Jiayi (Jessie) Tong

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Education & Professional Experiences

- **Ph.D. in Biostatistics, Sep 2019 - June 2024 (Expected)**
  Department of Biostatistics, Epidemiology and Informatics
  Perelman School of Medicine at the University of Pennsylvania
  Advisor: Dr. Yong Chen

- **M.S. in Biostatistics, Sep 2019 - June 2021**
  Department of Biostatistics, Epidemiology and Informatics
  Perelman School of Medicine at the University of Pennsylvania
  Advisors: Dr. Yong Chen, Dr. Adam Cuker

- **Research Assistant, Oct 2017 - May 2019**
  Department of Biostatistics, Epidemiology and Informatics
  Perelman School of Medicine at the University of Pennsylvania
  Advisor: Dr. Yong Chen

- **B.S. with High Honors in Applied Mathematics, Sep 2014 - June 2017**
  Cum Laude
  University of California, San Diego
  Thesis title: Strongly Correlated Band Random Matrices
  Thesis paper: Random Matrices with Blocks of Intermediate Scale: Strongly Correlated Band
  Random Matrices
  Advisor: Dr. Todd Kemp

Professional Activities & Services

1. **Reviewer of Pacific Symposium on Biocomputing (PSB) 2022, 2023**

2. **Reviewer of American Medical Informatics Association (AMIA) Annual Symposium, 2019, 2020, 2021**

3. **Session chair at JSM 2021**
   Distributed Regressions in Real-World Data — Invited Papers. Section on Statistics in Epidemiology

4. **Session chair at ENAR 2021**
   Advanced Methods for Pharmacoepidemiology

5. **4th Annual Summer Institute in Statistics for Big Data (SISBID)**

Awards & Honors

- ***American Statistical Association (ASA) Philadelphia Chapter Exceptional Achievement Award for Graduate Students (2022)***
  American Statistical Association (ASA) Phidelphia Chapter

- ***Graduate Student Teaching Award (2022)***
  Graduate Group in Epidemiology and Biostatistics (GGEB) University of Pennsylvania

- ***Award for Outstanding Data Science Communication and Innovation (2021)***
  OptumLabs UnitedHealth Group, Minnetonka

- ***Department Honors in Mathematics (Applied) with High Distinction (2017)***
  https://math.ucsd.edu/_files/undergraduate/honors-program/honors-program-presentations/2016-2017/Jiayi_Tong_Honors_Thesis.pdf
  University of California, San Diego

- ***Honor society: Phi Beta Kappa (2017)***
  University of California, San Diego

- ***Provost's Honors (2015, 2016, 2017)***
  University of California, San Diego

Publications

<u>Published</u>

1. **Tong, J.**, Luo, C., Islam, M.N., Sheils, N.E., Buresh, J., Edmondson, M., Merkel, P.A., Lautenbach, E., Duan, R. and Chen, Y., (2022). Distributed learning for heterogeneous clinical data with application to integrating COVID-19 data across 230 sites. *NPJ digital medicine*, 5(1), pp.1-8.

2. **Tong, J.**, Chen, Z., Duan, R., Lo-Ciganic, W., Lyu, T., Tao, C., Merkel, P., Kranzler, H., Bian, J., Chen, Y.. (2020) Identifying Clinical Risk Factors of Opioid Use Disorder using a Distributed Algorithm to Combine Real-World Data from a Large Clinical Data Research Network. *AMIA Annu Symp Proc.* (Vol. 2020, p. 1220). American Medical Informatics Association.

3. **Tong, J.***, Duan, R.*, Li, R., Scheuemie, M. J., Moore, J. H., and Chen, Y. (2020). Robust-ODAL: Learning from heterogeneous health systems without sharing patient-level data. *In Pacific Symposium on Biocomputing* (Vol. 25, pp. 695-706).

