

LUCAS GÓMEZ TOBÓN

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EDUCATION

Master of Arts in Economics

Universidad de los Andes – GPA: 4.61/5.00

Bogotá, Colombia

Oct 2022

- Thesis: [Perreology: How to use music in statistical analysis?](#) I used a pre-trained Convolutional Neural Network to build a vector representation of music. With this, I developed two applications: the first one allows to predict with a 69% accuracy whether a song will be a commercial success in Colombia, and the second one explains up to 82% of the variation in the Consumer Confidence Index using only the information on how many plays the top 50 most listened songs in the country had. A demo of the first application can be seen here: <http://35.209.162.17:3000/>
- Relevant classes: Big Data and Machine Learning for Applied Economics (5.00/5.00), Data Mining Seminar (5.00/5.00) and Advanced Econometrics (4.57/5.00).

Bachelor of Arts in Economics

Universidad de los Andes – GPA: 4.46/5.00

Bogotá, Colombia

Apr 2020

- Relevant classes: Game Theory (4.80/5.00).
- Undergraduate Teaching Assistant: Game Theory and Introduction to Macroeconomics.

RESEARCH AND TEACHING EXPERIENCE

Lead Researcher

Barómetro de Xenofobia

Bogotá, Colombia

Mar 2022 – Present

- Directing two junior researchers to write a paper about how to use content from Twitter to measure xenophobia against Venezuelans using unsupervised learning techniques to process text.
- Programming a [Python library](#) to clean raw tweets to perform machine learning algorithms.

Adjunct Professor

Universidad de los Andes, Department of Economics

Bogotá, Colombia

Jan 2022 – Present

- Designing and teaching a [48-hour course](#) about structuring and developing analytical projects in Python. This course has two modules: the first is about [data analysis in Python](#), and the second is an [introduction to machine learning and business intelligence](#).

Graduate Teaching Assistant

Universidad de los Andes, Department of Economics

Bogotá, Colombia

Jan 2020 – Present

- Courses: Machine Learning for Applied Economics (2023-II, 2023-I, 2022-II, 2022-I, Master's degree), Big Data (2021-II, Master's degree), Advanced Game Theory (2021-I, Master's degree), Game Theory (2020-II, 2020-I, Undergraduate), Introduction to Econometrics (2020-II, Undergraduate) and Microeconomics III (2020-I, Undergraduate).
- Taught 1.5 hours of class per week per course, had 1.5 office hours per week per course to assist students and elaborated exams, quizzes, problem sets among other pedagogical material.
- Performed 4.6 out of 5.0 in the students' evaluations.

Research Assistant of [Ph.D. Ignacio Sarmiento Barbieri](#)

Universidad de los Andes and Coursera

Bogotá, Colombia

Jun 2021 – Oct 2022

- Built the course material for the unsupervised learning class for the [first virtual master's degree in artificial intelligence in Spanish in the world](#).

- Served as Lead Teaching Assistant for the first group of over 80 students.

Teaching Assistant of [Ph.D. Stefan Feuerriegel](#)
Universidad de los Andes, International Summer School

Bogotá, Colombia
Summer 2022

- Trained around 30 students in the applied aspects of the course [Artificial Intelligence in Social Sciences](#).

Teaching assistant of [Ph.D. Roberto Rigobon](#)
Universidad de los Andes, International Summer School

Bogotá, Colombia
Summer 2021

- Tutored around 17 students in the practical sessions of the course [Economía en la Era del Big Data: Retos Empíricos](#).

Research assistant of [Ph.D. Tomas Rodríguez](#)
Universidad de los Andes, Centro de Estudios sobre Desarrollo Económico (CEDE)

Bogotá, Colombia
Jan 2019 – Dec 2019

- Scraped over 30,000 tweets related to 2019 Bogotá's mayoral elections and performed community detection algorithms, sentiment analysis and centrality measures to describe the political context.

