

# Haozhe Zhang

DATA SCIENTIST & STATISTICIAN, PH.D. CANDIDATE

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Github : [github.com/haozhestat](https://github.com/haozhestat)

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| RESEARCH INTERESTS | Functional/Longitudinal Data Analysis, Machine Learning, Nonparametric and Semi-parametric Methods, Predictive Analytics, Spatial Statistics, and Interdisciplinary Quantitative Research. |
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| EDUCATION | <b>Iowa State University</b> , Ames, IA<br><i>Doctor of Philosophy, Statistics</i><br>Advisors: Prof. Dan Nettleton and Prof. Yehua Li<br>8/2014 - 5/2019 ( <i>Expected</i> ) |
|           | <b>University of Science and Technology of China</b> , Hefei, China<br>School of the Gifted Young<br><i>Bachelor of Science, Statistics</i><br>8/2010 - 6/2014                |
|           | <b>National Taiwan University</b> , Taipei<br>Department of Mathematics<br><i>Exchange Student</i><br>Fall 2012   |

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| ACADEMIC EXPERIENCE | <b>Laurence H. Baker Center for Bioinformatics and Biological Statistics</b> , Ames, IA<br><i>Research Assistant</i><br>5/2015 - Present <ul style="list-style-type: none"><li>- Build predictive models using machine learning algorithms to forecast crop yields in US Midwest.</li><li>- Develop methodologies that quantify the uncertainty of predictions from bagging methods (e.g. Random Forests), and develop regression-enhanced random forest to improve forecasting accuracy.</li><li>- Analyze genomic, phenotypic, and environmental data from agricultural and biological sciences.</li></ul> <b>Department of Statistics, Iowa State University</b> , Ames, IA<br><i>Teaching Assistant</i><br>8/2017 - 5/2018 <ul style="list-style-type: none"><li>- Lab Instructor of STAT 101 (Principle of Statistics) in the fall semester.</li><li>- Lab Instructor of STAT 326 (Introductory Business Statistics II) in the spring semester.</li></ul> <b>Center for Survey Statistics and Methodology</b> , Ames, IA<br><i>Research Assistant</i><br>8/2014 - 6/2016 <ul style="list-style-type: none"><li>- Work on interdisciplinary survey sampling projects, including National Resources Inventory (NRI) and Conservation Effects Assessment (CEA) projects.</li><li>- Use image-to-image neural network to predict landuse categories on remote sensing data.</li></ul> <b>Okinawa Institute of Science and Technology</b> , Okinawa, Japan<br><i>Research Intern</i><br>Summer 2013, Winter 2012 <ul style="list-style-type: none"><li>- Analyze satellite image data and 3D neuron data using Python (scipy, numpy), and Investigate the spatial-temporal pattern of fairy circle point processes.</li><li>- Build a probabilistic model for geometric patterns of neuron bifurcations.</li></ul> |
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| INDUSTRY EXPERIENCE | <b>eBay Inc.</b> , San Jose, CA<br><i>Data Scientist Intern</i><br>Summer 2018 <ul style="list-style-type: none"><li>- Develop large-scale graph-based semisupervised learning algorithm utilizing label propagation for look-alike system of eBay ads business.</li><li>- Design and perform back test and online A/B test for the proposed graph-based recommendation system and classic SVD-based collaborative filtering.</li></ul> |
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- Develop and test deep neural networks (CNN, LSTM, ResNet, U-net etc.) for telematics data (i.e., vehicle GPS data) using MXNet and Tensorflow.
- Compare the performance of deep learning with state-of-art machine learning methods such as gradient boosting and explore ensemble opportunities.
- Test and improve Amazon Website Service (AWS) based deep learning platform.

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MANUSCRIPT  
SUBMITTED

- **Zhang, H.**, and Li, Y. (2018+). “Spatially Dependent Functional Data: Covariance Estimation, Principal Component Analysis, and Prediction”. Submitted to *The Annals of Statistics*.
- Guo, T., Yu, X., Li, X., **Zhang, H.**, Zhu, C., Flint-Garcia, S., McMullen, M., Szalma, S., Holland J., Wissner, R., and Yu, J. (2018+). “Optimal Designs for Genomic Prediction in Hybrid Crops”. Revision submitted to *Molecular Plant*.

REFERRED  
JOURNAL  
PUBLICATION

- **Zhang, H.**, Zimmerman, J., Nettleton, D., and Nordman, D.J. (2018+). “Random Forest Prediction Intervals”. Accepted by *The American Statistician*.
- He, Z., Zhang, M., and **Zhang, H.** (2016). “Data-driven Research on Chemical Features of Jingdezhen and Longquan Celadon by Energy Dispersive X-ray Fluorescence”. *Ceramics International*, 42(4):5123–5129. DOI: 10.1016/j.ceramint.2015.12.030.
- Liang, X., Zou, T., Guo, B., Li, S., **Zhang, H.**, Zhang, S., Huang, H., and Chen, S.X. (2015). “Assessing Beijing’s PM<sub>2.5</sub> Pollution: Severity, Impacts of Weather, APEC and Winter Heating”. *Proceedings of the Royal Society A*, 471(2182). DOI: 10.1098/rspa.2015.0257.
- **Zhang, H.**, and Sinclair, R. (2015). “Namibian Fairy Circles and Epithelial Cells Share Emergent Geometric Order”. *Ecological Complexity*, 22:32-35. DOI:10.1016/j.ecocom.2015.02.001.

