Rodrigo Azuero Melo

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Citizenship: United States, Colombia.

I am a data science leader with expertise in causal inference, causal machine learning, experimentation (A/B testing), and econometrics. I have international experience leading data science projects in the tech industry, academia, and government agencies. I am an advanced coder in Python, R, Julia, Spark, among other programming languages. I am the author of various R-packages including gmapsdistance, a tool to compute distance and travel time between multiple points using the Google Maps Distance API, which has accumulated 75,000 total downloads. I have field experience in survey design in Latin America and the Caribbean. Dialogue with policymakers in Peru, Colombia, Ecuador, Mexico, and the Dominican Republic. Fluent in English and Spanish. Advanced knowledge of French.

Education

- Ph.D. Economics, University of Pennsylvania, 2012-2017.

- M.A. Economics, University of Pennsylvania, 2015.

- M.A. Economics, Universidad de los Andes, Bogota, 2011.

- B.Sc. Economics, *Cum Laude* (Top 3% GPA of last 5 years). Minor: History. Universidad de los Andes, Bogota, 2009.

Career Experience

- **Amazon: 2020 - Present**.

  - **Amazon Web Services.**
    Economics, Manager: 2024 - current position.
    Senior Economist: 2022-2024.

    Lead a team of data scientists, applied scientists, and economists within the Sales, Marketing, and Global Services Organization, focused on developing AI/ML and causal inference models. As the team leader for our organization's VP goal, I spearhead the development of a model to predict the ROI of AWS sales interventions. Our results are utilized to prioritize interventions, inform leadership (CEO and S-team) about program effectiveness, and diagnose the health of our sales pipeline.

I am actively involved in driving science initiatives at Amazon. I served as co-chair for Amazon's 2023 Machine Learning Conference (AMLC) and co-organized the AMLC workshops on Causal Inference in 2021 and 2023. These events featured distinguished speakers including Nobel Laureate in Economics Guido Imbens, Alberto Abadie, Victor Chernozhukov, and Matias Cattaneo. I have also presented my work at internal events such as the Amazon Consumer Science Summit, AMLC, and Amazon's Economist Summit.

– **Amazon.com. Customer Behavior Analytics.**
Economist II: 2020-2022.
As one of three science team members assigned to a top-tier S-team goal at Amazon, I contributed to developing a model that delivers downstream impact estimates aligned with P&L reports. I led an initiative to provide real-time causal estimates to various organizations across Amazon, focusing on obtaining heterogeneous treatment effects from customer actions on long-term behavior in latencies of milliseconds. I have advised over 500 internal team requests on obtaining causal estimates for various Amazon programs using observational and experimental data.

- **Emory University: 2019-2020.**
On leave from Inter-American Development Bank.

– **Department of Quantitative Theory and Methods.**
Visiting Professor
I served as the faculty leader for three interdisciplinary capstone projects in collaboration with the Inter-American Development Bank. These projects focused on leveraging data analytics to combat tax fraud and corruption in Peru, Colombia, and the Dominican Republic. Additionally, I instructed a course introducing junior students to concepts of causal inference. Additionally, I taught an course introducing junior students to causal inference.

- **Inter-American Development Bank (IADB): 2010-2020**.
Multilateral organization based in Washington, DC and largest source of development financing for Latin America and the Caribbean with total ordinary capital amounting to $101B.

– **Sector Specialist: 2017 - 2020.** As the team leader for the project "Implementing Data Analytics in Government Agencies," I spearheaded a research agenda aimed at establishing data analytics offices in government agencies across Mexico, Peru, the Dominican Republic, and Colombia. I developed the repository for the IDB Tax Administration Tookit for Machine learning. I also led a research initiative focused on assessing the impacts of tax regimes on productivity and informality in Latin America and the Caribbean, managing a total budget of $300,000. During this time, I co-authored four publications for the Inter-American Development Bank (IDB) on this topic. Furthermore, I organized

seminars in collaboration with the International Monetary Fund (IMF) and engaged with policymakers and stakeholders in Peru, Colombia, Mexico, and the Dominican Republic.

– **Consultant: 2013-2017.** Between 2013 and 2017, I served as a consultant, leading teams of 10 to 50 enumerators in the execution of household surveys in Ecuador. During this time, I specialized in developing data analyses for academic and policy papers focused on early childhood development.

