

# Tom (Hyeon Seok) Yu

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**Economist** applying causal inference and machine learning to **go-to-market and consumption-based revenue** problems. I build measurement frameworks and predictive systems that turn commercial data into business decisions across customer **acquisition, retention, and growth**.

## EXPERIENCE

**Amazon Web Services (AWS)** — Economist II, Central Economics & Science Team Feb 2025 – Present

- **Go-to-Market Sales-Coverage Strategy Evaluation:** Owned the causal-impact evaluation of AWS's 2026 sales-coverage re-segmentation, using matched-cohort ATT and fuzzy regression-discontinuity designs with a set of robustness checks (placebo/pre-trend tests, FDR correction, weak-instrument diagnostics). Findings drove next-year GTM planning at a CFO-level review, including evidence that partner-led coverage converts at competitive-or-better rates than direct — supporting continued partner-capacity investment.
- **Customer Churn Early-Warning ML System (Retention):** Built a production ML system flagging customer churn 6+ months ahead for millions of AWS customers to surface at-risk revenue for proactive retention. Pairs segment-specific gradient-boosted models (XGBoost) with SHAP-based, seller-actionable plays; back-tested PR-AUC reached  $\approx 6.8\times$  the base-rate floor, with 90% precision on top-ranked accounts at a 7-month median early-warning lead time. Designed the A/B-vs-holdout pilot to measure intervention efficacy (production pilot 2026).
- **Partner Payment-Extension Program Pilot Design (\$140–180M opportunity):** Built simulation-based power analysis on synthetic-control methods to size a strategic partner payment-extension pilot — including a custom parallel-computing package that cut runtime from 32+ hours to 6 — and used sensitivity analysis of effect-size assumptions to drive the go/no-go decision and flag detectability risk before spend.
- **Growth Diagnostics (CLV) Framework:** Built a customer-lifetime-value measurement framework decomposing growth into acquisition, retention, and per-customer expansion, with survival-analysis churn models for the sales-ops team; adopted across AWS (Finance, Global Sales) as the standard metric for evaluating GTM program success and featured in monthly leadership reporting.
- **Partner Program Causal Evaluation:** Developed matched difference-in-differences and AIPW frameworks (with placebo tests and matching diagnostics) to estimate the causal revenue incrementality of AWS partner incentive programs — driving a low-incrementality program's wind-down (est. \$150–175M annual savings) and shaping the 2026 partner incentive structure.

**Tesla** — Senior Data Scientist, Core Business (Sales, Service, Delivery) Apr 2024 – Feb 2025

- Built ML-based service-demand forecasting for 250+ North American service locations (50% accuracy gain over baseline), informing staffing and capacity decisions (\$10M+ impact).
- Applied synthetic-control methods to estimate causal sales lift from marketing campaigns; designed A/B tests with heterogeneous-treatment-effect (HTE) estimation to target high-conversion customer segments for lead generation.

**Netflix** — Experimentation & Causal Inference Intern Jun – Sep 2023

- Developed IPW and entropy-balancing methods to correct non-response bias in large-scale user surveys; built ensemble ML proxy-quality metrics (GBM, RF) operationalized into content-evaluation decisions. Return-offer recommendation received.

**Analysis Group** — Analyst, Economic Consulting Aug 2016 – May 2017

- Applied difference-in-differences to quantify the macroeconomic impact of client products across Latin American markets, supporting expert testimony in litigation and regulatory proceedings.

## EDUCATION

**Stanford University** — Ph.D., Political Economy · M.S., Statistics (M.S. Advisor: Percy Liang) 2017 – 2024

Doctoral committee: Matthew Gentzkow (Chair) · Neil Malhotra · Ken Shotts · David Broockman

**Middlebury College** — B.A., Economics, *Summa Cum Laude* · Phi Beta Kappa · Class Salutatorian 2012 – 2016

## TECHNICAL SKILLS

- **Causal Inference:** Difference-in-Differences, Synthetic Control, Regression Discontinuity, Propensity-Score Methods, Doubly-Robust Estimation (AIPW), Entropy Balancing, Survey Experiments
- **Experimentation & Statistics:** A/B Testing, Experimental Design, Power Analysis, Simulation-Based Evaluation Design, Time-Series Forecasting
- **ML:** Gradient Boosting (XGBoost, LightGBM, CatBoost), Random Forests, Survival Analysis, SHAP, Imbalanced Classification, Walk-Forward Validation, Hyperparameter Optimization (Optuna), Transformers (Mistral-7B, LoRA, vLLM)
- **Go-to-Market & Commercial Analytics:** Customer Acquisition / Retention / Churn, Customer Lifetime Value, Consumption-Based Revenue, B2B Sales-Coverage Analytics
- **Programming:** Python, SQL · AWS SageMaker · Claude Code, Kiro CLI