

# LU TANG

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## EDUCATION

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| 2018 | <b>University of Michigan</b><br>Ph.D. in Biostatistics<br>Thesis: <i>Statistical Methods of Data Integration, Model Fusion, and Heterogeneity Detection in Big Biomedical Data Analysis</i>                                 | Ann Arbor, MI                           |
| 2013 | <b>University of Virginia</b><br>M.S. in Statistics  | Charlottesville, VA                     |
| 2012 | <b>University of Virginia</b><br>B.A. in Mathematics, minor in Computer Science<br><b>Sun Yat-sen University</b><br>Studied Information and Computational Science 2008–2010<br>Transferred to University of Virginia in 2010 | Charlottesville, VA<br>Guangzhou, China |

## PROFESSIONAL APPOINTMENTS AND EXPERIENCE

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| 2018–Present | <b>Assistant Professor</b><br>Department of Biostatistics<br>School of Public Health<br>University of Pittsburgh, Pittsburgh, PA   |  |
| 2013–2018    | <b>Graduate Student Research Assistant</b><br>Children’s Environmental Health and Disease Prevention Research Center<br>School of Public Health<br>University of Michigan, Ann Arbor, MI<br><i>Advisor: Peter X.K. Song; Principal Investigator: Karen E. Peterson</i> |  |
| 2017 Summer  | <b>Graduate Data Science Intern</b><br>A9.com, Inc. (Amazon.com, Inc.), Palo Alto, CA  |  |
| 2012–2013    | <b>Research Assistant</b><br>Predictive Technology Laboratory<br>University of Virginia, Charlottesville, VA<br><i>Principal Investigator: Matthew S. Gerber</i>   |  |

## MEMBERSHIP IN PROFESSIONAL SOCIETIES

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| 2018–Present | Member, International Chinese Statistical Association (ICSA)                  |
| 2015–Present | Member, American Statistical Association (ASA)                                |
| 2014–Present | Member, International Biometric Society, Eastern North American Region (ENAR) |

## HONORS AND AWARDS

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2022	Faculty Computing Award, University of Pittsburgh School of Public Health
2021	Nominated for James L. Craig Excellence in Education Award, University of Pittsburgh School of Public Health
2019	New Researcher Conference Travel Award, Institute of Mathematical Statistics.
2018	Outstanding Contribution in Reviewing, Journal of Multivariate Analysis
2017	Kaggle Prediction Challenge Third Place, Michigan Student Symposium for Interdisciplinary Statistical Sciences
2016	Poster Award, Michigan Institute for Data Science Annual Symposium
2015	ENAR Best Poster Award
2014–2016	Conference Travel Grant, University of Michigan Rackham Graduate School
2012	Outstanding Student Scholarship, University of Virginia Department of Statistics
2012	Induction into <i>Pi Mu Epsilon</i> Honorary Mathematics Society
2011, 2012	Dean's List, University of Virginia College of Arts and Sciences
2009	Sun Yat-sen University Merit-based Scholarship

## PUBLICATIONS

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<sup>+</sup>: as the senior/corresponding author

<sub>-</sub>: student advisee supervision/co-supervision

### Refereed Articles

1. Ahrens, K., Sharbaugh, M., Jarlenski, M.P., **Tang, L.**, Allen, L., Austin, A.E., Barnes, A.J., Burns, M.E., Clark, S., Zivin, K., Mack, A., Liu, G., Mohamoud, S., McDuffie, M.J., Hammerslag, L., Gordon, A.J., and Donohue, J.M. (2023). Prevalence of testing for HIV, HBV, and HCV among Medicaid enrollees treated with medications for opioid use disorder in 11 states, 2016-2019. *Clinical Infectious Diseases*. (Accepted)
2. Tan, X., Qi, Z., Seymour, C.W., and **Tang, L.**<sup>+</sup> (2022). RISE: Robust individualized decision learning with sensitive variables. *Advances in Neural Information Processing Systems (NeurIPS 2022)*. [An earlier version won Distinguished Student Paper Award at International Biometric Society ENAR 2023.]
3. Smart, R., Kim, J.Y., Kennedy, S., **Tang, L.**, Allen, L., Crane, D., Mack, A., Mohamoud, S., Pauly, N., Perez, R., and Donohue, J.M. (2022). Association of polysubstance use disorder with treatment quality among Medicaid beneficiaries with opioid use disorder. *Journal of Substance Abuse Treatment*, 114, 108921.
4. Cole, E.S., Allen, L., Austin, A., Barnes, A., Chang, C.H., Clark, S., Crane, D., Cunningham, P., Fry, C., Gordon, A.J., Hammerslag, L., Idala, D., Kennedy, S., Kim, J.Y., Krishnan, S., Lanier, P., Mahakalanda, S., Mauk, R., McDuffie, M.J., Mohamoud, S., Talbert, J., **Tang, L.**, Zivin, K., and Donohue, J.M. (2022). Outpatient Follow-Up and Use of Medications for Opioid Use Disorder after Residential Treatment among Medicaid Enrollees in 10 States. *Drug and Alcohol Dependence*, 241, 109670.
5. Goodrich, J.M., **Tang, L.**, Carmona, Y.R., Meijer, J.L., Perng, W., Watkins, D.J., Meeker, J.D., Mercado-Garcia, A., Cantoral, A., Song, P.X., Tellez-Rojo, M.M., and Peterson, K.E. (2022).

