# Silvana **Acosta**

DATA SCIENTIST · ECONOMETRICIAN

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*Time-Series, Causal Inference, Statistical Learning, Reproducibility*

## Profile

Lead Data Scientist with 7+ years of industry experience across tech (King & Dynatrace), finance (Nasdaq & UBS), and consulting (Deloitte & Cinve), plus 8+ years of academic research. PhD in Econometrics from a top-ranked research centre, with graduate training in mathematics, time series, statistical inference, and causal analysis. Led end-to-end modeling projects —from problem framing and data design to production workflows— across experimentation, forecasting, risk, and decision-critical systems. Experienced in building interpretable, production-grade models that balance statistical rigor, scalability, and operational constraints, partnering closely with engineering, product, finance, and leadership. Background spans optimization, probabilistic modeling, and statistical learning, complemented by Machine Learning engineering and operations reinforced through formal certifications. Demonstrated leadership through team supervision, cross-functional coordination, and community roles at Women Who Code (Director) & R-Ladies (Co-Organizer). Extensive teaching and public-speaking experience translating complex models into clear, actionable insights.

*SQL Server | BigQuery | Snowflake • R | Python • Rmarkdown | Jupyter | LaTeX • GitHub | GHA | Docker • Jira | Notion | GitHub Projects*

## Education

### Ph.D. Economics — *Denmark*

CREATES, AARHUS UNIVERSITET — *2018*

Research on volatility and dependence in continuous-time processes, developing estimators under noise with applications to finance and forecasting using Itô semi-martingales, with parametric and non-parametric methods. CREATES is ranked in 2018 by IDEAS RePEc in the world's top 4 in Time-Series Econometrics, and in the world's top 10% both in Finance and in Econometrics.

### M.Sc. Economics — *Denmark*

CREATES, AARHUS UNIVERSITET — *2015*

Measure Theory, Real Analysis and Probability, Probability Theory, Markov Chains, Mathematical Analysis, Advanced Financial Econometrics, High-Frequency Econometrics, Modeling and Forecasting Volatility, & Time-Series Econometrics. Aarhus Universitet is ranked in 2015 by IDEAS RePEc and by Tilburg in the world's top 50 for Economics, and 21st place in Europe by Tilburg.

### M.A. Economics — *Uruguay*

UNIVERSIDAD DE MONTEVIDEO — *2013*

Bellman Equations, Dynamic Programming, Constrained Optimization, Nash Equilibrium, Bayesian Games, Auction Theory, Mechanism Design, Contract Theory, Markov Processes, Stochastic Control, & Econometrics. Professors hold Ph.D. degrees from the world's top 10% universities in 2013: M.I.T, N.Y.U, Columbia University, Harvard University, Boston University, University of Chicago, etc.

### B.A. Economics — *Uruguay*

UNIVERSIDAD DE LA REPÚBLICA — *2011*

I ranked in the top 5% of my class and I wrote my thesis on a Markov regime switching GARCH model for FX data. For a conversion to United States of America G.P.A system, see www.wes.org, which places me as an A student (4.00/4.00) in 2011.

## Experience

### Lead Data Scientist — *Spain*

DYNATRACE, BUSINESS INSIGHTS — *Feb.2025 - Jun.2025*

Led an exec-commissioned churn-prediction initiative, reframing churn into an economic model & consolidating inconsistent product, support, sales, and usage sources into the company's first coherent churn dataset. Engineered domain-aligned features in Feature Store and delivered an interpretable, deployment-constrained logistic-regression prototype calibrated for risk-tier decisions. Acted as project manager and lead 3 data scientists, working also cross-functionally, navigating data-governance requirements, and partnering with engineering on model architecture. Established the conceptual, data, and modelling foundations for a production churn-risk system. Left the role after an unexpected major change of my reporting line and in team roles announced 6 weeks after joining.

***Tech***: Python, Jupyter, Snowflake, Jenkins, AWS, Bitbucket, Jira, Confluence
***Models***: Logistic Regression, Gradient Boosting Decision Tree

### Senior Data Scientist — *Spain*

ACTIVISION BLIZZARD KING, CENTRAL INSIGHTS — *Jan.2021 - Aug.2024*

Worked end-to-end across experimentation, causal inference & forecasting, delivering rigorous A/B evaluations (e.g. long-term uplift via surrogates), payer-segmentation models, and analyses of retention and spend dynamics for games with millions of users. Built revenue drivers and a production-grade forecasting system used by finance. Led modelling from scoping asks into analytical frameworks, data design, feature engineering, pipelines & method selection, to packaging internal R/Python libraries (modular architecture, validation layers, unit tests, CI/CD) and supporting deployment and dashboard integration. Produced documentation and analytical narratives for product, finance, experimentation strategy & leadership, ensuring clarity, reproducibility and decision impact.

