# LU ZHONG

Research Assistant Professor Department of Public Health Sciences Clemson University ■ lucinezhong@gmail.com ↓ https://www.lucinezhong.com/

### **RESEARCH INTERESTS**

My research focuses on improving healthcare operations during disaster events. Through developing data-driven modeling (Big Data/ML/AI) with network science theory, my research endeavors to understand human behavior and social network dynamics to model infectious disease spread and inform public health policymaking for crisis preparedness and response.

#### ACADEMIC APPOINTMENTS

Research Assistant Professor	South Carolina, USA
Department of Public Health Sciences; Center for Public Health Modeling and Response	Apr 2025-now
Clemson University	
PI: Dr. Lior Rennert	
Postdoctoral Research Associate	New York, USA
Department of Computer Science; Network Science and Technology Center	Nov 2019–Feb 2025
Rensselaer Polytechnic Institute	
Advisor: Dr. Jianxi Gao (Network Science and Resilience)	
Doctoral Research Assistant	Hong Kong SAR
School of Data Science	Sep 2015–Oct 2019
City University of Hong Kong	
Advisor: Dr. Qingpeng Zhang (Health informatics)	
EDUCATION	
Ph.D. in Data Science	Hong Kong SAR
School of Data Science	Sep 2015–Oct 2019
City University of Hong Kong	
B.S. in Computer Science	Chongqing, China

Department of Computer Science Southwest University

# GRANTS

Bill & Melinda Gates Foundation, COVID-19 Research Database, Healthcare Cost Institute	Jul 2021–Dec 2024
Harness network science to reduce treatment resource disparities and social disadvantage (\$90,000)	
Role: co-Principal Investigator	
National Training Programs of Innovation and Entrepreneurism for Undergraduates	May 2013–Dec 2014
A recommended information transmission system based on user behaviour (\$3,000)	
Role: Principal Investigator	

Sep 2011-Jul 2015

#### PUBLICATIONS

<sup>†</sup> indicates a student I mentored. <sup>‡</sup>indicates corresponding aurthor. <sup>\*</sup>indicates co-first authorship.

#### • Computational resilience:

[16] Jason Lian<sup>†</sup>, Pei, S., Gao, J., & **Zhong, L.**<sup>‡</sup> (2025). Examining inequality in healthcare utilization during pandemic disruptions. *medRxiv* (under review)

[15] **Zhong, L.**, Pei, S., & Gao, J. (2024). Patient flow networks absorb healthcare stress during pandemic crises. *arXiv preprint* (under review).

[14] **Zhong, L.**, Lopez, D.<sup>†</sup>, Pei, S., & Gao, J. (2024). Healthcare system resilience and adaptability to pandemic disruptions in the United States. *Nature Medicine*, 1-9. [See dashboard].

#### • Computational epidemiology:

[13] Zhong, L., et al. (2024). Assessing the impact of climate change-related migration on global disease spread. (working paper)

[12] Zhong, L.\*, Dong, L.\*, Wang, Q., Song, C., & Gao, J. (2023). Switching exploration modes in human mobility (under review).

[11] Zhong, L.\*, Dong, L.\*, Wang, Q., Song, C., & Gao, J. (2025). Universal spatial inflation of human mobility. Nature Cities.

[10] **Zhong, L.**, Diagne, M., Wang, Q., & Gao, J. (2022). Vaccination and three non-pharmaceutical interventions determine the dynamics of COVID-19 at 381 metropolitan statistical areas in the US. *Humanities and Social Sciences Communications*, *9*(*1*).

[9] Wang, Y.<sup>†</sup>, **Zhong, L.**, Du, J., Gao, J., & Wang, Q. (2022). Identifying the shifting sources predicts the dynamics of COVID-19 in US. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 32(3).

[8] **Zhong, L.**, Diagne, M., Wang, W., & Gao, J. (2021) Country distancing increase reveals the effectiveness of travel restrictions in stopping COVID-19 transmission. *Nature Communications Physics*, 4(1), 121. [cover story].

[7] Yang, J., Zhang, Q., Cao, Z., Gao, J., Pfeiffer, D., **Zhong, L.**, Zeng, D. (2021). The impact of non-pharmaceutical interventions on the prevention and control of COVID-19 in New York City. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 31(2). [editor's pick].

[6] Zhang, Q., **Zhong, L.**, Gao, S., & Li, X. (2018). Optimizing HIV Interventions for Mulitplex Social Networks Via Partition-Based Random Search. *IEEE Transactions on Cybernetics*, 48(12), 3411-3419.

[5] **Zhong, L.**, Zhang, Q., Li, X. (2018). Modeling the Intervention of HIV Transmission across Intertwined At-Risk Populations. *Scientific Reports*, 8(1), 2432.

#### • others :

[4] Chen H.\*,<sup>†</sup>, Bu Yi.\*, **Zhong, L.**, Du C., Meyer E., Ding Y., Gao J., (2024). Resilience hinges on persistence in scientific collaboration. (under review).

