

# JAESEOK HWANG

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## PROFESSIONAL EXPERIENCE (Research Assistant)

### Data Intensive Farm Management (USDA NRCS)

Sep 2020 – Aug 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 unique datasets.
- Benchmarked tree-based and Bayesian modeling frameworks to systematically evaluate yield–nitrogen response patterns across heterogeneous field environments.

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

Jan 2021 – Aug 2024

- Conducted geospatial and economic scenario analysis using Monte Carlo simulation to assess profitability and sustainability outcomes.
- Applied panel-based counterfactual models to estimate the impact of management changes, contributing to national-scale policy evaluations.

## DATA SCIENCE AND ECONOMICS PROJECTS

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

### Bayesian Modeling of Yield–Nitrogen Responses Using On-Farm Experiment Data (2022–2025)

- Developed ML and Bayesian models using >500k OFPE observations to characterize yield–nitrogen response heterogeneity.
- Identified limits of tree-based models under sparse covariates; introduced timing-specific weather to proxy soil–water–N dynamics.
- Advanced Bayesian curve-feature models (plateau, steepness, curvature) to quantify timing effects.
- Applied shrinkage priors and pooling to support nitrogen decision-making under limited field-year data.

### Producer Input Decisions Under Weather and Price Uncertainty (Behavioral and Causal Analysis)

- Studied fertilizer input adjustments under weather and price volatility using behavioral elasticity models.
- Built uncertainty-aware decision frameworks identifying strategies robust to volatile environments.
- Designed econometric models connecting individual adjustments to system-level behavior.

### Nitrogen Loss Measurement and Yield Impacts (Ongoing)

- Analyze real-time nitrogen-loss sensor data to quantify leaching dynamics.
- Build time-series and spatial models linking N-loss patterns with weather events and soil conditions.
- Develop an inference framework to evaluate yield and profit penalties associated with N-loss.

## EDUCATION

### 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

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

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

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

**Methods:** Causal Inference, Bayesian Models, Geospatial Analysis