4. **Tong, J.**, Huang, J., Chubak, J., Wang, X., Hubbard, R., and Chen, Y. (2019) An Augmented Estimation Procedure for EHR-based Association Studies Accounting for Differential Misclassification, *Journal of the American Medical Informatics Association.* 27(2), pp.244-253.

5. **Tong, J.**, Huang, J., Du, J., Cai, Y., Tao, C. and Chen, Y. (2018) The Use of Likelihood Ratio Test to Identify Rare Adverse Events with Year-varying Reporting Rates for FLU4 Vaccine in VAERS, *AMIA Annual Symposium Proceedings.* American Medical Informatics Association. (Vol. 2018, p. 1544)

6. Li, W., **Tong, J.**, Anjum, M., Mohammed, N., Chen, Y. and Jiang, X., (2022). Federated learning algorithms for generalized mixed-effects model (GLMM) on horizontally partitioned data from distributed sources. *BMC Medical Informatics and Decision Making (in press)*

7. Yin, Z., **Tong, J.**, Chen, Y., Hubbard, R.A. and Tang, C.Y., (2022). A cost-effective chart review sampling design to account for phenotyping error in electronic health records (EHR) data. *Journal of the American Medical Informatics Association.* 29(1), pp.52-61

8. Duan, R., **Tong, J.**, Lin, L., Levine, L.D., Sammel, M.D., Stoddard, J., Li, T., Schmid, C.H., Chu, H. and Chen, Y. (2021). PALM: Patient-centered Treatment Ranking via Large-scale Multivariate Network Meta-analysis. *AOAS* (In press)

9. Djulbegovic, M., **Tong, J.**, Xu, A., Yang, J., Chen, Y., Cuker, A. and Pishko, A.M., (2022). Adding caplacizumab to standard of care in thrombotic thrombocytopenic purpura: A systematic review and meta-analysis. *Blood Advances.*

10. Zhang, M., **Tong, J.**, Ma, W., Luo, C., Liu, H., Jiang, Y., Qin, L., Wang, X., Yuan, L., Zhang, J. and Peng, F., (2022). Predictors of Lung Adenocarcinoma With Leptomeningeal Metastases: A 2022 Target-Therapy Assisted molGPA Model for LM.

11. Luo, C., Islam, M., Sheils, N.E., Buresh, J., Reps, J., Schuemie, M.J., Ryan, P.B., Edmondson, M., Duan, R., **Tong, J.** and Marks-Anglin, A., (2022). DLMM as a lossless one-shot algorithm for collaborative multi-site distributed linear mixed models. *Nature communications*, 13(1), pp.1-10.

12. Rao, S., Jing, N., Liu, X., Lorman, V., Maltenfort, M., Schuchard, J., Wu, Q., **Tong, J.**, Razzaghi, H., Mejias, A. and Lee, G.M., 2022. Clinical Subphenotypes of Multisystem Inflammatory Syndrome in Children: An EHR-based cohort study from the RECOVER program. *medRxiv.*

13. Qin, B.E., Cheng, C., Luo, C., Liu, J., Xu, X.F., **Tong, J.**, Yuan, D., Chen, Y., Peng, F.H. and Jiang, Y., (2022). The effect on brain volume in HIV-negative and non-transplant cryptococcal meningitis. *Medical Mycology*, 60(9), p.myac068.

14. Luo, C., Jiang, Y., Du, J., **Tong, J.**, Huang, J., Lo Re III, V., Ellenberg, S.S., Poland, G.A., Tao, C. and Chen, Y., (2021). Prediction of post-vaccination Guillain-Barré syndrome using data from a passive surveillance system. *Pharmacoepidemiology and Drug Safety* (30(5), pp.602-609).

15. Fan, R., Zhang, Y., Xu, Y., **Tong, J.,** Chen, Z., Gu, M., Fan, W., Chen, Y., Peng, F., Jiang, Y., (2021) Serum antinuclear antibodies associate with worse prognosis in AQP4-positive neuromyelitis optica spectrum disorder. *Brain and Behavior*, p.e01865.

