JAESEOK HWANG

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PROFESSIONAL EXPERIENCE (Quantitative Research)

Data Intensive Farm Management (USDA Grant) Sep 2020 – Aug 2025

- **ETL & Data Pipelines:** Architected R and Python pipelines to clean, merge, and analyze large-scale geospatial and time-series datasets (500k+ observations).
- **Model Validation:** Benchmarked Machine Learning (Gradient Boosting/RF) against Bayesian Hierarchical models to evaluate predictive accuracy versus interpretability for decision support.
- **Heterogeneity Analysis:** Quantified heterogeneous response effects across diverse environmental segments to optimize resource allocation strategies.

Center for the Economics of Sustainability (UIUC) Jan 2021 – Aug 2024

- **Stress Testing (Monte Carlo):** Designed Monte Carlo simulations to analyze profit-at-risk and outcome variance under stochastic volatility scenarios.
- **Causal Inference:** Applied econometric panel data methods and counterfactual analysis to isolate the marginal impact of management decisions on financial performance.

QUANTITATIVE MODELING PROJECTS

Reproducible Code Portfolio: github.com/jaeseokh

Bayesian Hierarchical Modeling & Uncertainty Quantification (2022–2025)

- Developed hierarchical Bayesian models to estimate non-linear return functions, accounting for parameter uncertainty across distinct operating segments.
- Implemented **shrinkage estimators** and **partial pooling** to stabilize inference in segments with sparse data (solving for ”thin-file” data challenges).
- Analyzed posterior distributions to calculate confidence intervals and risk-adjusted probability of returns.

Behavioral Response Modeling under Market Volatility

- Estimated elasticity of input decisions in response to exogenous price shocks and stochastic weather events.
- Modeled agent decision-making under uncertainty to predict shifts in risk exposure.
- Aggregated micro-level behavioral parameters to forecast macro-level system outcomes.

Spatial-Temporal Modeling of Loss Events (Ongoing)

- Utilized high-frequency sensor data to model the dynamics of resource loss events.
- Built time-series (ARIMA/Spatial) models linking loss patterns to external volatility factors.
- Quantified the financial impact of loss events on overall profit margins.

EDUCATION

University of Illinois at Urbana–Champaign *Expected Dec 2025*
Ph.D. Agricultural and Applied Economics
Focus: Econometrics, Bayesian Statistics, Optimization under Uncertainty

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 (Pandas, Scikit-Learn), SQL **Tools:** GitHub, Jupyter, Quarto

Modeling: Bayesian Inference, Monte Carlo Simulation, Logistic Regression, Time-Series Analysis

Concepts: Stress Testing, Causal Inference, A/B Testing Design, Optimization, Risk Quantification