

Xinyu Guo

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EDUCATION

Sichuan University, West China Fourth Hospital

Chengdu, China

Master of Health Policy and Management

09/2022 - 06/2025

Nanjing University of Traditional Chinese Medicine

Nanjing, China

Bachelor of E-Commerce

Rank 1 out of 39

09/2018 - 06/2022

Cambridge University, Girton College

Cambridge, UK

International Organizations Program

07/2023 - 08/2023

PUBLICATIONS

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.

Wang, L., **Guo, X.**, Zhou, Y., Li, Z., Jiang, L., Zhao, L., ... & Lu, L. (2024). Dynamic Causal Graph-Based Learning Approach for Predicting Cognitive Impairment in Middle-Aged and Older Adults. In *Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 46).

Zeng, Y., Song, J., Zhang, Y., **Guo, X.**, Xu, X., Fan, L., ... & Jiang, L. (2024). 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. In *European Child & Adolescent Psychiatry* (1-14).

Wang, L., **Guo, X.**, Han, B., Lihua, J., Li, Z., ... & Lu L. (2025). CRISP: A causal relationships-guided deep learning framework for advanced ICU mortality prediction. In *BMC Medical Informatics and Decision Making*, 25(1), 165.

Wang, L., **Guo, X.**, Haoyue, S., ... & Lu L. (2025). Long-Term Cognitive Trajectory Prediction in a Chinese Cohort of Middle-Aged and Older Adults Using Causal Machine Learning. In *The Annual Meeting of the Cognitive Science Society 2025*(Accepted).

Li, S., Wang, L., **Guo, X.**, ... & Lu L. (2025). Prediction of Cognitive Impairment in Middle-aged and Elderly People: A Method Based on Granger Causality. In *The Annual Meeting of the Cognitive Science Society 2025*(Accepted).

Under Review:

Guo, X., Liu, S., Xiong, Z., Zhao, L., & Jiang, L. (2025). Dynamic Prediction of Adolescent Non-Suicidal Self-Injury: A Multi-Center Longitudinal Study Using Eight Machine Learning Methods.

Guo, X., Peng, Y., Li, X., Zhao, L., Jiang, L., & Shek, DTL. (2025). Academic Values, Academic Anxiety, and Non-Suicidal Self-Injury in Chinese Adolescents: A Three-Wave Longitudinal Study.

Wang, L., **Guo, X.**, Lihua, J., Li, Z., ... & Lu L. (2025). Causality-Driven Models for MDRO Infection Prediction: Enabling Effective ICU Antibiotic Stewardship.

RESEARCH EXPERIENCES

Computational Healthcare and Machine Learning Lab

Research Assistant, Prof. Li Lu's Lab | College of Computer Science, SCU

08/2023 - Present

• Causality-Enhanced ICU Analytics:

- Developed CRISP, a novel causal prediction model for ICU mortality prediction using multivariate time series data, outperforming 9 established benchmarks on public ICU datasets.

- Created MDRO infection prediction models using MIMIC-III and MIMIC-IV datasets, implementing five predictive methods (Logistic Regression, Random Forest, XGBoost, Bi-LSTM, Bi-GRU) and incorporating causal discovery algorithms to refine feature selection (AUROC up to 0.87).

- **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.

Mental Health and Public Health Research

Master student, Prof. Li Zhao and Prof. Lihua Jiang | West China Fourth Hospital, SCU

07/2021 - Present

- **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.

Hong Kong Polytechnic University Collaboration

Project Assistant

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

03/2024 - 07/2024

- 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

Research Assistant

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

01/2021 - 05/2022

- 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

Hong Kong Polytechnic University Department of Applied Social Sciences Hong Kong SAR, China
Project Assistant 03/2024 - 07/2024

- Implemented RI-CLPM extended and LGCM models using R and Mplus software to analyze cohort data.
- Searched and organized the policy texts on children's mental health from all levels of government in mainland China.
- Assisted in teaching workshops and practicum for the undergraduate course "Service Leadership through Serving Children and Families with Special Needs".

MedRobot Beijing, China
Editor 08/2022 - 02/2025

- 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.

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 analyzing and 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** Rotterdam, The Netherlands 07/2024
Poster: Dynamic Causal Graph-Based Learning Approach for Predicting Cognitive Impairment
- **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:

- Deputy 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 three 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
- **Second-Class Graduate Scholarship**, SCU (**Top 20%**) 2022-2024
- **Second-Class Graduate Scholarship**, SCU (**Top 20%**) 2022-2024

Entrepreneurship:

- **China College Student Entrepreneurship Competition**, National Bronze Award (Team Leader) 12/2020
- **The 12th China College Students' "Innovation, Creativity, and Entrepreneurship" Challenge**, National Bronze Award (Team Member) 09/2021
- **11th Jiangsu Province "Challenge Cup" Entrepreneurship Competition**, Silver Award (Team Leader) 11/2020
- **"Internet +" Entrepreneurship Competition**, NJUCM, Gold Award (Team Leader) 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, Putonghua Level 2-A), English (Proficient)

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

Research Methods: Statistical Analysis, Causal Discovery, Machine Learning, Deep Learning, Survey Design and Implementation, Longitudinal Data Analysis, Qualitative Research

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