– **Research Fellow: 2010-2012.** I co-authored a publication in the Journal of Human Resources related to wealth gradients in cognitive skills in Latin America and the Caribbean. Developed the data analysis used for the IADB's 2011 Strategy's for Equity and Productivity. The objective of the Strategy is to improve the effectiveness of the IADB in promoting social policies that enhance equity and productivity in the Region as part of the IADB's ninth general capital increase.

- **Universidad de los Andes. Economics department: 2009-2010.**.

– **Researcher.** Developed computational files for the book ("A Practical Guide for Causal Inference" (In Spanish). Research assistance for academic papers related to the econometrics of early childhood development.

- **Ferro Consulting Group. 2006-2010.**

– **Consultant.** Consultant on various projects related to actuarial sciences, mathematics, statistics, and game theory.

Volunteer Experience

- **Gift of Adoption**. I serve as board member for the Gift of Adoption chapter in the State of Washington since October, 2022.

- **The Citizen's Branch** (La Rama Ciudadana, in Spanish). I co-founded this initiative in 2016 with the goal to contribute to the public policy debate in Colombia through extensive data analysis related to various topics of major relevance in Colombia.

– **Major goal**. We identified, processed, and presented absenteeism data of congressmen in Colombia's Senate for the legislative period of 2014-2018. This project got coverage in all the major news organizations in Colombia and was influential in determining the regulation of minimum assistance of Colombia's senators.

Press coverage (in Spanish). El Espectador, Semana, El Colombiano.

Teaching Experience

- **Emory University**. Department for Quantitative Theory and Methods. Introduction to Scientific Methods. (Fall, 2019).

- **Inter-American Development Bank:** Machine Learning (Spring, 2019) Link to course materials.

- **University of Pennsylvania:** Introduction to Microeconomics (Summer, 2015). Teaching Assistant for intermediate microeconomics and statistics for economists between 2013 and 2017.

- **Universidad de los Andes:** Stata workshop (Spring, 2010)

Presentations

- **2017-2022**

  - Consumer Science Summit (Amazon), Amazon Machine Learning Conference Workshop on Causal Inference, University of South Carolina, Universidad de los Andes Conference on misallocation (partnership between IDB and IMF), Peru - Tax Administration Office (SUNAT) conference on data analytics to identify tax evasion, Arizona State University, American Institutes for Research, Universidad del Rosario (Colombia), IMPAQ International, NERA Economic Consulting.Economics of Informality (Universidad del Rosario, Bogota); 1st Conference of Colombian Economics Meetings (Universidad de los Andes), Machine Learning Applications for Development (Inter-American Development Bank).

- **2014-2016**

  - EMCON: Empirics and Methods in Economics, Northwestern University., University of Pennsylvania: Empirical Micro Seminar. Universidad Católica de Chile. Workshop on Early Childhood Development. ECONCON. Conference sponsored by Columbia University, New York University, Princeton University, University of Pennsylvania and Yale University. LACEA: Latin American and Caribbean Economics Association Annual Meetings.

Honors, Awards, & Fellowships

- Customer Behavior Analytics Leadership Award. Invent & Simplify, Bias for Action, and Dive Deep.

- Judith Rodin Fellow. Fellowship awarded to doctoral students in the Social Sciences who are committed to nation-building. 2016

- University of Pennsylvania Fellowship. 2012-2017.

- *Cum Laude*. Universidad de los Andes. Awarded to students with GPA located in the top 3% of the department department during the last 5 years. 2009.

Programming Skills

- Fortran, Matlab, Python, Stata, R, Rcpp, C++, OpenMP, Julia, Cuda, SQL, Spark.

Software

- gmapsdistance: R-package to compute distance and travel time between multiple points using the Google Maps Distance API. 61,000 downloads.

- Rtauchen: R-package to discretize an AR(1) process following Tauchen (1986). A discrete Markov chain that approximates in the sense of weak convergence a continuous-valued univariate Autoregressive process of first order is generated. It is a popular method used in economics and in finance.

Certificates

- Econometrics Certificate, Tilburg University, Spring 2008.

- Machine Learning Certificate. Stanford University on Coursera. 2018.

- Neural Networks and Deep Learning. . deeplearning.ai on Coursera. 2019.

- Version Control with Git. Atlassian University. 2020

- SQL for Data Science. UC Davis on Coursera. 2020

Publications

Available in this link.

References

Norbert Schady.
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