

Jiahe (Grace) Liu

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RESEARCH INTEREST

Committed Data Science student pursuing Master's degree from The University of Melbourne, specialising in NLP, machine learning, and public health informatics, seeking a PhD position focused on "AI for health". With a strong background in data analytics and a drive to enhance healthcare and environmental sustainability for the wider community, I aim to contribute meaningful advancements in public health and clinical science. I am dedicated to conducting rigorous research and deeply committed to lifelong learning and professional advancement.

SKILLS

Programming Languages: Python, R, SQL, C, C#, JavaScript, HTML/CSS

Frameworks/Libraries: React, Node.js, Flask, TensorFlow, PyTorch, Spark, PRISMA (Meta-analysis)

Tools & Platforms: GitHub, Jupyter Notebook, Hugging Face, Google Colab, MySQL, MongoDB, CouchDB, VSCode, Unity, Docker, Ansible, MATLAB, STATA

Domains: Natural Language Processing, Machine Learning, Data Engineering, Deep Learning, Web Development, Cloud Computing, Big Data Analysis, Public Health Informatics, Women with Epilepsy, Medical Image Analysis

EDUCATION

Master of Data Science <i>The University of Melbourne</i>	2023.03 - 2024.12 WAM: 80.26 / 100 (H1)
Bachelor of Science in Data Science <i>The University of Melbourne</i>	2020.08 - 2022.12 Melbourne, Australia
Post-master's Certificate: AI Applications for Health Data <i>Washington University in St. Louis</i>	2023.08 - 2023.12 Online
Summer Workshops: Fundamentals of Data Science <i>Stanford University</i>	2022.08 - 2022.08 Online
Exchange Study: Business Psychology <i>University College London</i>	2022.07 - 2022.8 London, United Kingdom
Scholarship: Merit Scholarship (2019); Mobility Award (2022)	

PUBLICATIONS

Paper

Shi, W., **Liu, J.** (co-author), et al. (2024). "Help-Seeking Preferences and Influencing Factors Among Chinese Nurses Exposed to COVID-19: A Person-Centered Approach". *Journal of Community Health Nursing*. DOI: 10.1080/07370016.2024.2314076.

Liu, S., **Liu, J.** (co-author), et al. (2024). "Estimating the impact of short-term sulfur dioxide exposure on the COVID-19 incidence: A spatiotemporal study in the continental United States". *Atmospheric Pollution Research*. DOI: 10.1016/j.apr.2024.102053.

Shi, W., **Liu, J.** (co-author), et al. (2023). "Study on the mental health status and its influencing factors among middle school students in Yi nationality areas: a case study of Xide County, Liangshan Prefecture, Sichuan Province". *Sichuan Mental Health*. DOI: 10.11886/scjsws20221116001.

Liu, J. (first-author) & Jiang, L. "Machine Learning Prediction of Internet Addiction Behaviours Among Children". (Under review).

Lozoya, D.C. & Liu, J. (co-author) "Prompt Engineering with Multi-modal Large Language Models". (Under review).

Liu, J. (first-author) & Ju, K. "The Longitudinal Association between PM2.5 and Sensory Impairment". (Working in progress).

Liu, J. (first-author) & Chen, L. "Women with Epilepsy and Reproductive Complications: A Systematic Review". (Working in progress).

Liu, J. (first-author) & Conway, M. "Detect Lung Cancer Stigmatisation on Online Discussion with NLP". (Working in progress).

Patent

Liu, J. (2017). "Utility Model Patent: A Multi-gear Flow-limiting Water-saving Faucet". *State Intellectual Property Office of the People's Republic of China*. DOI: CN206290818U.

RESEARCH EXPERIENCE

Machine Learning Application in Internet Addiction Detection 2023.12 - 2024.04
Sichuan University West China, School of Public Health Chengdu, China

- **Project Overview:** Addressed the critical public health issue of internet addiction among children by applying machine learning to identify key social, psychological, and demographic predictors.
- **Machine Learning:** Secured access to longitudinal cohort data, conducted a comprehensive literature review, and conceptualised the research paper. Selected relevant predictors for feature selection, compared multiple machine learning models, and fine-tuned the best-performing model to enhance predictive accuracy.
- **Project Result:** First authored and submitted a research paper detailing the findings. Managed manuscript preparation, coordinated the project team, and handled submission logistics to target publications.

Reproductive Complications of Women with Epilepsy: A Systematic Review 2023.12 - 2024.04
Sichuan University West China, Department of Neurology Chengdu, China

- **Project Overview:** Initiated a systematic review to explore the complex reproductive challenges faced by women with epilepsy, focusing on issues related to contraception, pregnancy complications, medication effects on mother and fetus, and neonatal developmental concerns.
- **Systematic Review Development:** Conceptualised the review by analyzing existing literature on the topic. Registered the study with PROSPERO and adhered to PRISMA guidelines to ensure rigorous methodology and transparent reporting.
- **Expected Result:** Positioned as the first author of the forthcoming paper, anticipated for completion and submission by June 2024.

