de Frutos José Manuel

COMPUTER SCIENTIST · MATHEMATICIAN

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Experience

Carlos III University
Madrid, Spain

RESEARCHER DL MODEL APPLIED TO FILTERING METHODS
March 2023 - Today

- Generative modelling with sliced rank-statistic
- Rank statistics, two sample tests, f-divergences, deep learning, generative model
- Teacher of the course Machine Learning II at Carlos III University (100h)
- Course Instructor BBVA for Machine Learning (25h)
- pyTorch, Jax, Python, Julia

Devo inc
Madrid, Spain

R&D SOFTWARE ENGINEER: "INTERACTIVE SEARCHES" TEAM FOR LOGS MANAGEMENT.
January 2020 - March 2023

- Performed and improve handling of queries: JS (ES6, Nodejs, Webpack), Java8 (Spring Boot). Increase in the processing speed of queries up to x100.
- Implemented new mathematical operations for logs management: JS (ES6, Nodejs, Jest, Mocha), Sql.
- Create data pipelines capable of handling petabytes of data: Python3
- Design of a SQL-like language for data extraction using ANTLR

Cadiz University
Cadiz, Spain

GRADUATED RESEARCHER
June 2019 - September 2019

- Monteiro–Baaz operator and its deduction in multivalued logics.

European Organization for Nuclear Research (CERN)
Geneva, Switzerland

SUMMER INTERN
July 2018 - August 2018

- I was one of 42 selected from more than 2000 applicants.
- Study and implementation of how to convert puppet bolt into a server application, in order to achieve persistence of connections: Ruby, Python.
- Study and learn how a Large Scale Computing Infrastructure works, up to 40.000 Linux servers: Puppet (Mcollective, Puppet Bolt), Ansible.

Instituto of Mathematical Sciences (ICMAT)
Madrid, Spain

GRADUATED RESEARCHER
June 2018 - September 2018

- Developed of fluid dynamics algorithms, improvement of already existing algorithms for the calculation of speeds and temperatures, improvement obtained up to x100: Python3 (Dedalus, PyMPI).

European Southern Observatory (ESO)
Paranal, Chile

DATA ENGINEER INTERN
July 2017 - July 2018

- Installed Datalab for Observatory Logs, Ability to store more than 1 petabytes per day: Elasticsearch, Cassandra, Elassandra, Kairosdb.
- Servers orchestration: Puppet.
- Installed and managed Data Analytic tools, ELK: Jupyter, Grafana, Kibana.
- Coded anomaly detection algorithms for the detection of instrumental failures of the observatory: Python3 (Pandas, TensorFlow).
- Performed Data ingestion, extraction and load (ETL), Boosted by 1000x: Python3, Bash.
- Data Visualization: Python3 (Matplotlib, Bokeh, Plotly).

Education

Autonomous University of Madrid
Madrid, Spain

MASTER DEGREE IN MATHEMATICS AND APPLICATIONS
September 2018 - July 2020

- Stochastic processes, Advanced statistics, Numerical methods, Advanced PDEs, Geometry.
- Master's thesis on the mathematical foundations of image segmentation.
- Got the University Scholarship "AYUDAS PARA MATRÍCULA DE ESTUDIOS DE MÁSTER-UAM 2018". Got one of the two Scholarship available for mathematics.
- Grade: 8.71/10

Autonomous University of Madrid
Madrid, Spain

DOUBLE DEGREE MATHEMATICS AND COMPUTER SCIENCE ENGINEER.
September 2012 - June 2018

- Foundations of mathematics: PDEs, Numerical Methods, Statisitics, Artificial intelligence, Algorithm analysis.
- Internacional exchange program September 2015 - June 2016, Ecole Polytechnique Paris.
- Programming languages: C/C++, Java, Javascript, Php, Sql, R, Python
- Grade: 8.00/10

Skills

Languages   Spanish (Native), French (Native), English (Toefl C1 - 101/120)

Summer Schools & Others

- **MSML - Mathematical and Scientific Machine Learning Congress**
  Naples, Italy (03/08/2025–08/08/2025). Presented poster; received scholarship.
- **EMS Summer School: Mathematical Modelling, Numerical Analysis, and Scientific Computing**
  Kácov, Czech Republic (15/06/2025–21/06/2025). Presented poster; received a full scholarship.
- **Summer School on Bayesian Filtering**
  Edinburgh, Scotland (06/05/2024–10/05/2024).
- **Nordic Probabilistic Machine Learning (ProbIA) Summer School**
  Copenhagen, Denmark (01/06/2024–07/06/2024). Presented poster.
- **Hamburg School of Data Science 2020**
  Hamburg, Germany (12/02/2020). Presented personal data science project.

Publications

- José Manuel de Frutos, Manuel A. Vázquez, Pablo M. Olmos, and Joaquín Míguez. Explicit density approximation for neural implicit samplers using a Bernstein-based convex divergence. *arXiv preprint arXiv:2506.04700*, 2025.
- José Manuel de Frutos, Manuel A. Vázquez, Pablo Olmos, and Joaquín Míguez. Robust training of implicit generative models for multivariate and heavy-tailed distributions with an invariant statistical loss. *arXiv preprint arXiv:2410.22381*, 2024.
- José Manuel de Frutos, Pablo Olmos, Manuel A. Vázquez, and Joaquín Míguez. Training implicit generative models via an invariant statistical loss. *Proceedings of the International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2024, pp. 2026–2034. PMLR.
- José Manuel de Frutos Porras and Simon Traylen. Parallel Task Execution. *Zenodo*, December 5, 2018. DOI: 10.5281/zenodo.1971291.

Extracurricular Activity

- **JuliaLang**
  Julia open source projects developer. Work on projects *Stats* and *JuliaCore*.
  Madrid, Spain (June 2020–Present).
- **Club Baloncesto Estudiantes**
  Basketball coach for people with disabilities.
  Madrid, Spain (January 2023–Present).