Lingbo Tong

CONTACT INFORMATION

University of Notre Dame
430 Corbett Family Hall
Notre Dame, IN 46556

ltong2@nd.edu
1ingbo-t.github.io

RESEARCH INTERESTS

Natural Language Processing, Machine learning, Structural Equation Modeling, Longitudinal Data Analysis, and Computational Social Science.

EDUCATION

University of Notre Dame, Notre Dame, IN, USA
Joint Ph.D. in Quantitative Psychology and Computer Science and Engineering — Expected 2025
M.S. in Computer Science and Engineering — 2024

Sichuan University, Chengdu, China
B.Eng. in Computer Science and Technology — 2020

RESEARCH EXPERIENCE

Lab for Big Data Methodology, University of Notre Dame
Graduate Research Assistant, Advisor: Prof. Zhiyong Johnny Zhang — Aug 2020 – present

DM2 Lab, University of Notre Dame
Graduate Research Assistant, Advisor: Prof. Meng Jiang — Aug 2020 – present

Natural Language Processing Lab (THUNLP), Tsinghua University
Research Assistant, Advisors: Prof. Zhiyuan Liu & Prof. Huimin Chen — Sep 2020 – Jan 2021

PUBLICATIONS

My research centers on **developing more suitable AI-driven techniques and applications for text data in psychological research**. This includes: (1) explainable machine learning for psychological data, (2) empathetic AI for mental health support, and (3) large-scale text analysis in social bias and sentiment. Substantively, my work applies to areas such as clinical, health, social, and educational psychology.

Under Review / In Preparation

Tong, L., & Zhang, Z. (under review). TextSEM: Structural Equation Modeling for Text Data. Submitted to *Structural Equation Modeling: A Multidisciplinary Journal*. [R package]

Tong, L., & Zhang, Z. (under review). Neural Network Analysis of Psychological Data: A Step-by-Step Guide. Submitted to *Multivariate Behavioral Research.* [preprint]

Wan R., **Tong, L.** (co-first author), Knearem T., Li T., Huang K., & Wu Q. (under review). Hashtag Re-appropriation For Audience Control on Recommendation-driven Social Media Xiaohongshu. Submitted to *the ACM Conference on Human Factors in Computing Systems (CHI)*.

Tong, L. & Zhang, Z. (in prep). Incorporating Text as High Dimensional Data in Structural Equation Modeling. Proposal accepted by *Psychometrika*.

Tong, L., Turpin M., Crockett N., Zhang Z., & Jiang M. (in prep). Leveraging Large Language Models for Suicide Intervention in Online Crisis Counseling.

Tong, L., Nguyen, B., Dang H., Hoq, A., Jiang M., & Li T. (in prep). An LLM-based Writing Assistant for Peer-to-Peer Mental Health Support in Online Forums. [video demo]

Tong, L., Krush A. & Zhang, Z. (in prep). Investigating Gender Bias in Teaching Evaluation via Large Language Models.

Published / In Press

Lu, Y., **Tong, L.**, & Cheng, Y. (in press). Advanced Knowledge Tracing for Intelligent Tutoring Systems: Incorporating Process Data and Curricula Information via an Attention-Based Framework for Accuracy and Interpretability. *Journal of Educational Data Mining.* [paper]

Tong, L., Qu, W., & Zhang, Z. (2024). Comparison of the K1 Rule, Parallel Analysis, and the Bass-Ackward Method on Identifying the Number of Factors in Factor Analysis. *Fudan Journal of the Humanities and Social Sciences*, 1-28. [paper]

Tong, L., Liu, Q., Yu, W., Yu, M., Zhang, Z., & Jiang, M. (2023). Improving mental health support response generation with event-based knowledge graph. *Workshop on Knowledge-Augmented Methods for NLP (KnowledgeNLP) at AAAI Conference on Artificial Intelligence (AAAI).* [paper]

Jiang M., Dang H., & **Tong L.** (2023). A Quantitative Review on Language Model Efficiency Research. Large Language Model. *Symposium at International Joint Conference on Artificial Intelligence (IJCAI).* [paper]

Wan, R., & **Tong, L.** (2023). Digital and Historical Exclusivity in Feminine Linguistics: From Nüshu to Xiaohongshu. *WiNLP workshop at Conference on Empirical Methods in Natural Language Processing (EMNLP).* [paper]

Yu, M., Yu, W., **Tong, L.**, & Jiang, M. (2022). Scientific Comparative Argument Generation. *Document Intelligence Workshop (DI) at ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD).* [paper]

Kuebler, J., **Tong, L.**, & Jiang, M. (2021). Multi-Round Parsing-Based Multiword Rules for Scientific Knowledge Extraction. *IEEE International Conference on Big Knowledge (ICBK)* (pp. 331-338). IEEE. [paper]

Chen, H., Jin S., Lin W., Zhu Z., **Tong L.**, Liu Y., ... & Sun M. (2021). Quantitative analysis on the Communication of COVID-19 Related Social Media Rumors. (In Chinese). *Journal of Computer Research and Development*, 58(7), 1366-1384. [paper]

