LINYING ZHANG

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EDUCATION

Columbia University   2018 - 2023
PhD in Biomedical Informatics
Advisors: George Hripcsak and David Blei
Thesis: Causal machine learning for reliable real-world evidence generation in healthcare.

Harvard University   2016 - 2018
MS in Computational Biology and Quantitative Genetics (CBQG)
Advisor: Giovanni Parmigiani
Thesis: Interactions between multiple myeloma cells and bone marrow stromal cells impact epigenetic profiles of multiple myeloma.

Boston University   2011 - 2014
BA with Honors (*Summa Cum Laude*) in Biochemistry and Molecular Biology
Advisor: Ulla Hansen
Thesis: Establishing hepatocellular carcinoma cell lines with inducible expression of degradable LSF to investigate LSF regulation in cell cycle.

APPOINTMENT

Washington University in St. Louis   October 2023 - Present
Assistant Professor of Biostatistics
Institute for Informatics, Data Science, and Biostatistics (I2DB)

PUBLICATIONS & PREPRINTS

Manuscripts – In Submission

1. **Zhang L.**, Richter L.R., Wang Y., Ostropolets A., Elhadad N., Blei D.M., Hripcsak G. A Bayesian causal inference approach for assessing fairness in clinical decision-making. ***arXiv preprint***, 2022.

2. **Zhang L.**, Richter L.R., Kim T., Hripcsak G. Evaluating and improving performance and racial fairness of algorithms for GFR estimation. ***medRxiv preprint***, 2022.

3. Sun T., Bhave S., **Zhang L.**, Urteaga I., Plecko D., Hripcsak G., Bareinboim E., and Elhadad N. Assessing Fairness of Time to Diagnosis in Healthcare Through a Causal Fairness Approach. ***MLHC***, 2023. [Under review]

4. Song W., Liu L., Rice H., Sainlaire M., Min L., **Zhang L.**, Thai T., Kang M.J., Li S., Tejeda C., Lipsitz S., Samal L., Carroll D., Adkison L., Herlihy L., Ryan V., Bates D., Latham N., Dykes P. From Traditional Fall Injury Risk Screening to a Temporal Machine Learning-Based Approach: Improving Algorithm Generalizability and Clinical Action. 2023. [Under review]

Publications – Conference and Journal

5. **Zhang L.**, Wang Y., Schuemie M.J., Blei D.M., and Hripcsak G. Adjusting for indirectly measured confounding using large-scale propensity score. ***Journal of Biomedical Informatics***, 2022.

6. **Zhang L.**, Wang Y., Ostropolets A., Mulgrave J.J., Blei D.M., and Hripcsak G. The medical deconfounder: Assessing treatment effects with electronic health records. ***Machine Learning for Healthcare Conference (MLHC)***, 2019.

7. Ostropolets A., Albogami Y., Conover M, Banda J.M., Baumgartner W.A. Jr., Blacketer C., Desai P., DuVall S.L., Fortin S., Gilbert J.P., Golozar A., Ide J., Kanter A.S., Kern D.M., Kim C., Lai L.Y.H., Li C., Liu F., Lynch K.E., Minty E., Ins Neves M., Ng D.Q., Obene T., Pera V., Pratt N., Rao G., Rappoport N., Reinecke I., Saroufim P., Shoaibi A., Simon K., Suchard M.A., Swerdel J.N., Voss E.A., Weaver J., **Zhang L.**, Hripcsak G., and Ryan P.B. Reproducible Variability: Assessing investigator discordance across nine research teams attempting to reproduce the same observational study. ***JAMIA***, 2023.

8. Richter L.R., Albert B.I., **Zhang L.**, Ostropolets A., Zitsman J.L., Fennoy I., Albers D., Hripcsak G. Data assimilation on mechanistic models of glucose metabolism predicts glycemic states in adolescents following bariatric surgery. ***Frontiers in Physiology***, 2022.

9. Song W., **Zhang L.**, Liu L., Sainlaire M., Karvar M., Kang M., Pullman A., Lipsitz S., Massaro A., Patil N., Jasuja R., Dykes P.C. Predicting hospitalization of COVID-19 positive patients using clinician-guided machine learning methods. ***JAMIA***, 2022.

10. Song W., Kang M.J., **Zhang L.**, Jung W., Song J., Bates D.W., Dykes P.C. Predicting pressure injury using nursing assessment phenotypes and machine learning methods. ***JAMIA***, 2021.

11. Ostropolets A., **Zhang L.**, and Hripcsak G. A scoping review of clinical decision support tools that generate new knowledge to support decision making in real time. ***JAMIA***, 2020.