REFEREED  
PROCEEDING

- **Zhang, H.**, Zhu, Z., and Yin, S. (2016). “Identifying Precipitation Regimes in China Using Model-based Clustering of Spatial Functional data”. *Proceedings of the Sixth International Workshop on Climate Informatics*, pages 117–120. DOI:10.5065/d6k072n6.

NON-REFEREED  
PROCEEDING

- **Zhang, H.**, Nettleton, and D., Zhu, Z. (2017). “Regression-Enhanced Random Forests” In JSM Proceedings, Section on Statistical Learning and Data Science, pages 636 – 647.

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WORKING  
PAPERS

- “Optimal Penalized Scalar-on-Function Regression with Incomplete Functional Predictors”. Joint work with Yehua Li. In preparation.
- “Functional Modeling of Plant Phenotypic Data Measured by Amazon Mechanical Turks”. Joint work with Dan Nettleton. In preparation.
- “A Spatial Functional Mixture Model for China PM<sub>2.5</sub> with Application to Regionalization”. Joint work with Decai Liang, Hui Huang, and Xiaohui Chang. Ready to submit.
- “Neonate Garter Snakes *Thamnophis Elegans* Exhibit Consistent Among-individual Variation in Behavior and Habituation at Multiple Time Scales”. Joint work with Eric J. Gangloff, Vianey Leos, and Anne Bronikowski. Ready to submit.
- “Scalable Graph-base Recommendation System for eBay Look-alike Audience Extension System”. Joint work with Shad Kirmani and Yan Qu In preparation.

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## TALKS & POSTERS

\* Denotes presenter.

- **Zhang, H.\***, and Li, Y. “On the Covariance Estimation and Principal Component Analysis for Spatially Dependent Functional Data”. In: Joint Statistical Meetings, Vancouver, Canada, August 2018.
- **Zhang, H.\***, Nettleton, D., and Nordman, D.J. “Random Forest Prediction Intervals”. In: Symposium on Data Science and Statistics, Reston, Virginia, May 2018.
- **Zhang, H.\***, and Li, Y. “On the Covariance Estimation and Principal Component Analysis for Spatially Dependent Functional Data”. In: ENAR Spring Meeting, Atlanta, Georgia, March 2018.
- **Zhang, H.\***, Nettleton, D., and Zhu, Z. (2017). “Regression-Enhanced Random Forests”. In: Joint Statistical Meetings, Baltimore, Maryland, August 2017.
- **Zhang, H.\***, and Nettleton, D. “Prediction-Guided Statistical Ranking of Maize Seed Brands”. In: Symposium on Predictive Crop Design: Genome-to-Phenome, Lincoln, Nebraska, April 2017.
- **Zhang, H.\***, and Zhu, Z. “Clustering Multiscale Spatial Functional Data with Application to Precipitation Regimes Identification”. In: the 6th International Workshop on Climate Informatics, Boulder, Colorado, September 2016.
- **Zhang, H.\***, and Zhu, Z. “Clustering Multiscale Spatial Functional Data with Application to Precipitation Regimes Identification”. In: Workshop on Bayesian environmetrics, Columbus, Ohio, March 2016.

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## SELECTED AWARDS & HONORS

- **SAMSI Travel Award**, 2018. Travel fund for presenting a paper in the Symposium on Data Science and Statistics in Reston, Virginia.
  - Travel support from ASA Section for Statistical Programmers and Analysts, 2017-18.
  - **The George W. Snedecor Award**, Department of Statistics, Iowa State University, 2016. This award is for the most outstanding Ph.D. candidate in the department.
  - Climate Informatics Travel Fellowship Award, 2016. Travel fund for giving a spotlight oral presentation in the 6th International Workshop on Climate Informatics, Boulder, CO.
  - **The Holly C. and E. Beth Fryer Award**, Department of Statistics, Iowa State University, 2015. This award is for a top second-year Ph.D. student in the department.
  - **2nd Place** and **5th Place** at Data Mining Cup 2016, Prudsys AG, Berlin, Germany.
  - **Presidential Scholars Fellowship**, Iowa State University, 2014.
  - **National Scholarship of China**, Ministry of Education of the People’s Republic of China, 2013. This award is for outstanding undergraduate students in China.
  - Outstanding Student Scholarship, School of the Gifted Young, University of Science and Technology of China, 2012.
  - National Encouragement Scholarship, School of the Gifted Young, University of Science and Technology of China, 2011
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PROGRAMMING  
SKILLS

- **Projects in:** Python, R, SQL, C/C++, Hive, Hadoop, Matlab, LATEX.
- **Familiar with:** Unix shell, SAS, HTML.
- **IDEs:** vi/vim, Visual Studio, PyCharm, Jupiter.

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SERVICE AND  
LEADERSHIP

- Reviewer for *Statistica Sinica*.
- International Student Advisory Board, Iowa State University, 2018.
- Computation Advisory Committee, Department of Statistics, Iowa State University, 2017.
- **President** of the Iowa STAT-ers, 2017–18.
- Treasurer of the Iowa STAT-ers, 2016–17.
- **Graduate and Professional Student Senate**, Iowa State University, 2015–16.
- Student Assistant, Office of International Affairs, University of Science and Technology of China, 2013–14.

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PROFESSIONAL  
AFFILIATION

- American Statistical Association, Member, 2014 - Present
- Institute of Mathematical Statistics, Member, 2014 - Present
- International Chinese Statistical Association, Member, 2015 - Present
- Society for Industrial and Applied Mathematics, Member, 2017 - Present

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REFERENCE

Dan Nettleton, Ph.D.  
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