

# Xiongtao Dai

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## Education

PhD in Statistics, *University of California, Davis*, June 2018

Bachelor of Science, Statistics, *University of Hong Kong*, June 2013

## Academic Positions

Assistant Professor, *Department of Statistics, Iowa State University*, Aug. 2018 – now

## Research Interests

Functional/longitudinal data, manifold data analysis, and statistical applications in plant genomics and neuroscience.

## Publications and Manuscripts

### *Methodology*

1. **Dai, X.**, Müller, H.-G. and Yao, F. (2017) Optimal Bayes classifiers for functional data and density ratios. *Biometrika*, **104**, 545–560
2. **Dai, X.**, Müller, H.-G. and Tao, W. (2018) Derivative principal components for representing the time dynamics of longitudinal and functional Data. *Statistica Sinica*, **28**, 1583–1609
3. **Dai, X.** and Müller, H.-G. (2018) Principal component analysis for functional data on Riemannian manifolds and spheres. *The Annals of Statistics*, **46**, 3334–3361
4. (Submitted) **Dai, X.**, Lin, Z. and Müller, H.-G. (2019) Modeling longitudinal data on Riemannian manifolds. *ArXiv*
5. (Almost submitted) Zhu, W., Zhu, Z. and **Dai, X.** (2020) Spatiotemporal satellite data imputation based on sparse functional data analysis

### *Applications*

1. Luo, M.-C., Gu, Y. Q., Puiu, D., Wang, H., Twardziok, S. O., Deal, K. R., Huo, N., Zhu, T., Wang, L., Wang, Y., McGuire, P. E., Liu, S., Long, H., Ramasamy, R. K., Rodriguez, J. C., Van, S. L., Yuan, L., Wang, Z., Xia, Z., Xiao, L., Anderson, O. D., Ouyang, S., Liang, Y., Zimin, A. V., Perteau, G., Qi, P., Bennetzen, J. L., **Dai, X.**, Dawson, M. W., Müller, H.-G., Kugler, K., Rivarola-Duarte, L., Spannagl, M., Mayer, K. F., Lu, F.-H., Bevan, M. W., Leroy, P., Li, P., You, F. M., Sun, Q., Liu, Z., Lyons, E., Wicker, T., Salzberg, S. L., Devos, K. M. and Dvorak, J.

- (2017) Genome sequence of the progenitor of the wheat D genome *Aegilops tauschii*. *Nature*, **551**, 498–502
2. Dvorak, J., Wang, L., Zhu, T., Jorgensen, C. M., Deal, K. R., **Dai, X.**, Dawson, M. W., Müller, H.-G., Luo, M.-C., Ramasamy, R. K., Dehghani, H., Gu, Y. Q., Gill, B. S., Distelfeld, A., Devos, K. M., Qi, P., You, F. M., Gulick, P. J. and McGuire, P. E. (2018) Structural variation and rates of genome evolution in the grass family seen through comparison of sequences of genomes greatly differing in size. *The Plant Journal*, **95**, 487–503
  3. **Dai, X.**, Wang, H., Zhou, H., Wang, L., Dvořák, J., Bennetzen, J. and Müller, H.-G. (2018) Birth and death of LTR retrotransposons in *Aegilops tauschii*. *Genetics*, **210**, 1039–1051
  4. Xu, J., **Dai, X.**, Ramasamy, R. K., Wang, L., Zhu, T., McGuire, P. E., Jorgensen, C. M., Dehghani, H., Gulick, P. J., Luo, M.-C., Müller, H.-G. and Dvorak, J. (2019) *Aegilops Tauschii* genome sequence: A framework for meta-analysis of wheat QTLs. *G3: Genes, Genomes, Genetics*, **9**, 841–853
  5. **Dai, X.**, Müller, H.-G., Wang, J.-L. and Deoni, S. C. L. (2019) Age-dynamic networks and functional correlation for early white matter myelination. *Brain Structure & Function*, **224**, 535–551
  6. **Dai, X.**, Hadjipantelis, P., Wang, J.-L., Deoni, S. C. L. and Müller, H.-G. (2019) Longitudinal associations between white matter maturation and cognitive development across early childhood. *Human Brain Mapping*, **40**, 4130–4145
  7. Li, H., Wang, L., Luo, M.-C., Nie, F., Zhou, Y., McGuire, P. E., Distelfeld, A., **Dai, X.**, Song, C.-P. and Dvorak, J. (2019) Recombination between homoeologous chromosomes induced in durum wheat by the *Aegilops speltoides* *Su1-Ph1* suppressor. *Theoretical and Applied Genetics*

## Teaching Experience

At Iowa State University

- Instructed STAT 547 Functional Data Analysis. Enrollment: 25 (4 are auditors).
- Instructed DS 202 Data Acquisition and Exploratory Data Analysis. Enrollment: 35.
- Instructed Stat 330 Probability and Statistics for Computer Science. Enrollment: 62.