Trimester-specific phthalate exposures in pregnancy are associated with circulating metabolites in children. *PLOS One*, 17(8), p.e0272794.

6. Tan, X., Chang, C.H., Zhou, L., and **Tang, L.**<sup>+</sup> (2022). A tree-based model averaging approach for personalized treatment effect estimation from heterogeneous data sources. *Proceedings of the 39<sup>th</sup> International Conference on Machine Learning (ICML 2022)*.  
[An earlier version won Student Research Award at New England Statistics Symposium (NESS) 2022 and received Honorable Mention at Joint Statistical Meetings (JSM) 2021 SLDS Section Student Paper Competition.]
7. Burns, M., **Tang, L.**, Chang, C.H., Kim, J.Y., Ahrens, K., Lindsay, A., Cunningham, P., Gordon, A., Jarlenski, M.P., Lanier, P., Mauk, R., McDuffie, M.J., Mohamoud, S., Talbert, J., Zivin, K., and Donohue, J.M. (2022). Duration of medication treatment for opioid-use disorder and risk of overdose among Medicaid enrollees in eleven states: A retrospective cohort study. *Addiction*, 117(12), 3079–3088.
8. Zivin, K., Lindsay, A., Barnes, A., Junker, S., Kim, J.Y., **Tang, L.**, Kennedy, S., Ahrens, K.A., Burns, M., Clark, S., Cole, E., Crane, D., Idala, D., Lanier, P., Mohamoud, S., Jarlenski, M., McDuffie, M.J., Talbert, J., Gordon, A.J., and Donohue, J.M. (2022). Design, implementation, and evolution of the Medicaid Outcomes Distributed Research Network (MODRN). *Medical Care*, 60(9), 680–690.
9. Cunningham, P., Barnes, A., Mohamoud, S., Allen, L., Talbert, J., Jarlenski M.P., Kim, J.Y., Gordon, A.J., **Tang, L.**, Chang, C.H., Junker, S., Mauk, R., Ahrens, K., Austin, A.E., Clark, S., McDuffie, M.J., Kennedy, S., Donohue, J.M., and Burns, M. (2022). Follow-up visits after ED visits for opioid use disorder: Do they reduce future overdoses? *Journal of Substance Abuse Treatment*, 142, 108807.
10. Cohen, C.C., Dabelea, D., Michelotti, G., **Tang, L.**, Shankar, K., Goran, M.I., and Perng, W. (2022). Metabolome alterations linking sugar-sweetened beverage intake with dyslipidemia in youth: the Exploring Perinatal Outcomes among Children (EPOCH) study. *Metabolites*, 12(6), 559.
11. Jarlenski, M., Chen, Q., Ahrens, K.A., Allen, L., Austin, A.E., Chappell, C., Donohue, J.M., Hammerslag, L., Lanier, P., McDuffie, M.J., Talbert, J., **Tang, L.**, and Krans, E.E. (2022). Postpartum follow-up care for pregnant persons with opioid use disorder and hepatitis C virus infection. *Obstetrics & Gynecology*, 139(5), 916–918.
12. Marchlewicz E., McCabe C., Djuric Z., Hoenerhoff M., Barks J., **Tang L.**, Song P.X., Peterson K.E., Padmanabhan V., and Dolinoy D.C. (2022). Gestational exposure to high fat diets and bisphenol A alters metabolic outcomes in dams and offspring, but produces hepatic steatosis only in dams. *Chemosphere*, 286(2), 131645.
13. Wang, F., Zhou, L., **Tang, L.**, and Song, P.X. (2021). Method of contraction-expansion (MOCE) for simultaneous inference in linear models. *Journal of Machine Learning Research*, 22(192), 1–32.
14. Donohue, J.M., Jarlenski, M., Kim, J.Y., **Tang, L.**, Ahrens, K., Allen, L., Austin, A., Barnes, A.J., Burns, M., Chang, C.H., Clark, S., Cole, E., Crane, D., Cunningham, P., Idala, D., Junker, S., Lanier, P., Mauk, R., McDuffie, M.J., Mohamoud, S., Pauly, N., Sheets, L., Talbert, J., Zivin, K., Gordon, A.J., and Kennedy, S. (2021). Use of medications for treatment of opioid use disorder among US Medicaid enrollees in 11 states, 2014–2018. *Journal of the American Medical Association*,