WORK EXPERIENCE

Deputy Associate Director
Quantil, Data mining area

Bogotá, Colombia
Jul 2022 – Present

- Directing a consulting project for the Colombian National Directorate of Taxes and Customs (DIAN) to develop artificial intelligence algorithms to identify tax evaders and create automatic tax returns for more than 5 million taxpayers based on exogenous information held by the entity.
- Developing a methodology to evaluate and refine the quality of over 1.5 billion records of occupational incidents stored by the Association of Colombian Insurers (Fasecolda).
- Managing the group of researchers who are responsible for building the platform to collect and clean new and historical information provided by the 11 insurance firms that comprise the Colombian market. This work will consolidate an unprecedented dataset that unifies all the history of workers' compensation, which will be used to calculate the likelihood of accidents or diseases resulting from labor activities. Consequently, this project will enable an accurate estimation of the risk premium of the assurances offered by the companies.

Senior Data Scientist
Quantil, Data mining area

Bogotá, Colombia
Oct 2021 – Jul 2022

- Determined the machine learning model used to estimate the prices of all automobile and motorcycle models available in the Colombian new and used markets. This model powers the "[Guía de Valores Fasecolda](#)", a public source of information used by all insurance companies in Colombia as a reference to price their products. One of the main strengths of the model is that it updates its calculations every month with the newest information available on the primary internet sales portals. Hence, the Guía de Valores can capture the volatility of the market. This development reduced the Mean Average Percent Error (MAPE) from 12% to 5% when compared with its predecessor.
- Structured a model that uses satellite images to generate early warnings of deforestation for the Ministry of Environment and Sustainable Development of Colombia.

Junior Data Scientist
Quantil, Data mining area

Bogotá, Colombia
Jan 2020 – Oct 2021

- Devised a web application for the detection and correction of anomalies in the registration of transactions of the Bolsa Mercantil de Colombia, a trading marketplace for agricultural, industrial, mining-energy products and other commodities.
- Formulated functions for automatic web scraping to retrieve Colombia's leading macroeconomic indicators as: Consumer Price Index, Producer Price Index, Consumer Confidence Index, DTF interest rate, macroeconomic intervention rate, among others.

PUBLICATIONS AND WORKING PAPERS

[Modelling underreported Spatio-temporal Crime Events](#) with Álvaro J. Riascos Villegas, Francisco Gómez, Jose Sebastian Nungo and Mateo Dulce Rubio (2023). Being reviewed for acceptance into [PLOS ONE](#).

[Perreology: How to use music in statistical analysis?](#) (2022).

HONORS

Juan Luis Londoño Award

Universidad de los Andes, Department of Economics

Bogotá, Colombia

2023

Nominated for the best thesis of the master's degree in economics. Awaiting results.

Asistencia Graduada Scholarship

Universidad de los Andes

Bogotá, Colombia

2022-I, 2021-II

Scholarship that covered the master's degree tuition while working as a research assistant for Ph.D. Ignacio Sarmiento Barbieri.

VOLUNTEERING

Co-founder and Director

Mochileros x Colombia

Bogotá, Colombia

Jan 2019 - Present

- Presided over “[Estamos Contigo Chocó](#)” an initiative that raised around 10,000 USD to buy groceries and food for approximately 100 poor families in Quibdó, Chocó during four months of COVID-19 lockdowns in 2020.
- Received the [Medalla al Mérito Turístico](#) granted by the Ministry of Commerce, Industry, and Tourism in recognition for the work of our team promoting community tourism as a tool for social transformation.

Student Representative

Universidad de los Andes, Concejo Estudiantil Uniandino (CEU)

Bogotá, Colombia

2018

Volunteer

Fundación Irradia

Bogotá, Colombia

2018

SKILLS

Programming: Python, R, Stata, SQL.

Machine learning: Pytorch, Tensor Flow, Scikit-learn, SciPy, NumPy, Pandas, Caret, Tidymodels, Tidymodels, Tidymodels.

Data visualization: Plotly, Dash, Matplotlib, Seaborn, ggplot2, Shiny.

Web scrapping: Requests, BeautifulSoup, Selenium, Regular Expressions.

Tools: Git, Google Cloud Platform, Latex, Markdown, Excel.