

Xinyu Guo

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EDUCATION

Sichuan University, West China Fourth Hospital

Master of Medicine

Chengdu, China

09/2022 - 06/2025

Nanjing University of Chinese Medicine

Bachelor of Management

Nanjing, China

09/2018 - 06/2022

Cambridge University, Girton College

Exchange Program

Cambridge, UK

06/2023 - 09/2023

PUBLICATIONS

Guo, X., Liu, S., Jiang, L., Xiong, Z., Wang, L., Lu, L., ... & Shek, D. T. (2025). Longitudinal machine learning prediction of non-suicidal self-injury among Chinese adolescents: A prospective multicenter cohort study. *Journal of Affective Disorders*, 120110. [Q1, IF: 4.9] [code]

Guo, X., Wang, L., Li, Z., Feng, Z., Lu, L., Jiang, L., & Zhao, L. (2024). Factors and pathways of non-suicidal self-injury in children: Insights from computational causal analysis. *Frontiers in Public Health*, 12, 1305746. [Q1, IF: 3.4]

Guo, X., Peng, Y., Li, X., & Shek, D. T. L. (2025). Academic values, academic anxiety, and non-suicidal self-injury in Chinese adolescents: A three-wave longitudinal study. (Under review)

Guo, X., Li, X., Tan, L., Zhao, L., & Shek, D. T. (2025). Prediction of Anxiety-Related Emotional Disorders Among Chinese Adolescents Using Statistical Machine Learning: A Longitudinal Study in the Chinese Mainland. (Under review)

Wang, L., **Guo, X.**, Shi, H., Ma, Y., Bao, H., Jiang, L., Zhao, L., Feng, Z., Zhu, T., & Lu, L. (2025). CRISP: A causal relationships-guided deep learning framework for advanced ICU mortality prediction. *BMC Medical Informatics and Decision Making*, 25(1), 165. [Q2, IF: 3.8]

Zeng, Y., Song, J., Zhang, Y., **Guo, X.**, Xu, X., Fan, L., Zhao, L., Song, H., & Jiang, L. (2025). Life changes and symptoms of depression and anxiety among Chinese children and adolescents before, during, and after the COVID-19 pandemic lockdown: A combination of cross-sectional, longitudinal, and clustering studies. *European Child & Adolescent Psychiatry*, 34(3), 1025–1038. [Q1, IF: 4.9]

Wang, L., **Guo, X.**, Zhou, Y., Li, Z., Jiang, L., Zhao, L., Feng, Z., & Lu, L. (2024). Dynamic causal graph-based learning approach for predicting cognitive impairment in middle-aged and older adults. In *Proceedings of the 46th Annual Conference of the Cognitive Science Society* (Vol. 46). [Conference].

Li, S., Wang, L., **Guo, X.**, Shi, H., Ma, Y., Zhang, X., Feng, Z., & Lu, L. (2025). Prediction of cognitive impairment in middle-aged and elderly people: A method based on Granger causality. In *Proceedings of the 47th Annual Conference of the Cognitive Science Society* (Vol. 47). [Conference].

Wang, L., **Guo, X.** (co-first author), Feng, Z., & Lu, L. (2025). Causality-driven models for MDRO infection prediction: Enabling effective ICU antibiotic stewardship. (Under Revision)

RESEARCH EXPERIENCES

The Hong Kong Polytechnic University, P.A.T.H.S. Project

Research Assistant

PI: Prof. Daniel T. L. Shek | PolyU

08/2025 - Present

- Developed interpretable machine learning (ML) models using three longitudinal school cohort datasets to predict adolescent mental health trajectories, including anxiety and suicide-related behaviors.
- Explored applications of large language models (LLMs) to analyze student diaries and self-assessment data for evaluating youth mental health intervention outcomes and informing policy.
- Co-developed Positive Youth Development teaching materials (lesson plans, PPTs, videos) for primary schools, integrating developmental psychology to tailor content for different age groups.