326(2), 154–164.

15. Li, Y., Rahman, T., Ma, T., **Tang, L.**, and Tseng, G. (2021). A sparse negative binomial mixture model for clustering RNA-seq count data. *Biostatistics*. DOI: 10.1093/biostatistics/kxab025.
16. Yu, F., Saand, A., Xing, C., Lee, J.W., Hsu, L., Palmer, O.P., Jackson, V., **Tang, L.**, Ning, M., Du, R., Kochanek, P.M., Lo, E.H., and Chou, S.H. (2021). CSF lipocalin-2 increases early in subarachnoid hemorrhage are associated with neuroinflammation and unfavorable outcome. *Journal of Cerebral Blood Flow & Metabolism*, 41(10), 2524–2533.
17. **Tang, L.**<sup>+</sup>, and Song, P.X. (2021). Post-stratification fusion learning in longitudinal data analysis. *Biometrics*, 77(3), 914–928.
18. Goodrich, J.M., Hector, E.C., **Tang, L.**, LaBarre, J.L., Dolinoy, D.C., Mercado-Garcia, A., Cantoral, A., Song, P.X., Tellez-Rojo, M.M., and Peterson, K.E. (2020). Integrative analysis of gene-specific DNA methylation and untargeted metabolomics data from the ELEMENT cohort. *Epigenetics Insights*, 13, 1–10.
19. **Tang, L.**, Zhou, Y., Wang, L., Purkayastha, S., Zhang, L., He, J., Wang, F., and Song, P.X. (2020). A review of multi-compartment infectious disease models. *International Statistical Review*, 88(2), 462–513.  
[Top Cited Article 2020-2021 in International Statistical Review.]
20. LaBarre, J.L., Peterson, K.E., Kachman, M.T., Perng, W., **Tang, L.**, Hao, W., Zhou, L., Karnovsky, A., Cantoral, A., Tellez-Rojo, M.M., Song, P.X., and Burant C.F. (2020). Mitochondrial nutrient utilization underlying the association between metabolites and insulin resistance in adolescents. *The Journal of Clinical Endocrinology & Metabolism*, 105(7), 2442–2455.
21. Wang, L., Zhou, Y., He, J., Zhu, B., Wang, F., **Tang, L.**, Kleinsasser, M., Barker, D., Eisenberg, M., and Song, P.X. (2020). An epidemiological forecast model and software assessing interventions on COVID-19 epidemic in China. *Journal of Data Science*, 18(3), 409–432.
22. **Tang, L.**, Zhou, L., and Song, P.X. (2020). Distributed simultaneous inference in generalized linear models via confidence distribution. *Journal of Multivariate Analysis*, 176, 104567.
23. Dai, Y., Shan, W., Yang, Q., Guo, J., Zhai, R., Tang, X., **Tang, L.**, Tan, Y., Cai, Y., and Chen, X. (2019). Biomarkers of iron metabolism facilitate clinical diagnosis in mycobacterium tuberculosis infection. *Thorax*, 74(12), 1161–1167.
24. Perng, W., Tamayo-Ortiz, M., **Tang, L.**, Sanchez, B.N., Cantoral, A., Solano-Gonzalez, M., Meeker, J., Dolinoy, D., Roberts, E., Schnaas, L., Watkins, D., Goodrich, J., Lee, R.C., Bautista, L.F., Lamadrid-Figueroa, H., Mercado-Garcia, A., Martinez-Mier, E.A., Song, P.X., Ettinger, A., Wright, R., Arora, M., Hu, H., Hernandez-Avila, M., Tellez-Rojo, M.M., and Peterson, K.E. (2019). Cohort profile paper: The early life exposure in Mexico to environmental toxicants (ELEMENT) project. *BMJ Open*, 9(8).
25. Perng, W., **Tang, L.**, Song, P.X., Goran, M., Tellez-Rojo, M.M., Cantoral, A., and Peterson, K.E. (2019). Urate and nonanoate mark the relationship between sugar-sweetened beverage intake and blood pressure in adolescent girls: A metabolomics analysis in the ELEMENT cohort. *Metabolites*, 9(5), 100.

