

ZHANGLONG CAO

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EDUCATION

University of Otago

September 2014 - August 2018¹

Doctor of Philosophy

Research Topic: Inference and Characterization of Planar Trajectories

University of Shanghai for Science and Technology

September 2008 - March 2011

Master in Science

Major in Complex Analysis

Jiangsu Normal University²

September 2003 - June 2007

Bachelor in Science

Major in Mathematics and Applied Mathematics

ACADEMIC STRENGTH

Publications

- S. Rakshit, et al, Novel approach to the analysis of spatially-varying treatment effects in on-farm experiments, Field Crops Research, June, 2020.
- M. Shankar, et al, Targeting improved partial resistance using yield-loss response curves for foliar diseases of wheat, GRDC updates, 2020.
- Z. Cao, D. Bryant, T. Molteno, C. Fox, M. Parry. Adaptive Smoothing V-Spline for Trajectory Reconstruction, Submitted to Journal of Computational and Graphical Statistics
- Z. Cao, D. Bryant, M. Parry. Adaptive Sequential MCMC for Combined State and Parameter Estimation, arXiv:1803.07734.
- Z. Cao, D. Bryant, M. Parry, V-Spline as Bayes Estimates, arXiv:1803.07645.1
- X.L. Wang, Z. Cao. Unicity Theorems of Meromorphic Functions with Three Weighted Sharing Values, Chinese Quarterly Journal of Mathematics, 2012, 27(1):110-116
- Z. Cao, X.L. Wang. Meromorphic Functions Sharing Two Sets with Weighted Value of One, Journal of the University of Shanghai for Science and Technology, Vol.32, No.5, 2010.

Manuscripts in Preparation

- F. Evans, Z. Cao, S. Cook. Analysis of data from large of on-farm experiments using Bayesian latent Gaussian models.
- M. Ashworth, R.L. Rocha, R. Devlin, R. Smith, Z. Cao. The interaction between wheat (*Triticum aestivum*) establishment timing and pre-emergent herbicides choice on annual ryegrass (*Lolium rigidum* Gaud.) growth and competition.
- M. Ashworth, R.L. Rocha, R. Devlin, R. Smith, Z. Cao. The interaction between seeding rate and row spacing of hybrid and open pollinated canola (*Brassica napus*) varieties on wild radish (*Raphanus raphanistrum*) growth and seed production.
- M. Ashworth, R.L. Rocha, R. Devlin, R. Smith, Z. Cao. The interaction between seeding rate and seed size of hybrid and open pollinated canola (*Brassica napus*) varieties on annual ryegrass (*Lolium rigidum*) growth and competition.
- M. Ashworth, R.L. Rocha, R. Devlin, R. Smith, Z. Cao. The contribution of nitrogen fertilizer timing and placement in reducing the growth and seed production of ryegrass (*Lolium rigidum* Gaudin) in competition with wheat (*Triticum aestivum* L.).
- Z. Cao, M. Lee. Assessing accuracy of imputation using different SNP panel densities.

Project Reports

- Low weed seed bank persistence under sustained integrated weed management, 2019. Collaboration with Dr Mike Ashworth from Australian Herbicide Resistance Initiative (AHRI).
- Wodjil Workout – Rise of the pH, 2019. Collaboration with TekAg.
- Low weed seed bank persistence under sustained integrated weed management, 2019. Collaboration with Dr Mike Ashworth.

¹Submission: December 21st, 2017. Oral examination: July 4th, 2018. Graduation ceremony: August 18th, 2018.

²The university was named Xuzhou Normal University before 2011.

- Crop competition for weed control and maintenance of crop yield, 2020. Collaboration with Dr Mike Ashworth.
- Investigating Susceptibility of Plant breeds to Fungal Disease. Collaboration with Prof Michael Francki from the Department of Primary Industries and Regional Development.
- National Phenology Initiative 2020. Collaboration with NPI Team, Animal Plant and Soil Sciences, School of Life Sciences, La Trobe University.

