

# JAESEOK HWANG

[jaeseok2@illinois.edu](mailto:jaeseok2@illinois.edu) · 217-778-8776 · [Github](#) · [LinkedIn](#)

## **PROFESSIONAL EXPERIENCE (Research Assistant)**

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### **Data Intensive Farm Management (USDA NRCS)**

Sep 2020 – May 2025

- **Engineered** Python/R data pipelines to process and integrate 500k+ geospatial and time-series records, enabling large-scale modeling and public data delivery.
- **Collaborated with** Oracle cloud engineers to support scalable ETL workflows, developing core R/Python scripts for processing of 300+ unique datasets.
- **Developed and benchmarked** tree-based models (XGBoost, Causal Forest) to forecast performance outcomes and improve accuracy over baseline methods.

### **Center for the Economics of Sustainability (UIUC)**

Jan 2021 – Aug 2024

- **Conducted** large-scale economic and geospatial scenario analyses using Monte Carlo simulations to evaluate the profitability and sustainability of different business strategies.
- **Applied** panel-based counterfactual models to estimate the economic impact of management changes, informing national-scale policy studies.

## **DATA SCIENCE AND ECONOMICS PROJECTS**

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*Reproducible Code Portfolio:* [github.com/jaeseokh](https://github.com/jaeseokh)

### **Predictive Model Generalization and Validation (2022–2025)**

- Began by developing ensemble-based predictive systems (XGBoost, Random Forest) to improve cross-environment yield forecasting and model stability under data heterogeneity.
- Advanced the framework toward Bayesian tree models to integrate domain priors and quantify uncertainty.
- Demonstrated how Bayesian approaches enhance learning when experimental data are limited or noisy by incorporating production-theoretic beliefs into posterior updates, linking economic theory with machine-learning inference.

### **Causal Inference for Optimal Resource Allocation and Risk Analysis**

- Conducted systematic analysis of crop producers' decision behavior to evaluate how growers respond to historical changes in price and weather to maximize profitability.
- Explored risk-based decision frameworks identifying strategies that remain optimal under volatile input–output price ratios and unpredictable weather shocks.

### **Trade-Off of Production Output and Core Input**

- Evaluated profitability and precision of new high-tech groundwater control systems, focusing on spatial spillover effects and accurate measurement of economic return.
- Developed frameworks to assess trade-offs between production outputs and essential resource inputs under spatially heterogeneous production environments.

## **EDUCATION**

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### **University of Illinois at Urbana–Champaign**

*Expected May 2026*

Ph.D. Agricultural and Applied Economics

### **University of Illinois Urbana–Champaign**

*May 2020*

M.A. Agricultural and Applied Economics

### **Sogang University**

*Aug. 2013, South Korea*

B.S. Economics

## **TECHNICAL SKILLS**

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**Languages:** R (Expert), Python (Proficient), SQL

**Tools:** GitHub, Jupyter, QGIS, Quarto

**Data Science & ML:** Scikit-learn, PyTorch, Pandas.

**Methods:** Causal Inference, Bayesian Models, Time-Series Analysis, Geospatial Analysis