26. **Tang, L.**, Zhou, L., and Song, P.X. (2019). Fusion learning algorithm to combine partially heterogeneous Cox models. *Computational Statistics*, 34(1), 395–414.
27. Perng, W., **Tang, L.**, Song, P.X., Tellez-Rojo, M.M., Cantoral, A., and Peterson, K.E. (2019). Metabolomic profiles and development of metabolic risk during the pubertal transition: A prospective study in the ELEMENT project. *Pediatric Research*, 85(3), 262–268.
28. **Tang, L.**, Chaudhuri, S., Bagherjeiran, A., and Zhou, L. (2018). Learning large scale ordinal ranking model via divide-and-conquer technique. *Companion Proceedings of The Web Conference 2018*, 1901–1909.
29. Zhou, L., **Tang, L.**, Song, A.T., Cibrik, D., and Song, P.X. (2017). A LASSO method to identify protein signature predicting post-transplant renal graft survival. *Statistics in Biosciences*, 9(2), 431–452.
30. **Tang, L.**, and Song, P.X. (2016). Fused LASSO approach in regression coefficients clustering – Learning parameter heterogeneity in data integration. *Journal of Machine Learning Research*, 17(113), 1–23.
31. Marchlewicz, E.H., Dolinoy, D.C., **Tang, L.**, Milewski, S., Jones, T.R., Goodrich, J.M., Soni, T., Domino, S.E., Song, P.X., Burant, C., and Padmanabhan, V. (2016). Lipid metabolism is a key mediator of developmental epigenetic programming. *Scientific Reports*, 6, 34857.
32. Gerber, M.S., and **Tang, L.** (2013). Automatic quality control of transportation reports using statistical language processing. *IEEE Transactions on Intelligent Transportation Systems*, 14(4), 1681–1689.

### Selected Preprints

33. Fu, H., **Tang, L.**, Rosen, O., Hipwell, A.E., Huppert, T.J., and Krafty, R.T. Covariate-guided Bayesian mixture model for multivariate time series. *arXiv preprint*. arXiv:2301.01373. [**Received Honorable Mention at Joint Statistical Meetings (JSM) 2023 MDD Section Student Paper Competition.**]
34. Liu, P., Fang, Y., Ren, Z., **Tang, L.**, and Tseng, G. Outcome-guided disease subtyping for high-dimensional omics data. *arXiv preprint*. arXiv:2007.11123. [**An earlier version won Distinguished Student Paper Award at International Biometric Society ENAR 2020.**]

### Book Chapters

35. Hector, E.C., **Tang, L.**, Zhou, L., and Song, P.X. (2023+). Data integration and fusion in the Bayesian and Frequentist frameworks. Chapter in *Handbook of Bayesian, Fiducial, and Frequentist Inference*. Tentatively accepted, in press.

### Other Published Articles

36. **Tang, L.** (2021). Discussion on “The timing and effectiveness of implementing mild interventions of COVID-19 in large industrial regions via a synthetic control method” by Tian et al. *Statistics and Its Interface*, 14(1), 13–14.

37. **Tang, L.** (2020). Discussion of “Tracking reproductivity of COVID-19 epidemic in China with varying coefficient SIR model”. *Journal of Data Science*, 18(3), 475–476.
38. **Tang, L.** (2018). *Statistical Methods of Data Integration, Model Fusion, and Heterogeneity Detection in Big Biomedical Data Analysis*. [PhD Thesis] Ann Arbor, MI. University of Michigan.

Google Scholar – <https://scholar.google.com/citations?user=1D6kQ18AAAAJ&hl=en>

My Bibliography – <https://www.ncbi.nlm.nih.gov/myncbi/1xQzjv50nqak3/bibliography/public>

## SOFTWARE

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### *Data Integration*

- **ifedtree**: R package for federated learning of causal treatment effects from heterogeneous data sources (on Github). See details in Tan et al. (ICML 2022).
- **metafuse**: R package for GLM regression parameter fusion (on CRAN). See details in Tang and Song (JMRL 2016).
- **modac**: Python MapReduce implementation of GLM for Hadoop Distributed File Systems (on GitHub).