Computational Healthcare and Medical Imaging Lab

Research Assistant and Master Student

Prof. Li Lu | College of Computer Science, SCU

08/2023 - 06/2025

- **Causal Deep Learning for ICU Mortality Prediction:**
 - Developed causal ML framework achieving AUROC 0.904-0.948 across 69,190 patients from three ICU datasets(MIMIC-III, MIMIC-IV, and West China Hospital, demonstrating superior generalizability over traditional methods.
 - Created Counterfactual Minority Generation (CMG) module using causal graphs to address severe class imbalance, outperforming standard oversampling techniques (SMOTE, ADASYN).
 - Integrated SHAP analysis for model interpretability, identifying key risk/protective factors and validating transportability across diverse populations and clinical outcomes (mortality, AKI).
- **Multi-Target MDRO Infection Prediction in ICU Patients:**
 - Developed multi-target models predicting five common MDROs using MIMIC-III (training) and MIMIC-IV (external validation), comparing five algorithms (Logistic Regression, Random Forest, XGBoost, Bi-LSTM, Bi-GRU) achieving AUROC up to 0.87.
 - Integrated causal discovery with multi-target causal graph framework for feature selection, identifying shared and pathogen-specific risk factors across MDRO types.
- **Cognitive Impairment Prediction in Aging Adults:**
 - Developed a dynamic causal graph-based learning approach utilizing DAGs derived from GAE and CGNN, combined with LSTM and MLP, using the China Health and Retirement Longitudinal Study data (2011-2020, n=3,660) to predict cognitive impairment (AUROC=0.88).
 - Conducted multi-round experiments and sub-group analyses (gender, health, education) to validate model robustness, surpassing benchmark performance.

Health Promotion Group, West China Hospital and West China Fourth Hospital

Master student

Prof. Li Zhao and Prof. Lihua Jiang | SCU

07/2021 - 06/2025

- **COVID-19 Impact on Youth Mental Health:**
 - Analyzed survey data from 7,829 Chinese students across three waves (Dec 2019 – Jul 2021) to assess the impact of COVID-19 lockdown on mental health.
 - Applied logistic regression and clustering analysis to identify associations between life changes and increased depression and anxiety risks.
- **Non-Suicidal Self-Injury (NSSI) Research:**
 - Investigated causal pathways influencing NSSI among children during COVID-19, identifying 9 critical causal factors.
 - Applied computational causal discovery techniques (PC, FCI, GAE algorithms) to construct a DAG elucidating relationships between variables.
- **Field Surveys and Policy Research:**
 - Co-led the Chengdu Positive Child Development (CPCD) Survey, organizing the 5th wave of cohort data collection and analyzing longitudinal data.
 - Participated as a co-leader in chronic disease surveys of community residents in Sichuan Province, analyzing data and writing policy recommendations for 5 regions.
 - Co-led the Sichuan survey team for the 2023 Chinese General Social Survey (CGSS), conducting fieldwork in multiple cities.

The Hong Kong Polytechnic University

Project Assistant

03/2024 - 07/2024

Prof. Daniel T. L. Shek and Prof. Xiang Li | Department of Applied Social Sciences, PolyU

- Investigated interactions among academic anxiety, academic values, and NSSI behaviors in adolescents using three waves of longitudinal data from Chengdu (N = 5,321). Applied an extended random intercept cross-lagged panel model (RI-CLPM) to highlight changes in within-person and between-person dynamics.
- Coordinated “Service Leadership through Serving Children and Families with Special Needs” project between Sichuan University and Hong Kong Polytechnic University.

Health Economics and Traditional Chinese Medicine Research Lab

01/2021 - 05/2022

Student Assistant

Prof. ShaoLiang Tang | School of Health Economics and Management, NJUCM

- Conducted data mining of Traditional Chinese Medicine prescriptions for perianal abscesses using R, performing frequency analysis, complex network visualization, and clustering analysis.

- Modified and applied the SIRS infectious disease model using system dynamics to simulate COVID-19-related network rumor propagation, analyzing intervention effects with Vensim PLE.

WORKING EXPERIENCES

The Hong Kong Polytechnic University

Hong Kong SAR, China

Research Assistant

08/2025 - Present

Project Assistant

03/2024 - 07/2024

MedChina(MedRobot)

Beijing, China

Editor & Policy Analyst

08/2022 - 08/2025

- Contributed and reviewed articles on medical devices and policies for a industry media platform, growing the WeChat public account “Device Market” follower count from **0** to **13,864**.
- Collected and analyzed policy and market data on medical devices, authored content for a global surgical robot market analysis report, and assisted in organizing Global Medical Robotics Conference 2023, and 2024.
- Researched market trends and regulatory changes in the medical device sector, provided consulting services on medical device commercialization policies.

JD Health International Inc.