Presentations and Posters

Tong, L. & Jiang, M. (2024). Large Language Models in Mental Health Support. Invited talk for *Summer Research Experience for Teacher's (RET) Program*, 19 June, Notre Dame, USA. [slides]

Tong, L., Zhang, Z., Jiang M., & Li J. (2023). Permutation test of Importance-Weighted Autoencoder for Factor Analysis. *Symposium at Lucy Family Institute for Data & Society*, 7 September, Notre Dame, USA. [poster]

Tong, L. & Zhang, Z. (2023). Evaluation of the Bass-Ackward Method for Identifying the Number of Factors. *Annual Meeting of the International Society for Data Science and Analytics*, 4–6 July, Shanghai, China. [slides]

Tong, L., Liu, Q., Yu, W., Yu, M., Zhang, Z., & Jiang, M. (2023). MHKG: Improving mental health support response generation with event-based knowledge graph. *KnowledgeNLP at AAAI*, 7–14 February, Washington DC, USA. [slides]

Zhang, J., Chen, H., & **Tong, L.** (2022). Structured Gender Bias: How is Gender Cognition Changed and Affected by Digital Communities in China? *Annual Conference of International Association for Media and Communication Research Conference (IAMCR)*, 11–15 July, Beijing, China (online).

Tong, L., Zhang, Z., Jiang M., & Li J. (2022). Estimating Structural Equation Models with Neural Networks. *Symposium at Lucy Family Institute for Data & Society*, 28 September, Notre Dame, USA. [poster]

Software Development

Tong, L., Nguyen, B., Dang H., Hoq, A., &Taki S. BLASH: An LLM-based Chrome Plugin for Peer-to-Peer Mental Health Support in Online Forums. [video demo] [code]

Tong L., & Zhang, Z. (2024). TextSEM: An R Package for Structural Equation Modeling with Text Data. [code]

Tong L., & Zhang, Z. (2022). An Online Tool for Bass-Ackward Factor Analysis. [online app]

Xu, J., **Tong L.**, & Zhang, Z. (2020). Webnetvis: An Online Tool for Network Visualization.

Honors and Awards

ISLA Graduate Student Research Award ($4,000) 2024
University of Notre Dame

First place, 2023 EDM Cup 2023
International Educational Data Mining Society (IEDMS)

Most Innovative Project Award 2019
Google AI ML Winter Camp, Beijing

First Prize Academic Scholarship 2019
Sichuan University

Outstanding Undergraduate Student Award 2017, 2018, 2019
Sichuan University

National Innovation Training Grant for Undergraduates 2017, 2018
Sichuan University

Teaching Experience

Co-Instructor, Grad Seminar: Quantitative Study (PSY 63199) Fall 2024
Department of Psychology, University of Notre Dame

Teaching Assistant/Lab Instructor, Methods for Behavioral Sciences (PSY 30160) Fall 2023, Spring 2022
Department of Psychology, University of Notre Dame

Mentored Students

- Noah Crockett, ND undergraduate student in psychology 2024
- Anna Krush, ND master's student in applied and computational mathematics and statistics 2023 – 2024
- Yue Wan, ND exchange undergraduate student in data science 2023 – 2024
- Ishita Masetty, Penn High School student 2022
- Qi Liu, ND visiting undergraduate student in computer science 2022
- Longqing Chen, ND undergraduate student in computer science 2021

Professional Leadership & Service

Workshop Co-Organizer:

- The Second Workshop on Knowledge Augmented Methods for NLP at ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 6–10 August, 2023, Long Beach, CA, USA. [website]
- Workshops at the Annual Meeting of the International Society for Data Science and Analytics, 21–24 July, 2024, Vienna, Austria. [website]

Manuscript Reviewer:

- Journal of Behavioral Data Science (JBDS)
- Journal of Chinese Political Science (JCPS)
- Annual Meeting of the Association for Computational Linguistics (ACL)
- Conference on Empirical Methods in Natural Language Processing (EMNLP)
- China National Conference on Computational Linguistics (CCL)

University Service:

- Departmental DEI Committee Representative 2023 – 2024
- Mentor for STEMentorship Program, Association with Women in Science 2023 – 2024
- Departmental Faculty Meeting Representative 2022 – 2023

Technical Skills

- Programming Languages: Python, R, JavaScript, SQL, HTML and others
- Quantitative Methods: Structural Equation Modeling, Multivariate Analysis, Longitudinal Data Analysis, Bayesian Statistics, Item Response Theory
- Machine Learning Topics: Explainable Machine Learning, Generative models, Dialog System, Empathetic AI, Human-AI Collaboration

References

Dr. Zhiyong Johnny Zhang
Professor
Department of Psychology
University of Notre Dame
+1 574-631-2902
zzhang4@nd.edu

Dr. Meng Jiang
Associate Professor
Department of Computer Science and Engineering
University of Notre Dame
+1 574-631-7454
mjiang2@nd.edu

Dr. Guangjian Zhang
Associate Professor
Department of Psychology
University of Notre Dame
+1 574-631-3751
Guangjian.Zhang.106@nd.edu

Dr. Jordyn Wilcox
Assistant Teaching Professor
Department of Psychology
University of Notre Dame
+1 574-631-0383
jwilcox5@nd.edu