Xingche Guo

Data & Applied Scientist, Ph.D Candidate in Statistics

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Research Interests

Nonparametric models; Functional data analysis; High-dimensional statistics/Variable selection methods; Bayesian statistics; Spatial Statistics; Image analysis; Statistical machine learning.

Education

Iowa State University

Ames, IA

Doctor of Philosophy, Statistics

Aug. 2016 – Aug. 2021

- GPA: 3.98/4.0
- Advisor: Prof. Dan Nettleton (ISU) / Prof. Somak Dutta (ISU) / Prof. Yehua Li (UC Riverside)
- Courses: Advanced Probability Theory / Advanced Statistical Methods / Advanced Statistical Inference / Nonparametric Statistical Methods / Functional Data Analysis / Statistical Computing / Advanced Spatial Statistics / Advanced Bayesian Theory / Missing Data Analysis / Modern Multivariate Statistical Learning / Deep Machine Learning.

University of Science and Technology of China

Hefei, China

Bachelor of Science, Statistics

Aug. 2012 – Jun. 2016

- Average Score: 87.4/100

Skills

Projects in R, Rcpp, Python, Matlab, C, C++, LaTeX

Knowledgeable in SAS, SQL, Shell, HTML

Research Experience

A RKHS Approach for Variable Selection in High Dimensional Functional Linear Models

Ames, IA

PhD Thesis (with Prof. Yehua Li)

Feb. 2019 – PRESENT

- Proposed an elastic-net type estimator for functional linear regression with scalar responses and functional predictors under a reproducing kernel Hilbert space framework.
- To establish precise conditions on the problem dimension, the number of nonzero elements, and the number of observations that are necessary and sufficient for sparsity pattern recovery using the functional elastic-net method.

A Hierarchical Spatial Finlay-Wilkinson Model for Analysis of Multi-Environment Field Trials

Ames, IA

PhD Thesis (with Prof. Somak Dutta and Prof. Dan Nettleton)

Jan. 2018 – PRESENT

- Developed a statistical framework for understanding and predicting crop performance across environments by integrating genomic, environmental, and within-field spatial information.
- Proposed projected intrinsic autoregression prior (PIAR) for spatial adjustment of fertility that alleviates an identifiability issue.
- Designed matrix free fast computation algorithms for simulating high-dimensional GxE and spatial effects in MCMC procedures.

Work Experience

Laurence H. Baker Center for Bioinformatics and Biological Statistics — *Ames, IA*

Research Assistant — *Jan. 2018 – PRESENT*

- To develop methods for automatic and real-time maize traits measurement providing a sequence of maize field photos over time.
- Improved image segmentation algorithm to better distinguish maize from noisy field backgrounds using clustering and deep neural network.
- Enhanced Finlay-Wilkinson modeling for genotype-by-environment interaction analysis by incorporating genetic, weather, and spatial information using Genomes-to-Fields (G2F) data.
- Performed statistical testing and clustering methods to analysis tobacco nectar metabolite levels across sections/species.

Department of Statistics, Iowa State University — *Ames, IA*

Research Assistant — *Aug. 2017 – Dec. 2017*

- Responsible for monitoring the randomization of experiment design in an exercise study.

Department of Statistics, Iowa State University — *Ames, IA*

Teaching Assistant — *Aug. 2016 – May 2017*

- Grader for course: Probability and Statistics for Computer Science.

Talks & Posters

Talk & Poster: A Hierarchical Spatial Finlay-Wilkinson Model for Analysis of Multi-Environment Field Trials, Second International Workshop on Machine Learning for Cyber-Agricultural Systems, Ames, IA, Sep. 2019.

Talk: Automated Fraud Detection Model for Self-Scanning Systems, Statistics Department Seminar, Iowa State University, Ames, IA, Sep. 2019.

Talk: A Hierarchical Spatial Finlay-Wilkinson Model for Analysis of Multi-Environment Field Trials, Joint Statistical Meetings, Denver, Colorado, Aug. 2019.

Poster: Automated Fraud Detection Model for Self-Scanning Systems, Retail Intelligence Summit by Prudsys, Berlin, Germany, Jul. 2019 **(Data Mining Cup 1st Place Solution)**.

Selected Honors & Awards

2019	**MLCAS Best paper award** Travel grant for International Workshop on Machine Learning for Cyber-Agricultural Systems	*MLCAS*
2019	**1st Place at Data Mining Cup** 1/149 Teams from 114 universities in 28 countries	*Prudsys AG*
2018	**Meritorious Research Award** Advanced Spatial Statistics Course Project	*ISU*
2018	**The George W. Snedecor Award in Statistics** Presented annually to honor the most outstanding Ph.D candidate in Statistics	*ISU*

Professional Membership

American Statistical Association (ASA)

International Chinese Statistical Association (ICSA)