Conferences and Seminars

- IBS Dec 2019, Adelaide, Model selection and principle of parsimony in statistical modelling in agriculture.
- SAGI Symposium, May 2019, Rottenest, Early Career Statistician.
- Seminar, Jul 2018, Dunedin, Adaptive Sequential MCMC for Combined State and Parameter Estimation.
- BayesComp, Mar 2018, Barcelona, Adaptive Sequential MCMC for Combined State and Parameter Estimation
- ISCA2016, Dec Shanghai, Trajectory estimation from GPS data using an adaptive smoothing spline.
- NZMASP, Nov 2016, Queenstown (*Member of Organizing Committee*), Going Online with GPS Data.
- Seminar, May 2016, Dunedin, Spline-based Approach to Infer Farm Vehicle Trajectories.
- NZMASP, Nov 2015, Roturora, Spline-based Approach to Infer Farm Vehicle Trajectories.
- NZMASP, Nov 2014, Auckland, Uniqueness of Meromorphic Function with Its k -th Derivative Sharing Two Weighted Values.

R-package

- **V-Spline**. Adaptive V-spline and the Bayesian estimates.

WORK EXPERIENCE

SAGI West, Curtin University

Research Associate

November 2018 – present

Perth, Australia

- ***Biometrician*** Work closely with agronomists and plant breeders. Advise and consult with research and advisory staff on the experimental design and statistical analysis of experiments.
- ***Statistician*** Contribute to research output. Develop cutting-edge statistical methodology and algorithms. Publish/exhibit in high quality journals/outlets.

University of Otago (Part-time)

Research Assistant

March - November 2018

Dunedin, New Zealand

- ***R Programmer*** Working on genotype imputation research topic. Assisting with developing and coding in R to achieve a higher accuracy and efficiency. Testing computer code for big data set.
- ***Data Analyst*** Assisting with analysing results to linear mixed models on the topic about genotype imputation accuracy.

University of Otago

Researcher, Tutor, Teaching Fellow

September 2014 - August 2018

Dunedin, New Zealand

- ***Statistician*** Worked on a joint project with Physics department. Used statistical modeling method to infer trajectories of moving vehicles from noisy GPS data.
- ***Teaching Fellow*** Taught STATS 110 summer school 2016, 2017 and 2018. It was a collaborative work with other two Ph.D. students. Each of us taught one-third of the course book. My portion covered basic distribution definitions, hypothesis testing, χ^2 testing and contingency table.
- ***Tutor*** Tutored Stats and Maths undergraduates from 2015 to 2017.

Honghai Longteng E-Commercial Ltd Company

Senior Data Analyst

May - August 2014

Jinan, China

- ***Data Analyst*** Analyzed marketing data with advanced statistical models and wrote market analysis reports.
- ***Manager*** Reported sales and marketing performance to the director. Provided data analysis support to the sales department.
- ***Statistician*** Cooperated with software engineers to create a new daily, weekly and monthly reporting system using *Excel VBA* and *Java* with advanced statistical models.
- ***Cooperator*** Cooperated with other departments to improve the security of the data management system.

Beijing Yisheng Leju Information Service Ltd Company

Data Analyst

July 2011 - June 2013

Beijing & Jinan, China

- **Products Manager** Managed network products and provided product management service to clients.
- **Data Analyst** Worked on monthly, quarterly and annually marketing summary and prediction report with the intelligent analysis system. Presented current and predicted marketing situation to the manager and directors of other departments.
- **Mentor** Guided new staff to get used to the products. Helped graduated students to adopt to the new career in this company.

Bureau of Shanghai World Expo Coordination (Internship)

Data Analyst/Leader of New System Research Group

July - October 2010

Shanghai, China

- **Data Analyst** Analyzed hourly and daily visitors' data for the site operation and control center. Predicted the number of visitors to the Expo Park in the following 2 and 3 days.
- **Group Leader** Led a group of staff to develop advanced forecasting mathematical model and system, which have more precise hourly and daily predictions. This work was reported in newspapers and other media.
- **Volunteer** Volunteer of Shanghai Expo 2010. Provided services for visitors in the Expo site.