

Dr. Leong Hou U
(Associate Professor, SKL of IoTSC, Dept. CIS, UM)

General Information

CONTACT INFORMATION Centre for Data Science
State Key Lab of Internet of Things for Smart City
Department of Computer and Information Science
University of Macau
E11-4021
University of Macau
Macau

Voice: (853) 88224493
Fax: (853) 88222426
E-mail: ryanlhu@um.edu.mo

RESEARCH INTERESTS Spatial and Spatio-Temporal Databases, Graph Learning, Reinforcement Learning, Vector Databases

EDUCATION Ph.D. Computer Science, **University of Hong Kong**
MSc. E-Commerce Technology, **University of Macau**
BSc. Computer Science and Information Engineering, **National Chi Nan University**

WORKING EXPERIENCE **University of Macau**, Macau

Head of Centre for Data Science Aug 2023 to present
Interim Head of Centre for Data Science Aug 2019 to Aug 2023
Associate Professor September 2016 to present
Assistant Professor August 2010 to August 2016
University of Hong Kong, Hong Kong
Research Assistant November 2009 to July 2010
Max-Planck Institute for Informatics, Germany
Internship February 2009 to May 2009
Singapore Management University, Singapore
Visiting Research Fellow September 2008 to December 2008
Visiting Research Fellow September 2007 to December 2007

RESEARCH EXPERIENCES Dr. U's research interests encompass a wide range of areas, including spatial, spatio-temporal, graph, and high-dimensional data analysis. Within these domains, his research focuses on query optimization, graph theory and learning, as well as reinforcement learning applied to diverse applications in Big Data Engineering, Urban Data Mining, and Intelligent Transportation. Dr. U is a prolific researcher who consistently publishes in highly regarded conferences and journals, including SIGMOD, PVLDB, ICDE, NeurIPS, AAAI, SIGIR, IJCAI, TIST, TKDE, VLDB J, and many others.

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Research & Teaching

ACADEMIC SERVICES

International Conference Steering/Organization Committee

Program co-chair of IEEE BigData 2025

General co-chair of ISET and ICBL 2024

ICPC Macau Regional Director 2021-2025

Program co-chair of APWeb-WAIM 2021, ICTE 2020, GeoRich 2018

Tutorial co-chair of APWeb-WAIM 2020

Local co-chair of HDIS 2023, HDIS 2021, ACM ICN 2019, WAIM 2014, WIC 2012

PhD consortium co-chair of DASFAA 2023

International Conference Technical Program/Review Committee and Session Chair

SIGMOD, PVLDB, ICDE, KDD, NeurIPS, AAI, ER, SIGMOD/PODS PhD Symposium, CIKM (KM Track), DASFAA, PAKDD, WAIM, APWeb, MobiGIS, WebDB

International Journal Reviews

IEEE Transactions on Knowledge and Data Engineering (TKDE), Knowledge and Information Systems (KAIS), Information Systems (IS), Information Sciences (INS), GeoInformatica, IEEE Transactions on Parallel and Distributed Systems (TPDS)