***Tech***: R, Python, Rmarkdown, Jupyter, BigQuery, GCP, Docker, Shiny, GitHub, GitHub Actions, LLM via API, Jira, Confluence
***Models***: A/B Tests, Surrogates, Difference-in-Differences, Survival, Hazard, K-means, Linear Regression, Copulas, Time-Series Models

### Associate Director Data Scientist
*Switzerland*

UBS, AI, Monitoring & Surveillance Models Validation
*Jul.2020 - Nov.2020*

Led an end-to-end transaction anomaly-detection validation project, translating fragmented rule logic into a coherent, regulator-aligned analytical framework under strict timelines. Built and assessed data pipelines, evaluated rule effectiveness and statistical behavior, and worked on robustness and stress-testing approaches to reliably flag suspicious activity while controlling false alerts. Acted as technical lead and project manager, supervising and mentoring a data scientist and coordinating cross-functional stakeholders and delivery across data, modelling, documentation, and governance constraints. In parallel, reviewed related transaction models, providing statistical guidance on customer behavior, non-stationarity, and regime shifts under extreme market conditions.

***Tech***: Python, Jupyter, Oracle, SQL Server, GitHub, Jira, Confluence
***Models***: Anomaly Detection, Rule-Based Systems, Random Forest, Bayesian Estimates, K-means, Structural Breaks, Markov Switching

### Quantitative Risk Analyst
*Sweden*

NASDAQ, Risk Modeling
*Apr.2019 - Jun.2020*

Worked on large-scale risk analytics for cleared derivatives, designing statistical models and decision metrics used to price instruments in fixed-income and equities, assess tail risk, and evaluate margin adequacy under extreme market scenarios. Translated complex market dynamics into interpretable, production-oriented analytical frameworks, including correlation-based grouping, sensitivity analysis, and stress testing, supporting both regulatory compliance and business decision-making. Led work end-to-end: from problem framing and reconstruction of legacy models with limited documentation, through data engineering, modelling, simulation, and validation, to automated reporting and executive-level communication. Delivered reproducible pipelines and scalable analytical outputs that improved pricing accuracy, stress-testing realism, and risk governance in a high-stakes environment.

***Tech***: R, Matlab, Python, Rmarkdown, Shiny, SQL Server, Bitbucket, Jira, Confluence
***Models***: Correlation Networks, Regularization, Black-Scholes & Heston, Implied Volatility, Factor Models, PCA, Stress & Sensitivity

### Researcher & Teacher
*Denmark*

CREATES, Aarhus Universitet
*Sep.2013 - Aug.2018*

Developed advanced econometric models and large-scale simulations for high-frequency financial data, bridging discrete- and continuous-time processes. Built parametric and non-parametric estimators for volatility, correlations and factor betas under noise and asynchronicity, combining theory, simulation and empirical validation on NYSE TAQ data. Designed parallelized estimation pipelines, rigorous testing frameworks, and forecasting-oriented models with clear assumptions and diagnostics. In parallel, taught applied econometrics, leading hands-on sessions on regression, limited dependent variables, censored & truncated data, selection & duration models, panel data and time-series modelling, translating mathematical theory into practical, reproducible analysis.

***Tech***: Matlab, C++, R, Stata
***Models***: Dynamic Correlation, State-Space, Factor Models, Kernel & Fourier Estimation, High-Frequency & Realized Volatility, GARCH

### Researcher & Teacher Assistant
*Uruguay*

Department of Economics, Universities UM & UdelaR
*Jun.2008 - Jul.2013*

Conducted applied economic research in microeconomics, causal inference, and empirical analysis. Built and analysed national & cross-country panel datasets, estimated & forecasted with time-series & panel methods, and evaluated policy impact via control–treatment comparisons & experimental data. Led lab-based experimental data collection & behavioural analysis under intervention. Independently designed & secured competitive research funding to lead a policy-impact study on technology adoption using causal inference in observational panel data. Taught undergraduate microeconomics: constrained optimisation, opportunity cost, supply and demand, competitive price formation, price differentiation & auctions basics, translating theory into applied analytical reasoning.