Beijing, China

Intern, Capability Enhancement Department

02/2022 - 06/2022

- Managed the group’s first internal “Spark Plan” innovation and entrepreneurship project, executing process design, publicity, solicitation, and selection of 36 projects for professional training, culminating in 2 investments.
- Assisted department leaders in addressing key business challenges through targeted workshops.

The Science and Technology Park of Sichuan University

Sichuan, China

Intern

09/2023 - 09/2024

- Developed promotion and recruitment plans for the new interdisciplinary project incubation center.
- Coordinated with an 8-department team to build and test a full-service platform (website and WeChat mini-program) for transforming scientific and technological achievements, and applied for intellectual property rights (authorized).

TEACHING EXPERIENCE

Graduate Compulsory Class on Public Health Master’s Professional Foreign Language

Teaching Assistant, Sichuan University

09/2024 - Present

Undergraduate Optional Class on Service Leadership through Serving Children and Families with Special Needs

Project Assistant, Hong Kong Polytechnic University

03/2024 - 07/2024

Undergraduate Optional Class on Emergency Management of Public Health Incidents

Teaching Assistant, Sichuan University

09/2023 - 01/2024

Undergraduate Optional Class on Health Literacy

Teaching Assistant, Sichuan University

03/2023 - 07/2023

Undergraduate Practice Class on Innovation and Entrepreneurship Practice

Teaching Assistant, Nanjing University of Chinese Medicine

03/2021 - 07/2021

ACTIVITIES & PRESENTATIONS

Conference Presentations:

- **46th Annual Meeting of the Cognitive Science Society**
(Poster) Rotterdam, The Netherlands 07/2024
- **46th Annual Meeting of the Cognitive Science Society**
(Poster) San Francisco, USA 07/2025
- **2023 China Conference on Children and Family Development** Chengdu, China 12/2023
Oral: Life Changes and Symptoms of Depression and Anxiety Among Chinese Children and Adolescents Before, During, and After the COVID-19 Pandemic Lockdown
- **China’s 4th Interdisciplinary Behavioral Health Conference** Nanjing, China 04/2023
Poster: Predicting Adolescent Obesity in China Using Machine Learning Methods

Leadership Activities:

- Director of the Graduate Student Chapter's Practice, Entrepreneurship and Employment Center
SCU, 10/2022 - 08/2023
- Representative for the 25th Student Congress, NJUCM
12/2019 - 12/2020

HONOR & AWARD

Academic:

- **President's Special Award**, NJUCM (**Top 10** of one academic year) 10/2020
- **First-Class Scholarship**, NJUCM (**Top 3%** for four consecutive academic years) 2019-2022
- **Outstanding Student Leader**, NJUCM (**Top 1%**) 2019-2021
- **Huatuo Scholarship**, NJUCM (**Top 5%**) 2020-2021
- **Outstanding Graduate**, NJUCM (**Top 7%**) 2022
- **Graduate Scholarship**, SCU (**Top 20%**) 2022-2024
- **Graduate Mingmei Scholarship**, SCU (**Top 5%**) 2025

Entrepreneurship:

- **China College Student Entrepreneurship Competition**
National Bronze Award 12/2020
- **The 12th China Colleges' Innovation, Creativity, and Entrepreneurship" Challenge**
National Bronze Award 09/2021
- **11th Jiangsu Province "Challenge Cup" Entrepreneurship Competition**
Silver Award 11/2020
- **"Internet +" Entrepreneurship Competition**
Gold Award 11/2020

Sports:

- **China National College Taekwondo Championships**
5th Place in Women's 59kg category 07/2021
- **Jiangsu Provincial College Taekwondo Championships**
5th Place in Women's 59kg category 11/2020

SKILLS

Languages: Mandarin Chinese (Native), English (Proficient)

Programming & Software: R, Python, SPSS, Mplus, Epidata, MATLAB, LaTeX

Core Courses:

- **Graduate:** Health Economics (97), Health Policy and Management (90), Research on Hospital Management (90)
- **Undergraduate:** Linear Algebra (A), Network Marketing (A), Systems Engineering (A), MATLAB and Management Decisions (A), Game Theory and Information Economics (A), SPSS Economic Statistical Analysis (A), Cloud Computing (A)

Certifications:

- China National Social Sport Instructor 10/2020
- China National Taekwondo Reference, Level Three 08/2020
- International Taekwondo Black Belt, 1st Dan 12/2013