Ana Elisa Lopez-Miranda

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Research Interests

Probabilistic modeling; survival analysis; high-dimensional inference; statistical machine learning; computational statistics; applications in social science.

Education

University of Toronto — Toronto, Canada

Honours Bachelor of Science in Statistics, Economics, and Computer Science, GPA: 3.71. — *Expected June 2026*

Awards

- UofT's President's Scholars of Excellence Program. — 2022
- UofT's Entrance Award (Renewable). — 2022, 2023, 2024, 2025
- UofT's Dean's List Scholar. — 2023, 2024, 2025

Research Experience

Research and Development Associate — May 2025–Aug. 2025

Project Title: ***Prompting the Professoriate*** — *Supervisor: Prof. Rohan Alexander*

- Conducted qualitative interviews and co-authored a research paper on the use of Large Language Models in data science for journal publication (under review at Harvard Data Science Review) while working at the Investigative Journalism Foundation.
- Developed and analyzed simulation studies in Python and R to evaluate survey design, sampling assumptions, and response bias; visualized results using ggplot2 and Matplotlib.
- Produced reproducible workflows, notebooks, and technical documentation to support transparent and long-term maintainable research.

Research Assistant — May 2025–Aug. 2025

Project Title: ***Estimation under Cox Model with Biased Sampling Data*** — *Supervisor: Prof. Omidali Jazi*

- Wrote a research paper comparing Composite Partial Likelihood (CPL) estimation method and Partial Likelihood (PL) estimation method under length-biased sampling, confirming results by Huang & Jin (2012).
- Designed and ran 40+ simulation conditions on biased sampling with left truncation and right censoring varying hazard shape (constant, increasing, U-shaped), censoring schemes (0–40%), and sample sizes (N=200, 400); evaluated estimator bias, empirical SE, MSE, and CI coverage, and applied methods to the Channing House dataset.

Data Scientist — Sept. 2025–Present

Project Title: ***A Study of Students' Perspectives on LLMs*** — *Supervisor: Prof. Rohan Alexander*

- Contributed to the ethics application and research protocol for a qualitative study on student perspectives toward LLMs in statistics courses while working at the Investigative Journalism Foundation.
- Conducted literature review on LLM usage, student learning behaviors, and AI-assisted education.
- Developed simulation workflows in R to test survey structure, ranking systems, and data-processing procedures.

Research Assistant — Sept. 2025-Present

Project Title: ***The Effect of Omitted Variable Bias on Empirical Papers*** — *Supervisor: Prof. Roman Zarate*

- Assisted in a project on omitted variable bias in applied econometrics, focusing on how it affects published empirical results.
- Conducted extensive literature reviews of empirical economics papers and documented key model specifications, variables, and results.
- Used Stata to replicate published results and began analyses to assess the sensitivity of estimates to alternative specifications.

Publications

Lopez-Miranda, A.E., R. Alexander, and T. Timbers (2025). "Prompting the Professoriate: A Qualitative Study of Instructor Perspectives on LLMs in Data Science Education." *Harvard Data Science Review* (Accepted).

Research Presentations

Undergraduate Research Showcase| *Estimation under Cox Model with Biased Sampling Data* Sept. 2025
Data Science Institute Talent Showcase (Accepted)| *Prompting the Professoriate* Jan. 2026

Teaching Experience

Teaching Assistant Sept. 2024-Present
University of Toronto

- TA for macroeconomics (ECO102), microeconomics (ECO101), probability theory (STA256), and mathematical proofs (MAT102) to over 300 students, enhancing their understanding of foundational concepts.
- Led tutorials, graded problem sets and tests, held office hours to provide additional support to reinforce learning and improve student outcomes; emphasized probabilistic reasoning and mathematical rigor.

Projects

Machine Learning Model Development | Python, PyTorch, NumPy

- Collaborated on building K-Nearest Neighbors (KNN), Decision Tree, and Neural Network models from scratch, including data pre-processing with regex, train/validation/test splits, and model evaluation.
- Led the neural network component using PyTorch, performing hyperparameter tuning, extracting weights, and implementing a manual forward pass without libraries.

Service

Academic Appeals Subcommittee| *Student Member* Sept. 2024-Present

- Serve as the science student representative on the Academic Appeals Subcommittee, one of four divisional student members.
- Review petitions and transcripts with faculty committee members and assess academic and procedural considerations.

Mathematical and Computational Sciences Society (MCSS)| *Events Director* Sept. 2024-Present

- Lead weekly meetings and coordinate tasks for a team of associates.
- Organize mid- to large-scale academic events, evaluate performance, and implement process improvements.

Technical Skills

Languages: Java, Python, R, Stata.
Developer Tools: Git, PyCharm, IntelliJ, Quarto, Agile methodologies (Scrum), Excel, LaTeX, VSCode, Docker.
Methods: Simulation, survival analysis, reproducible workflows, ML model implementation.