Fabricio Jiménez Morales

Scientist

AI - Data - Physics PhD

Profile

Scientist trained in Machine Learning at CERN experiments like the Large Hadron Collider (LHC), motivated by data challenges. Striving to find solutions to problems with tangible impact in society. With years of experience in understanding natural phenomena, I process, visualize and model data for prediction and efficient decision making. I value effective communication across large interdisciplinary and diverse teams.

Skills

Technical

- Scientific programming
- Python, C++, SQL, Bash/Linux, Git
- Data exploration, monitoring, visualization, modelling
- AI / Machine Learning
  - Generative AI
  - Anomaly detection
  - Libraries: pytorch, scikit-learn, pandas
- Simulations, Monte Carlo methods
- Particle Physics, Statistics

Communication

- Technical writing
- Student supervision
- Talks to small and large audiences
  - To experts and non-experts
- Scientific project management
- Interdisciplinary team player
- Fluent in Spanish, English, French and Portuguese; basic German.

Work Experience

Physics Postdoc | CNRS - École Polytechnique, France [2019 - 22]

- Machine Learning (ML) for Higgs physics at future colliders
  - Modelling and analysis of particle detector simulated data

→ *A combined fit to the Higgs Branching Ratios at ILD* (arXiv)

- R&D for next-generation particle detectors
  - Prepared, tested a prototype with +15k readout channels
  - Improved object identification, time separation

→ *Beam test of a highly granular SiW-ECAL technical prototype for the ILD* (arXiv)

Ph.D. Researcher | U. Clermont-Auvergne, France [2016 - 19]

- In charge of auto-fast monitoring of LHC data (TBs daily)
- Projects developed and coordinated through scientific visits:

Internship | MathWorks, Inc., US
- First implementation: Generalized Additive Models for MATLAB

Secondment | U. of California at Irvine, US
- Gaussian processes for New Physics (NP) searches at the LHC
- Signal detection improved via new kernels and priors

→ Multivariate Analysis Methods for NP Searches at LHC (arXiv)

Secondment | U. of Padova, Italy
- Penalized Anomaly Detection and Gaussian Mixture Models (link)

Internships | IPNL, France; Fermilab, US; CERN, Switz. [2014 - 16]

- Trained Boosted Decision Trees for Higgs physics at CERN
- Particle detector trigger design for a CERN experiment
- Searched for NP with collider data and simulations (arXiv).

Education

AI developer bootcamp | Le Wagon, France [2024]
- Hands-on Data Science and AI stack

Ph.D., Physics | Clermont-Auvergne University, France [2019]

→ *Model independent searches for New Physics using Machine Learning at the ATLAS experiment at CERN* (link)

MSc, Particle Physics | Paris VII University, France [2016]

BSc, Physics | USB, Venezuela; Lund University, Sweden [2015]

Selected conferences, awards

- **ICHEP** International Conf. in High Energy Physics, Italy [2022]
- **CHEF** Calorimetry for High Energy Frontier, Japan [2019]
- **EU Marie-Curie Grant** for doctoral research [2016]

Info

Citizenship French and Venezuelan
Location Paris region
Born 1991 (33 years old)

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Book a meeting