

JAESEOK HWANG

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PROFESSIONAL EXPERIENCE (Research Assistant)

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

Reproducible Code Portfolio: 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

University of Illinois at Urbana–Champaign

Ph.D. Agricultural and Applied Economics

Expected May 2026

University of Illinois Urbana–Champaign

M.A. Agricultural and Applied Economics

May 2020

Sogang University

B.S. Economics

Aug. 2013, South Korea

TECHNICAL SKILLS

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