Daiwei (David) Zhang

Department of Biostatistics and Epidemiology
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Research Interests

Methodology: statistical learning, deep learning, Bayesian methods

Applications: medical imaging, spatial multi-omics, genetics

Education

Ph.D. Biostatistics and Scientific Computing, University of Michigan, Ann Arbor 2016 – 2021

Novel statistical learning methods for complex biomedical data analysis

Advisors: Jian Kang & Seunggeun Lee

B.S. (Hon.) Mathematics, Calvin College, Grand Rapids, MI 2012 – 2016

Research Experience

Postdoctoral Researcher, Department of Biostatistics & Epidemiology 2021 – Present
University of Pennsylvania, Philadelphia

- Machine learning methods for spatial multi-omic data analysis

Research Assistant, Department of Biostatistics 2016 – 2021
University of Michigan, Ann Arbor

- Image-on-scalar regression via neural networks
- Neural network-guided ICA with application to neuroimaging
- Robust PCA for predicting population stratification in the UK Biobank
- Multi-omic analysis of the Multi-Ethnic Study of Atherosclerosis
- GWAS of metabolomic pathway dynamics

Research Assistant, Department of Mathematics 2013 – 2016
Calvin College, Grand Rapids

- Algebraic classification of highly connected $2n$-manifolds
- Analytic functions of a generalized complex variable

Awards

University of Michigan

International Biometric Society ENAR Distinguished Student Paper Award	2021
Michigan Student Symposium for Interdisciplinary Statistical Sciences Best Oral Presentation	2021
Rackham Conference Travel Grant	2018, 2020

Calvin College

William Rinck Memorial Prize (for the best graduating mathematics major)	2016
W. L. Putnam Mathematical Competition (ranked 266/3088 internationally)	2013
William Rinck Memorial Scholarship (for outstanding mathematics majors)	2013 – 2016
Trustee Scholarship (full tuition coverage)	2012 – 2016

Publications

PREPRINTS

1. **D. Zhang**, L. Li, C. Sripada, and J. Kang. Image-on-scalar regression via deep neural networks. *arXiv:2006.09911*, 2021. Another version of this manuscript won an International Biometric Society ENAR Distinguished Student Paper Award (2021).

JOURNAL ARTICLES

2. **D. Zhang**, R. Dey, and S. Lee. Fast and robust ancestry prediction using principal component analysis. *Bioinformatics*, 36(11):3439–3446, 2020.

3. L. G. Fritsche, Y. Ma, **D. Zhang**, M. Salvatore, S. Lee, X. Zhou, and B. Mukherjee. On cross-ancestry cancer polygenic risk scores. *PLOS Genetics*, 17(9):e1009670, September 2021. Publisher: Public Library of Science.

4. S. Auyeung, J. Ruiter, and **D. Zhang**. [alphabetical authorship]. An algebraic characterization of highly connected 2n-manifolds. *Rose-Hulman Undergraduate Mathematics Journal*, 17(2):5, 2016.

5. C. Blom, T. DeVries, A. Hayes, and **D. Zhang**. [alphabetical authorship]. Analytic extension and conformal mapping in the dual and the double planes. *Rose-Hulman Undergraduate Mathematics Journal*, 14(2):9, 2013.

Presentations

INVITED

1. **D. Zhang**, L. Li, C. Sripada, and J. Kang. *Image-on-Scalar Regression via Deep Neural Networks*. Distinguished Student Paper Award Presentation, Spring Meeting, ENAR, International Biometric Society, Virtual Event, 2021.

2. **D. Zhang**, R. Dey, and S. Lee. *Fast and robust ancestry prediction with FRAPOSA*. Tools and Technology Seminar, Department of Internal Medicine and Bioinformatics, University of Michigan, Ann Arbor, MI, 2020.

CONTRIBUTED

3. **D. Zhang**, L. Li, C. Sripada, and J. Kang. *Image-on-Scalar Regression via Deep Neural Networks*. Michigan Student Symposium for Interdisciplinary Statistical Sciences, Virtual Event, 2021.

4. **D. Zhang**, Y. Guo, and J. Kang. *Neural network-guided independent component analysis with application to neuroimaging*. Spring Meeting, ENAR, International Biometric Society, Nashville, TN, 2020.

5. **D. Zhang**, R. Dey, and S. Lee. *Fast and robust ancestry inference using principal component analysis*. Annual Meeting, American Society of Human Genetics, San Diego, CA, 2018.

Teaching Experience

Teaching Assistant (Calculus I,II,&III, differential equations) 2013 – 2014
Department of Mathematics, Calvin College, Grand Rapids, MI

Teaching Assistant (Introduction to Programming, Information Technology) 2012 – 2013
Department of Computer Science, Calvin College, Grand Rapids, MI

Additional Experience

Exchange student of Budapest Semester in Mathematics Aug – Dec 2014
Eötvös University & Hungarian Academy of Sciences, Budapest, Hungary

Courses: group theory, set theory, non-Euclidean geometries, Hungarian

Information Technology Technician 2012 – 2013
Center of Information Technology, Calvin College, Grand Rapids, MI

Programming Skills

Proficient: Python, R, Bash, Linux environment, LaTeX

Competent: C++, TensorFlow, PyTorch

Rudimentary: MATLAB, Mathematica, Java