

LIMEI (ELIZA) LIU

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💡 RESEARCH PROFILE

Final-year PhD Candidate(completed all 3 milestones) at Monash University specializing in **Causal Inference** and **Multimodal Spatio-temporal AI**. My research focuses on developing robust, generalizable Machine Learning models for complex urban systems and biological data. I have published multiple first-author papers in top-tier journals (e.g., *IEEE T-ITS*) and served as a reviewer for leading transportation journals.

🎓 EDUCATION

Monash University, Melbourne, Australia 2022 – May 2026 (Expected)

PhD in Information Technology, Faculty of IT

- **Thesis:** Causal-driven Learning for Generalizing Spatiotemporal Prediction
- **Focus:** OOD Generalization, Causal Discovery, Graph Neural Networks.

China Agricultural University, Beijing, China 2020 – 2022

Master in Electronic Information, College of Information and Electrical Engineering

- **GPA:** 86.0/100. Focus on Computer Vision and Biological Image Processing.

Beijing University of Chemical Technology, Beijing, China 2014 – 2018

B.S. in Life Science and Technology (GPA: 3.53/4.00)

🧑‍🔬 RESEARCH EXPERIENCE

PhD Candidate | Monash University 2022 – Present

Focus: Urban Computing and Causal AI

- **OOD Generalization in Traffic Networks:** Proposed a Causality-based Spatial-Temporal Graph (STG) framework to address data distribution shifts across different cities. Leveraged causal intervention to eliminate spurious correlations.
- **Continual Learning on Evolving Graphs:** Developed a memory-efficient framework for dynamic traffic networks, utilizing clustering contrastive learning to mitigate catastrophic forgetting during model updates.
- **Multi-modal Reasoning with LLMs:** (Current Work) Exploring the integration of Large Language Models as reasoning engines to explain traffic anomalies through causal discovery in heterogeneous data streams.

Graduate Researcher | China Agricultural University 2020 – 2022

Focus: Computer Vision in Agriculture

- **Camouflaged Object Segmentation:** Designed a deep learning architecture (*EG-PraNet*) to segment biological pests in complex natural background.

TEACHING EXPERIENCE

Monash University | Teaching Assistant (Tutor, postgraduate course) 2023 – Present

- **FIT5215: Deep Learning** - Facilitated workshops on PyTorch, CNNs, and RNNs.

- **FIT5225: Cloud Computing and Security** - Guided students on AWS/OpenStack/K8s/Docker deployments.
- **FIT5196: Data Wrangling** - Taught Python-based data cleaning and pre-processing techniques.
- **FIT5221: Intelligent Image and Video Analysis** - Assisted in teaching advanced CV techniques.

SELECTED PUBLICATIONS

Journal Articles

- **L. Liu**, P. Duan, et al. “Spatiotemporal Generalization Graph Neural Network-Based Prediction Models...” *IEEE Transactions on Intelligent Transportation Systems (T-ITS)*, 2025. **(Q1, IF: 8.4)** – *Selected for Oral Presentation at the AJCAI 2025 (Encore Track)*.
- **L. Liu**, M. Liu, et al. “Camouflaged Locust segmentation based on PraNet.” *Computers and Electronics in Agriculture*, 2022. **(Q1, IF: 8.9)**
- **L. Liu**, X. Chen, et al. “A review of Application of Deep Learning on Drug Activity Prediction.” *Progress in Biochemistry and Biophysics*, 2021.
- (Under Review) **L. Liu**, et al. “ E^3 -CGCN: An Effective Framework for Continual Traffic Forecasting on Expanding Graphs” *IEEE T-ITS* **(Q1, IF: 8.4)**.

Conference Papers

- **L. Liu**, Z. Chen, et al. “Causality-based OOD Generalization in zero-shot cross-region traffic flow prediction.” *Transportation Research Board (TRB) Annual Meeting*, 2025.
- (Under Review) **L. Liu**, et al. “CadST: Causality-driven Alignment and Disentanglement in Multi-modal Spatio-Temporal Traffic Prediction.” *PAKDD*, 2026.

★ AWARDS AND SCHOLARSHIPS

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| • Monash International Scholarship | 2022–2026 |
| • Graduate Academic Scholarship | 2021 |
| • National Encouragement Scholarship | 2016 |

ACADEMIC SERVICE

Journal Reviewer:

- *Transportation Research Part C: Emerging Technologies*

REFERENCES

Dr./Prof. Peibo Duan

PhD Supervisor

Monash University/Northeast University

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Dr. Jackie Rong

PhD Co-supervisor

Monash University

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Prof. Shuli Mei

Master Supervisor

China Agricultural University

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