Yilin Lyu

School of Computer and Information Systems, University of Melbourne

yilin.bio | yillyu1@student.unimelb.edu.au | +61 0478614575

EDUCATION

University of Melbourne   07/2023-Present

Master' Degree in Software Engineering

GPA: 77/100 (Expected to graduate with First-Class Honour)

Concentration: Process mining, AI in Education

Core Modules: Fundamentals and Applications of Molecular Simulations (100), Modelling Complex Software Systems (87), High Integrity Systems Engineering (87)

Zhengzhou University   09/2017-07/2021

Bachelor' Degree in Computer Science and Technology

GPA: 81.71/100

Academic Rank: 15 / 176 (Top 10%)

Core Modules: Linear Algebra (93), Introduction to Artificial Intelligence (95), Complex Function & Integral Transform (90), Data Communication (90), Introduction to Computer Systems (90)

EXPERIENCES

Research

Discovering Self-Regulated Learning Patterns in Chatbot-Powered Education Environment   05/2024 – Present

- Constructed the Gen-SRL framework with four macro phases and 16 micro actions, each mapped to Bloom's taxonomy, enabling fine-grained tagging of student–ChatGPT interactions.
- Annotated 894 prompts from the RECIPE4U dataset and applied process mining to visualize macro- and micro-level SRL behaviour patterns.
- Discovered imblanced distribution and nonsequential patterns in authentic Chatbot-based learning environment.

Accelerating the deep integration of GenAI into disciplinary post-secondary education   10/2024-Present

- Building a logic-based adaptive education model, constructing an interdisciplinary logical knowledge graph, and integrating state-of-the-art GenAI Chatbots, automated grading systems, Intelligent Tutoring Systems, and adaptive learning systems. In our system, GenAI will act as a teacher, tutor, and peer, dynamically adapting to different roles within a feedback loop to create personalized learning pathways for students.
- Applied data-driven process mining methods effectively monitor student engagement, help education administrators identify at-risk students at an early stage, and provide personalized recommendations based on collaborative filtering.

Approximate Conformance Checking for Business Process Modelling   06/2024-10/2024

- Proposed an approximate conformance method that applies agglomerative hierarchical clustering techniques to preprocess event logs for constructing behavioral subsets, and conducted simulation experiments on real-world event logs, achieving higher approximate accuracy compared to benchmark methods such as k-means and k-medoids.
- Proposed a Mamba-based method MACC, integrating Temporal Convolutional Network(TCN) for fine-grained feature extraction to capture correlations between traces, and developed a split-bucket strategy to dynamically adjust trace lengths, reducing coding sparsity in fixed-length encoding.

Improving Quantum Kernel Models Using Next-Generation Circuit Architecture with MPS Simulation 11/2024-12/2024

- Introduced a novel 2D-grid quantum circuit structure to simulate the quantum kernel models using Matrix Product State (MPS) simulations. Additionally, it provided a guaranteed and aggressive SVD truncation mechanism, trading off the computation complexity and performance.

Enhancing Android Init Routine Security Analysis with Dynamic and Hybrid Techniques   11/2024-12/2024

- Building on DEFInit (USENIX'21), DynamicSecInit integrates dynamic simulation, machine learning, and enhanced dependency modeling to address the limitations of static analysis in Android Init routine security. By capturing runtime behaviors and expanding kernel-space analysis with eBPF.

Discussion of Migration of Common Neural Network Regularization Methods on SNNs   10/2023-01/2024

- Conducted a pioneering study to evaluate the effectiveness of traditional ANN dropout techniques—such as standard dropout, dropout2d, feature dropout, and alpha dropout—on the unique architecture of Spiking Neural Networks (SNNs), utilizing benchmark datasets MNIST and CIFAR-10.
- Identified key limitations of applying traditional dropout methods to SNNs and highlighted the need for developing SNN-specific regularization strategies.

Research on Cell Virtual Staining Method Based on Multiple GAN Approaches   12/2020-06/2021
- Engaged in pioneering research aimed at developing innovative virtual staining techniques for cells utilizing CycleGAN, BayesGAN, AttentionGAN and U-GAT-IT.
- Developed an improved U-GAT-IT framework for better virtual staining result.

Industry

Information Center, Yellow River Conservancy Commission of the Ministry of Water Resources   09/2021-07/2023

Cybersecurity Fellow (Full-time)
- Responsible for the daily security management and maintenance of over 140 critical information systems, ensuring stable operation and conducting monthly security vulnerability scans and patches to eliminate potential threats.
- Optimized a network defense system covering the entire basin, including firewalls, intrusion detection systems, and antivirus software.
- Performed daily backups of critical data and established a comprehensive data recovery mechanism to restore key business data in emergencies.

