JITAO WANG

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SUMMARY

Jitao Wang is a fourth year Ph.D. candidate at the Biostatistics Department, University of Michigan. His research primarily focuses on the development of novel **statistical learning** methods, with a strong emphasis on **reinforcement learning**, **causal inference**, and **hypothesis testing**. Furthermore, he is also interested in applying these methodologies to the real-world mobile health and personalized healthcare applications.

Currently, Jitao Wang is actively seeking 2024 summer internship opportunities (May 2024 - Sep 2024) in the field of machine learning and data science, and will be available for full-time positions starting from May 2025.

EDUCATION

University of Michigan Ann Arbor, MI
Ph.D. candidate in Biostatistics Sep 2020 - Apr 2025(expected)
Supervised by: Dr. Zhenke Wu and Dr. Chengchun Shi (LSE)

University of Michigan Ann Arbor, MI
Master of Science in Biostatistics Aug 2017 - May 2019

Shanghai Jiao Tong University Shanghai, China
Bachelor of Science in Bioinformatics Aug 2013 - Jun 2017

RESEARCH EXPERIENCE

Multivariate Dynamic Mediation Analysis under a RL Framework Apr 2023 - Sep 2023
Graduate Research Assistant University of Michigan

- Derived recursive formulas within the proposed Markov mediation process framework and introduced a novel algorithm to estimate dynamic mediation effects.
- Implemented the proposed algorithm and validated its effectiveness through a combination of simulation studies and a real-world longitudinal mobile health application.

Testing Stationarity Assumption in Sequential Decision Making Nov 2021 - Apr 2023
Graduate Research Assistant University of Michigan

- Proposed a novel model-based doubly robust procedure for testing the stationarity assumption and identifying change points in complex high-dimensional offline reinforcement learning scenarios.
- Proved the size and double robustness property of the developed test within a general bidirectional asymptotic framework, and demonstrate its effectiveness through numerical studies and real-world applications.

A Reinforcement Learning Framework for Dynamic Mediation Analysis Oct 2022 - Apr 2023
Graduate Research Assistant University of Michigan

- Performed simulation studies to demonstrate the multiple robustness property and statistical efficiency of the proposed method for estimating the dynamic mediation effects.
- Applied the developed algorithm to a real-world mobile health application to analyze the mediation effect of physical exercise and sleeping on individuals' mood status, providing new insight for future study design.

Statistical Inference in Hidden Markov Models Under k-Segment Constraints May 2018 - Jul 2018
Graduate Research Assistant University of Michigan

- Derived Viterbi, forward-backward and expectation-maximization algorithms tailored to k-segment constraints within Hidden Markov Models (HMMs), and introduced a Gibbs sampler for posterior sampling.

- Implemented both expectation-maximization and Markov Chain Monte Carlo algorithms to estimate the parameters in HMMs subject to k-segment constraints, and conducted a comprehensive comparison of their robustness through numerical simulations.

TEACHING EXPERIENCE

Graduate Student Instructor, University of Michigan Sep 2018 - Dec 2018
Course: Statistical Computing (Biostat 615), taught by Dr. Jian Kang.

Graduate Student Instructor, University of Michigan Jan 2019 - May 2019
Course: Statistical Inference (Biostat 602), taught by Dr. Min Zhang.

RESEARCH INTERESTS

Theory and Methods: Reinforcement Learning, Causal Inference, Sequential Decision Making, Machine Learning, Deep Learning, Longitudinal Data Analysis, Hypothesis Testing, Fairness in Machine Learning.

Applications: Mobile Health, Personalized/Individualized Healthcare, Computerized Adaptive Test.

PUBLICATIONS

PUBLISHED PEER-REVIEWED ARTICLES:

1. **Wang, J.**, Shi, C., & Wu, Z. (2023). A Robust Test for the Stationarity Assumption in Sequential Decision Making. Proceedings of the 40th International Conference on Machine Learning, 36355–36379.
2. Ge, L., **Wang, J.**, Shi, C., Wu, Z., & Song, R. (2023). A Reinforcement Learning Framework for Dynamic Mediation Analysis. Proceedings of the 40th International Conference on Machine Learning, 11050–11097.
3. **Wang, J.**, Wu, Z., Choi, S. W., Sen, S., Yan, X., Miner, J. A., Sander, A. M., Lyden, A. K., Troost, J. P., & Carlozzi, N. E. (2023). The Dosing of Mobile-Based Just-in-Time Adaptive Self-Management Prompts for Caregivers: Preliminary Findings From a Pilot Microrandomized Study. *JMIR Formative Research*.
4. **Wang, J.**, Fang, Y., Frank, E., Walton, M. A., Burmeister, M., Tewari, A., Dempsey, W., NeCamp, T., Sen, S., & Wu, Z. (2023). Effectiveness of gamified team competition as mHealth intervention for medical interns: A cluster micro-randomized trial. Npj Digital Medicine, 6(1), 1-8.
5. Carlozzi, N. E., Choi, S. W., Wu, Z., Troost, J. P., Lyden, A. K., Miner, J. A., Graves, C. M., **Wang, J.**, Yan, X., & Sen, S. (2022). An app-based just-in-time-adaptive self-management intervention for care partners: The CareQOL feasibility pilot study. Rehabilitation Psychology, 67(4), 497–512.
6. Chen, X.-P., Shi, T., Wang, X.-L., **Wang, J.**, Chen, Q., Bai, L., & Zhao, Y.-L. (2016). Theoretical studies on the mechanism of thioesterase-catalyzed macrocyclization in erythromycin biosynthesis. ACS Catalysis, 6(7), 4369–4378.
7. Ting, S., Ming, C., Xiongping, C., **Jitao, W.**, Ajun, W., & Yi-Lei, Z. (2015). Molecular Mechanism of Protein S-Nitrosylation and Its Correlation with Human Diseases. PROGRESS IN CHEMISTRY, 27(5), 594–600.

MANUSCRIPTS IN PROGRESS: (*co-first authors)

1. *Luo, L., *Shi, C., ***Wang, J.**, Wu, Z., Li, L. (2023). Multivariate Dynamic Mediation Analysis under a RL Framework. *Annals of Statistics. Submitted.*

SKILLS

Programing Languages: R(Advanced), Python(Advanced), C++(Proficient), SQL(Proficient), Julia(Proficient).
skills and Tools: Git, PyTorch, Pandas, Linux, LaTeX, MATLAB, English (Fluent), Chinese (Native).