### *Decision Rule Learning*

- **RISE**: Python package for robust individualized decision rule learning with sensitive variables (on Github). See details in Tan et al. (NeurIPS 2022).

### *Variable Selection*

- **pgee**: R implementation of penalized GEE with LASSO, SCAD and MCP (on GitHub).

### *Infectious Disease Modeling*

- **eSIR**: R package for extended SIR model (on GitHub). See details in Wang et al. (JDS 2020).

Links to software available at [www.pitt.edu/~lutang](http://www.pitt.edu/~lutang)

## PATENTS

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1. Chaudhuri, S., **Tang, L.**, and Bagherjeiran, A.H. (2022). *Learning Ordinal Regression Model via Divide-and-Conquer Technique* (U.S. Patent No. US 11,269,974).

## PRESENTATIONS

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### Invited

1. International Biometrics Society WNAR Annual Meeting, Anchorage, AK. June 2023.
2. ICSA Applied Statistics Symposium, Ann Arbor, MI. June 2023.
3. Department of Statistics, University of Rajshahi, Rajshahi, Bangladesh. April 2023. (virtual)
4. International Biometrics Society ENAR Spring Meeting, Nashville, TN. March 2023.

5. Biostatistics and Computational Biology Branch (BCBB), National Institute of Environmental Health Sciences (NIEHS), Durham, NC. March 2023.
6. CMStatistics, London, UK. December 2022. (virtual)
7. Department of Biostatistics and Informatics, Colorado School of Public Health, Denver, CO. March 2022. (virtual)
8. CMStatistics, London, UK. December 2021. (virtual)
9. Division of Biostatistics, University of Minnesota, Minneapolis, MN. September 2021. (virtual)
10. ICSA Applied Statistics Symposium. September 2021. (virtual)
11. Quality and Productivity Research Conference (QPRC), Tallahassee, FL. July 2021. (virtual)
12. ICSA Applied Statistics Symposium. December 2020. (virtual)
13. Division of Intramural Population Health Research, *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), Bethesda, MD. November 2020. (virtual)
14. Department of Biostatistics, Boston University, Boston, MA. October 2020. (virtual)
15. Graduate School of Public Health, University of Pittsburgh, Pittsburgh, PA. June 2020. (virtual)
16. Department of Critical Care Medicine, University of Pittsburgh, Pittsburgh, PA. December 2019.
17. International Biometrics Society WNAR Annual Meeting, Portland, OR. June 2019.
18. Clinical Research, Investigation, and Systems Modeling of Acute Illness (CRISMA) Center, University of Pittsburgh, Pittsburgh, PA. January 2019.
19. Department of Statistics, University of Pittsburgh, Pittsburgh, PA. September 2018.
20. Statistics Student Seminar, Department of Statistics, University of Michigan, Ann Arbor, MI. February 2018.
21. A9.com, Inc. (Amazon.com, Inc.), Palo Alto, CA. August 2017.
22. Precision Medicine Workshop, Sun Yat-sen University, Guangzhou, China. June 2016.
23. Department of Systems and Information Engineering, University of Virginia, Charlottesville, VA. October 2012.

### Contributed

1. Joint Statistical Meetings (JSM), Toronto, Canada. August, 2023.
2. Joint Statistical Meetings (JSM). August, 2021. (virtual)
3. 21<sup>st</sup> Meeting of New Researchers in Statistics and Probability, Colorado State University, Fort Collins, CO. July 2019. (poster)
4. International Biometrics Society ENAR Spring Meeting, Philadelphia, PA. March 2019.
5. Michigan Student Symposium for Interdisciplinary Statistical Sciences, Ann Arbor, MI. March 2017. (poster)
6. International Biometrics Society ENAR Spring Meeting, Washington, DC. March 2017.
7. Michigan Institute for Data Science Annual Symposium, Ann Arbor, MI. November 2016. (poster)
8. Joint Statistical Meetings, Chicago IL. August 2016. (poster)
9. International Biometrics Society ENAR Spring Meeting, Austin, TX. March 2016.
10. International Biometrics Society ENAR Spring Meeting, Miami, FL. March 2015. (poster)

