

# MANUEL A. QUINTERO CORONEL

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## EDUCATION

**Massachusetts Institute of Technology (MIT), Cambridge, MA, USA**  
PhD in Social and Engineering Systems & Statistics

2023 - 2027

**University of Cambridge, Cambridge, UK**  
Master's in Mathematical Statistics. Concentration: Statistics, Probability, and Optimization

2022 - 2023

**Instituto Tecnológico Autónomo de México (ITAM), Mexico City, Mexico**  
Bachelor of Science in Applied Mathematics

2015 - 2020

**Instituto Tecnológico Autónomo de México (ITAM), Mexico City, Mexico**  
Bachelor of Arts in Economics. Concentration: Econometrics and Economic Theory

2015 - 2020

## SELECTED PUBLICATIONS (( $\alpha$ - $\beta$ ) INDICATES ALPHABETICAL AUTHORSHIP)

- **Quintero, M.**, Stephenson, W., Shreekumar, A., & Broderick, T. (2025). “Why Reference Choice Matters: Sign Reversals in Oaxaca–Blinder Decomposition.” In preparation.
- ( $\alpha$ - $\beta$ ) Broderick, T., Jadbabaie, A., Lin, V., **Quintero, M.**, Sarker, A., & Sinclair, S. (2025). “Network and Risk Analysis of Surety Bonds.” <https://arxiv.org/abs/2511.05691>.
- **Quintero, M.**, Stephenson, W., Shreekumar, A., & Broderick, T. (2025). “Common Functional Decompositions Can Mis-attribute Differences in Outcomes Between Populations.” Oral presentation at *ATTRIB NeurIPS 2024*. Also presented at *ICLR 2025*. <https://arxiv.org/abs/2504.16864>.
- ( $\alpha$ - $\beta$ ) Christia, F., Larreguy, H., Parker-Magyar, E., & **Quintero, M.** (2023). “Empowering Women Facing Gender-Based Violence Amid COVID-19 Through Media Campaigns.” *Nature Human Behaviour*. <https://doi.org/10.1038/s41562-023-01665-y>.
- ( $\alpha$ - $\beta$ ) Bandiera, A., Larreguy, H., Parker-Magyar, E., & **Quintero, M.** (2023). “Can We Shield Citizens Against Misinformation Through Digital Literacy Training and Fact-checks?” Undergraduate thesis.

## SELECTED HONORS AND AWARDS

- Fortunato and Catalina Brescia Fellowship, MIT (2025)
- Presidential Graduate Fellowship, MIT (2023-2024)
- FUNED Maestrías Scholarship (Aug 2022)
- Research Award: Honors Thesis in Applied Mathematics (July 2022)
- Research Award: Honors Thesis in Economics (June 2022)

## WORK EXPERIENCE

### PhD Researcher, MIT (IDSS, LIDS, SDSC)

Aug 2023 - Current

- Lead author on black-box decomposition methods for evaluating outcome differences across populations; compared to SHAP, ALE, and Sobol approaches; presented at NeurIPS 2024 (oral) and ICLR 2025.
- Developed and optimized a Bayesian migration model with MCMC on Supercloud, improving efficiency by 70% and reducing runtime from 60 to 18 days.

### Research Assistant, Harvard and ITAM

Mar 2021 - Jan 2023

- Co-authored two research projects; led statistical analysis and implemented machine learning models in R and Python.
- Scrapped, cleaned, and integrated large datasets from multiple sources; built reproducible data pipelines.
- Applied variable selection and predictive modeling at scale (caret, glmnet), improving robustness and interpretability.

### Research Assistant to Fotini Christia (MIT, IDSS Director)

Mar 2021 - Aug 2022

- Led statistical analysis for an RCT on gender violence in Egypt, published in *Nature Human Behavior*, using Linear mixed effect models, Difference-in-Differences and other causal inference methods.
- Applied Bayesian methods, variable selection, and cross-validation to ensure robust results and actionable policy insights.

## TECHNICAL SKILLS

**Programming:** Python, R, MATLAB (Advanced); Stata (Intermediate), C++, Java (Basic); **ML/DL Frameworks:** PyTorch, TensorFlow, scikit-learn. **Specialized:** Statistical Machine Learning, Causal Inference. **Tools:** Git, Supercloud HPC. **Collaboration:** Experienced with GitHub, reproducible pipelines, and open-source contributions.

### Licenses and Certifications:

Neural Networks and Deep Learning (DeepLearning.AI); Improving Deep Neural Networks: Hyperparameter Tuning, Regularization, and Optimization (DeepLearning.AI); Python for Data Science and Machine Learning Bootcamp; Machine Learning (HarvardX); High-Dimensional Data Analysis (HarvardX); Using Python for Research (HarvardX);