16. Paydary, K., Banwell, E., **Tong, J.**, Chen, Y. and Cuker, A., (2020). Diagnostic accuracy of the PLASMIC score in patients with suspected thrombotic thrombocytopenic purpura: A systematic review and meta-analysis. *Transfusion*, 60(9), pp.2047-2057.

17. Duan, R., Chen Z., **Tong, J.**, Luo, C., Lyu, T., Tao, C., Maraganore, D., Bian, J. and Chen, Y.. (2020) Leverage real-world longitudinal data in large clinical research networks for Alzheimer's disease and related dementia. *AMIA Annu Symp Proc.* (Vol. 2020, p. 393). American Medical Informatics Association.

18. Duan, R., Luo, C., Schuemie, M.J., **Tong, J.**, Liang, J., Boland, M.R., Bian, J., Xu, H., Berlin, J.A., Moore, J.H., Mahoney, K.B. and Chen, Y., (2020). Learning from local to global - an efficient distributed algorithm for modeling time to event data. *Journal of the American Medical Informatics Association*, 27(7), pp.1028-1036.

19. Hubbard, R. A., **Tong, J.**, Duan, R., Chen, Y. (2020). Reducing Bias Due to Outcome Misclassification for Epidemiologic Studies Using EHR-derived Probabilistic Phenotypes. *Epidemiology*, 31(4), pp.542-550.

20. Li, R., **Tong, J.**, Duan, R., Chen, Y. and Moore, J.H., (2019). Evaluation of phenotyping errors on polygenic risk score predictions. *International Conference on Bioinformatics Models, Methods and Algorithms* (in press).

21. Liang, J., Liu, J., Fan, R., Chen, Z., Chen, X., **Tong, J.**, Chen, Y., Peng, F. and Jiang, Y., (2019). Plasma Homocysteine Level Is Associated with the Expanded Disability Status Scale in Neuromyelitis Optica Spectrum Disorder. *Neuroimmunomodulation*, 26(5), pp.258-264.

22. Chiasakul, T., Jesus, E., **Tong, J.**, Chen, Y., Crowther, M., Garcia, D., Chai-Adisaksopha, C., Messe, S. and Cuker, A. (2019) Inherited Thrombophilia and the Risk of Arterial Ischemic Stroke: A Systematic Review and Meta-Analysis. *Journal of the American Heart Association*, 8(19), e012877.

23. Huang, J., Zhang, X., **Tong, J.**, Du, J., Duan, R., Yang, L., Moore, J.H., Tao, C. and Chen, Y., (2019). Comparing drug safety of hepatitis C therapies using post-market data. *BMC medical informatics and decision making*, 19(4), p.147.

24. Luo, C., Zhang, X., Yang, L., Du, J., **Tong, J.**, Huang, J., Tao, C. and Chen, Y., (2019), August. Rare adverse effects analysis of new generation hepatitis C medications using EMR and FAERS data.*Pharmacoepidemiology and Drug Safety* (Vol. 28, pp. 580-581). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.

25. Huang, J., Zhang, X., **Tong, J.**, Du, J., Duan, R., Yang, L., Moore, J.H., Chen, Y. and Tao, C. (2018). Comparing adverse effects of Hepatitis C drugs using FAERS data. *In 2018 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)* (pp. 1653-1656). IEEE.

Under review/Under revision/Preprints

26. **Tong, J.**, Qu, A., Carroll, R., Yang, N., and Chen, Y. (2022) On the proportional likelihood ratio model for sparse data. (Under review by *Biostatistics*).

27. **Tong, J.**, Duan, R., Li, R., Luo, C., Moore. J.H., Zhu, J., Foster, G.D., Volpp, K.G., Yancy, W.S., Shaw, P.A., and Chen, Y. (2022). Quantifying and correcting bias due to outcome dependent self-reported weights in longitudinal study of weight loss interventions (Under review by *Scientific Reports*).

