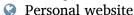
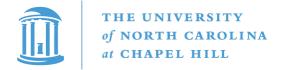
Didong Li

☑ didongli@unc.edu





Research Interests

Geometric data analysis, information geometry, nonparametric Bayes, spatial statistics.

Employment

2022 –	Assistant Professor, Department of Biostatistics, Gillings School of Global Public Health, University of North Carolina at Chapel Hill.
2021 - 2022	▼ Visiting Postdoctoral Scholar, Gladstone Institutes.
2020 – 2022	■ Postdoctoral Research Associate, Department of Computer Science, Princeton University. Supervisor: Barbara Engelhardt.
2020 – 2022	■ Assistant Project Scientist, Department of Biostatistics, University of California, Los Angeles. Supervisor: Sudipto Banerjee.

Education

2020	▶ Ph.D. Mathematics , Duke University, USA.
	Advisors: David B. Dunson and Sayan Mukherjee
2020	■ M.Sc. Statistics, Duke University, USA.

2015 ■ M.Sc. Mathematics, Beijing Institute of Technology, China.
2012 ■ B.Sc. Mathematics, Beijing Institute of Technology, China.

Publications

Publications

- Badea*, A., Li*, D., Niculescu, A., Anderson, R., Stout, J., Williams, C., ... Dunson, D. (2022). Absolute winding number differentiates spatial navigation strategies with genetic risk for alzheimer's disease. *Frontier Neuroscience*.
- Cui, S., Yoo, E. C., **Li**, **D.**, Laudanski, K., & Engelhardt, B. E. (2022). Hierarchical Gaussian processes and mixtures of experts in predicting COVID patient trajectories. *Pacific Symposium on Biocomputing (PSB)*.
- Jones, A., Townes, F. W., Li, D., & Engelhardt, B. E. (2022b). Contrastive latent variable modeling with application to case-control sequencing experiments. *The Annals of Applied Statistics*.
- **Li**, **D.**, Mukhopadhyay, M., & Dunson, D. (2022). Efficient manifold approximation with spherelets. *Journal of the Royal Statistical Society: Series B. Inaugural IMS Lawrence D. Brown Ph.D. Student Award*.
- Cao, Y., **Li**, **D.**, Sun, H., Assadi, A. H., & Zhang, S. (2021). Efficient Weingarten map and curvature estimation on manifolds. *Machine Learning*, 1–26.
- **Li**, **D**. & Dunson, D. B. (2020). Classification via local manifold approximation. *Biometrika*, 107(4), 1013–1020.

- Li, M., Sun, H., & Li, D. (2020a). A geometric approach to average problems on multinomial and negative multinomial models. *Entropy*, 22(3), 306.
- 8 Li, M., Sun, H., & Li, D. (2020b). Riemannian submersion based Riemannian center of mass of positive definite matrices. *Mathematical Methods in the Applied Science*, 43(7), 4927.
- 9 Mukhopadhyay*, M., Li*, D., & Dunson, D. B. (2020). Estimating densities with non-linear support by using Fisher–Gaussian kernels. *Journal of the Royal Statistical Society: Series B* (Statistical Methodology), 82(5), 1249–1271.
- Wang, J., Sun, H., & Li, D. (2017). A geodesic-based Riemannian gradient approach to averaging on the Lorentz group. *Entropy*, *19*(12), 698.
- 11 Cao, L., Li, D., Zhang, E., Zhang, Z., & Sun, H. (2014). A statistical cohomogeneity one metric on the upper plane with constant negative curvature. *Advances in Mathematical Physics*, 2014.

Preprints/under revision

- Jones, A., Townes, F. W., Li, D., & Engelhardt, B. E. (2022a). Alignment of spatial genomics and histology data using deep Gaussian processes. BioRxiv.
- 2 Luo, H. & Li, D. (2022). Spherical rotation dimension reduction with geometric loss functions. arXiv:2204.10975.
- 3 Li, D., Jones, A., Banerjee, S., & Engelhardt, B. E. (2021). Multi-group Gaussian processes. arXiv:2110.08411.
- 4 Li, D., Tang, W., & Banerjee, S. (2021). Fixed-domain inference for Gausian processes with Matérn covariogram on compact Riemannian manifolds. arXiv:2104.03529.
- Wang, T., Huang, Y., & Li, D. (2021). From the Greene–Wu convolution to gradient estimation over Riemannian manifolds. arXiv:2108.07406.
- **Li***, D., Jones*, A., & Engelhardt, B. (2020). Probabilistic contrastive principal component analysis. arXiv:2012.07977.
- **Li**, **D.**, Lu, Y., Chevallier, E., & Dunson, D. (2020). Density estimation and modeling on symmetric spaces. arXiv:2009.01983.
- 8 Li, D. & Mukherjee, S. (2020). Random Lie brackets that induce torsion: A model for noisy vector fields. arXiv:2007.07309.
- 9 Paul, D., Chakraborty, S., Li, D., & Dunson, D. (2020). Principal Ellipsoid Analysis (PEA): Efficient non-linear dimension reduction & clustering. arXiv:2008.07110.
- Li, D. & Dunson, D. (2019). Geodesic distance estimation with spherelets. arXiv:1907.00296.

