

# JAESEOK HWANG

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## EXPERIENCE (Graduate Research Assistant)

### Data Intensive Farm Management (USDA NRCS)

Sep 2020 – Present

- Developed automated Python/R pipelines to clean, join, and serve 500k+ geo-referenced yield and weather records for public use via difm.farm
- Partnered with Oracle Cloud engineers to build scalable ETL workflows and storage solutions—leveraging SQL for data queries and ingestion of 300+ field experiment datasets across 16 U.S. states
- Trained and evaluated ensemble and neural ML models (scikit-learn, PyTorch, R6) to predict field productivity under environmental uncertainty

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

Jan 2021 – Present

- Collaborated in weekly interdisciplinary meetings to build region-scale simulation workflows with agronomists and economists
- Trained in Monte Carlo simulation, geospatial scenario modeling, and panel-based counterfactual simulations to evaluate land use, sustainability, and profitability under uncertainty
- Applied simulation and analytics skills in joint research with South Africa's Bureau for Food and Agricultural Policy (BFAP), supporting national-scale land use and input management studies

### Advanced Ag Alliance

Jan 2019 – Dec 2019

- Led data analytics of genetically engineered hybrid seeding experiments in large-scale field trials across northern New York
- Supported Cornell University's crop science and genetics teams as a data scientist, contributing insights on productivity analysis

## RESEARCH

Reproducible R & Python Code Share: [github.com/jaeseokh](https://github.com/jaeseokh)

### *The Value of Conducting On-Farm Field Trials Using Precision Agriculture Technology*

Bullock, D., Mieno, T., & Hwang, J. (2020).

*Precision Agriculture*, 21(5), 1027–1044. DOI

- Simulated 1,000 synthetic fields over 30 years to analyze long-run grower learning in input management using Monte Carlo methods

### *Evaluating the External Validity of Yield–Nitrogen Response Models Using Multi-Farm Experiment Data*

Hwang, J.

*Working paper*

- Trained yield–nitrogen response models using XGBoost, Causal Forest, and PyTorch-based MLP to evaluate external validity across 100+ experimental fields in 16 states

### *Improving Seeding Accuracy in Corn: Profitability Analysis Using On-Farm Experimental Data*

Hwang, J.

*Working paper*

- Applied GAM-based productivity models to uncover consistent over-seeding behavior among farmers, informing potential policy interventions for input efficiency

### *Modeling Full Yield–Nitrogen Distributions Under Weather Uncertainty: A Data-Based Alternative to Regional Averages*

Hwang, J., Bullock, D., Mieno, T.

*Working paper*

- Adopted Maximum-Entropy method upon Quantile Forest and GAM regression combined with higher-moment estimation to model full yield–nitrogen distributions under precipitation uncertainty

### *Informing Site-Specific Input Management in South Africa Using On-Farm Experimentation*

Delpert, M., Hwang, J., Otterman, H., Truter, K.

*Submitted*

- Led spatial and economic analysis for fertilizer targeting in partnership with South Africa's BFAP

## EDUCATION

### University of Illinois at Urbana-Champaign

Expected Dec. 2025

Ph.D. Agricultural & Applied Economics

### University of Illinois Urbana-Champaign

May 2020

M.A. Agricultural & Applied Economics

### Sogang University

Aug. 2013, South Korea

B.S. Economics

## TECHNICAL SKILLS

**Data Science & ML:** Develop full-stack ML and analytics pipelines in R (expert) and Python (proficient). Specialized in causal inference and spatial analysis using PyTorch (Python), scikit-learn, and R6 (R).

**Workflow:** Proficient in SQL, GitHub, Jupyter, VS Code, and QGIS.