### TEACHING

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Year(s)	Course Number, Title	Role	Credit, Class Size
2023 Spring	BIOST 2080, Advanced Statistical Learning	Instructor	2 credits, 4 enrolled
2022 Fall	BIOST 2079, Introductory Statistical Learning for Health Sciences	Instructor	2 credits, 12 enrolled
2021 Fall	BIOST 2079, Introductory Statistical Learning for Health Sciences	Instructor	2 credits, 25 enrolled
2021 Spring	BIOST 2080, Advanced Statistical Learning	Instructor	2 credits, 7 enrolled
2020 Fall	BIOST 2079, Introductory Statistical Learning for Health Sciences	Instructor	2 credits, 15 enrolled
2020 Spring	BIOST 2080, Advanced Statistical Learning	Instructor	2 credits, 19 enrolled
2019 Fall	BIOST 2025, Biostatistics Seminar	Coordinator	1 credit, 18 enrolled
2019 Spring	BIOST 2025, Biostatistics Seminar	Coordinator	1 credit, 13 enrolled
2018 Fall	BIOST 2025, Biostatistics Seminar	Coordinator	1 credit, 31 enrolled

## MENTORING AND ADVISING

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Student's home department is Biostatistics unless specified otherwise

### Undergraduate Students

Year	Student	Role
2019–2020	Emeka Amadi, Yuxi Liu, Yuchen Shi (Computer Science), “Machine learning for electronic health records data”	CS Senior Capstone Project Supervisor

### Master's Students

Year	Student	Role
	<u>in the role of Thesis Advisor</u>	
2021–2022	Liling Lu, “Safe reinforcement learning for sepsis treatment”; First position: Biostatistician at University of Pittsburgh Medical Center * Best Presentation Honorable Mention, Pitt Biostatistics Research Day, 2022	Thesis Advisor
2020–2021	Jason N. Kennedy, “Towards a learning health system: using reinforcement learning to optimize treatment decisions in sepsis patients”; First position: PhD student in Epidemiology at University of Pittsburgh	Thesis Advisor
2019–2020	Zhuxuan Fu, “A prognostic model of immunohistochemistry biomarkers for high-grade serous ovarian cancer”; First position: Biostatistician II at University of Utah	Thesis Advisor
2019–2020	Ruishen Lyu, “Improving treatment decision for sepsis patients by reinforcement learning”; First position: Biostatistician at Cleveland Clinic <u>in the role of Thesis Committee Member</u>	Thesis Advisor



2021–2021	Xiaojun Shi, “Sensitivity analysis on unmeasured confounders for studies of opioid use disorder”	Thesis Committee Member
2018–2019	Yan Jiang, “Estimating DNA methylation levels for single-cell bisulfite sequencing (BS-SEQ) data” <u>in the role of Research Supervisor</u>	Thesis Committee Member
2022–Present	RuoFei Yin <u>in the role of Academic Advisor</u>	Research Supervisor
2022–Present	Eva V. Zadorozny	Academic Advisor
2021–Present	Venus Yang	Academic Advisor

### Doctoral Students

Year	Student	Role
	<u>in the role of <b>Dissertation Advisor/Co-advisor</b></u>	
2021–Present	Jinhong Li, TBD	Dissertation Advisor
2021–Present	Xinlei Chen, TBD	Dissertation Advisor
2020–2022	Haoyi Fu, “Bayesian clustering and modeling approaches for the analysis of brain-imaging data” * Student Paper Award Honorable Mention, Medical Devices and Diagnostics (MDD) Section, American Statistical Association, 2023	Dissertation Co-advisor
2020–2022	Xiaoqing Tan, “Causal inference under data restrictions”; First position: Data Scientist at Meta (i.e. Facebook) * Student Paper Award Honorable Mention, Statistical Learning and Data Science (SLDS) Section, American Statistical Association, 2021 * NSF Scholarships for Quality and Productivity Research Conference (QPRC), 2022 * Student Research Award, New England Statistics Symposium (NESS), 2022 * Distinguished Student Paper Award, ENAR Spring Meeting, International Biometric Society, 2023	Dissertation Advisor
2019–2021	Peng Liu, “Outcome-guided disease subtyping for high-dimensional omics data”; First position: Postdoctoral Associate at Carnegie Mellon University; Current position: Senior Scientist at Merck * Distinguished Student Paper Award, ENAR Spring Meeting, International Biometric Society, 2020 <u>in the role of Dissertation Committee Member</u>	Dissertation Co-advisor
2022–Present	Wei Zong, “TBD”	Dissertation Committee Member