12. Ostropolets A., Chen R., **Zhang L.**, and Hripcsak G. Characterizing physicians information needs related to a gap in knowledge unmet by current evidence. ***JAMIA Open***, 2020.

13. Gottesman O., Johansson F., Meier J., Dent J., Lee D., Srinivasan S., **Zhang L.**, Ding Y., Wihl D., Peng X., Yao J., Lage I., Mosch C., Lehman L.H., Komorowski M., Faisal A., Celi L., Sontag D., and Doshi-Velez F.. Evaluating reinforcement learning algorithms in observational health settings. ***arXiv preprint***, 2018.

CONFERENCE ABSTRACTS (PEER-REVIEWED)

1. **Zhang L.**, Jiang X., Natarajan K., Hripcsak G. Explaining Treatment Disparities from a Causal Perspective with EHRs. In ***AMIA Annual Symposium***, 2023. [Presentation]

2. Song W., Liu L., Sainlaire M., Cho S., Furlong D., Gilles-Fowler W., Herlihy L., Kang M.J., Lipsitz S., Melanson B., Massaro J., Martel T., Wolski P., **Zhang L.**, Dykes P. An EHR-based Comparative Analysis of the Distribution of Pressure Injury Anatomical Locations and Stages and Associated Disparities Across a Large Healthcare System. In ***AMIA Annual Symposium***, 2023. [Presentation]

3. **Zhang L.**, Richter L.R., Wang Y., Ostropolets A., Elhadad N., Blei D.M., and Hripcsak G. A Bayesian causal inference approach for assessing fairness in clinical decision-making. In ***Algorithmic Fairness through the Lens of Causality and Privacy Workshop, NeurIPS***, 2022. [Poster]

4. **Zhang L.**, Richter L.R., Blei D.M., Wang Y., Ostropolets A., Elhadad N., and Hripcsak G., Assessing racial fairness of dialysis allocation in end-stage renal disease. In ***OHDSI Global Symposium***, 2022. [Presentation]

5. **Zhang L.**, Richter L.R., Hripcsak G. Assessing the impact of race on glomerular filtration rate (GFR) prediction. In ***OHDSI Global Symposium***. 2021. [Presentation]

6. Song W., **Zhang L.**, Sainlaire M., Karvar M., Kang M., Pullman A., Massaro A., Patil N., Jasuja R., Dykes P.C. Predicting hospitalization of COVID-19 positive patients using machine learning methods. In ***AMIA Annual Symposium***. 2021. [Presentation]

7. **Zhang L.**, Wang Y., Ostropolets A., Chen R., Blei D.M., and Hripcsak G. The Multi-Outcome Medical Deconfounder: Assessing Treatment Effects on Multiple Renal Measures. In ***AMIA Annual Symposium***. 2020. [Poster]

8. **Zhang L.**, Wang Y., Ostropolets A., Chen R., Blei D.M., and Hripcsak G. The multi-outcome medical deconfounder: assessing treatment effects on multiple renal measures. In ***OHDSI Global Symposium***. 2020. [Poster]

9. Chen R., Schuemie M., Suchard M., Ostropolets A., **Zhang L.**, Ryan P., Hripcsak G. Evaluation of large-scale propensity score modeling and covariate balance on potential unmeasured confounding in observational research. In ***AMIA Annual Symposium***. 2020. [Poster]

10. **Zhang L.**, Wang Y., Ostropolets A., Mulgrave J.J., Blei D.M., and Hripcsak G. The medical deconfounder: assessing treatment effects with electronic health records. In ***Women in Machine Learning (WiML) Workshop***. Vancouver, Canada. 2019. [Poster]

11. **Zhang L.**, Wang Y., Ostropolets A., Mulgrave J.J., Blei D.M., and Hripcsak G. The medical deconfounder: assessing treatment effects with electronic health records. In ***Machine Learning for Health Workshop***. Vancouver, Canada. 2019. [Poster]

12. Ostropolets A., **Zhang L.**, Mulgrave J.J., Hripcsak G. Investigating female-male differences in risk factors for myocardial infarction using OHDSI tools. In ***AMIA Annual Symposium***. 2019. [Poster]

13. Song W., **Zhang L.**, E. Gill, J.Z. Liu, A. Wright. Personalized treatment for type 2 diabetes using weighted k-nearest neighbors. In ***AMIA Annual Symposium***. 2019. [Poster]

14. Szalat R., Samur M.K., Ott C.J., Lawlor M., Epstein C., Abraham B.J., Lin C.Y., **Zhang L.**, Prabhala R., Farrell N., Wes K., Tai Y.T., Fulciniti M., Parmigiani G., Young R.A., Anderson K.C., and Munshi N.C. Integrative oncogenomic analysis combining whole genome, transcriptome and epigenome identifies altered chromatin accessibility landscape in multiple myeloma. In ***American Society of Hematology Annual Meeting***. 2018. [Presentation]

