- **Research outputs**: 1 accepted Q1 journal article (*Computer-Aided Civil and Infrastructure Engineering, IF=9.1*) and 1 published conference paper (AAEE 2024).

Research Assistant, with Dr. Hoam Chung, Dr. Michael Burke, Dr. Elahe Abdi, Dr. Hung Quang Luu — 2022 –2023
Mechanical and Aerospace Engineering, Monash University, Clayton, VIC

- Performed comprehensive literature reviews in high-quality journals, systematically identifying, filtering, and synthesizing research on risk assessment methodologies for autonomous system design.

RESEARCH INTERESTS

- Human–AI Interaction & User Experience in Autonomous Systems
- Business Analytics for Emerging Mobility Solutions

- Predictive Modelling & Real-Time Analytics in Transport and Behavioural Decision-Making
- Applications of Large Language Models in Education and Business Environments
- Psychological Ownership and Technology Acceptance

TEACHING EXPERIENCE

Assistant Lecturer, Civil and Environmental Engineering, Monash University Jan 2025 – Present

- Assisted in coordinating administrative processes, led practical sessions, and managed student consultations for units with cohorts of up to 340 students.
- Developed assessments and teaching materials.
- Manage the online learning portal for course materials, discussions, and assessment markings.

Tutor, Sustainable Commerce, The University of Melbourne Feb 2024 – Present

- Assisted in delivering lectures. Assisted in delivering lectures and supporting a large first-year cohort of ~1,700 students per semester.
- Independently led and delivered tutorial sessions (20 students each) and interactive class activities to foster student engagement, personal growth, and a deeper understanding of sustainable commerce. Supported students in applying theoretical concepts to practical, real-world sustainability challenges.
- Managed consultations, graded assessments, and provided individualized support and guidance to students.

Teaching Associate, Civil and Environmental Engineering, Monash University Feb 2023 – Jan 2025

- Undergraduate core and elective units, including *Spatial Communication in Engineering, Transport and Traffic Engineering,* and *Road Engineering.*
- Facilitated engaging and inclusive classroom environments to promote active learning and critical thinking.
- Guided students in computing engineering drawings, understanding traffic concepts, and road designs.
- Managed the consultation and graded assessments.

AWARDS AND HONORS

- **Best Student Presentation (Travel Behaviour Modelling)** Australasian Transport Research Forum (ATRF) 2024

  Awarded **1st place** for the top Ph.D. student presentation in the Travel Behaviour Modelling stream.

- **GHD Highway Design Prize** Monash University 2022

  Awarded to the top **1%** of student teams for the best highway design project in CIV4287 Road Engineering.

- **Monash Graduate Scholarship** Monash University 2025

  Awarded to high-achieving doctoral candidates based on academic excellence and research achievements.

PUBLICATION

JOURNAL ARTICLE

- **Guo, L.**, Burke, M. G., & Griggs, W. M. (2025). A new framework to predict and visualize technology acceptance: A case study of shared autonomous vehicles. Technological Forecasting and Social Change, 212, 123960. https://doi.org/10.1016/j.techfore.2024.123960 **(Q1, IF 13.3, ABS 3)**
- Hua, L., **Guo, L.**, Zheng, N., Lu, Y., Xu, J., & Deng, J. (2025). Proactive framework for evaluating retrieval-augmented generation-based learning assistants in engineering education. Computer-Aided Civil and Infrastructure Engineering, 1–18. https://doi.org/10.1111/mice.70063 **(Q1, IF 9.1)**

PREPRINTS (UNDER REVIEW)

- **Guo, L.**, Burke, M. G., & Griggs, W. M. (2025). Exploring human-SAV interaction using large language models: The impact of psychological factors on user experience. arXiv.org. https://arxiv.org/abs/2504.16548