PUBLIC SERVICES

Macau Town Planning Board 2020-2026

Macau Academy of Public Security Forces Academic Committee 2020-2026

AWARDS

University of Macau

Faculty of Science and Technology Teaching Award 2022/2023

Best CIS Final Year Project 2022/2023, 2017/2018

External

Huawei ICT Global Competition, Runner-up @ Cloud Track, Coach, 2024

RECENT 3 YEARS
SELECTED
PUBLICATIONS
*

- [1] Yiming Wang, Kaiyan Zhao, Borong Zhang, Yan Li, and Leong Hou U. Latent state-predictive exploration for deep reinforcement learning. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2026.
- [2] Yiming Wang, Kaiyan Zhao, Xu Li, Yan Li, Jiayu Chen, Steven Morad, and Leong Hou U. Explore to learn: Latent exploration through disentangled synergy patterns for reinforcement learning in overactuated control. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2026. Oral.
- [3] Yiming Wang, Kaiyan Zhao, Ming Yang, Yan Li, Furui Liu, Jiayu Chen, and Leong Hou U. Dsap: Enhancing generalization in goal-conditioned reinforcement learning. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2026.
- [4] Rongqin Chen, Fan Mo, Pak Lon Ip, Shenghui Zhang, Dan Wu, Ye Li, and Leong Hou U. Connectivity-guided sparsification of 2-fwl gnns: Preserving full expressivity with improved efficiency. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2026. Oral.
- [5] Jingtian Ma, Jingyuan Wang, and Leong Hou U. Hierarchical frequency-decomposition graph neural networks for road network representation learning. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2026. Oral.
- [6] Jiayang Wu, Jiale Zhou, Xingyi Zhang, Xun Lin, Tianxu Lv, Leong Hou U, Rubo Wang, and Yefeng Zheng. Multimodal mixture-of-experts with retrieval augmentation for protein active site identification. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2026. Oral.
- [7] Rongqin Chen, Yan Li, Dan Wu, MO FAN, Shenghui Zhang, Pak Lon Ip, Hoi Cheong Iam, Ye Li, and Leong Hou U. Enhanced subgraph learning in 2-fwl gnns via local connectivity, spectral, and distance encodings. In *KDD 2025*.
- [8] Yiming Wang, Kaiyan Zhao, Yan Li, and Leong Hou U. Bile: An effective behavior-based latent exploration scheme for deep reinforcement learning. In *IJCAI 2025*.
- [9] Siyuan Wu, Leong Hou U, and Panagiotis Karras. Balancing bias in two-sided markets for fair stable matchings. In *The Thirteenth International Conference on Learning Representations, ICLR 2025, Singapore, April 24-28, 2025*. OpenReview.net, 2025.
- [10] Zijie Zhou, Zhaoqi Lu, Xuekai Wei, Rongqin Chen, Shenghui Zhang, Pak Lon Ip, and Leong Hou U. Tokenphormer: Structure-aware multi-token graph transformer for node classification. In Toby Walsh, Julie Shah, and Zico Kolter, editors, *AAAI-25, Sponsored by the Association for the Advancement of Artificial Intelligence, February 25 - March 4, 2025, Philadelphia, PA, USA*, pages 13428–13436. AAAI Press, 2025.
- [11] Tsz Nam Chan, Rui Zang, Bojian Zhu, Leong Hou U, Dingming Wu, and Jianliang Xu. LION: fast and high-resolution network kernel density visualization. *Proc. VLDB Endow.*, 17(6):1255–1268, 2024.
- [12] Shunran Zhang, Xiubo Zhang, Tsz Nam Chan, Shenghui Zhang, and Leong Hou U. A computation-aware shape loss function for point cloud completion. In Michael J. Wooldridge, Jennifer G. Dy, and Sriraam Natarajan, editors, *Thirty-Eighth AAAI Conference on Artificial Intelligence, AAAI 2024, February 20-27, 2024, Vancouver, Canada*, pages 7287–7295. AAAI Press, 2024.
- [13] Jian Zeng, Leong Hou U, Xiao Yan, Yan Li, Mingji Han, and Bo Tang. Extracting top- frequent and diversified patterns in knowledge graphs. *IEEE Trans. Knowl. Data Eng.*, 36(2):608–626, 2024.
- [14] Yiming Wang, Ming Yang, Renzhi Dong, Binbin Sun, Furui Liu, and Leong Hou U. Efficient potential-based exploration in reinforcement learning using inverse dynamic bisimulation metric. In Alice Oh, Tristan Naumann, Amir Globerson, Kate Saenko, Moritz Hardt, and Sergey Levine, editors, *Advances in Neural Information Processing Systems 36: Annual Conference on Neural Information Processing Systems 2023, NeurIPS 2023, New Orleans, LA, USA, December 10 - 16, 2023*, 2023.
- [15] Siyuan Wu, Leong Hou U, and Panagiotis Karras. k-best egalitarian stable marriages for task assignment. *Proc. VLDB Endow.*, 16(11):3240–3252, 2023.
- [16] Tsz Nam Chan, Zhe Li, Leong Hou U, and Reynold Cheng. PLAME: piecewise-linear approximate measure for additive kernel SVM. *IEEE Trans. Knowl. Data Eng.*, 35(10):9985–9997, 2023.
- [17] Hanlin Li, Xiaowei Wu, Leong Hou U, and Kun Pang Kou. Near-optimal scheduling for crowdsourced transit system with skip-stop tactic. *IEEE Trans. Knowl. Data Eng.*, 35(11):11668–11680, 2023.
- [18] Tsz Nam Chan, Leong Hou U, Byron Choi, Jianliang Xu, and Reynold Cheng. Large-scale geospatial analytics: Problems, challenges, and opportunities. In Sudipto Das, Ippokratis Pandis, K. Selçuk Candan, and Sihem Amer-Yahia, editors, *Companion of the 2023 International Conference on Management of Data, SIGMOD/PODS 2023, Seattle, WA, USA, June 18-23, 2023*, pages 21–29. ACM, 2023.