

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

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

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, Geospatial Analysis