ZIANG ZHANG

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Education:

Ph.D. Statistical Sciences (2020 –)

University of Toronto
Supervisors: Patrick Brown, James Stafford

Honors Bachelor of Science (2016-2020)

University of Toronto
Specialist in Statistics, Minor in Mathematics and Economics
CGPA: 3.99/4.00

Affiliations:

- CANSSI Ontario STAGE Fellow Trainee, CANSSI Ontario STAGE, April 2022 - April 2024
- Doctoral Student Researcher, Centre for Global Health Research, St Michael's Hospital, March 2022 – April 2024

Research Contributions:

Submitted Papers with Preprints:

- **Zhang, Z.**, Brown, P., & Stafford, J. (2023). Efficient Modeling of Quasi-Periodic Data with Seasonal Gaussian Process. Submitted.
- **Zhang, Z.**, Stringer, A., Brown, P., & Stafford, J. (2023) Model-based Smoothing with Integrated Wiener Processes and Overlapping Splines. Under revision at the *Journal of Computational and Graphical Statistics*.

Published Papers:

- **Zhang, Z.**, & Sun, L. (2023). The hidden factor: accounting for covariate effects in power and sample size computation for a binary trait. *Bioinformatics*, 39(4), btad139.
- **Zhang, Z.**, Stringer, A., Brown, P., & Stafford, J. (2022). Bayesian inference for Cox proportional hazard models with partial likelihoods, nonlinear covariate effects and correlated observations. *Statistical Methods in Medical Research*.

Software:

- **Zhang, Z**. (2023), R package *SGPfit* (https://github.com/AgueroZZ/sGPfit): An open-source R package that implements the seasonal Gaussian process model with either state space method or the seasonal B-spline approximation.
- **Zhang, Z.**, Lin, Y. (2023), R package *OSplines* (https://github.com/Smoothing-IWP/OSplines): An open-source R package that efficiently implements model-based smoothing with the integrated Wiener's process, within a variety of Bayesian hierarchical models.
- **Zhang, Z.**, Sun, L. (2022), R package *SPCompute* (cran.rproject.org/web/packages/SPCompute): An open-source R package that does efficient power/sample size computation for genome-wide association study of binary traits, that allows different gene-covariate relationship to be accounted. This R software has been published on Comprehensive R Archive Network (CRAN), a network of ftp and web servers around the world that stores R packages of publication quality.
- **Zhang, Z.** (2020), R package *abcoxp* (https://github.com/AgueroZZ/abcoxp): An open-source R package that implements the approximate Bayesian inference for Cox PH Model on partial likelihood, which accommodates the existence of correlated survival times, semi-parametric smoothing and spatial variation.

Oral Presentations:

- **Zhang, Z.**, Stringer, A., Brown, P., & Stafford, J. (2023) Model-based Smoothing with Integrated Wiener Processes and Overlapping Splines. 2023 Joint Statistical Meetings (JSM), Toronto, Canada
- **Zhang, Z.**, Stringer, A., Brown, P., & Stafford, J. (2023) Bayesian Smoothing and Inference of Derivatives through Integrated Wiener Processes. 2023 SSC Annual Meeting, Ottawa, Canada

Poster Presentations:

- **Zhang, Z.**, Sun, L. (2023). Exploiting latent gene-environment Interaction in the analysis of binary traits. Upcoming at the American Society of Human Genetics 2023 Annual Meeting, Washington, DC, USA
- **Zhang, Z.**, Sun, L. (2022). The hidden factor: the importance of accounting for covariate effects in power and sample size computation when analyzing a binary trait. Abstract # PB3600 presented at the American Society of Human Genetics 2022 Annual Meeting, Los Angeles, USA
- **Zhang, Z.**, Sun, L. (2022). Power and Sample Size Computation for Association Analysis of a Binary Trait: Accounting for Covariate Effects. Abstract #196 presented at the International Genetic Epidemiology Society 2022 Annual Meeting, Paris, France.
- **Zhang, Z.**, Stringer, A., Brown, P., & Stafford, J.(2022). Bayesian inference for Cox Proportional Hazard Models with Partial Likelihoods, Semi-parametric Covariate Effects and Correlated Observations. Abstract presented at 2022 ISBA World Meeting. Montreal, Canada.
- **Zhang, Z.**, Sun, L. (2021). Genetic association analysis of a binary trait detects more than just the genetic effect: implications for pleiotropy and replication studies. Abstract # 3177 presented at the American Society of Human Genetics 2021 Virtual Meeting (Abstract selected for Reviewer-Choice Award).
- **Zhang, Z.**, Sun, L. (2021). Genetic association analysis of a binary trait detects more than just the genetic effect: implications for pleiotropy and replication studies. Abstract # 148 presented at the International Genetic Epidemiology Society 2021 Annual Meeting.

Services:

- Reviewer for *Journal of Multivariate Analysis*, 2023 –
- Reviewer for *Journal of the Royal Statistical Society, Series C (Applied Statistics),* 2023 -
- Reviewer for *PLOS Genetics,* 2023 -
- Reviewer for *Statistical Methods in Medical Research*, 2023 –
- Organizing committee for 2023 Statistics Graduate Student Research Day, University of Toronto

Grants and Awards:

Grants:

2023-2024 DSI-McLaughlin Centre Polygenic Risk Score Grant; Title: Addressing noncollapsibility in logistic regression when constructing polygenic risk scores for binary traits; PI and co-PI: Lei Sun, Andrew Paterson, **Ziang Zhang**. 20,000 CAD/year

Research Fellowships and Academic Awards:

2023-2024, Ontario Graduate Scholarship (OGS) - International, 15,000 CAD in total
2022-2024, CANSSI Ontario STAGE, 5,000 CAD per year
2022-2023, Mary H. Beatty Fellowships, 10,000 CAD in total
2022-2023, DoSS International Doctoral Excellence Award, 3,000 CAD in total
2021-2022, Mary H. Beatty Fellowships, 10,000 CAD in total
2020-2021, Doctor Recruitment Award, 5,000 CAD in total
2017-2019, Dr. James A. & Connie P. Dickson Scholarship In Science & Mathematics, $1400 CAD in total

Teaching Experience:

Course Instructor:

July 1st – Aug 31st: STA314: Statistical Methods for Machine Learning I

Teaching Assistant:

2023-2024: STA355: Theory of Statistical Practice
2022-2023: STA410: Statistical Computation
2022-2023: STA355: Theory of Statistical Practice
2021-2022: STA237: Probability, Statistics and Data Analysis I
2021-2022: STA261: Probability and Statistics II
2021-2022: STA447: Stochastic Processes
2021-2022: STA302: Methods of Data Analysis I
2021-2022: STA303: Methods of Data Analysis II
2020-2021: STA365: Applied Bayesian Statistics
2020-2021: STA410: Statistical Computation
2020-2021: STAC32: Applications of Statistical Methods