CONFERENCE PROCEEDING

- **Guo, L.**, Burke, M. G., & Griggs, W. M. (2025). Sentiment matters: An analysis of 200 human-sav interactions. Proceedings of the IEEE International Conference on Intelligent Transportation Systems (ITSC), Gold Coast, Australia, Nov. 18–21, 2025
- Hua, L., Zheng, N., Lu, Y., **Guo, L.**, & Xu, J. (2024). Use of large language models in engineering education: A case study on infrastructure design report introductions. Proceedings of AAEE 2024. 35th Australasian Association for Engineering Education Annual Conference, Christchurch, New Zealand. https://easychair.org/publications/preprint/XpQv/download

Conference Presentations

- IEEE International Conference on Intelligent Transportation Systems (ITSC), Gold Coast, Australia 2025
  "Sentiment matters: An analysis of 200 human-sav interactions."
- The 35th Australasian Association for Engineering Education (AAEE 2024) Annual Conference, Christchurch 2024
  "Use of Large Language Models in Engineering Education: A Case Study on Infrastructure Design Report Introductions"
- Australasian Transport Research Forum (ATRF), Ph.D. Student Research Symposium, Melbourne, Australia 2024
  "Exploring User Interaction with Shared Autonomous Vehicles: The Impact of Psychological Ownership and Anthropomorphism on User Experience"
- Monash 4th Engineering Postgraduate Conference, Melbourne, Australia 2024
  "Exploring User Interaction with Shared Autonomous Vehicles: The Impact of Psychological Ownership and Anthropomorphism on User Experience"
- ITS Australia Global Summit, Melbourne, Australia 2023
  "A Random Forest Approach to Predict and Visualize Public Acceptance of Shared Autonomous Vehicles"
- Monash 3rd Engineering Postgraduate Conference, Melbourne, Australia 2023
  "Sentiment Analysis of Shared Autonomous Vehicle Voice Assistants: The Role of Psychological Ownership and Anthropomorphism in Chatbot Responses"

ACADEMIC SERVICE

Monash University, Clayton, VIC

- Mental Health First Aider (MHFA) | Faculty of Engineering 2024 – Present
- First Aider | Monash Robotics 2024 – Present
- First-Year Branch Selection Event, Civil Engineering Specialization Representative 2024
- Monash University Open Day Civil Engineering Student Volunteer 2023 – 2024

Journal Reviewer

- The IEEE Robotics and Automation Letters, Acta Psychologica 2024 – Present

MENTORING PROGRAM EXPERIENCE

Access Monash Mentoring – Mentor
Monash University | 2023

- Provided one-on-one mentoring to Year 11–12 students navigating the Victorian Certificate of Education (VCE).
- Support students from under-represented communities to explore campus and university life and discover their dream careers.

MentorLinkPhD – Mentee (Mentored by Professor Jeremy Barr)
Monash University | 2025

- Engaged in structured mentoring with senior academics and fellow PhD students from diverse disciplinary backgrounds.
- Discussed strategies for academic success, professional development, and post-PhD career planning.

LANGUAGES AND SKILLS

Computer languages: R, Python
Languages: Fluent in English and Chinese (Mandarin)
Technical & Software: Survey & user study design, Qualtrics, educational technologies (Canvas, Moodle, Zoom), AutoCAD, SketchUp, ArcGIS
Licenses & certifications: Working With Children Check (Employee), Standard Mental Health First Aider, Provide First Aid, White Card

REFEREES

Dr. Wynita Griggs (Ph.D. Supervisor)
Lecturer, Deputy Director of Education (3rd & 4th Year) ECSE
Department of Civil and Environmental Engineering
Department of Electrical and Computer Systems Engineering
Monash University
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Dr. Michael Burke (Ph.D. Supervisor)
Senior Lecturer, Deputy Graduate School Coordinator & Graduate Experience/Culture ECSE
Department of Electrical and Computer Systems Engineering
Monash University
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Associate Professor Nan Zheng (Project Supervisor, Course Coordinator)
Director of MARRS (Monash Research Center for Automated Resilient Road Systems)
Deputy Director (International)
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Associate Professor Dong Ngoduy (Course Coordinator)
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Professor Hai Vu (Chair of PhD Milestone Panel and Undergraduate Research Supervisor)
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