


RODRIGO DE LA FUENTE, Ph.D.

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PROFESSIONAL PROFILE

I am an experienced Researcher and Data Science Manager with extensive expertise in machine learning, optimization, and large-scale simulation, operating in the U.S. and South America. I specialize in leading projects from inception to completion, aligned with strategic objectives. Known for a results-driven and innovative approach, I excel in high-pressure environments with decisive and forward-thinking leadership. I have successfully led interdisciplinary cross-cultural teams, managing complex analytical challenges and overseeing more than 30 research projects. I am adept at maintaining productive relationships with all stakeholders. As a green card holder, I am fully authorized to work in the U.S. without visa sponsorship.

AREAS OF EXPERTISE

Managerial

Leadership | Coaching and mentoring | Team building | People management | Multidisciplinary team leader | Cross-cultural teams | Project management | Strategic Planning.

Technical

Deep Learning: CNN, RNN, Reinforcement learning, Representation learning, Deep generative models | **Machine Learning:** Regression, Classification, Tree-based models, Dimensionality reduction, Clustering, Anomaly detection | **Statistics:** Generalized linear models, Inference, Hypothesis testing, Experimental designs.

Computational

Programming: Python, R | **Data Science:** Tensorflow, Sklearn, Keras, Pytorch, SQL, pySpark | **Google:** Vertex AI, Looker Studio | **Microsoft:** Azure ML, Power BI | **DevOps:** Docker, Kubernetes, FastApi, MIFlow.

PROFESSIONAL EXPERIENCE

Valencell Inc, USA

May 2022 - Present

• Data Science Manager

- Led a team of six PhD-level data scientists, driving professional growth, fostering innovative thinking, and championing continuous education through Coursera while introducing advanced coding tools like ChatGPT Teams and Copilot to enhance productivity.
- Directed the comprehensive redevelopment of the ETL process using Docker containers and Kubernetes, accelerating feature experimentation and supporting agile project execution.
- Engineered and implemented a rigorous framework for evaluating classification and regression models focused on blood pressure prediction, establishing industry benchmarks.
- Led the strategic deployment of scalable model endpoints, reducing prediction request times from stakeholders by orders of magnitude, while ensuring robust access and integration for both internal and external users.
- Implemented improved task management practices using Linear and enhanced experimental tracking with MLFlow, resulting in better workload distribution and increased efficiency.

• Senior Research Data Scientist

- Transformed and explored PPG data, implementing hemodynamic features to enhance physics-informed CNN models. Achieved a 30% reduction in feature space, leading to more efficient firmware implementation.
- Enhanced PPG data representation using techniques such as wavelet scattering, continuous wavelet transforms, and the latent space of CVAEs. These advancements improved the efficiency of firmware implementation.
- Conducted comprehensive literature reviews and implemented state-of-the-art regression and classification models to predict blood pressure. The current best model, developed from these efforts, sets a new benchmark.

- Used Linear Mixed Effects models to evaluate the impact of new hardware configurations on feature generation, ensuring robust analysis by accounting for both fixed and random effects.

Assistant Professor - University of Concepcion, Chile

August 2016 - March 2022

- **Director of the Master of Operations Management**

- Oversaw a program with 7 faculty members and 15 students enrolled annually, boosting graduation by 50%.
- Led the revision and transition of the program’s curriculum from onsite to online delivery.

- **Consultant for the College of Engineering**

- Developed a predictive model linking oceanographic variables to fish sizes, significantly enhancing fishing predictions in zones where currents and temperature change abruptly.
- Spearheaded the creation of air quality models to forecast respiratory disease outbreaks.
- Designed an ensemble of convolutional neural networks that improved wildfire susceptibility mapping accuracy by 5% in the Bio-Bio region of Chile, which suffers annual losses of approximately \$200M due to wildfires.
- Developed a model combining a conditional variational autoencoder and a transportation mode choice predictor, reducing costs (\$0.5M) and addressing small survey sample sizes.
- Developed a Facility location model that improves firefighters’ coverage by 32% in Concepción, Chile.

- **Applied Research**

- Used 4 real-life modal choice datasets to show that deep neural networks are, on average, 10% more accurate than mixed multinomial logit for transportation mode choice prediction.
- Applied recurrent neural networks to combat illegal fishing in Southern Chile, predicting future positions of unlawful ships. This aids the Chilean Army, which spends \$3M per surveillance tour.
- Used gradient boosting classifier and K-means to teach the Baxter robot to identify and sort tools.
- Proposed an online optimization model that reduces workload by 13.5% among ambulances in NYC.

- **Instructor at the Department of Industrial Engineering**

- Developed an Introduction to Machine Learning course and an Introduction to Deep Learning course for graduate and senior undergraduate engineering students. Around 30% work as Data Scientists.
- Taught Simulation Analysis, Stochastic Models, and Operations Management at the graduate level.
- Direct supervision and guidance of 20+ capstone project, 5 masters thesis, and one Ph.D. dissertation.
- Graduate research mentoring and placement of 6 students in top IE/OR Ph.D. programs in the US.

EDUCATION

Ph.D. in Industrial Engineering , North Carolina State University, Raleigh, NC.	June 2016
Master of Industrial Engineering , North Carolina State University, Raleigh, NC.	May 2013
B.S. in Industrial Engineering , Universidad del Bio-Bio, Concepción, Chile.	May 2009
B.S. in Business Administration - Accounting , Universidad del Bio-Bio, Concepción, Chile.	May 2004

SCHOLARSHIPS AND AWARDS

Fulbright Scholarship , U.S. Department of State scholarship for Ph.D. studies, USA.	May 2011
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RELEVANT PUBLICATIONS

- 2024 - *An optimization-based approach for an integrated forest fire monitoring system with multiple technologies and surveillance drones*, European Journal of Operations Research.
- 2022 - *Comparison of statistical and machine learning methods to understand and predict travel mode choice: A methodological approach*, Expert Systems with Applications.
- 2021 - *A deep learning ensemble model for wildfire susceptibility mapping*. Ecological Informatics.