

# REBECCA KNOWLTON

(404) 610-1869 ◊ rkknow@gmail.com ◊ www.linkedin.com/in/rebecca-knowlton

## EDUCATION

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**University of Texas at Austin**  
Ph.D. in Statistics

May 2025

**Trinity University**  
Bachelor of Arts in Mathematics, Summa Cum Laude

May 2017

## INDUSTRY EXPERIENCE

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**Data Scientist II at Microsoft | Austin, TX** July 2025 – Present

- Led development of time series forecasting and risk modeling for IP capacity planning in large-scale cloud infrastructure, improving early detection of capacity constraints.
- Evaluated 7 time series forecasting methods using historical data for 100+ sites and 400+ subnets; selected SARIMA based on weighted test performance and uncertainty quantification (8%–11% MAPE), and designed pipeline generating 180-day site and 60-day subnet forecasts with risk classification, standardizing forecasting and replacing manual analysis.
- Accelerated capacity mitigation following a high-severity incident by enabling allocation of 40K IPs in under 1 week (vs. multi-week baseline), coordinating across 3+ partner teams per deployment; led recovery effort reducing proportion of unhealthy networks from 14% to less than 2% over three months.
- Designed and implemented a schema-validated, test-gated IP inventory system, scaling coverage 6x across IP types and resolving data quality issues impacting 10+ downstream datasets and pipelines.

**Data Scientist Intern at Microsoft | Redmond, WA** Summers 2022 – 2024

- Developed and implemented a migration tool in C# to transfer existing Managed Service Identity (MSI) configurations to a modern, platform-agnostic configuration library, thereby supporting modernized feature management and zero-touch enablement of new environments.
- Piloted metrics to monitor efficiency and drive improvements for the building out of new cloud environments for Microsoft Identity services, and made recommendations to engineering team for streamlining deployment of new services.
- Synthesized 8 operational datasets to quantify application blast radius in Azure Active Directory and improve health-risk monitoring.

**Data Scientist Intern at Apple | Austin, TX** Summer 2021

- Researched and engineered candidate features for App Store fraud decisioning models by analyzing a 9B-row dataset and assessing incremental predictive lift.
- Partnered across 4 teams to productionize feature insights and improve model-informed risk decisions.

**Actuarial Analyst at USAA | San Antonio, TX** 2017 – 2020

- Supported pricing strategy for Texas auto insurance portfolio (\$1.9B written premium), including behavior-based insurance, improved rate-capping methodology, catastrophe-informed rate adequacy reviews, and regulatory filing support for approved pricing changes.
- Led a team of 5 to analyze nationwide auto loss trends and drivers of frequency/severity to inform annual rate planning recommendations.
- Scored 9+ on first 5 Casualty Actuarial Society exams (at least 130% of passing mark).

## RESEARCH EXPERIENCE & PUBLICATIONS

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**Graduate Researcher, University of Texas at Austin** 2022 – 2025

- Developed novel statistical methods for surrogate marker evaluation in heterogeneous populations, improving how clinical studies identify when surrogate endpoints are reliable across patient subgroups.
- Designed efficient hypothesis tests and meta-learner-based estimators for both randomized trials and observational settings, with validation through simulation studies and real AIDS clinical trial applications.
- 3 first-author publications (Statistics in Medicine, Biometrical Journal, Journal of Causal Inference) with open-sourced accompanying R packages for reproducible adoption of each method (`cohetsurr`, `etsi`).

## SKILLS

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<b>Programming</b>	R (including package development), Python, SQL, Spark, C#, Kusto (KQL)
<b>Statistical Modeling</b>	Maximum Likelihood Estimation, Bayesian Methods, GLMs, Mixture Models, MCMC, Semiparametric & Nonparametric Methods, Tree-Based Models, Bootstrapping, Forecasting, Time Series Analysis

## SELECTED HONORS AND ACTIVITIES

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- University of Texas at Austin Graduate School Dissertation Writing Fellowship, 2025
- American Statistical Association Student and Early Career Travel Award, 2024
- Invited Session Chair, 2024 Women in Statistics and Data Science Conference
- Four invited presentations, including the 2023 Joint Statistical Meetings in Toronto
- Visiting researcher at the SISTM Team at the University of Bordeaux (November 2023)

## **TEACHING EXPERIENCE**

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### **University of Texas at Austin**

2021 – 2024

- Head Teaching Assistant, Data Science for Health Discovery and Innovation (Spring 2024 & Fall 2024)
- Course Co-Developer, Data Science for Health Discovery and Innovation (2023)
- Teaching Assistant, Elements of Statistics and Regression Analysis (Fall 2021 & Spring 2022)

### **Advantage Testing | Austin, TX**

2022 – 2025

- Private tutor for SAT, ACT, Mathematics, Statistics, and Writing
- Collaborated with Breakthrough Central Texas to administer a free short course in ACT prep for first-generation students