

Jiehua Chen

QED, Inc.

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Research Interests

Spatial-temporal modeling, time series analysis, infill asymptotics, and multilevel modeling. Extensive application experience in rainfall forecasting, environment digital mapping, renewable energy planning, and forecasting.

Education

Stanford University

Ph.D. Statistics

Stanford, CA

09/2003 - 5/2008

- Thesis: *Regression Models With Spatially and Temporally Correlated Errors: Applications to Urban Core Growth in China*. Developed new techniques in spatial-temporal modeling to study the process of urbanization in three coastal provinces of China from 1988 to 2004.

Stanford University

M.A. Economics

Stanford, CA

09/2005 - 5/2008

Tsinghua University

B.Sc. Mathematics and Physics, *summa cum laude*

Beijing, China

08/1998 - 06/2002

Work Experience

QED (<http://qed.ai>)

Co-Founder and Senior Statistician

California

2008 - present

- Co-founder of a technology business that builds customized data processing solutions to a wide range of clients, ranging from individuals to corporations. Past projects have included ad revenue optimization, clinical data analysis, early warning systems for detecting orchard insects, and quantitative finance.

The Earth Institute, Columbia University

Associate Research Scientist

New York, NY

8/2011 - present

- Research interests are in developing statistical tools for analyzing spatial-temporal data, high-dimensional data analysis, and image processing of remote sensing data. These interests are currently being applied toward the African Soil Information System (AfsIS) project, which includes statistical analyses of spatial-temporal soil and agricultural yield data, hyperspectral soil data, and satellite imagery.
- Soil Prediction Tool using BART (Bayesian Additive Regression Tree) model, deployed at <http://spectpred.kutabiri.com>, where the results were carefully calibrated for different kinds of spectrometers. Launched Kaggle competition to test and validate new techniques gleaned from the global data science community (<https://www.kaggle.com/c/afsis-soil-properties>).
- Workflow for efficiently computing landscape information maps, developed based on crowdsourcing data generated via Geosurvey <http://geosurvey.kutabiri.com/>. The code will be gradually published in github.

The Earth Institute, Columbia University

Data Analyst

New York, NY

4/2011 - 7/2011

- Developed MATLAB package for wind energy analysis. The code is used in Course MECE E4211.001 (Energy Sources and Conversion) at Mechanical Engineering Department, Columbia University.

The Earth Institute, Columbia University
Statistician

New York, NY
3/2011 - 4/2011

- Evaluated children nutrition projects in the Millennium Village Projects.

The Earth Institute, Columbia University
Senior Monitoring & Evaluation Manager

New York, NY
1/2011 - 3/2011

- Developing optimal sampling algorithms for selecting locations to conduct soil quality monitoring across all of Africa for African Soil Information Service.
- Estimating soil digit maps for Africa to map soil conditions, setting a baseline for monitoring changes, and providing options for improved soil and land management based on existing world soil information for African Soil Information Service.

IRI, Columbia University
Casual Employment

New York, NY
12/2010

- Consultant for index insurance project in Ethiopia conducted by IRI (International Research Institute for Climate and Society of Columbia University). Simulated rainfall from historical data to help determine rainfall index insurance prices.

UN Development Programme
Consulting Statistician

New York, NY
5/2010 - 11/2010

- Evaluating the impact of health, education, and infrastructure-related interventions introduced by the United Nations Millennium Village Projects conducted in fourteen African countries.
- Current two main projects related to the evaluation: Changes in nutrition status in the villages, and cost-effect analysis of water pipe projects.

Statistics Department and the Earth Institute, Columbia University
Postdoctoral Fellow

New York, NY
07/2008 - 6/2010

- Worked with the Millenium Village Projects on a field random experiment about information diffusion for fuelsaving woodstoves in Uganda. Designed a new kind of randomized experiment, and implemented a new propensity score weighting method.
- Developed machine learning algorithms (convolutional neural networks) for identifying households from satellite images of the African landscape. Deduced information will be used to optimize the placement of energy utilities and layout of roads.
- Taught graduate level classes for statistics department.

World Bank, Beijing Office
Economics Research Intern

Beijing, China
07/2005 - 09/2005

- Investigated the problem of socioeconomic inequality in China. Advised by Bert Hofman, chief of the Economics Unit at Beijing.

Hong Kong University of Science and Technology
Research Assistant

Hong Kong, China
07/2003 - 09/2003

- Studied applications of statistics in management science. Advised by Professor Samuel Wong.

The University of Hong Kong, Mathematics Department
Research Assistant

Hong Kong, China
02/2003 - 07/2003

- Researched weighted Tabu search clustering for decision making, implemented in C. Advisor: Michael Ng.

Past Research Projects and Deliveries

- Evaluated children nutrition projects in Millennium Village Projects and conducting causal inference studies on related topics. The publication will show up in the American Journal of Clinical Nutrition.
- Developed optimal sampling algorithms for selecting locations to conduct soil quality monitoring across all of Africa for African Soil Information Service (<http://www.africasoils.net>), and analyzed legacy soil data, and developed spatial-temporal models incorporating a preferential sampling procedure.
- Developed spatial analysis R code (kriging with cross-validation) for the simulation of rainfall based on historical data. The simulation was needed for an index insurance project in Ethiopia conducted by IRI (International Research Institute for Climate and Society of Columbia University).
- Evaluated the impact of health, education, and infrastructure-related interventions introduced by the United Nations Millennium Village Projects conducted in fourteen African countries on their HIV prevalence rates. A report has been written for UNDP.