Shanghai Mengchuang Shuangyang Data Technology Co., Ltd   12/2023-01/2024

Configuration Engineer (Intern)
- Managed the daily operations and maintenance of the office automation system in Shanghai's Jing'an District, including system monitoring, performance optimization, troubleshooting.
- Participated in the development of new features and optimization of the office automation system. Conducted requirement analysis, system design, coding, testing, and deployment based on user needs.

Shenzhen Zhixueyun Technology Co., Ltd   07/2020-08/2020

Operations and Maintenance Engineer (Intern)
- Responsible for the installation and deployment of various company products, including the configuration of new product launches, version updates of existing products, and feature expansions.
- Assisted in daily monitoring and troubleshooting, utilizing various monitoring tools to track system performance metrics and provided technical support.

Teaching

Department of Computer Science, Texas Tech University   12/2024-Present

Teaching Assistant

School of Computer and Information Systems, University of Melbourne   04/2024-07/2024

Peer Tutor in COMP90005(Advancing Study in Computing)

PUBLICATIONS

Journal Articles

[1] **Y. Lyu,** A. A. Cervantes, and A. Mendoza, "Discovering Self-Regulated Learning Patterns in Chatbot-Powered Education Environment," Education and Information Technologies (SSCI Q2, IF = 4.8)*, 2025.*   **Submitted**

[2] **Y. Lyu**, "Enhancing Approximate Conformance Checking Accuracy with Hierarchical Clustering Model Behaviour Sampling," International Journal of Advanced Computer Science and Applications (IJACSA)*, Scopus-indexed, 2025.* **Accepted**

[3] **Y. Lyu**, "Analysis of computer remote monitoring and management system for wireless communication technology," *Digital Technology (Chinese Core Journal), vol. 5, no. 2, pp. 40-41, Sep. 2019.*   **Published**

[4] **Y. Lyu**, "Application of computer science and technology in the background of the information age," *Science and Technology (Chinese Core Journal), vol. 11, no. 4, pp. 126-127, Jul. 2019*   **Published**

Conference Articles

[5] **Y. Lyu,** A. A. Cervantes, "Unveiling Self-Regulated Learning Patterns in Chatbot-Based Learning: A Process Mining Study," *36th Australasian Association for Engineering Education Annual Conference,2025.*   **Under Submission**

[6] Y. Hu, **Y. Lyu**, "An Optimized Multimodal Feedback System for VR Skill Training Based on ST-GCN and WaveNet," *The 10th International Conference on Electronic Technology and Information Science (ICETIS 2025).*   **Accepted**

[7] **Y. Lyu**, B. Yin, "A Discussion of Migration of Common Neural Network Regularization Methods on SNNs," *Proceedings of the Ninth International Symposium on Advances in Electrical, Electronics, and Computer Engineering (ISAEECE 2024), Vol.13291, Article 132915G, Changchun, China, 2024*. https://doi.org/10.1117/12.3034448   **Published**

[8] **Y. Lyu**, "A Mamba-based approximate conformance checking method," *Proceedings Volume 13416, Fourth International Conference on Advanced Algorithms and Neural Networks (AANN 2024); 134163N (2024)*. https://doi.org/10.1117/12.3049698

Published

PATENTS

[1] **Y. Lyu**, "U-GAT-IT-based Cell Virtual Staining System V1.0", *Software copyright, authorized by China Copyright Protection Center in 2021.*

[2] H. Xu, **Y. Lyu**, et.al., "Internet Procurement Management Information Platform", *Software copyright, authorized by China Copyright Protection Center in 2020.*

[3] **Y. Lyu**, Q. Zhou, et al., "Public Tender Procurement Information Platform V1.0", *Software copyright, authorized by China Copyright Protection Center in 2020.*

AWARDS & SCHOLARSHIPS

- ➢ Melbourne Global Scholars Award *(Awarded by Melbourne University)*   2024
- ➢ First-Class Scholarship for Outstanding Students *(Awarded by Zhengzhou University)*   2021
- ➢ All-Rounder Outstanding Award *(Awarded by Zhengzhou University)*   2020

ADDITIOANL INFORMATION

- ➢ **Languages:** Mandarin, English (IELTS: 7.0).
- ➢ **Programming language**: Proficient in Python, Skilled in Java and C++.