Cong Jiang

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RESEARCH INTERESTS

Causal Inference, Dynamic Treatment Regimes, Interference, Semiparametric/nonparametric theory, Machine learning, health & Public policy

TRAINING

Postdoctoral Researcher, Biostatistics, Université de Montréal, CANADA Oct. 2022 -

Supervisors: Dr. Mireille Schnitzer and Dr. Denis Talbot

University of Waterloo (UW), CANADA Sep. 2017 - Aug. 2022

Ph.D. of Statistics

Dissertation: "Dynamic Treatment Regimes with Interference" (*Link*), defended on Aug. 2nd, 2022.

Committee: Dr. Michael R. Kosorok (University of North Carolina at Chapel Hill), Dr. Yeying Zhu, Dr. Zahid Butt, Dr. Paul Marriott, Dr. Michael P. Wallace and Dr. Mary E. Thompson.

City University of New York (CUNY), U.S.A. Aug. 2015 - Jul. 2017

Master of Mathematics, Supervisors: Dr. Asohan Amarasingham and Dr. Shirshendu Chatterjee

Anhui University of Finance and Economics, CHINA Sep. 2011 - Jul. 2015

Bachelor of Mathematical Finance

RESEARCH EXPERIENCE

Postdoctoral Researcher, Université de Montréal

Supervisors: Mireille Schnitzer and Denis Talbot *Oct. 2022 –*

Keywords: Causal inference, machine learning, vaccine effectiveness (VE), test-negative design (TND)

- Project 1: Efficient and doubly robust estimation of COVID-19 VE under TND, using nonparametric theory.
- Project 2: Estimate heterogeneous COVID-19 VE under TND, and develop optimal treatment allocation strategy with scarcity constraints, in the presence of interference (i.e., considering herd immunity).

Research Assistantships, UW

Supervisors: Mary E. Thompson and Michael P. Wallace *Sep. 2017 – Aug. 2022*

Keywords: Dynamic Treatment Regimes (DTR), interference, Tobacco usage, nicotine addiction and cessation

- Project 1: Proposing network propensity function for doubly robust DTR estimation with network interference.
- Project 2: Introducing weights for model balance, addressing misspecification in generalized linear models, and enhancing doubly-robust approach for binary outcomes in DTR estimation.
- Project 3: Examining heterogeneous causal effects of smoking alternatives (e.g., e-cigarettes) on nicotine addiction and cessation, considering household members' behaviors.
- Project 4: Applying probabilistic record linkage methods to derive efficient estimators using linked data from the International Tobacco Control Project.

NYU Langone Health (Buzsáki Lab) **Supported by the Research Foundation of CUNY**

Research Assistant, CUNY (Asohan Amarasingham's Group) *May 2016 – Jul. 2017*

Keywords: Neuroscience, Spike trains, Non-Stationary Point processes, Spike-Centered Jitter

- Utilizing a rate- and history-preserving resampling algorithm, we obtained a closed-form expression for synchrony distribution. We showcased dynamic programming's Markov Chain sampling and FFT's 'faster-jitter' computation of synchrony distribution.
- Cooperated with Professor Amarasingham and contributed to a simulation study in Platkiewicz, Stark and Amarasingham (2017), *Spike-Centered Jitter Can Mistake Temporal Structure, Neural Computation.*

PRESENTATIONS

Invited talks

Centre de Recherches Mathématique StatLab annual meeting **Montreal, Canada**
2023

- Efficient and doubly robust estimation of COVID-19 vaccine effectiveness under the test-negative design

CANSSI Quebec Postdoc Day **Montreal, Canada**
2023

- Efficient and doubly robust estimation of COVID-19 vaccine effectiveness under the test-negative design

Pacific Causal Inference Conference 2023 **Beijing, China**
2023

- Vaccine effectiveness estimation under the test-negative design: efficiency theory for causal inference under conditional exchangeability

Second CANSSI-NISS Health Data Science Workshop **Waterloo, Canada**
C. Jiang *& M. Schnitzer* *2023*

- Vaccine effectiveness estimation under the test-negative design: identifiability and efficiency theory for causal inference under conditional exchangeability

Statistical Society of Canada (SSC) Annual Meeting **Ottawa, Canada**
2023

- Estimating dynamic treatment regimes for ordinal outcomes with household interference.

Health Data Science Lab (HDSL), Univerisity of Waterloo **Waterloo, Canada**
2022

- Dynamic Treatment Regimes with Interference.

Contributed Oral Presentations

Joint Statistical Meetings (JSM) **Toronto, Canada**
C. Jiang *2023*

- Efficient estimation of COVID-19 vaccine effectiveness under the test-negative design

Statistical Society of Canada (SSC) Annual Meeting (virtual)
C. Jiang *2022*

- Doubly Robust Dynamic Treatment Regimen Estimation for Binary Outcomes.

Statistical Society of Canada (SSC) Annual Meeting (virtual)
C. Jiang *2021*

- Dynamic Treatment Regimes with Network Interference.

Waterloo Student Conference in Statistics, Actuarial Science and Finance **Waterloo, Canada**
C. Jiang *2020*

- Dynamic Treatment Regimes with Interference — Q-learning.

Statistical Society of Canada (SSC) Annual Meeting **Calgary, Canada**
C. Jiang *2019*

- Dynamic Treatment Regimes with Interference.

