# Daniel Huencho Mardini

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## SUMMARY

With a strong foundation in statistics and machine learning, I have over seven years of experience delivering impactful data-driven solutions in the finance and transportation industries. As Head of Data Science at Metro de Santiago, I lead a team designing AI models for predictive maintenance, anomaly detection, and generative AI applications, driving transformative operational outcomes. My career highlights include presenting data insights to technical and executive committees, creating scalable analytics tools, and pioneering novel applications of AI in demand analysis and urban transportation. I am passionate about leveraging data and technology to innovate complex systems and create measurable societal value.

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## EDUCATION

**2025-Present** — **University College London - UCL, United Kingdom**
*Master of Science in Artificial Intelligence for Sustainable Development*
*Relevant modules: Probabilistic modelling, Foundations of Artificial Intelligence, Deep Representations and Learning.*

**2019-2020** — **Pontificia Universidad Católica de Chile, Chile**
*Master of Science in Statistics*
*Ranked 2nd in my cohort, GPA: 3.75 / 4.0.*
*Thesis: Designed a multinomial logit model to study route choice behavior in the Santiago Metro, utilizing the 2019 Origin-Destination survey and spatial predictors.*
*Relevant modules: Generalized Linear Models, Time Series, Analysis of Survival, Seminar on Statistics (Machine Learning Applications), Statistics Seminar III (Bayesian Statistics)*

**2011-2018** — **Pontificia Universidad Católica de Chile, Chile**
*Civil Engineer of Industry with a Diploma in Transportation Engineering*
*Relevant modules: Calculus I, II & III, Differential Equations, Linear Algebra, Probability and Statistics, Operational Research, Information Systems, Programming as a tool for engineering, Simulation, Integer Programming, Travel Demand Modeling, Advanced Traffic Flow Theory, Transport Network Equilibrium.*

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## TEACHING, INVESTIGATION, PUBLICATIONS

**2025** — **XXII Congreso Chileno de Ingeniería de Transporte - CCHIT, Chile**
*Authored and submitted a presentation on the research and application of an Urban Quality of Life Index, focusing on the environmental and social dynamics surrounding Metro stations in Santiago, using POI dataset, censal information and administrative tax data. This project helped the company's real estate department improve investment decisions for store allocation and rentals, and provided information to the state transport department to help identify areas needing better connectivity infrastructure.*

**2018-2019** — **Metro de Santiago - Telefónica R&D - Universidad del Desarrollo, Chile**
*Support Eduardo Graells-Garrido's academic research of large-scale mobile phone antenna data (big data) to uncover mobility patterns within the city. (https://arxiv.org/pdf/2204.09482)*

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## RECENT CONFERENCES AND EVENTS

**2025** — **EurIPS, Copenhagen DK**
*Volunteered at EurIPS, facilitating logistics and technical support for two specialized workshops: 'Rethinking AI' (focusing on Efficiency and Sustainability) and 'Advances in Representation Learning for Earth Observation' (targeting robust and scalable planetary monitoring models).*

**2024** — **InnoTrans 2024, Berlin DE**
*Represented Metro de Santiago as part of a five-person delegation at the world's largest transportation technology fair. Actively engaged in exploring cutting-edge trends in sustainability, digitalization, and artificial intelligence, focusing on their application to enhance Metro's operational efficiency and competitiveness. Participated in strategic meetings with global suppliers, evaluating innovative solutions to integrate into Metro's technical and financial frameworks. With technical visits to companies such as Alstom, Siemens, Hitachi, Huawei, CAF, among others.*

**2024** — **OpenAI Hackathon and Conference – Latin America. Chile**
*Participated in the first OpenAI Hackathon and Conference in Latin America, an inspiring event showcasing cutting-edge advancements in generative AI and their transformative applications across industries. Engaged with leading panelists, developers, and innovators, drawing inspiration for applying AI technologies to public transportation.*

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## WORK EXPERIENCE

**2023-2025** — **Head of Data Science - Metro de Santiago, Chile**

- Led a team of 5 Data Scientists and Data Engineers to design and deploy AI-driven solutions using cloud services, addressing critical challenges in operations, sustainability, predictive maintenance, customer experience, safety, and infrastructure monitoring within Santiago's subway network.

- Architected an end-to-end big data pipeline for high-frequency SCADA energy data, addressing complex spatial-temporal challenges across overlapping electrical zones and synthesized energy consumption with diverse operational variables, including kinematics (trains acceleration, velocity) and network morphology, to identify key drivers of efficiency using linear models and anomaly detections techniques.