Invited Talks

- Aug. 2022 Inference for Gaussian Processes on Compact Riemannian Manifold, Joint Statistical Meeting 2022, Washington D.C.
- Jun. 2022 Probabilistic Contrastive Principal Component Analysis, The 5th International Conference on Econometrics and Statistics (EcoSta 2022), Ryukoku University, Kyoto, Japan.

^{*:} co-first authors

Invited Talks (continued)

- Nov. 2021 Inference for Gaussian Processes on Compact Riemannian Manifold, The Fifth EAC-ISBA Conference: A Satellite Meeting of the 2020 ISBA World Meeting in Celebrating James O Berger's 70th Birthday, Dali, China.
- Jul. 2021 Efficient Manifold Approximation with Spherelets, IMS Annual Meeting/Bernoulli-IMS 10th World Congress in Probability and Statistics, Seoul, South Korea.
- Jun. 2021 Manifold Learning in High Dimensional Spaces, The 4th International Conference on Econometrics and Statistics (EcoSta 2020), Yonsei University, Seoul, South Korea.
- Jun. 2021 Density Estimation and Modeling on Riemannian Symmetric Spaces, ISBA World Meeting 2020, Kunming, China.
- Aug. 2020 Efficient Manifold Approximation with Spherelets, Bernoulli-IMS One World Symposium, Online.
- Jan. 2019 Manifold Approximation with Spherelets, Joint Mathematical Meeting 2019, Baltimore, MD.
- Jul. 2018 Efficient Manifold and Subspace Approximations with Spherelets, Workshop on Computational strategies for large-scale statistical data analysis, ICMS, Edinburgh, UK.
- May 2017 Efficient Manifold Learning via Spherelets, International Workshop in Applied and Computational Topology in Data Science, Beijing Institute of Technology, Beijing, China.

Contributed Conference Talks and Seminars

- Jun. 2022 Inference for Gaussian Processes on Compact Riemannian Manifold, Keio University, Applied Mathematical Sciences Colloquium.
- Apr. 2022 Multi-group Gaussian Processes, Fudan University, Shanghai Center for Mathematical Sciences Seminar.
- Feb. 2022 Multi-group Gaussian Processes, University of Carolina at Chapel Hill, Department of Biostatistics Seminar.
- Feb. 2022 Multi-group Gaussian Processes, University of California, Davis, Department of Statistics Seminar.
- Jan. 2022 Multi-group Gaussian Processes, North Carolina State University, Department of Statistics Seminar.
- Jan. 2022 Multi-group Gaussian Processes, University of Notre Dame, Department of Applied and Computational Mathematics and Statistics Seminar.
- Jan. 2022 Multi-group Gaussian Processes, University of California, Irvine, the Department of Statistics Seminar.
- Dec. 2021 Multi-group Gaussian Processes, University of Hong Kong, Department of Statistics and Actuarial Science.
- Sept. 2021 Probabilistic Contrastive Principal Component Analysis, Bayesian Young Statisticians Meeting.

Contributed Conference Talks and Seminars (continued)

July.	2021	Efficient Manifold and Density Estimation with Spherelets , Northeast Normal University, Webinar.
May.	2021	Fixed-domain Inference for Gaussian Process on Compact Riemannian Manifold , Seminar "Industrial Mathematics" at Chebyshev Laboratory, Saint Petersburg State University, Webinar.
Dec.	2020	Density Estimation on Manifold with Curved Kernel , University of Macau, Webinar.
Nov.	2020	Learning & Exploiting Low-Dimensional Structure in High-Dimensional Data, Collegio Carlo Alberto, Webinar.
Oct.	2020	Density Estimation and Modelling on Symmetric Spaces , Beijing Institute of Technology, Webinar.
Oct.	2020	Learning & Exploiting Low-Dimensional Structure in High-Dimensional Data, Institute of Natural Sciences Data Science Seminar, Shanghai Jiao Tong University, Webinar.
Feb.	2020	Learning & Exploiting Low-Dimensional Structure in High-Dimensional Data, Joint Duke-UNC probability seminar, Duke University, Durham, NC.
Jan.	2020	Efficient Manifold and Density Estimation with Spherelets , Statistics Department Seminar, Stanford University, Stanford, CA.
Nov.	2019	Density Estimation on Manifolds with Fisher-Gaussian Kernels , MIDAS Annual Symposium, University of Michigan-Ann Arbor, Ann Arbor, MI.
Jul.	2019	Efficient Manifold Approximation with Spherelets , Joint Statistical Meeting 2019, Denver, CO.
Jun.	2019	Density Estimation with Mixture of Spherelets , Bayesian Nonparametric 2019 Meeting, University of Oxford, Oxford, UK.
Apr.	2018	Subspace Approximations with Spherelets , Graduate-Faculty Seminar, Duke University, Durham, NC.
Nov.	2017	Efficient Manifold and Subspace Approximations with Spherelets , Triangle Area Graduate Mathematics Conference, North Carolina State University, Raleigh, NC.
Jun.	2017	Bayesian Manifold Learning Using Locally Curved Basis Functions, Bayesian Nonparametric 2017 Meeting, École Normale Supérieure, Paris, France.
Nov.	2015	Information Geometry, Graduate Students Geometry Seminar, Duke Univer-

