

Qingquan “Raphael” Xie  
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## Education

University of Washington -- Seattle, WA 9/2025-Present  
M.S. in **Statistics** (*Expected Mar 2027*)

University of Washington -- Seattle, WA 10/2019-06/2023  
B.S. in **Applied and Computational Mathematical Sciences** & B.A. in **Sociology**  
Minor: Data Science | *Cum Laude*  
• Annual Dean’s List at University of Washington 2020&2022&2023

## Skills

- Programming & Data: Python, R, SQL
- Machine Learning: Regression, Random Forest, KNN, Structural Topic Model
- Statistical Methods: Causal Inference, SEM, Monte Carlo method, network modeling
- AI Systems & LLM Engineering: LLM-accelerated development, prompt engineering

## Publications

- [1] **Xie, Q.**, Liu, Y., Zhu, Z., Xiao, K., & Li, D. (2026). Depth-dependent mechanisms underpinning soil organic carbon accumulation following afforestation. *Journal of Plant Ecology*
- [2] Zhu, Z., Xiao, K., Liu, Y., **Xie, Q.**, & Li, D. (2026). Microbial necromass dominates particulate and mineral-associated organic carbon accumulation in calcareous soil following afforestation. *Journal of Applied Ecology*
- [3] Zhu, Z., Chen, S., **Xie, Q.**, Wen, Li., Wang, K., & Li, D. (2026) Twelve-year high manure input enhances soil organic carbon stability and ecosystem multifunctionality in a karst agroecosystem. *Plant and Soil*.
- [4] Fang, Y., He, X., **Xie, Q.**, & Li, D. (2025). Increasing tree phylogenetic diversity stimulates microbial functional potential in a subtropical forest. *Journal of Plant Ecology*.
- [5] Liu, Q., Xie, Z., Tang, S., He, X., **Xie, Q.**, & Li, D. (2024). Synthetic microbial community enhances lignocellulose degradation during composting by assembling fungal communities. *Bioresource Technology*.

## Research Experience

University of Washington, Seattle 01/2026-Present

**Research Assistant** | *Supervised by Prof. Tyler H. McCormick*

- Led large-scale codebase refactoring using LLM-assisted development (**100 million+ tokens, 5k+ lines changed**), including system debugging, custom script design, and post-simulation network inference.
- Built an LLM-based generative agent pipeline to measure network cognition; achieved 79% pairwise tie accuracy (validated) and quantified centrality, brokerage, and self-position from social interaction.
- Extended a multi-agent simulation (n=15) with structured perception surveys, ground-truth network extraction, retrieval diagnostics, and automated validation pipeline.
- Implemented hub vs. broker network shocks – isolated by degree vs. betweenness centrality, enabling pre/post-shock perception update tests.

Institute of Subtropical Agriculture, Chinese Academy of Sciences, China

06/2024-08/2025

**Research Assistant** | *Supervised by Prof. Dejun Li*

- Applied statistical learning methods including Boruta-enhanced random forest, regression modeling, and structural equation modeling to analyze depth-dependent mechanisms of soil carbon accumulation.
- Independently managed end-to-end experimental data pipelines involving preprocessing, assumption diagnostics, modeling, and visualization in R.
- Improved methodological robustness by introducing Boruta feature selection to address instability in standard random forest workflows.
- **First-author** on an accepted paper in Journal of Plant Ecology, contributing to collaborative manuscripts.

Hunan University, China

11/2023-04/2024

**Research Assistant** | *Supervised by Prof. Jianhua Wang*

- Analyzed large-scale patent datasets across 139 Chinese cities using structural topic models to study innovation dynamics.
- Developed Monte Carlo Markov Chain simulations to construct randomized bipartite networks for evaluating patent novelty.
- Supported research on computational social science applications of network modeling and probabilistic inference.

## Industry Experience

**Data Analyst** (Part-Time) | Wondershare Technology, Changsha, China

11/2023-04/2024

- Analyzed and visualized **100K+** user behavior records with SQL, Google Analytics 4, Quick BI, and Sensors Data to support product decisions.
- Conducted funnel analysis and churn studies; identified a UI bottleneck and recommended design changes that increased conversion rate by 17% within one week.
- Collaborated with product managers and engineers across seven product lines to standardize event-tracking workflows, build behavior flow charts, and drive data-informed feature optimization.

## Selected Course Project in Statistical Modeling

- **Diamond Price Prediction:** Analyzed 54K+ diamond records, selected optimal regression model via AIC/BIC stepwise algorithm and k-fold validation.
- **U.S. Presidential Election Forecasting:** Designed Monte Carlo simulation (100,000 trials) based on voting mechanisms; successfully predicted 2024 outcome by focusing on swing states.
- **Stochastic SI Epidemic Models:** Simulated viral transmission in closed networks (Small World & Random Graph) with synchronous/asynchronous updates and threshold/probabilistic decision rules.

## Campus Involvement

Grader of STAT 394, 26 Spring

04/2026-06/2026

Academic Tutor, Statistics Study Center

09/2025-Present

## Other Projects

**Freelance Whisky Writer** | AngeShare, China

01/2026-Present

- *Write blog posts about the Greater Seattle Area whisky distilleries, combining distillery history, Seattle's urban context, in-depth whisky making process analysis, and tasting notes.*