# Katherine Delno

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## Profile

Statistician focused on statistical inference, predictive modeling, and reproducible data analysis. Work spans data cleaning and validation, model development and diagnostics, and clear reporting of results and uncertainty. Emphasis on methodological rigor and on producing analyses that are useful, reliable, and understandable to the people who rely on them.

## Education

**M.S. Statistics: Advanced Methods and Data Analysis** March 2025
University of Washington – Seattle, WA

**B.S. Mathematics** December 2022
University of Nevada – Reno, NV

## Technical Skills

**Statistical Theory & Inference:** Principled estimation and uncertainty quantification; likelihood-based inference; hypothesis testing; confidence intervals; model diagnostics and goodness-of-fit; asymptotic approximations; multiple testing control (FDR); Bayesian updating (conjugate models); simulation-based validation (bootstrap/Monte Carlo); sensitivity analysis and robustness checks.

**Modeling & Applied Inference:** Linear regression/ANOVA; categorical predictors; interactions; diagnostics; GLMs (logistic; Poisson; Gamma); likelihood-based inference; WLS/robust (sandwich) SEs; resampling (cross-validation; bootstrap); longitudinal/clustered data; mixed models (LMM/GLMM; REML/BLUP); GEE; covariance structures.

**Computing & ML Tools:** R; Python; Git; Jupyter; reproducible workflows; reproducible reporting (R Markdown/Quarto); visualization (ggplot2; matplotlib); tree/ensemble methods (random forests; gradient boosting/XGBoost); classification; clustering; PCA; NLP basics (transformers; embeddings); Excel (basic); SQL (basic).

## Selected Project Experience

**RandomForestSpecCheck: A Permutation-Based Random Forest Diagnostic for LMMs**
Developed a novel diagnostic method for detecting model misspecification in linear mixed models (LMMs) utilizing random forests and permutation testing. Achieved false-positive rates <3% and >90% power in detecting misspecification in 5400 simulated datasets and verified on real-world data.

**A Conformal Prediction Framework for Multi-Label Movie Genre Classification**
Built a multi-label movie genre classifier by fine-tuning a lightweight transformer and adding conformal prediction to generate calibrated, quality-controlled tag sets, balancing coverage of relevant labels with reduction of inconsistent or spurious ones.

**Fine-Tuning BERT Models for Recipe Classification**
Fine-tuned transformer-based NLP models to classify recipes by dietary category, applying an end-to-end workflow with rigorous data cleaning/label QA, embedding-based features, hyperparameter tuning, and cross-validation to deliver a robust, generalizable classifier.

## Relevant Experience

**Private Statistics Instructor** August 2025 – Present
Self-Employed – Seattle, WA

Provide one-on-one statistics instruction to high school and early college students, focusing on AP Statistics and university-level courses. Develop concise mini-lessons, custom handouts, and targeted problem sets to reinforce core concepts and exam-style reasoning. Review student work with detailed feedback and adjust pacing and content to address individual learning needs.

**Mentor for Statistics & Probability Directed Reading Program** September 2024 – December 2024
University of Washington – Seattle, WA

Designed and delivered a one-on-one 10-week short course on statistical learning, covering topics including linear regression, classification methods, resampling techniques, and regularization. Created all course materials and lectures, guided the student through weekly discussions, and provided ongoing feedback and support to deepen their understanding.

**Graduate Teaching Assistant** January 2022 – June 2022
University of Nevada – Reno, NV

Served as a Graduate Teaching Assistant for an undergraduate statistics course, leading discussion sections, designing and delivering lecture materials, and providing one-on-one and group tutoring to help students understand complex statistical concepts. Mentored undergraduate students by offering academic support and career guidance.