Other Work Experience

The Earth Institute, Columbia University and tempSource Statistician; Senior Monitoring & Evaluation Manager	New York, NY 2/2011 - 4/2011
UN Development Programme Consulting Statistician	New York, NY 5/2010 - 11/2010
IRI, Columbia University Casual Employment	New York, NY 12/10/2010-12/31/2010

Publications

- “Regression models with spatially correlated residuals: applications to urban core growth in China.” Jiehua Chen. PhD Thesis, Statistics Department, Stanford University (2008).
- “Comparative analysis of REML and ML estimation in spatial statistics.” Jiehua Chen. *Joint Statistical Meeting Proceedings*, August 2007.
- “Testing institutional biomass cookstoves in rural Kenyan schools for the Millennium Villages Projects.” Edwin Adkins, Jiehua Chen, Jacob Winiecki, Peter Koinei, and Vijay Modi. *Energy Policy*, **14**, 3, 186–193, 2010.
- “Reducing sexual HIV/STI risk and harmful alcohol use among female sex workers in Mongolia: A randomized clinical trial.” Susan S. Witte, Batsukh Altantsetseg, Toivgoo Aira, Marion Riedel, Jiehua Chen, Katie Potocnik, Nabila El-Bassel, Elwin Wu, Louisa Gilbert, Catherine Carlson, Hanfei Yao. *AIDS and Behavior*, **15**, 8, 1785–1794, 2011.
- “Adjusting survey weights using multilevel modeling: a case study of jatropha adoption in Mali.” Matt Basinger, Jiehua Chen, Frances Jeffrey-Coker, F. S. Rodriguez-Sanchez, Tim Singer, Vijay Modi. *Agroforestry Systems*, **84**, 1, 59–72, 2012.
- “Multi-sector intervention to accelerate reductions in child stunting: an observational study from nine sub-Saharan African countries.” Roseline Remans et al. *The American Journal of Clinical Nutrition*. **94**, 1632–1642, 2011.
- “Reducing intimate and paying partner VAW who exchange sex in Mongolia.” Susan S. Witte, Toivgoo Aira, Marion Riedel, Jiehua Chen, Catherine Carlson. *The Journal of Interpersonal Violence*, **27**, 10, 1911–1931, 2011.
- “Rao-score test for spatial correlation.” Jiehua Chen and David Siegmund. Submitted to *Geographical Analysis*. (2015)
- “Infill asymptotics with unknown mean function.” Jiehua Chen. Under revision.

Work in Preparation

A random experiment about improved-stove information seeding in Uganda. Collaborators: Macartan Humphreys and Vijay Modi.

Detecting houses in remote sensing maps of Millennium Villages in Africa. Collaborators: Roy Han.

Rainfall simulation combining remote sensing data and weather station data. Collaborator: Tufa Dinku.

Regression models with survey weights. Collaborator: Andrew Gelman.

Presentations

“A Rao Score Test for Spatial Correlation,” Spatial Econometrics Conference 2007.

“A Spatial-temporal Modeling of Urbanization in East-coastal Provinces in China,” JSM 2007.

“Fuel Efficient Wood Stoves Testings in Sauri Kenya,” Colloq. of The Earth Institute at Columbia Univ., 2008.

Teaching Experience

Columbia University

Statistics Professor

New York, NY

Autumn 2008-2009

- Taught graduate-level statistics course in Time-Series Analysis (W4437). Topics included ARMA and ARIMA models, ACF, forecasting, parameter estimation, unit root tests, and spectral analysis.
- Taught graduate-level statistics course in Multilevel Modeling (W4330). Topics included multilevel linear modeling, multilevel general modeling, model interpretation and diagnostics.

Computer and Verbal Skills

Programming Languages: R, Python, Winbugs, STATA, MATLAB, Perl

Databases: MySQL, MongoDB, PostgreSQL

Version Control and Project Management: Git, Asana, JIRA, Slack

Operating Systems: Mac OS X, UNIX, Windows 95/98/2000/XP/7

Verbal: Perfect fluency in both English and Mandarin Chinese. Conversational fluency in Cantonese. Can order food smoothly in Swahili.

Awards

- Scholarships
 - Stanford Teaching Assistant and Research Assistant Scholarships 2003-2008
 - Tsinghua Outstanding Student Scholarships 1999-2002
- Technical Awards
 - Berkeley Social Innovation Hackathon, First Place 2014
 - Berkeley Cleanweb 2.0 Hackathon, First Place Water Track 2014
 - UC Berkeley Center For New Media (BCNM) Chatbot Hackathon, First Place 2014
 - DARPA Shredder Challenge, Honorable Mention, 13th out of +9000 teams worldwide 2011

Coursework

- **Statistics**

estimation, statistical inference, hypothesis testing, parametric and nonparametric models, linear regression, analysis of variance, theory of probability, asymptotics, large deviation theory, bootstrapping, time series analysis, machine learning, Bayesian methods, spatial statistics

- **Mathematics**

single and multivariable calculus, differential equations, topology, real and complex analysis, group theory, convex optimization

- **Economics**

econometrics, core macroeconomics and microeconomics, development economics