15. **Zhang L.**, Samur M.K., Szalat R., Epstein C.B., Prabhala R., Fulciniti M., Munshi N.C.*, Parmigiani G.*. Interactions between multiple myeloma cells and bone marrow stromal cells impact epigenetic profiles of multiple myeloma. In ***Program in Quantitative Genomics Conference***. Boston, MA. 2017. [Poster]

16. **Zhang L.**, Samur M.K., Szalat R., Epstein C.B., Prabhala R., Fulciniti M., Munshi N.C.*, Parmigiani G.*. Interactions between multiple myeloma cells and bone marrow stromal cells impact epigenetic profiles of multiple myeloma. In ***Dana-Farber/Harvard Cancer Center Celebration of Junior Investigators***. Boston, USA. 2017. [Poster]

INVITED TALKS

University of Colorado School of Medicine 2023
Department of Biomedical Informatics
Improving the Reliability of Real-World Evidence Generation from Large-Scale Observational Data

Ohio State University College of Medicine 2023
Department of Biomedical Informatics
Improving the Reliability of Real-World Evidence Generation from Large-Scale Observational Data

Vanderbilt University 2023
Department of Biomedical Informatics
Improving the Reliability of Real-World Evidence Generation from Large-Scale Observational Data

Washington University in St. Louis 2023
Institute for Informatics, Data Science, and Biostatistics
Improving the Reliability of Real-World Evidence Generation from Large-Scale Observational Data

OHDSI Global Symposium 2022
When does statistical equality meet health equity: developing analytical pipelines to compare associational and causal fairness in their application to EHR data.

OHDSI Global Symposium 2022
Health Equity Work Group
Evaluating and improving performance and racial fairness of algorithms for GFR estimation.

OHDSI Global Symposium 2022
Population-Level Estimation Work Group
Adjusting for indirectly measured confounding using large-scale propensity score.

Columbia University 2021
Department of Biomedical Informatics
Algorithmic fairness in medicine: A case study in glomerular filtration rate (GFR) prediction.

OHDSI Health Equity Work Group Monthly Meeting 2021
Assessing the impact of race on glomerular filtration rate (GFR) prediction.

Columbia University 2020
Department of Biomedical Informatics
Adjusting for unobserved confounding using large-scale propensity score.

AMIA Annual Symposium 2020
Causal Inference Panel
The medical deconfounder: assessing treatment effects with electronic health records.

University of Pennsylvania School of Medicine 2020
SC-TRM Working Group Meeting
The medical deconfounder: assessing treatment effects with electronic health records.

TEACHING EXPERIENCE

Computational Methods. *Columbia University.* Spring 2020.

Computer Applications in Health Care and Biomedicine. *Columbia University.* Fall 2019.

Principles of Biostatistics I&II. *Harvard T.H.Chan School of Public Health.* Summer 2017.

General Physics I&II. *Boston University.* 2012-2013.

PROFESSIONAL ACTIVITIES

Program Committee

- Co-Chair, I2BD Annual Symposium 2024

- Member, IEEE International Conference on AI for Medicine, Health, and Care (AIMHC) 2024

- Session chair, Machine Learning for Health (ML4H) Symposium 2024
  Causality in Health AI Research Roundtable

- Session chair, AMIA Symposium 2024
  Precision Medicine and Disease Subtyping

Journal & Conference Reviewing

- Reviewer, Journal of Biomedical Informatics (JBI). 2023-Present
- Reviewer, Journal of Medical Internet Research (JMIR). 2023-Present
- Reviewer, Health Informatics Journal. 2022-Present
- Reviewer, Applied Clinical Informatics Journal. 2022-Present
- Reviewer, Machine Learning for Healthcare (MLHC). 2020, 2022
- Reviewer, AMIA Annual Symposium. 2022
- Reviewer, International Conference on Machine Learning (ICML). 2020
- Reviewer, Women in Machine Learning (WiML) Workshop. 2019
- Reviewer, Machine Learning for Health (ML4H) Workshop. 2019, 2020

Conference & Workshop Organizing

- Mentor, the AMIA Annual Symposium Career Development for Women Event. 2022
- Mentor, the Columbia DBMI Summer Research Program. 2022
- Volunteer, OHDSI Global Symposium. 2022
- Volunteer, NeurIPS. 2022

AWARDS

- OHDSI Best Community Contribution Award in Methodological Research. 2022
- Women in Machine Learning Travel Award. 2019
- Senior Book Award. Boston University Department of Biology. 2014
- Dean's List. Boston University College of Arts and Sciences. 2011,2012,2013, 2014