28. **Tong, J.**, Shen, Y., Xu, A., Luo, C., Edmondson, M., Li, R., Siegel, L., Sun, L., Bian, J., Wang, D., He, K., Morton, S.C., Asch, D.A., and Chen, Y. (2022) A federated learning algorithm to quantify racial disparities in kidney graft failure rates using US registry data from 29,468 patients across 149 transplant centers (Under review by *Scientific Reports*).

29. **Tong, J.**, Hubbard, R.A., Saine, M.E., Xu, H., Zuo, X., Kimmel, S.E., Cuker, A. and Chen, Y., (2022). Advancing timely and reliable evidence synthesis in the era of COVID-19: A novel method for including preprints in systematic reviews. (Under review *by Journal of the American Medical Informatics Association*).

30. **Tong, J.**, Hubbard, R.A., Saine, M.E., Xu, H., Zuo, X., Kimmel, S.E., Cuker, A., Chen, Y. (2022). A New Approach for Timely Systematic Reviews of Rapidly Evolving Research: Identifying Evidence in Which We Can Place Our Confidence. *medRxiv.*

31. **Tong, T.**, Li, L., Rao, S., Edmondson, M., Lorman, V., Razzaghi, H., Chu, H., Forrest, C.B., Chen, Y. (2022) ODAP-B: A One-shot Distributed Algorithm for Modified Poisson Regression Approach for Prospective Studies with Binary Data (Under review by *American Journal of Epidemiology*)

32. Abene, J., **Tong, J.**, Chen, Y., Chao, A (2022) Binge Eating and Food Insecurity: A Systematic Review (Under revision by *International Journal of Eating Disorders*)

33. Duan, R,. **Tong, J.**, Asch, D., Sutton, A., Chu, H., Schmid, C., Chen, Y. (2022) Origami plot: a novel tool for visualizing multivariate data, (Under review by *Journal of Clinical Epidemiology*)

34. Tara Trujillo, T., Duan, R., **Tong, J.**, Chen, Y., Stoddard, J. Testing Multiple Outcomes Across Mental Health Treatment Options: An Example Using Antidepressants, (Under review)

35. Duan, R., Piao, J., Marks-Anglin, A., **Tong, J.**, Lin, L., Chu, H., Ning, J., Chen, Y. (2022) Testing for publication bias in meta-analysis under Copas selection model. *arXiv preprint* arXiv:2007.00836. (Under review by *Journal of the Royal Statistical Society: Series A*)

36. Liang, W., **Tong, J.**, Cappola, A. , Carroll, R., Chu, H., and Chen., Y. (2022) On Robust Inference for Reference Ranges, (Under reivew by *Biometrika*)

In preparation

37. **Tong, J.**, Reps, J., Luo, C., Bian, J., Brand, M., Chen, Z., DuVall, S., Falconerh, T., He, K., Mayer, M.A., Mayer, A., Patel, B., Wang, D., Xu, H., Zhou, Y., Chu, H., Schuemie, M., Ramírez-Anguita, J.M., Ryan, P., Williams, R., Wernerm, R., Asch, D., and Chen, Y. (2022). Secure federated hospital profiling using real-world data (To be submitted to *Nature Methods*).

38. **Tong, J.**, Islam, N., Buresh, J., Chu, H., Chen, Y. and Sheils, N.(2022) Which one to report? Odds ratio or Relative risk, (To be submitted to *American Journal of Epidemiology*).