Posters

sity, Durham, NC.

Aug. 2022	■ Inference for Gaussian Processes with Matérn Covariogram on Compact Riemannian Manifolds, Expressing and Exploiting Structure in Modeling, Theory, and Computation with Gaussian Processes, Institute of Mathematical and Statistical Innovation, Chicago, IL.
Nov. 2019	■ Learning and Exploiting Low-Dimensional Structure in High-Dimensional Data, MIDAS Annual Symposium, Univerity of Michigan-Ann Arbor, Ann Arbor, MI.
Oct. 2019	■ Learning and Exploiting Low-Dimensional Structure in High-Dimensional Data, Office of Naval Research PI meeting, Duke University, Durham, NC.

Posters (continued)

- Jun. 2019 Manifold Approximation with Spherelets, Statistics Conference in honor of Aad van der Vaart's 60th birthday, Leiden, The Netherlands.
- May. 2019 Manifold Approximation with Spherelets, Geometric Data Analysis, Chicago, IL.
- Oct. 2018 Manifold Approximation with Spherelets, Theoretical Foundations of Deep Learning, Georgia Institute of Technology, Atlanta, GA.
- Jun. 2018 **Bayesian Subspace Approximation via Mixtures of Spherelets**, ISBA World Meeting 2018, University of Edinburgh, Edinburgh, UK.
- Dec. 2017 **Bayesian Subspace Approximation via Mixtures of Spherelets**, Objective Bayes Meeting 2017, University of Texas-Austin, Austin, TX.
- Oct. 2017 Efficient Manifold and Subspace Approximations with Spherelets, Office of Naval Research PI meeting, Duke University, Durham, NC.

Teaching Experience

- Summer 2019 Summer@Duke Statistical Science Program, mentor, Nonlinear Dimensionality Reduction, led by Professor David B. Dunson and Professor Amy Herring, Duke University.
- Summer 2018 Domath, project manager, Local Affinity Construction for Dimension Reduction Methods, led by Professor Xiuyuan Cheng and Professor Hau-Tieng Wu, Duke University.
 - Fall 2016 **Laboratory Calculus and Functions I**, instructor, Duke University.
 - Fall 2015 Introductory Calculus II with Applications, teaching assistant, Duke University.
 - Fall 2012 Linear Algebra, teaching assistant, Beijing Institute of Technology.

Awards

- Jul. 2022 Recruitment Award, UNC Center for Environmental Health and Susceptibility (CEHS).
- Oct. 2019 Inaugural IMS Lawrence D. Brown Ph.D. Student Award, Institute of Mathematical Statistics (IMS).
- Jul. 2019 Finalist for the Student Paper Award in the Nonparametric Section, Joint Statistical Meeting, Denver, CO.
- Jun. 2019 | ISBA travel award, Bayesian Nonparametric Meeting, University of Oxford, Oxford, UK.
- Jun. 2018 Travel Award, ISBA World Meeting, University of Edinburgh, Edinburgh, UK.
- Dec. 2017 NSF Travel Award, Objective Bayes Meeting, University of Texas-Austin, Austin,
- Jul. 2017 **Travel Award**, Annual Summer Institute in Statistics for Big Data (SISBID), University of Washington-Seattle, Seattle, WA.
- Jun. 2017 **Travel Award**, Bayesian Nonparametric 2017 Conference, ECOLE NORMALE SUPÉRIEURE, Paris, France.
- May 2016 NSF-CBMS Travel Support Award, NSF-CBMS Conference: Topological Data Analysis, University of Texas-Austin, Austin, TX.

Refereeing

- \blacksquare Editorial Board, Journal of Machine Learning Research, 2020 \sim
- Annals of Applied Statistics
- Annals of Statistics
- Conference on Neural Information Processing Systems (NeurIPS) 2021
- Electronic Journal of Statistics
- IEEE Transactions on Neural Networks and Learning Systems
- International Conference on Artificial Intelligence and Statistics (AISTATS) 2020, 2021
- Journal of the American Statistical Association
- Journal of Computational and Graphical Statistics
- Statistica Sinica