At the University of California, Davis

- Instructed STA 100 Applied Statistics for Biological Sciences. Enrollment: 182.
- TA for STA 13, STA 100 (elementary statistics), STA 108 (linear models), STA 131B (mathematical statistics), and STA 201 (graduate level SAS programming).

## Software Development

RFPCA — *Developer*

- An R package for Riemannian and multivariate functional data analysis. [GitHub](#).

fdapace — *Developer*

- A comprehensive R package for functional data analysis. Available on [CRAN](#) and [GitHub](#).

- Includes functional principal component analysis, derivatives, regression, correlation, etc.

TE — *Developer*

- An R package for the insertion/deletion dynamics of genome transposable elements. Available on [CRAN](#).

PACE — *Former Maintainer*

- A Matlab package for functional data analysis and empirical dynamics.

## Departmental Service

1. Search committee, 2019–2020
2. STATCOM (faculty advisor), 2019–
3. Computation Advisory Committee, 2018–2019

## Referee Service

Served as referee 38 times in total for the following journals:

Annals of Applied Statistics; Annals of Statistics; Biometrika; Canadian Journal of Statistics; Econometrics and Statistics; Electronic Journal of Statistics; Genome Biology and Evolution; Metrika; Journal of the Korean Statistical Society; Journal of Multivariate Analysis; Journal of Nonparametric Statistics; Journal of the Royal Statistical Society: Series B; Scandinavian Journal of Statistics; STAT; Statistics and Computing; Statistica Sinica; Statistics & Probability Letters; Test; Technometrics; WIREs Computational Statistics.

## Presentations

1. Invited talk, *Modeling Longitudinal Data on Riemannian Manifolds*, CMStatistics, London, UK, Dec 2019
2. Contributed talk, *Modeling Longitudinal Data on Riemannian Manifolds*, Joint Statistical Meetings, Denver, CO, Aug 2019
3. Invited talk, *Modeling Longitudinal Data on Riemannian Manifolds*, International Conference on Econometrics and Statistics, Taiwan, June 2019
4. Invited talk, *Modeling Longitudinal Data on Riemannian Manifolds*, International Chinese Statistical Association Symposium, Raleigh, NC, June 2019
5. Invited talk, *Derivative Principal Component Analysis for Representing the Time Dynamics of Longitudinal and Functional Data*, International Biostatistics Symposium, Guangzhou, China, July 2018
6. Invited talk, *Principal component analysis for functional Data on Riemannian manifold and spheres*, International Chinese Statistical Association Symposium, New Brunswick, NJ, June 2018
7. Poster, *Functional Concurrent Regression and Correlation Analysis for Longitudinal MRI Measurements in the Developing Brain*, FLUX Society Satellite Conference, Chapel Hill, NC, May 2018

8. Contributed talk, *Derivative Principal Component Analysis for Representing the Time Dynamics of Longitudinal and Functional Data*, Joint Statistical Meetings, Baltimore, MC, Aug. 2017
9. Poster, *Principal component analysis for functional Data on Riemannian manifold and spheres*, UC Davis RTG Statistical Sciences Symposium: Geometry, Statistics, and Data Analysis, Davis, CA, May 2017
10. Poster, *Optimal Bayes Classifiers for Functional Data and Density Ratios*, Peter Hall Memorial Conference, Davis, CA, Sept. 2016
11. Topic contributed talk, *Functional Data Analysis for Sparse and Irregular Longitudinal MRI Measurements in the Developing Brain*, Joint Statistical Meetings, Chicago, IL, Aug. 2016
12. Invited talk, *Optimal Bayes Classifiers for Functional Data and Density Ratios*, Joint Statistical Meetings, Chicago, IL, Aug. 2016
13. Presentation, *Birth and Death of LTR Retrotransposons*, Sequencing the *Aegilops tauschii* Genome Project Annual Meeting, Davis, CA, July 2016
14. Poster, *Optimal Bayes Classifiers for Functional Data and Density Ratios*, Joint Statistical Meetings, Seattle, WA, Aug. 2015

## Honors and Awards

Peter Hall Graduate Research Award, *UC Davis*, 2017

Summer Graduate Student Researcher Award, *UC Davis*, 2017

Outstanding Teaching Assistant, Honorable Mention, *UC Davis*, 2017

Graduate Student Travel Award, *UC Davis*, 2017

China Soong Ching Ling Foundation Expedition Scholarship, *CSCLF*, 2009–2013

Saw Swee Hock Statistics Scholarship, *University of Hong Kong*, 2013

Starr Scholarship for Exchange Study, *University of Hong Kong*, 2012