



Education

PhD | Bioinformatics & Statistics (co-major)

Iowa State University | 2015-2020

- Advisors: Iddo Friedberg and Mark S. Kaiser
- Lora and Russ Talbot Graduate Fellowship in Veterinary Medicine (2019)
- Miller Scholarship (2015 - 2018)

MA | Statistics

Columbia University | 2013-2014

- Relevant coursework: data mining, nonparametric statistics, advanced data analysis
- Grader for STAT W1111, Intro to Statistics

BS | Information and Computing Science

Beijing Jiaotong University | 2009-2013

- Thesis topic: Bayesian inference on time series data

Selected Publications

- Zhou, N., *et al.* (2019). The CAFA challenge reports improved protein function prediction and new functional annotations for hundreds of genes through experimental screens. *Genome Biology*. *in press*.
- Zhou, N., *et al.* (2018). Crowdsourcing image analysis for plant phenomics to generate ground truth data for machine learning. *PLoS computational biology*.

Software Developed

- **PhiMRF**: R package for Poisson Hierarchical Markov Random Field models for capturing spatial dependence in count data observed on irregular lattices.
- **CAFA Assessment Tool**: Assessment tool for automated protein function prediction using precision-recall.

Selected Talks

- Exploring the 3D spatial dependency of gene expression using Markov Random Fields. **Genome Informatics**, Cold Spring Harbor, NY, 2019
- The Critical Assessment of Protein Function Annotation: Preliminary Assessment. **Intelligent Systems for Molecular Biology**, Prague, Czech Republic, 2017
- Effects of Beta Blockers on Hospital Admission Rates and Cost. **Joint Statistical Meeting**, Seattle, WA, 2015

Experience

ISU Friedberg Lab | Graduate Research Assistant

2015 - Present

- Developed statistical model and R package to analyze RNA-seq and HiC data
- Organized an online challenge with 200GB of submissions from 68 teams of researchers
- Developed algorithms to analyze Gene Ontology Annotation data
- Implemented algorithms to evaluate accuracy of protein function prediction

New York City Health and Hospitals Corporation | Research Intern

2014 - 2015

- Developed statistical model to analyze patient diagnoses and drug prescriptions from hospital admission data
- Cleaned and organized electronic medical records under HIPAA

Pfizer China | Intern

2013

- Supported the External Medical Affairs team in organizing academic seminars and conferences

Skills

Large-scale genomics

- RNA-seq data analysis
- Gene Ontology and Gene Ontology Annotation Database
- HiC data analysis

Statistics

- Hierarchical models, Markov random fields, Bayesian methods, Markov chain Monte Carlo
- Data mining, machine Learning, statistical computing
- Generalized linear mixed models

Programming and scientific computing

- Proficient in python, R, C and Linux/Unix shell scripting
- R package development
- Parallel computing, OpenMP, LAPACK, BLAS
- Experience in SAS, LaTeX and Matlab

Leadership Experience

- Senator, **Graduate and Professional Students Senate**, Iowa State University, 2017-2018
- Director of Outreach, **BCB Graduate Student Organization**, Iowa State University, 2016-2017
- Volunteer, **MUMO Education and Orphanage Center**, Nairobi, Republic of Kenya, 2011