39. Lu, Y.*,**Tong, J.***, Hubbard, R., and Chen, Y. (2022) An Augmented Estimation Procedure for EHR-based Association Studies with Multiple Surrogate Outcomes (To be submitted to *Journal of the American Medical Informatics Association*)

40. Shen, Y., **Tong, J.**, Wu, Q., Forrest, C., Chen, Y. Distributed Assumption Lean (To be submitted to *NPJ Digital Medicine*)

41. Zhang, D.,**Tong, J.**, Jing, N., Luo, C., Carroll, R., Forrest, C., and Chen, Y. (2022) One-Shot Distributed Algorithms for Competing Risks Models (ODACoR) using Real-world Time-to-event Data (To be submitted to *Journal of the American Medical Informatics Association*)

42. Wu, Q., Pajor, N.M., **Tong, J.**, Forrest, C.B., and Chen, Y. (2022) Advancing learning health system via targeted causal inference of heterogeneous effect of COVID-19 exposure on healthcare utility outcomes - findings from RECOVER EHR study (To be submitted to *Nature Communications*)

43. Chisolm, D., Webb, R., Salamon, K.S., Schuchard, J., Mendonca, E.A., Sills, M.R., Prahalad, P., Patel, P., **Tong, J.,**, Zhang, D., Chen, Y., Musante, J., Bailey, C.L., Christakis, D., Forrest, C.B., Jhaveri, R., Pajor, N.M., Rao, S., Razzaghi, H., Thacker, D., Lee, G., and Mejias, Asun. (2022) Pediatric COVID-19 and community level social determinants of health: An EHR-based cohort study from the RECOVER program (To be submitted to *Pediatrics*)

44. Yin. Z, **Tong, J.**, Chen., Y. Tang. C (2022) Statistical Inference of M-estimations with Distributed Data (To be submitted to *Journal of the American Statistical Association*)

45. Lake, E., Zhang, B., Mpundu, G., Gross, K., Chen, Y., and **Tong, J.**[†], (2022) Practice Environment Scale of the Nursing Work Index: A Descriptive Statistics Meta-Analysis (In preparation)

46. Wang, Y., Ye, Z., **Tong, J.**, Tang. C., Chen., Y. (2022) Analysis of Time to Event Data Under Two-Layer Censoring. (In preparation)

   [*]: co-first author; [†]: corresponding author; [#]: co-corresponding author

Oral Presentations

1. **Tong, J.**, Yang, N., Islam, N., Qu, A. and Chen, Y. (2022) On the proportional likelihood ratio model for sparse data. **2022 Joint Statistical Meetings (JSM)**, Washington DC, July 2022.

2. **Tong, J.**, Hubbard, R., Saine, E., Xu, H., Zuo, X., Kimmel, S., Umscheid, S., Cuker, A. and Chen, Y. (2021) Advancing timely and reliable evidence synthesis for COVID-19 research by including preprints in systematic reviews. **Eastern North American Region (ENAR)**, virtual March 2022.

3. **Tong, J.**, Hubbard, R., Saine, E., Xu, H., Zuo, X., Kimmel, S., Umscheid, S., Cuker, A. and Chen, Y. (2021) Advancing timely and reliable evidence synthesis for COVID-19 research by including preprints in systematic reviews. **The 34th New England Statistics Symposium (NESS)**, **invited session**, virtual October 2021.

4. **Tong, J.**, Hubbard, R., Saine, E., Xu, H., Zuo, X., Kimmel, S., Umscheid, S., Cuker, A. and Chen, Y. (2021) Advancing timely and reliable evidence synthesis for COVID-19 research by including preprints in systematic reviews **2021 Joint Statistical Meetings (JSM)**, virtual August 2021.

5. **Tong, J.**, Luo, C., Islam, M.N., Sheils, N., Buresh, J., Edmondson, M., Merkel, P.A., Lautenbach, E., Duan, R. and Chen, Y. (2021) Distributed Binary Regression of Electronic Health Records Data Across Heterogeneous Clinical Sites **Eastern North American Region (ENAR)**, virtual March 2021.