[3] Yang, D., Chow, T., **Zhong, L.** et al. (2018). The Competitive Information Spreading over Multiplex Social Networks. *Physica A: Statistical Mechanics and its Applications*.

[2] Yang, D., Chow, T., **Zhong, L.** et al. (2018). True and fake information spreading over the Facebook. *Physica A: Statistical Mechanics and its Applications*.

[1] Gao, C., **Zhong, L.** et al. (2015). Combination methods for identifying influential nodes in networks. *International Journal of Modern Physics C*.

## TALKS

NERCCS 2025	New York, USA
"Patient flow networks absorb healthcare stress during pandemic crises in US"	2025
INFORMS Annual Meeting	Seattle, USA
"Hospital collaboration network foster healthcare resilience during pandemics"	2024
NERCCS 2024	New York, USA
"Adaptability reveals the healthcare resilience to pandemics"	2024
NERCCS 2024	New York, USA
"Revealing the transition of exploration modes in human mobility networks"	2024
INFORMS Annual Meeting	Arizona, USA
"Global supply chain network analysis and its resilience."	2023
COVID-19 Modeling - Interventions (CDC)	Atlanta, USA
"Vaccination and three non-pharmaceutical interventions determine the end of COVID-19 in the US"	2021
NetSci Conference	Paris, France
"Optimizing HIV Interventions for Mulitplex Social Networks Via Partition-Based Random Search"	2018
NetSci-X Conference.	Hangzhou, China
"Modeling the Intervention of HIV Transmission across Intertwined At-Risk Populations"	2018
INFORMS Annual Meeting	Houston, USA
"Modeling the Intervention of HIV Transmission across Intertwined At-Risk Populations."	2017

## TEACHING

Guest lecturer, Rensselaer Polytechnic Institute	New York, USA
Introduction to Network Science/Resilience (Network epidemiology lecture)	Jan 2023-Feb 2025
Guest lecturer, Northeastern University	Massachusetts, USA
Urban Informatics and Processing (Spatial epidemiology lecture)	Jan 2023-May 2023
Teaching Assistant, City University of Hong Kong	Hong Kong SAR, China
Logistics and Materials Management (Lab lecture)	Sep 2017-Dec 2017
Quality Engineering (Lab lecture on statistics)	Feb 2017-Jun 2017
Supply Chain Management (Network science lecture)	Sep 2016-Dec 2016

# MENTORSHIP

Graduate students:	
• Dimitri Lopez, Rensselaer Polytechnic Institute (current Northeastern University Ph.D student)	Jun 2022-now
Undergraduate students:	
Tarun Venkatasamy, Rensselaer Polytechnic Institute	Sep 2022-Dec 2022
High-school students:	
Jason Lian, Niskayuna High School	Sep 2024-now
James Lian, Niskayuna High School (current Yale University undergraduate)	Feb 2023-Feb 2024

# SERVICES

#### Membership:

• The Network Science Society, INFORMS

#### **Guest editor:**

• Special Issue "Dynamics of Complex Networks" of Entropy (ISSN 1099-4300)

**Reviewer for Journal/Conferences:** BMJ Global Health, IEEE Transactions on Computational Social Systems, Scientific Reports, Humanities and Social Sciences Communications, Philosophical Transactions of the Royal Society A, Physica A, and etc.

# MEDIA COVERAGE

RPI news "Rensselaer Researcher Draws Insights from COVID-19 to Inform Improved Health Care in Times of Crisis	" 2024
Healthcare Cost Institute "Winners of COVID-19 Research Accelerator Grants Announced"	2021
RPI news "Model Sets Minimum Restrictions Needed To Control COVID-19 Given Vaccination Rate"	2021
<b>News Medical</b> "New model reveals the effectiveness of travel restrictions to slow COVID-19 transmission" 2020	RPI news
"New COVID-19 Model Reveals Need for Better Travel Restriction Implementation"	2020

### SKILLS

Expertise: Big Data Analytics, Complex Networks, System Resilience, Machine Learning, Computational Modeling, Health Informatics, Geoinformatics.

Tools: Apache Spark, Minitab, Plotly, Gephi, Cytoscape, Pajek

Programming: Python, C/C++, SQL, JAVA, MATLAB, LATEX

# Dr. Jianxi Gao (Postdoctoral advisor) Associate Professor Department of Computer Science Rensselaer Polytechnic Institute ✓ gaoj8@rpi.edu

# Dr. Qingpeng Zhang (PhD advisor)

Associate Professor Musketeers Foundation Institute of Data Science Department of Pharmacology and Pharmacy Hong Kong University ✓ qpzhang@hku.hk

Dr. Sen Pei (Collaborator) Assistant Professor Mailman School of Public Health Columbia University Sp3449@cumc.columbia.edu