

JIMMY CALVO-MONGE

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SUMMARY

Dedicated Data Scientist and Mathematician who enjoys challenges combining Mathematics, Statistics, Data Science and Software Development to solve business problems with a data-centered approach.

With 3 years' experience as a Data Scientist and a strong educational background in these four areas, I have made important technical contributions to different projects with my customers, you will find that my experience spans many areas: from the assessment of business needs and their translation to data analytics problems, to the experimentation, creation and deployment of production-level machine learning models, to the design, creation and maintenance of ETL processes for data management.

I hope you will find my preparation and experience attesting to my ability and disposition for making the most intelligent use of analytics and machine learning solutions to extract real, actionable value from data at your organization.

EXPERIENCE

Hakkoda, Heredia, Costa Rica: Data Engineer II

2024 -

Intel Corporation, Heredia, Costa Rica: Statistician & Data Scientist

2021 – 2023

- Implemented machine learning classification models to identify and predict manufacturing defects using data from earlier stages in the production process. These solutions involved many steps: training data recollection, data cleaning, correct prediction algorithms assessment and validation.
- Provided technical consulting and developing for statistical problems faced by client teams. Analyzed the challenges, proposed the correct statistical procedures, ran statistical tests and validations. Examples: ANOVA tests, mean comparison, regression analysis, multivariate outlier detection.
- Designed, created and maintained complete full stack software solutions for data analysis automation. Creation and Management of ETL processes. Implemented web-based solutions that automate processes of data recollection, transformation and merging. Final products deliver the data in final usable form to analysts and management.

University of Costa Rica, San José, Costa Rica: Mathematics Professor

2019 – 2022

- Designed material for courses in both pure and applied mathematics.
- Courses given: Calculus. Principles of Mathematics. Linear Algebra. Differential Equations for Engineers. Optimization Calculus. Number Theory. Honors Calculus. Abstract Algebra.
- Introduced programming applications using Python to mathematics courses syllabus, these include the use of mathematical simulations and the creation of modules for advanced calculations.

TECHNICAL SKILLS

Data Analysis and Statistics: Machine Learning Algorithms, Statistical Testing, Design of Experiments.

- Strong educational background and hands on experience using prediction Algorithms (Classification algorithms such as SVM, Logistic Regression, CART, Random Forest, Boosted and Ensemble Algorithms. Deep Learning algorithms such as Neural Networks, Convolutional Neural Networks, LSTM. Use of Tensorflow and Keras), Cluster analysis and high dimensional visualization algorithms for data segmentation. Statistical Tests, Hypothesis Testing, Design of Experiments, Mean comparison, ANOVA.

Programming: Python, R, JavaScript.

- Day to day experience with **Python** (4 years' experience). Data wrangling, consumption and transformation with pandas, dask. Data visualization with plotly, matplotlib, plotnine. Web application design and frameworks: flask, dash, flask-caching. Statistical and machine learning models: scipy, sklearn, statsmodels, tensorflow, keras. Outlier detection: pyod. API connection and use through python.

- Experience with **R** for data wrangling, inspection, model design, hands on experience with many of R's standard packages for data manipulation (dplyr, tidyr, purr, stringr, lubridate, ggplot2) and Machine Learning model creation and evaluation (caret, statsr, h2o, ranger). (4 years' experience)

Other Tools: HTML, CSS, JavaScript, SQL, Cloud Computing. (2 years' experience)

- **Data queries, database design and maintenance:** experience with SQL language (MySQL), with non-relational databases (MongoDB) for data-driven web applications.
- Use of HTML and CSS as well as JavaScript programming and Bootstrap libraries. In my master studies and free time I have used **React.js/Node.js** as a frontend framework. Check my personal [web-page](#) which I created using react, and [this project](#) which I created using react-gatsby.
- **Cloud computing:** 1 year experience with AWS services such as S3 for data storage, and Sagemaker/API-Gateway for model experiments, tracking and deployment.
- Daily use **git** for version control, code syntax best practices (flake8, pylint), experience with **matlab** to address numerical problems (numerical integration, matrix decomposition algorithms, solving systems of differential equations by step-wise algorithms). Use of **GitHub actions** for creating and managing CI/CD pipelines.

PROFESSIONAL CERTIFICATIONS

Certificates

- AWS Certified Cloud Practitioner. https://www.credly.com/badges/81a5cf8e-3b9b-49b0-b04e-30d53da69776/public_url
- DBT Certified Developer. <https://credentials.getdbt.com/a9f173b6-48c5-4626-9dd3-444bb5df9cba#gs.8k6j4v>
- Snowflake Snowpro Core Certification. <https://achieve.snowflake.com/4a65b769-d139-4378-82f1-30b3c9fd9770gs.bxtnjjs>

EDUCATION

Masters degree in Applied Mathematics

2021-2023

University of Costa Rica, San José, Costa Rica

Applied Statistics, Probability, Optimization, Time Series, Data Analysis and Predictive Modeling. Research project about novel techniques on adaptive human behavior for epidemiological models. My advisor: Dr. Fabio Sanchez, Cornell University.

Masters degree in Full Stack Web Development

2021-2022

Three Points Business School, Polytechnical University of Catalunya, Barcelona, Spain (Virtual)

A complete masters degree in full stack web development, covering fundamentals of front-end and back-end design, use of AWS resources for database and servers allocation, use of git, unit and integration testing and containers. As final project we addressed a real company problem involving the replacement of a complicated manual internal orders management system with a cleaner, user-friendly web-based product. The solution involved design of database architecture, API creation and frontend UI/UX design and implementation.

Masters degree in Pure Mathematics

2019-2020

University of Costa Rica, San José, Costa Rica

Continuing my studies in pure mathematics I decided to collaborate on a research project in Algebraic and Arithmetic Geometry under the supervision of prof. Dr. Marco Antei. We extended important research results in this advanced area of Mathematics, resulting in a peer-reviewed article published in a high ranking journal.

Bachelor in Mathematics.

2013-2018

University of Costa Rica, San José, Costa Rica

ACADEMIC PROJECTS

Publications and Preprints

- Calvo-Monge, J., Arroyo-Esquivel, J. Gehman, A., Sanchez, F. *Source-Sink Dynamics in a Two-Patch SI Epidemic Model with Life Stages and No Recovery from Infection*. Bulletin of Mathematical Biology, Volume 86, article number 102 (2024). <https://link.springer.com/article/10.1007/s11538-024-01328-7>.
- Barquero-Sanchez, A. Calvo-Monge, J. *On the embedding of Galois Groups into wreath products*. arXiv preprint <https://arxiv.org/abs/2306.14386> (2023).
- Calvo-Monge, J., Sanchez, F., Calvo J.G., Mena, D. *A nonlinear relapse model with disaggregated contact rates: analysis of a forward-backward bifurcation*. Infectious Disease Modelling, Volume 8, Issue 3 (2023). <https://www.sciencedirect.com/science/article/pii/S2468042723000581>.
- Antei, M, Calvo-Monge, J. *Extension of torsors and prime to p fundamental group scheme*. Annales de l'Institut Fourier, Volume 72 (2022) no. 1, pp. 367-386. doi:10.5802/aif.3475. <https://aif.centre-mersenne.org/articles/10.5802/aif.3475>

Presentations and Talks

- **Gulf Coast Undergraduate Research Symposium, Rice University, Houston, TX**, November 2019. *Vector bundles and the fundamental group scheme over abelian schemes*.
- **Expeditions Club, Global Pervasive Computational Epidemiology, Biocomplexity Institute, University of Virginia**, December 2022. *Adaptive Human Behavior in Mathematical Models*.