6. **Tong, J.**, Chen, Z., Duan, R., Lo-Ciganic, W., Lyu, T., Tao, C., Merkel, P., Kranzler, H., Bian, J., Chen, Y.. (2020) Identifying Clinical Risk Factors of Opioid Use Disorder using

a Distributed Algorithm to Combine Real-World Data from a Large Clinical Data Research Network, **AMIA 2020 Annual Symposium**, virtual Nov 2020.

7. Duan, R., Chen Z., **Tong, J.**, Luo, C., Lyu, T., Tao, C., Maraganore, D., Bian, J. and Chen, Y.. (2020) Leverage real-world longitudinal data in large clinical research networks for Alzheimer's disease and related dementia, **AMIA 2020 Annual Symposium**, virtual Nov 2020.

8. **Tong, J.**, Ren, B., Liu, Y., Moore, J., Xu, H. and Chen, Y. (2020) Xmeta-COVID19: A Comprehensive Web-based Toolbox for Meta-analysis on COVID19 Research, **2020 OHDSI**, virtual Oct 2020.

9. **Tong, J.**, Luo, C., Duan, R., and Chen, Y. (2020) Distributed Learning From EHR across Multiple Heterogenous Clinical Sites, **2020 Joint Statistical Meetings (JSM)**, virtual July 2020.

10. **Tong, J.**, Huang, J., Chubak, J., Wang, X., Hubbard, R., and Chen, Y. (2020) An Augmented Estimation Procedure for EHR-based Association Studies, **Eastern North American Region (ENAR)**, virtual March 2020.

11. **Tong, J.***, Duan, R.*, Li, R., Scheuemie, M. J., Moore, J. H., and Chen, Y. (2020). Robust-ODAL: Learning from heterogeneous health systems without sharing patient-level data. **Pacific Symposium on Biocomputing**, Hawaii Jan 2020

12. **Tong, J.**, Li, R., Zhou, D., Duan, R., Moore, J., and Chen, Y. (2019) Improving the reproducibility of EHR-based association studies for pleiotropic effects by accounting for phenotyping errors, **Eastern North American Region (ENAR)**, Philadelphia Oct 2019.

13. **Tong, J.**, Huang, J., Du, J., Cai, Y., Tao, C. and Chen, Y. (2018) The Use of Likelihood Ratio Test to Identify Rare Adverse Events with Year-varying Reporting Rates for FLU4 Vaccine in VAERS, **AMIA 2018 Annual Symposium**, San Francisco Nov 2018.

Poster Presentations

14. **Tong, J.**, Reps, J., Luo, C., Bian, J., Brand, M., Chen, Z., DuVall, S., Falconerh, T., He, K., Mayer, M.A., Mayer, A., Patel, B., Wang, D., Xu, H., Zhou, Y., Chu, H., Schuemie, M., Ramírez-Anguita, J.M., Ryanb, P., Williams, R., Wernerm, R., Asch, D., and Chen, Y. Secure federated hospital profiling using real-world data, **OHDSI 2022**, October 2022.

15. **Tong, J.**, Shen, Y., Xu, A., Luo, C., Edmondson, M., Li, R., Siegel, L., Sun, L., Bian, J., Wang, D., He, K., Morton, S.C., Asch, D.A., and Chen, Y. (2022) A federated learning algorithm to quantify racial disparities in kidney graft failure rates using US registry data from 29,468 patients across 149 transplant centers (2022), **OHDSI 2022**, October 2022.

16. **Tong, T.**, Li, L., Rao, S., Edmondson, M., Lorman, V., Razzaghi, H., Chu, H., Forrest, C.B., Chen, Y. ODAP-B: A One-shot Distributed Algorithm for Modified Poisson Regression for Prospective Studies with Binary Data (2022), **OHDSI 2022**, October 2022.

17. Chen, Y., **Tong, J.**, Luo, C., Li, L., Lu, Y., Shu, H. PDA-OTA: Privacy-preserving Distributed Algorithms Over the Air, an OHDSI journey (2022) **OHDSI 2022**, October 2022.