- Predictive Maintenance for Reload Machines: Developed an ensemble-based model to forecast failures in ticket reload machines, optimizing maintenance schedules and minimizing downtime.
- Generative AI Agent Models: Implemented AI-driven agents to assist the Operations Control Center and Maintenance tasks by creating a complex embedded knowledge base, automating response procedures and enhancing event management across the metro network.

**2022-2023**   **Analytics Translator - Banco de Crédito e Inversiones, Chile**

- Bridging the technical expertise of data engineers and data scientists with the operational expertise of business and frontline managers. Help business leaders identify and prioritize their business problems and seek opportunities, focused on the development of strategies for a digital banking ecosystem. Analytical tools and platforms such as Databricks, R, Python, SQL, Spark, and Scala were utilized for the development and testing of machine learning models.
- Led a data-driven profitability initiative by identifying high-value segments within the low-value prepay channel using behavioral and financial clustering. Designed an optimized customer journey to transition these segments to high-value credit products, validating the strategy through rigorous A/B testing and batch-processed campaign logic. This methodology successfully increased customer adoption and reduced churn rates for core bank products.

**2021-2022**   **Senior Risk Management Analyst - Banco de Chile, Chile**

- Senior Data Analyst with a high focus on business, specifically monitoring the models that calculate provisions to mitigate portfolio risk (methodology required by the Commission for the Financial Market). Use of technical tools such as R, Python, RDBMS, PBI, and others. Present results in technical and executive committees to contribute to decision-making.
- Led the migration of data infrastructure and processes to an on-premises data lake platform for Big Data (Cloudera), aligning the analytics team's needs with the practical requirements of the PMO team and IT platform sub-management. This role included ensuring that key production processes remained uninterrupted and maintaining operational continuity.

**2018-2021**   ***Data Analyst, Planning and Development Department - Metro de Santiago, Chile***

- Responsible for developing algorithms and machine learning models to describe and forecast user behavior and creating automatic reports with R (C++ with Rcpp) and Python. Developing ETL processes with SQL databases and helping the management control department with the creation of the organization's KPI reports. Make strategic analysis with the technical team at Chile's Ministry of Transportation for future Metro lines projects in Santiago.
- Led the development and implementation of a train passenger density model, coordinating with the operations team to leverage this data. This model calculates a key performance indicator (KPI) to measure the level of service delivered to our users. Played a strategic role in defining Metro's approach through the Strategic Foresight methodology (2020), leading efforts and setting definitions in technology, automation, and artificial intelligence. I contributed from an industry perspective to a research initiative exploring using mobile phone data to detect mobility patterns.

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**ADDITIONAL SKILLS**

### LANGUAGES
**Spanish:** Native Speaker
**English:** IELTS Overall Band Score 8.0 (C1 - Advanced)
### SOFTWARE
**Python:** Advanced (proficient in data analysis, machine learning, and automation)
**R:** Advanced (skilled in statistical modeling and data visualization)
**SQL:** Advanced (proficient in database querying, optimization, and ETL processes)
**Amazon Web Services (AWS):** Intermediate (experience with EC2, S3, Glue, Athena, and EMR)
**Apache Spark (PySpark and MLlib):** Intermediate (machine learning models for big data pipelines)
**C++:** Intermediate (developed Rcpp package for advanced analytics and network algorithms)
**Docker:** Intermediate (machine learning environments and deploying scalable solutions on EC2)

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**ADDITIONAL EDUCATION (Diplomas, Courses, Workshops)**

2023   **MIT Professional Education, Remote**
*Applied Data Science Program*
2021   **IBM - Coursera, Remote**
*Data Science Professional Certificate*
2020   **Rstudio Conference 2020, San Francisco, USA**
*Modern Geospatial Analysis Workshop - ZevRoss*

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**VOLUNTEERING**

2012-2014   **PSU University Preparatory Program for Underprivileged Students - PUC, Chile**
*Instructor and responsible for developing the curriculum.*

## References

**Cristóbal Pineda - cpineda@mtt.gob.cl**
*Head of Regional Public Transport Division (DTPR) | Ministry of Transport and Telecommunications of Chile*
*MSc Transport and City Planning | The Bartlett School of Planning, UCL*
*Lecturer | Universidad de Chile*

**Eduardo Graells-Garrido - egraells@dcc.uchile.cl**
*Assistant Professor | Department of Computer Science, Universidad de Chile*

**Laure-Hélène Filhol – lhfilhol@gmail.com**
*Managing Director & Head of Operations | Egis Chile*
*French Foreign Trade Advisor - Conseillère du Commerce Extérieur de la France au Chili*

**Carlos Melo – cmelo@metro.cl**
*Director of Planning and Passenger Experience, Metro de Santiago*
*Lecturer, Pontificia Universidad Católica de Chile*