HAOHUI LU

lukhofai@gmail.com

Research on generative AI, knowledge graphs, and health informatics, with a focus on leveraging advanced machine learning methods for enhancing healthcare analytics and predictive modeling.

EDUCATION

The University of Sydney, Australia *2020 – 2023*
Doctor of Philosophy
Thesis title: Chronic Disease Prediction using Graph Machine Learning

The University of Sydney, Australia *2020 – 2020*
Master of Data Science
Transferred to Doctor of Philosophy

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

The University of Sydney, Australia *2012 – 2012*
Master of Project Management
Specialisation: Project Economics and Scheduling Management

The University of Sydney, Australia *2008 – 2011*
Bechelor of Commerce
Major: Operations Management and Decision Sciences (Business Analytics)

RESEARCH EXPERIENCE

Researcher July 2024 – Present
The University of Sydney *Sydney, Australia*

- Managed the end-to-end development and training of AI models, driving operational efficiency and quality through comprehensive analysis of project data and business scenarios.
- Led a faculty-funded project on child undernutrition, optimizing processes and enhancing collaboration with cross-functional international teams, including policymakers in Indonesia.
- Integrated Large Language Models (LLMs) into web-based GUIs, improving data interaction and visualization.

Research Assistant October 2022 – June 2024
The University of Sydney *Sydney, Australia*

- Supported multidisciplinary experts in National Health and Medical Research Council (NHMRC) Ideas Grant project.
- Spearheaded data preprocessing and analysis for Bilateral Investment Treaties (BITs) using Natural Language Processing (NLP), enhancing treaty analysis with a custom-built LLM featuring interactive querying capabilities.
- Developed and maintained dashboards, utilizing advanced data visualization tools to ensure clear communication of complex data insights.

Doctoral Researcher July 2020 – December 2023
The University of Sydney *Sydney, Australia*

- Conducted research on chronic disease prediction using graph machine learning, achieving improved accuracy in identifying high-risk patients.
- Managed large datasets using SQL and Python, employing machine learning techniques to derive actionable insights.
- Created interactive dashboards with Tableau, PowerBI, and Python, facilitating data-driven decision-making.

ACADEMIC EXPERIENCE

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

- Course design and lecturing
  - 2023 Semester 2 PMGT5866 Qantitative Methods in Project Management
- Tutoring and marking
  - 2024 Semester 2: PMGT6310 Business Operations Analysis, PMGT3340 Operations Management, QBUS2310 Management Science, PMGT3623 Scheduling
  - 2024 Semester 1: PMGT5873 Project Economics and Procurement, QBUS6820 Prescriptive Analytics: From Data to Decision, QBUS6840 Predictive Analytics
  - 2023 Semester 2: QBUS2310 Management Science, QBUS2810 Statistical Modelling for Business, QBUS6840 Predictive Analytics
  - 2023 Semester 1: QBUS2310 Management Science, QBUS6820 Prescriptive Analytics: From Data to Decision, QBUS6840 Predictive Analytics
  - 2022 Semester 2: QBUS6820 Business Risk Management, QBUS6840 Predictive Analytics
  - 2020 Semester 2 – 2022 Semester 2: PMGT6867 Quantitative Methods in Project Management

PROFESSIONAL EXPERIENCE

Peer Support Advisor/Senior Peer Support Advisor June 2021 – June 2023
The University of Sydney *Sydney, Australia*

- Helped students by addressing various inquiries, from understanding the support services offered by the university to exploring the social activities they could participate in.
- Gathered data analysis from various channels, derived insights from the information, and recommended activities for the student life team.

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

- Provided a full range of professional sales advice to help customers achieve their financial needs and goals. Explained lending products' fees, interest rates, and current campaigns to customers, ensuring that the products met their needs.
- Held Tier 2 Personal Advice, Personal lending, and small business accreditation.

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

· Identified fraudulent activity and took necessary actions for escalation. Analysed both unstructured and structured data to construct behavioural and predictive models, which doubled the number of business customers (merchants) during peak travelling periods.
· Performed data analytics, analysed sales, developed statistical models for sales forecasting and engaged in data visualisation.
· Developed and maintained interactive dashboards for daily transaction volume, amount, and new customer analysis, leading to a significant reduction in related data requests.

SELECTED PUBLICATIONS

- **Lu, H.**, Naseem, U., (2024). Can Large Language Models Enhance Predictions of Disease Progression? Investigating Through Disease Network Link Prediction. In *The 2024 Conference on Empirical Methods in Natural Language Processing* **(CORE A*)** (Accepted).
- **Lu H.**, Uddin S. (2024). A parameterised model for link prediction using node centrality and similarity measure based on graph embedding. *Neurocomputing*. 127820.
- **Lu H.**, Uddin S. (2024). Unsupervised machine learning for disease prediction: a comparative performance analysis using multiple datasets. *Health and Technology*, 1-14.
- **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. (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.
- **Lu, H.**, Uddin, S. (2022). Explainable stacking-based model for predicting hospital readmission for diabetic patients. *Information*, 13(9), 436.
- **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. (2021). A weighted patient network-based framework for predicting chronic diseases using graph neural networks. *Scientific Reports*, 11(1), 22607.

HONOURS AND AWARDS

- Startups Founders Hub Idea Grant 2024 - Microsoft
- Feedback for Teaching Student Survey Award 2024 - The University of Sydney
- Postgraduate Research Support Scheme 2022 - The University of Sydney
- Paulette Isabel Jones Career Award 2023 - The University of Sydney

PROFESSIONAL SERVICE

- Session Chair: Sunbelt 2022. Session 93-1. Migration and social networks in the COVID-19 context.

- Paper Reviewer: Advanced Engineering Informatics, BMC Health Services Research, BMC Medical Informatics and Decision Marking, Complexity, Computers in Biology and Medicine, IScience , Machine Learning with Applications, Scientific Reports, Journal of Computational Social Science, Journal of Medical Systems, Health Data Science

CERTIFICATES

- SAS Certified Specialist: Base Programming Using SAS 9.4
- SAS Certified Advanced Programmer for SAS 9