18. **Tong, J.**, Yang, N., Islam, N., Qu, A. and Chen, Y. (2022) On the proportional likelihood ratio model for sparse data. **2022 Joint Statistical Meetings (JSM)**, July 2022.

19. **Tong, J.**, Duan, R., Liu, Y., Hong, C., Chi, K., and Chen, Y. (2018) A Comprehensive Toolbox for Advanced Meta-analysis, **2018 DBEI & CCEB Research Day**, University of Pennsylvania, Philadelphia April 2018.

Research/Job Experiences

1. ***Data Scientist and Research Graduate Intern***
   OptumLabs Unitedhealth Group   *Jun 2021 - Aug 2021*
   Advisors: Dr. Natalie Sheils, Dr. Nazmul Islam   *Minnetonka, MN*

   - Research on two commonly used relative measures in biomedical and epidemiologic research studies: odds ratio and relative risk.
   - Investigated the difference between two measures through simulation study with a wide spectrum of settings and use cases with real-world claims data from UnitedHealth Group database.

2. ***Research Assistant***
   The Perelman School of Medicine, University of Pennsylvania   *Oct 2017 - Sep 2019*
   Advisor: Dr. Yong Chen   *Philadelphia, PA*

   - Statistical methodology development: worked with collaborators and developed an augmented method to handle misclassified phenotype in EHR data to improve reproducibility in EHR-based findings; applied the augmented method to multiple datasets.
   - Applied projects: applied a pairwise likelihood model to Keep it Off study, a three-arm randomized controlled trial study to analyze weight loss data that could be potentially missing not at random; applied semiparametric proportional likelihood ratio model to analyze the length of hospitalization with data from Penn ICU.
   - Collaborative projects: collaborated concurrently on multiple projects, including post-marketing pharmacovigilance study (e.g., vaccine safety) with medical informaticians from UTHealth and meta-analysis with physicians from Penn Medicine.
   - Web and module development: built and added interactive online meta-analysis module to *XMETA* (`https://www.xmeta.org/`), which is aimed to assist the doctors without prior programming experience to conduct meta-analyses.

3. ***Research Assistant***
   Department of Mathematics, UC San Diego   *Jun 2016 - Jun 2017*
   Advisor: Dr. Todd Kmep   *La Jolla, CA*

   - Designed "Maximally Correlated Band Random Matrices"; performed simulations using different distributed entries and investigated the pattern of the eigenvalues.
   - Proposed and proved eigenvalue pattern with Wick's Theorem and the method of matrix moment.
   - Wrote thesis paper "Random Matrices with Blocks of Intermediate Scale Strongly Correlated Band Matrices", which was awarded High Distinction Honors.

Teaching Experience

1. **Teaching Assistant** *August 2022*
JSM 2022 Professional Development Continuing Education Course: Practical Solutions for Working with Electronic Health Records Data *Washington, DC*

2. **Teaching Assistant** *July 2022*
27th Summer Institute in Statistical Genetics (SISG) – Regression methods: concepts and applications *Virtual*

3. **Teaching Assistant** *Nov 2021 - Present*
BSTA 754: Advanced Survival Analysis *Philadelphia, PA*

4. **Teaching Assistant** *Sep 2021 - Nov 2021*
BSTA 656: Longitudinal Data Analysis *Philadelphia, PA*

5. **Teaching Assistant** *Nov 2020 - Dec 2020*
BSTA 660: Design of Observational Studies *Philadelphia, PA*

6. **Teaching Assistant** *Sep 2020 - Nov 2020*
BSTA 661: Design Of Interventional Studies *Philadelphia, PA*

Memberships

1. **American Statistical Association** *2019 - Present*

2. **Eastern North American Region (ENAR)** *2019 - Present*

Computing Skills

- R, MATLAB, Python, JAVA, SQL