Statistical Society of Canada (SSC) Annual Meeting **Montreal, Canada**
C. Jiang *2018*

- Case Studies in Data Analysis Competition. Modelling and Predicting the Popularity of TED Talks with Cox (Time-Varying) Proportional Hazard Model.

SENSE TO SYNAPSE 2017, The Rockefeller University **New York City, USA**
J. Platkiewicz, ***C. Jiang****, A. Amarasingham.* *2017*

- Validation of Injected Synchrony Models for Detecting Monosynaptic Connectivity Using Large-Scale Labeled Datasets.

RESEARCH PRESENTATION AWARDS

First CANSSI-NISS Health Data Science Workshop
Poster Presentation Competition Award *2021*
"Dynamic Treatment Regimes with Network Interference."

Statistics and Actuarial Science and WatRISQ Research Presentation, UW
Best Research Presentation Prize *2021*
"Dynamic Treatment Regimes with Interference."

GRANTS, FELLOWSHIPS & AWARDS

- 2022 **Canadian Institutes of Health Research Project Grant** (2nd place in the committee)

  Co-investigator, Project title: The test-negative design for the estimation of COVID-19 vaccine effectiveness: design evaluation and development of statistical methods in the evolving context

- 2022 **Centre de Recherches Mathématiques StatLab Postdoctoral Fellowship** [$10,000 *CAD*]
- 2018 **OICR (Bio)statistics Training Initiative Fellowship Award**
  [Top (Bio)statistics PhDs of Ontario *(Link)*, $30,000 *CAD*]
- 2018, 2022 **Chair Award**, Department of Statistics and Actuarial Science, UW, [$1,000 *CAD*]
- 2017 **Doctoral Entrance Award**, Faculty of mathematics, UW, [$1,000 *CAD*]
- 2016 **Rich Summer Internships Award**, Department of Mathematics, CUNY, [$6,000 *USD*]
- 2015, 2016 **Rich Mathematics Scholarship**, CUNY, [$12,000 *USD*]

WORKING PAPERS

- **C. Jiang**, Denis Talbot, Mireille E Schnitzer (2023). **Effect of heterogeneity and optimal treatment under the test-negative design**.
- **C. Jiang**, Denis Talbot, Mireille E Schnitzer, and Sara Carazo (2023). **Efficient and Doubly Robust Estimation of COVID-19 Vaccine Effectiveness under the Test-Negative Design**.
- **C. Jiang**, M.P. Wallace, and M.E. Thompson (2023). **Doubly Robust Dynamic Treatment Regimen Estimation for Binary Outcomes: two-step weighted generalized linear models**. *Under Review (arxiv link)*.
- **C. Jiang**, M.E. Thompson, M.P. Wallace(2023). **Estimating dynamic treatment regimes for ordinal outcomes with household interference: Application in household smoking cessation**. *Under Review (arxiv link)*.
- E.O.Brizuela, M.Carabali, **C. Jiang**, J.Merckx, D.Talbot, M.E. Schnitzer (2023). **Potential Biases in Test-Negative Design Studies of COVID-19 Vaccine Effectiveness Arising from the Inclusion of Asymptomatic Individuals.** *Revise & resubmit to American Journal of Epidemiology.*
- M.Mésidor, Y.Liu, D.Skowronski, G.D.Serres, J.Merckx, A.Koushik, M.Tadrous, S.Carazo, **C. Jiang**, M.E.Schnitzer, D.Talbot (2023). **Test negative design for vaccine effectiveness estimation in the context of the COVID-19 pandemic: a systematic methodology review.** *Under Rewiew.*

PUBLICATIONS (*Google scholar link*)

- **C. Jiang**, M.P. Wallace, and M.E. Thompson (2023). **Dynamic Treatment Regimes with Interference**. *The Canadian Journal of Statistics.* **51(2)**: 469 - 502. *https://doi.org/10.1002/cjs.11702*.
- C. Hong, L. Qin, **C. Jiang**, M. Qin, Y. Sun, and J.Luo (2023). **Characteristics, risk management and GMP standards of pharmaceutical companies in China**. *Frontiers in Public Health 11:1103555.doi: 10.3389/fpubh.2023.1103555*.

TEACHING EXPERIENCE

Teaching Assistant:

- STAT 341 Computational Statistics and Data Analysis – Winter 2021, UW
- STAT 444/844, CM 764 Statistical Learning - Advance Regression - Spring 2021, UW
- STAT 337 - Introduction to Biostatistics - Fall 2020, UW
- STAT 441/841/CM763: Statistical Learning - Classification - Winters 2019, UW
- STAT 241 Statistics (Advanced Level) - Winters 2018, UW
- STAT 240 Probability (Advanced Level) - Fall 2017, UW

SERVICE TO THE SCIENTIFIC COMMUNITY

Peer-review Service: *Statistics in Medicine, Journal of the American Statistical Association*
Organized invited sessions at conferences: ''Advances And Applications In Optimal Dynamic Treatment Regimes" *May 2023 SSC, Ottawa.*

REFEREES

Mary E. Thompson, Professor of Statistics & Actuarial Science at UW, Canada.
methompson@uwaterloo.ca

Mireille Schnitzer, Associate Professor of Biostatistics at Université de Montréal, Canada.
mireille.schnitzer@umontreal.ca

Denis Talbot, Professor of Biostatistics at Université Laval, Canada.
denis.talbot@fmed.ulaval.ca

Michael P. Wallace, Associate Professor of Statistics & Actuarial Science at UW, Canada.
michael.wallace@uwaterloo.ca