2021–Present	Zhongyin Xu, “Novel adaptive trial designs for bioequivalence studies and studies with a composite endpoint”	Dissertation Committee Member
2021–2022	Yujia Li, “Clustering and association analysis for high-dimensional omics studies”	Dissertation Committee Member
2020–Present	Xiaoshuang Xun (Epidemiology), “Phthalate exposure during pregnancy and infant/child development: evaluating phthalate mixtures, time varying exposures, and placentally mediated biologic mechanisms”	Dissertation Committee Member
2020–2021	Zhuxuan Fu (Epidemiology), “Identifying opportunities for improving epithelial ovarian cancer survival using novel approaches for exploring the role of ovulation and hormone-related conditions”	Dissertation Committee Member
2020–2021	Xianling Wang, “Statistical considerations in latent class modelling of diagnostic tests and covariates with missing values”	Dissertation Committee Member
2018–2019	Li Zhu, “Bayesian variable selection model and differential co-expression network analysis for multi-omics data integration”	Dissertation Committee Member
	<u>in the role of Research Supervisor</u>	
2021–Present	Xinlei Chen	GSR Supervisor
2021–Present	Ziwei (Crystal) Zang	GSR Supervisor
	<u>in the role of Academic Advisor</u>	
2022–Present	Yuxin Ren	Academic Advisor
2020–2021	Garry W. Smyda	Academic Advisor

## RESEARCH GRANT PARTICIPATION

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### Active

Funding Agency:	NIH/NIDA R21 DA055672
Title of Grant:	Federated learning methods for heterogeneous and distributed Medicaid data
Principal Investigator:	<b>Tang, L.</b> (University of Pittsburgh)
Years Inclusive:	4/1/2023–3/31/2025
Percent Effort:	20%
Amount:	\$418,087
Funding Agency:	Competitive Medical Research Fund (CMRF), UPMC
Title of Grant:	Federated learning methods for heterogeneous and distributed Medicaid data
Principal Investigator:	<b>Tang, L.</b> (University of Pittsburgh)
Years Inclusive:	7/1/2022–6/30/2024
Percent Effort:	0% (no faculty salary support)
Amount:	\$25,000
Funding Agency:	PCORI

Title of Grant: Implementing doula care programs in Medicaid to advance racial equity in severe maternal morbidity  
 Principal Investigator: Kennedy, S. (AcademyHealth)  
 Tang Role on Grant: Co-Investigator and Lead of Data Coordinating Center  
 Years Inclusive: 2023–2028  
 Percent Effort: 10%

Funding Agency: NIH/NIDA R01 DA055585  
 Title of Grant: Improving racial equity in opioid use disorder treatment in Medicaid  
 Principal Investigator: Donohue, J. (University of Pittsburgh)  
 Tang Role on Grant: Co-Investigator  
 Years Inclusive: 9/1/2022–8/31/2026  
 Percent Effort: 10%

Funding Agency: PA Department of Health / CDC  
 Title of Grant: CDC PDMP OD2A Predictive Analytics Project  
 Principal Investigator: Gellad, W. (University of Pittsburgh)  
 Tang Role on Grant: Co-Investigator  
 Years Inclusive: 3/13/2020–4/30/2023  
 Percent Effort: 10%

Funding Agency: NIH/NHLBI R35 HL144804  
 Title of Grant: Organizational Strategies for Improving Evidence-Uptake in Intensive Care  
 Principal Investigator: Kahn, J. (University of Pittsburgh)  
 Tang Role on Grant: Co-Investigator  
 Years Inclusive: 1/21/2019–11/30/2025  
 Percent Effort: 9%

Funding Agency: NIH/NIGMS R01 GM141081  
 Title of Grant: Precision medicine approach to glucocorticosteroids in sepsis  
 Principal Investigator: Yende, S. (University of Pittsburgh)  
 Tang Role on Grant: Co-Investigator  
 Years Inclusive: 8/2/2021–6/30/2025  
 Percent Effort: 15%

Funding Agency: NIH/NHLBI R01 HL164835  
 Title of Grant: Individualized prediction of treatment effects using data from both embedded clinical trials and electronic health records  
 Principal Investigator: Cooper, G. (University of Pittsburgh)  
 Tang Role on Grant: Co-Investigator  
 Years Inclusive: 9/15/2022–7/31/2025  
 Percent Effort: 5%