NLP Analysis of Lung Cancer Stigma in Online Discussions 2023.2 - 2024.12
The University of Melbourne, School of Computing and Information Systems Melbourne, Australia

- **Project Overview:** Utilised natural language processing to examine lung cancer stigma in Reddit discussions across various demographics. Expanded research methods beyond traditional surveys and managed the ethics approval process to ensure compliance.
- **NLP Analysis:** Collected and annotated data concerning age and gender from lung cancer subreddits using the Reddit API. Implemented and refined existing age and gender classifiers, and conducted topic modeling to examine how different demographics discuss lung cancer stigma.
- **Expected Results:** Targeting two first author publications and one Master's thesis paper by the end of the year.

Cryo-EM Data Science Research Internship 2023.11 - 2024.02
Walter and Eliza Hall Institute of Medical Research (WEHI) Melbourne, Australia

- **Project Overview:** Implemented machine learning to automate the hole image selection process in Cryogenic Electron Microscopy (cryo-EM) research within the domain of structural biology. [View presentation.](#)
- **Machine Learning:** Utilised WEHI's High Performance Computing (HPC) infrastructure for the analysis of large datasets (5 TB), applying an unsupervised machine learning model to categorise hole images based on ice quality into three distinct groups.
- **Project Management:** Recorded internship instructions under [GitHub Wiki](#) to provide guidance and suggestions for future interns.

- **Project Overview:** Focused on the impact of air pollutants on human health, encompassing literature review, statistical analysis, and manuscript preparation.
- **Literature Review & Writing:** Reviewed literature on the sensory impact of PM2.5 on humans. Authored and co-authored manuscripts to share research insights with the scientific community.
- **Statistical Analysis:** Employed multilevel logistic regression to unravel the complex interplay between environmental factors and health outcomes. Performed statistical modelling using STATA and Python to derive meaningful public health insights.

INDUSTRY EXPERIENCE

Campus Ambassador

2021.01 - 2023.12

*BOE Technology, Overseas Recruitment Department**Beijing, China*

- **Experience Overview:** Promoted the company brand internationally, leading initiatives at different institutions and managing three in-person recruitment events at Australian universities. Researched local employment trends and academic environments.
- **Seasonal Recruitment:** Published over 100 recruitment notices on university online platforms and established connections with university career centers. Leveraged LinkedIn Talent Solutions for Spring and Fall international hiring, identifying over 5000 candidates.
- **Ambassador Recruitment for 2022 & 2023:** Conducted more than 10 interviews to recruit Campus Ambassadors. Created two vlogs highlighting the BOE Campus Ambassador position, achieving over 10,000 views.

Essay Tutor on Western History and Philosophy

2019.08 - 2021.01

*Max Language**Melbourne, Australia*

- **Experience Overview:** Equipped students with essay writing skills, emphasising argument formation, logical reasoning, and critical thinking. Introduced students to foundational knowledge in western history and philosophy.
- **Tutoring Highlights:** Covered Western history & philosophy topics from Ancient Rome to the Contemporary Period. Engaged over 20 students in discussions on key philosophical and historical themes, such as human rights, free will, and social structures.

SCHOOL PROJECTS

AIDetect | Pytorch, Tensorflow, Python, Git, Google Colab, VS Code

2023.08 - 2023.09

- Developed a deep learning based NLP model to distinguish human and machine-generated text.
- Experimented and compared several binary classifiers' performance: XGBoost, Logistic Regression, Random Forest, SVM, Recurrent Neural Network, Multi-layer Perceptron.
- Achieved 85% test accuracy, ranking 3/92 on Kaggle competition.

HappinessMining | Melbourne Research Cloud, Docker, Mastodon API, Git, CouchDB, React, Ansible

2022.04 - 2022.06

- Performed sentimental analysis across Australia and global population using data from Twitter and Mastodon.
- Collected and distributed 64GB social media data across multiple instances on the Melbourne Research Cloud.
- Conducted sentiment analysis using NLP, focusing on reasons, locations, and times associated with happiness.
- Developed a full-stack web application that automatically refreshes our analysis based on the most recent social media posts.

VOLUNTEER EXPERIENCE

Student Panelist and Participant

2022 - 2024

*University of Melbourne**Melbourne, Australia***Mathematics and Statistics Outreach Ambassador**

2022 - 2023

*University of Melbourne, Faculty of Science**Melbourne, Australia***Blood Donor**

2021

*Australian Red Cross Lifeblood**Melbourne, Australia***Support Teaching: 'Journey of Hope' Service Learning Summer Camp**

2019

*Polytechnic University of Hong Kong, Sichuan University**Chengdu, China***Support Teaching: 'Child, Take My Hand' Educational Support Project**

2017

*Chengdu No.7 High School**Liangshan, China***Volunteer: Promote Maternal and Child Health Project**

2014

*Save the Children International, Sichuan University**Tibet, China*