***Tech***: Stata, Eviews, Matlab
***Models***: Difference-in-Differences, Quantile Regression, Heterogenous Effects, Propensity Score Matching, VAR, ECM, Experiments

### Consultant & Analyst
*Uruguay*

Deloitte & CINVE, Economic Analysis
*Mar.2007 - Jun.2008*

Early-career analytical roles focused on applied economic analysis and data-driven insights. Worked with large macroeconomic datasets, supporting international finance analyses through data preparation, validation, diagnostics, and reporting for econometric model workflows at Deloitte. At Cinve I contributed to healthcare analytics by assembling and analysing national survey data to assess provider resources and population needs in the context of a national reform, supporting allocation decisions to directors of national healthcare providers under uncertainty. Produced analytical reports, built indicators, and translated data findings for senior stakeholders, gaining early experience in rigorous analysis, structured reasoning, and decision-oriented communication.

***Tech***: Stata, Excel
***Methods***: Descriptive Analytics, Exploratory Data Analysis, Indicator Construction, Stratification & Aggregation, Cohort Comparisons

## Certifications

### Data Querying & Analytics

Google Cloud

*Advanced BigQuery, 2021*. Internal architecture of column-based sharded storage & advanced SQL topics like nested & repeated fields through the use of arrays & structs. Also, how to optimize queries for performance & how to secure data through authorized views.

### Natural Language Processing & Large Language Models

DeepLearningAI

*NLP Specialization, 2025*: Sentiment analysis with logistic regression & Naïve Bayes, word vectors, PCA visualization, semantic similarity, and translation with embeddings via locality-sensitive hashing & k-nearest neighbors. Focus on supervised learning, feature engineering, dimensionality reduction, and vector space models, in Python, building foundations for my roadmap on advanced NLP & LLM workflows with HuggingFace, LangChain, and scalable deployment. In Progress.

### Statistical & Machine Learning

Duke, Michigan & Stanford Universities

*Managing Machine Learning Projects, 2023*: identifying ML opportunities from business problems and data availability, CRISP-DM process, structuring ML initiatives, decision trade-offs in model design, evaluation, and delivery. *Applied Machine Learning in Python, 2023*: classification and regression, feature engineering, predictive modeling, ensembles, clustering, cross-validation, overfitting and generalization. *Machine Learning Specialization, 2024*: supervised and unsupervised learning, recommender systems, neural networks and deep learning, optimization, regularization, hyperparameter tuning, scalable model training and evaluation.

### Machine Learning in Production & Operations

DeepLearningAI & IBM

*Machine Learning in Production, 2024*: model deployment and lifecycle management, data and model drift detection, monitoring and performance analysis, scalability, reliability, and continuous improvement of ML systems. *Containers & Orchestration, 2024*: containerization with Docker, Kubernetes orchestration, OpenShift deployments, cluster configuration, scaling strategies, and cloud-native workflows via CLI tooling.*CI/CD & Automation, 2024*: CI/CD pipelines with GitHub Actions and Tekton, automated testing and deployments, container image builds, release management to Kubernetes, and integration of quality checks into production workflows.

### Leadership & Communication

Michigan & Northwestern Universities

*Leading Teams, 2023*: team design and role definition, alignment of individual and team goals, decision-making structures, conflict resolution, trust-building, and sustaining performance through continuous learning and improvement. *Leadership Communication Storytelling, 2022*: executive storytelling, personal narrative and credibility, personal branding, communicating vision and innovation, and leading through uncertainty and crisis with clarity and impact.

### Econometrics & Statistics

Columbia University, Jeff Racine, Timo Terasvirta, Badi H. Baltagi

*Causal Inference, 2022*: identification, counterfactuals, propensity scores (matching, stratification, IPTW), treatment effects (ATE, ATT), links to ML-based estimation. *Non-Parametric, 2014*: kernel density and regression (local constant/polynomial), conditional distributions and quantiles, bias–variance trade-offs, curse of dimensionality. *Non-Linear, 2014*: parametric nonlinear regression, smooth transition and threshold models, regime-dependent dynamics, forecasting under structural change. *Panel Data, 2014*: fixed and random effects, endogeneity and IV, dynamic panels (GMM), specification testing, unbalanced panels, panel unit roots and cointegration.