Funding Agency: NIH/NLM R01 LM014142  
 Title of Grant: Disease subtyping guided by clinical phenotype for precision medicine  
 Principal Investigator: Tseng, G. (University of Pittsburgh)  
 Tang Role on Grant: Co-Investigator  
 Years Inclusive: 2/3/2023–11/30/2026  
 Percent Effort: 11%

**Unfunded/Pending Submissions as PI (or co-PI/MPI)**

Funding Agency:	NSF DMS Statistics Program
Title of Grant:	Fusion pursuit for pattern-mixture models with application to longitudinal studies with nonignorable missing data
Attempts and Scores:	1st Submission: 12/15/2021 (Very Good/Good, Very Good/Good, Good) 2nd Submission: 12/15/2022 (pending)
Percent Effort:	10%
Funding Agency:	DMS/NIGMS Joint Initiative
Title of Grant:	Collaborative Research: Transferable prediction, online informatics platform, and applications in biological aging clocks
Attempts and Scores:	1st Submission 9/19/2022 (pending)
Percent Effort:	20%

## **PROFESSIONAL ACTIVITIES AND SERVICE**

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### **Department Committees**

2023–Present	Member, Doctoral Monitoring Committee
2022–Present	Member, Curriculum Committee
2022–Present	Member, PhD Education Program Working Group
2021–Present	Member, Student Awards Committee
2020–2022	Member, PhD Admissions Committee
2019–2022	Organizer/Co-Organizer, Biostatistics Research Day

### **School/University Committees & Service**

2021–2022	Member, Biostatistics Chair Search Committee
2021–Present	Backup Representative, Educational Policies & Curriculum Committee (EPCC)
2019, 21, 22	Poster Judge, Pitt Public Health Dean’s Day

### **Journal Refereeing and Editorial Board**

2022–Present	Guest Editor	Statistics in Biosciences special issue on “Statistical Methods, Algorithms and Applications in Biomedical Data Integration”
2022–Present	Associate Editor	Journal of Data Science
2016–Present	Referee	Annals of Applied Statistics (AOAS), Biometrics, Biostatistics, Computational Statistics and Data Analysis (CSDA), Electronic Journal of Statistics (EJS), Journal of Data Science (JDS), Journal of Computational and Graphical Statistics (JCGS), Journal of Multivariate Analysis (JMVA), Journal of the American Medical Association (JAMA), Journal of the American Statistical Association (JASA), PLOS One, Science China Mathematics, Stat, Statistica Sinica, Statistics, Statistics in Medicine (SIM)

### **Grant Services**

2022	Grant Reviewer	NSF Methodology, Measurement, and Statistics (MMS) Program
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### **International Organizations**

2022–Present Member, ENAR Student Paper Award Committee  
 2022–2023 Member, ICSA 2023 Applied Statistics Symposium Program Committee  
 2022–Present Treasurer, ASA Pittsburgh Chapter  
 2019–Present Affiliate Liaison, National Institute of Statistical Sciences (NISS)  
 2021 Member, ICSA Student Paper Award Committee  
 2019, 22 Poster Judge, ASA Pittsburgh Chapter Spring Banquet Poster Competition  
 2017–2018 Member, Fifth Bayesian, Fiducial, and Frequentist Workshop Organizing Committee

### Conference Service

2023 Session Organizer, *When Data Integration Meets Causal Inference*, JSM (August 5-10, 2023, Toronto, Canada)  
 2023 Session Organizer, *Advanced Statistical Learning Methods for Heterogeneous Data and Model Integration*, ICSA International Conference (July 7-9, 2023, Hong Kong, China)  
 2023 Session Organizer, *Recent Statistical Developments for Precision Medicine and Recent Statistical Developments for Complex Survival Data*, ICSA Applied Statistics Symposium (June 11-14, 2023, Ann Arbor, MI)  
 2023 Session Organizer, *Analysis of Distributed Health Data: Novel Approaches and Applications*, ENAR (March 19-22, 2023, Nashville, TN)  
 2021 Session Organizer, *Integrative Modeling of Heterogeneous Observational Health Data*, ENAR (March 14-17, 2021, virtual)  
 2020 Session Organizer, *Distributed and Privacy-Preserving Methods for Electronic Health Records Data*, ENAR (March 22-25, 2020, virtual)