

# Xinhui Sun

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## Education

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**Ph.D. in Economics, University of Illinois at Urbana-Champaign, May 2025 (expected)**

**M.S. in Policy Economics, University of Illinois at Urbana-Champaign, Dec 2019**

Core Courses: Advanced Data Analysis, Machine Learning, Time Series Analysis, Mathematical Statistics

**B.S. in Economics, University of International Business and Economics (UIBE), Jun 2018**

Core Courses: Linear Algebra, Probability Theory, Investment Analysis, Financial Derivatives

**Exchange student, University of California, Berkeley, Jan 2017 - May 2017**

Core Courses: Stochastic Process, Statistical Methods of Data Science

## Research Interests

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Environmental Economics, Behavioral Economics, and Causal Inference

## Working Experience

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**Gies College of Business, University of Illinois at Urbana-Champaign** Illinois, United States

Research Assistant to Professor Tatyana Deryugina Aug 2022 – present

- Formatted **geo-spatial data** and matched it with block-level demographic data.
- Cleaned weather and labor-related data from 1969-2020.
- Established panel fixed effect models to estimate the marginal effect of climate.

**Department of Economics, University of Illinois at Urbana-Champaign** Illinois, United States

Research Assistant to Professor Eunyi Chung June 2021- Aug 2022

- Assisted in developing two adjusted permutation tests, which are more robust than the traditional permutation test. Wrote corresponding **R codes** and Packages.
- Implemented a **Regression Discontinuity** application to this framework.
- Compared the performance of these two adjusted permutation methods in terms of type 1 error and power by running Monte Carlo Simulations using R.

**Risk Management Department, Bank of Communications**

Shanghai, China

Data Analyst Intern

Jun 2017 - Aug 2017

- Sorted and selected mortgage loan data using SQL and conducted data cleaning and feature selection.
- Established Logistic Regression to Predict the Probability of Default of each client.
- Utilized Decision Tree and Support Vector Machine to realize client classification and updated the database by red-flagging high-risk clients.
- Acquired up-to-date housing price data from public networks using a web crawler and analyzed the risks of housing mortgage loans via statistical changes in housing prices

## Work in Progress

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**Air Pollution, Avoidance Behaviors, and Outdoor Activities: Evidence from the U.S.**

Paper in Progress

- Collected and formatted 26m+ mobile phone location data, and match each location with the nearest monitor group data using latitude and longitude.
- Performed **k-means** to cluster all air pollution data into spatial groups based on their location.

- Used change in wind direction as an **Instrumental Variable** to resolve the endogeneity problem of air pollution, and derived the causal effect of air pollution on time spent outdoors.

## Ensemble Machine Learning Model for Image Classification

Group project for STAT542 Statistical Learning

- Performed **unsupervised learning**, including k-means and density-based clustering, on the training data with 60k+ observations of the Fashion-MNIST dataset.
- Compared the performance of various multi-class **classifications**, including Linear and Quadratic Discriminant Analyses, mean-based classification, multi-class SVM, and random forest.
- Built the ensemble model by using the histogram-based **gradient boosting** and incorporating results from previous models and achieved 90.5% accuracy.

## Teaching Experience

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**ECON 102: Microeconomic Principles**

Fall 2021, Spring 2022

Teaching Assistant

**The Economic of the Firm** (EMBA at the University of Warsaw)

Summer 2019

Teaching Assistant to professor Hadi Esfahani

**Econ 528: Microeconomics for Business**

Spring 2019, Summer 2019

Course Assistant

## Awards

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Cleo Fitzsimmons Award (awarded to the student with the highest GPA), University of Illinois 2022

Graduate Fellowship, University of Illinois 2020

## Skills

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**Language:** Mandarin (Native), English (Proficient), French (Basic)

**Programming:** R (dplyr, caret, ggplot2), Python (Numpy, Pandas, Sklearn), STATA, QGIS (basic)

**Machine Learning:** Linear/Logistic Regression, KNN, Support Vector Machine, Decision Tree, Random Forest, etc.