HAOHUI LU

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EDUCATION

The University of Sydney, Australia *2020 – Present*
Doctor of Philosophy
Thesis title: Chronic Disease Prediction using Graph Machine Learning

The University of Sydney, Australia *2019 – 2020*
Graduate Certificate in Data Science

The University of Sydney, Australia *2012 – 2012*
Master of Project Management

The University of Sydney, Australia *2008 – 2011*
Bechelor of Commerce

RESEARCH EXPERIENCE

Research Assistant October 2022 – Present
The University of Sydney *Sydney, Australia*

· Collaboration on health and International Investment Agreements: This multidisciplinary collaboration brings together experts in international policy, law, data science, public health and political science to generate new knowledge of how to improve health safeguards in International Investment Agreements (IIAs) in Australia and globally, to protect and promote public health.

Researcher July 2020 – Present
The University of Sydney *Sydney, Australia*

· Chronic disease prediction using graph machine learning: Using Australian insurance data and graph-based machine learning, this research predicts chronic diseases and comorbidities, improving accuracy and identifying high-risk patients. This enables early interventions and reduced healthcare costs.

ACADEMIC EXPERIENCE

Casual Academic July 2020 – Present
The University of Sydney *Sydney, Australia*

· Tutoring and marking

- PMGT6867 Quantitative Methods: Project Management
- QBUS2310 Management Science
- QBUS6820 Prescriptive Analytics: From Data To Decision
- QBUS6840 Predictive Analytics

· Course design: PMGT5866 Quantitative Methods in Project Management

PROFESSIONAL EXPERIENCE

Peer Support Advisor/Senior Peer Supper Advisor June 2021 – Present
The University of Sydney *Sydney, Australia*

· Assist students with a range of enquiries, ranging from what support services the university offers to what social activities a student can join

Personal Banker June 2016 – April 2020
Australian and New Zealand Banking Group (ANZ Bank) *Sydney, Australia*

· Provide a full range of professional sales advice to help customers achieve their financial needs and goals. Explain lending products' fees, interest, and current campaigns to the customer, ensuring that the products meet customers' needs.
· Tier 2 Personal Advice, Personal lending, and small business accreditation.

Business Analyst August 2012 – July 2016
Dynamic Payment Pty Ltd *Sydney, Australia*

· Identifying fraudulent activity and taking the necessary action for escalation and analysing unstructured and structured data to build behaviour models and predictive models.
· Contributes essential administrative support to coordinate a technical team. Revised business performance metrics in collaboration with IT, which increased transparency on sales key factors.
· The duties of a project administrator include all aspects of facilitating a project: scheduling meeting times and locations, taking meeting minutes, enhanced business data visualisation for the weekly presentations and arranging training for staff.

PEER-REVIEWED ACADEMIC PUBLICATIONS

- **Lu H.**, Uddin S. (2023). Disease Prediction Using Graph Machine Learning Based on Electronic Health Data: A Review of Approaches and Trends. *Healthcare*. 11(7), 1031.
- **Lu H.**, Uddin, S., Hajati, F., Moni, M. A., & Khushi, M. (2022). A patient network-based machine learning model for disease prediction: The case of type 2 diabetes mellitus. *Applied Intelligence*, 52(3), 2411-2422.
- **Lu H.**, Uddin, S. (2021). A weighted patient network-based framework for predicting chronic diseases using graph neural networks. *Scientific reports*, 11(1), 22607.
- **Lu H.**, Uddin, S. (2022). Embedding-based link predictions to explore latent comorbidity of chronic diseases. *Health Information Science and Systems*, 11(1), 2.
- **Lu H.**, Uddin, S. (2022). A disease network-based recommender system framework for predictive risk modelling of chronic diseases and their comorbidities. *Applied Intelligence*, 52(9), 10330-10340.
- Uddin, S., Haque, I., **Lu, H.**, Moni, M. A., & Gide, E. (2022). Comparative performance analysis of K-nearest neighbour (KNN) algorithm and its different variants for disease prediction. *Scientific Reports*, 12(1), 1-11.
- Uddin, S., Ong, S., & **Lu, H.** (2022). Machine learning in project analytics: a data-driven framework and case study. *Scientific Reports*, 12(1), 15252.
- Uddin, S., Khan, A., **Lu, H.**, Zhou, F., & Karim, S. (2022). Suburban Road Networks to Explore COVID-19 Vulnerability and Severity. *International Journal of Environmental Research and Public Health*, 19(4), 2039.
- Uddin, S., **Lu, H.**, Khan, A., Karim, S., & Zhou, F. (2022). Comparing the Impact of Road Networks on COVID-19 Severity between Delta and Omicron Variants: A Study Based on Greater

Sydney (Australia) Suburbs. *International Journal of Environmental Research and Public Health*, 19(11), 6551.

- Uddin, S., Wang, S., **Lu, H.**, Khan, A., Hajati, F., & Khushi, M. (2022). Comorbidity and multimorbidity prediction of major chronic diseases using machine learning and network analytics. *Expert Systems with Applications*, 205, 117761.
- Wang, S., **Lu, H.**, Khan, A., Hajati, F., Khushi, M., & Uddin, S. (2022). A machine learning software tool for multiclass classification. *Software Impacts*, 13, 100383.
- Uddin, S., Wang, S., Khan, A., & **Lu, H.** (2023). Comorbidity progression patterns of major chronic diseases: The impact of age, gender and time-window. *Chronic Illness*, 19(2), 304-313.
- **Lu, H.**, Uddin, S. (2022). Explainable Stacking-Based Model for Predicting Hospital Readmission for Diabetic Patients. *Information*, 13(9), 436.
- Uddin, S., Ong, S., **Lu, H.**, & Matous, P. (2023). Integrating machine learning and network analytics to model project cost, time and quality performance. *Production Planning & Control*, 1-15.

CONFERENCES AND PAPER PRESENTATIONS

- **Lu, H.**, Uddin, S., Hajati, F., Khushi, M., & Moni, M. A. (2022). Predictive risk modelling in mental health issues using machine learning on graphs. In *Australasian Computer Science Week 2022* (pp. 168-175).
- **Lu, H.**, Uddin, S.(2022). Predicting readmission risk for diabetic patients: Make artificial intelligence work in real life with interpretable machine learning. In *Digital Health Week 2022*
- **Lu, H.**, Uddin, S.(2022). A network approach to explore COVID-19 vulnerability and severity In *INSNA Sunbelt 2022*.

GRANTS, AWARDS, AND FELLOWSHIPS

- Postgraduate Research Support Scheme 2022

KEY SKILLS

- **General-purpose programming languages**: Python
- **Statistical/Mathematical packages**:R, Matlab, SAS, Stata, SPSS and Excel VBA.
- **Relational databases**: MySQL, Postgres, SQL Server.
- **BI/data visualisation tools**: Power BI, Tableau.
- **Language**: English (professional proficiency), Cantonese and Mandarin (native)

Updated on 29 April 2023