Chang Lu

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EDUCATION

Ph.D., Economics   Expected May, 2022
University of Illinois at Urbana-Champaign
Master, Statistics   2018
University of Illinois at Urbana-Champaign
Master, Economics   2016
University of Illinois at Urbana-Champaign
B.A., Finance   2014
Peking University

FIELDS OF CONCENTRATION

Econometrics, Spatial Econometrics, High-dimensional Statistics, Urban Economics, Real Estate Economics.

WORKING PAPERS

- "Robust LM Test for Spatial Autoregressive Tobit Model with Spatial Autoregressive Disturbances." with Anil K. Bera. (Job Market Paper)
- "Modelling the Spatial Impact of Crime on Housing Prices: Evidence from Chicago City." with Geoffrey J. D. Hewings.
- "Bootstrap-based Inference of High Dimensional Means and Its Applications." with Xiaofeng Shao.

PUBLICATIONS

- "Prasanta Chandra Mahalanobis: A Renaissance Man and the Father of Statistics in India" with Anil K. Bera, *Bhavana: A Publication of the Indian Mathematics Consortium*, Vol 1, 2017, pp. 1-17.
- "What should we do under the European Debt crisis?", *The School Journal of Peking University*, 2011.

RESEARCH/TEACHING EXPERIENCE

Regional Economics Application Laboratory
Research Assistant   2019-2021
- Performed spatial analysis on the impact of different types of crime on house prices in 801 census tracts areas of Chicago.
- Made forecast on Chicago housing prices utilizing spatial methodologies.

University of Illinois at Urbana-Champaign   2016-Present
Research Assistant
- Developed a robust LM test for spatial autoregressive Tobit model with spatial autoregressive disturbances.
- Developed a new test statistic for high-dimensional data and utilized wild-bootstrap method to construct the sample version and proved the consistency.

Teaching Assistant   2015-2019
- Acted as teaching assistant of the core courses for Economics and Finance Ph.D. students (ECON 532 Econometrics I, ECON 535 Econometrics II and FIN 501 Financial Economics) and undergraduate level classes (ECON 102 Microeconomics, ECON 103 Macroeconomics).
- Developed and delivered lectures, review sessions and exams.
- Included in the List of Teachers Rated as Excellent in year 2017 and 2018.

Peking University   2010-2014
Research Assistant
- Research Assistant for Professor Yiming Wang
  - Studied the Chinese preschool education and families' over-investment on it.
  - Explained the phenomenon with game theory, built a model to verify the explanation, and accomplished a 50-page paper which was honored as the *Principle Funds of Undergraduate Research*.

HONORS AND AWARDS

Peking University
- Principle scholarships of undergraduate research   2013
- Outstanding summer research group   2012
- Ellen Eoyang scholarship   2011
- Outstanding study award   2011

PROFESSIONAL EXPERIENCE

- **Bayer Crop Science, USA**   Jan, 2021-Present
  - Data Scientist Intern - Crop Science/Breeding
  - Data wrangling to set up meta-analytic databases including the development of R codes to automate the process.
  - Leverage meta-analysis within Breeding organization to compare yield performance of soybean varieties with distinct native (resistance to nematodes) or biotech traits.
  - Development of profitability analysis to estimate return of investment based on yield performance of soybean varieties.
- **Ping An Annuity Insurance, Beijing**   Jun, 2013-Aug, 2013
  - Collected data and built the customer information database.
  - Analyzed the management of about 300 enterprises in Beijing and counted the achievements of the enterprise annuity investment management institutions from 2012 to the first quarter of 2013.
- **CITIC Bank, Beijing**   Dec, 2012-Jan, 2013
  - Acted as the product manager and helped to evaluate potential banking businesses.
  - Drafted contracts and implemented loan documents through coordination with customers, counsels, and internal related departments.
- **Industrial and Commercial Bank of China, Anyang**   Jun, 2011-Aug, 2011
  - Studied the personal credit procedure and basic bank business and helped to enter the customer information of personal credit into the database.

SKILLS

R, Python, ArcGIS, SQL, STATA, LaTex.

REFERENCES

Anil K. Bera (Dissertation Chair)   **Xiaofeng Shao**
Department of Economics   Department of Statistics
University of Illinois at Urbana-Champaign   University of Illinois at Urbana-Champaign
Phone: 217-333-4596   Phone: 217-244-7285
Email: abera@illinois.edu   Email: xshao@illinois.edu

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Department of Geography
University of Illinois at Urbana-Champaign
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ABSTRACTS

Robust LM Test for Spatial Autoregressive Tobit Model with Spatial Autoregressive Disturbances

This paper proposes the modified Lagrange multiplier (LM) tests for spatial autoregressive (SAR) Tobit model with SAR disturbances. There are two types of models considered in this paper, one is the latent SAR Tobit model with SAR disturbances, and the other one is the simultaneous SAR Tobit model with SAR disturbances. The difference of these two types of SARAR Tobit model is whether a certain area's data is affected by the actual data of its neighbors or by the latent data of its neighbors. We provide the corresponding score functions, information matrix and show the asymptotic distributions of the proposed test statistics. The finite sample size and power are investigated through a Monte Carlo simulation study. Our simulated results show that those proposed tests have good finite sample properties both in terms of size and power.

Bootstrap-Based Inference of High-Dimensional Means and Its Applications

This paper studies the consistency of the wild bootstrap for the U-statistic in the inference of high-dimensional means. Since our statistics turn out to be martingales, we can directly apply Heyde and Brown's (1970) results and compute the exact bounds of the U-statistics departure from the bootstrapped version. Besides, we also developed the studentized version of the test, which provides better results than its unstudentized counterpart under some data generating processes. Both unstudentized and studentized U-statistics are investigated and the consistency of wild bootstrap is established under mild conditions, allowing for the dimension "d" to grow at a faster rate than sample size "n". In order to show the applicability of our statistic, we apply our results to three problems in statistics and econometrics: overidentification test with growing number of instrumental variables, spatial sign-based mean test, and the sphericity hypothesis test for the covariance matrix.

Modelling the Spatial Impact of Crime on Housing Prices: Evidence from Chicago City

This paper examines the spatial distribution of crime in Chicago census tracts and its impacts on housing prices. The results show the spillover effects of crime among census tracts of Chicago city and the effect of crime on the local real estate market. We consider two kinds of spatial models, one is the spatial autoregressive model (SAR), and the other one is spatial Durbin model (SDM). With the data from 801 census tracts of Chicago city, we not only show the effect of current area crime but also show the significant effect of neighborhood area crime on housing prices. Besides, in our results, theft and burglary have positive but insignificant effects on housing prices, which means they are associated with higher-income neighborhoods, while violent crimes tend to be found in lower-priced neighborhood areas. This means that different from the conventional thoughts that crime always have a negative effect on the property prices, the effects of different types of crimes can have different and more complex effects on the housing prices.