Matias Pablo Borghi Orué

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Professional Experience

CRISIL GR&A (Buenos Aires, Argentina)   Aug 2017 – Present

Senior Quantitative Analyst:

Analyst for Internal R&D Project. Main activities include:

- Development of R&D of cutting edge Machine Learning and Deep Learning solutions for pricing products with early exercise features in both high and low dimensions (Multilayer Perceptron Neural Networks; Flux.jl; GPU training).
- Applied K-means algorithm and regression methods to the forecast of real estate house pricing and telco customer churn (Scikit-learn; TensorFlow; Jupyter Notebooks; Google Colab).
- Neural Style Transfer technique applied to images (CNN; VGG19).
- Handling of uneven distribution datasets (dev, test and train sets).
- Bias-Variance tradeoff analysis (regularization methods and dropout).
- Development of a high-performance library designed to achieve fast and advanced quantitative finance calculations, including: Monte Carlo universal pricing engine for exotic equity products with arbitrary basis layers; Greeks computation via automatic differentiation; domain specific language (DSL) design and implementation for syntactically-sweetened inputs.
- Technical leader in charge of the development, maintenance, testing, documentation and deployment of web applications using high standards for microservice deliveries, including: frontend development; backend development (GraphQL endpoints); documenting solution architecture; automated cloud migrated environments; and unit test performing.

Quantitative Analyst:

Consultant for a Tier-1 US investment bank in the equity/hybrid product desk. Main activities included:

- Design of testing strategies for structured notes and cross currency swaps, including stressed scenarios.
- Analysis of underlying dynamics, for equity, FX, and interest rates processes, using local and stochastic volatility models, as well as different term structure models such as deterministic rates and Libor Market Model.
- Product pricing by means of analytic, trees, PDE, and Monte Carlo methods.
- Parametric testing modifying relevant dynamics and/or payoff related parameters.
- Yield curve building and handling for various currencies.
- Reporting documentation.

National University of La Plata (La Plata, Argentina)   Sep 2015 – Sep 2017

Teaching Assistant (Electromagnetism, Optics, and Classical Mechanics)

Argentine Institute of Radio Astronomy - IAR (Buenos Aires, Argentina)   Nov 2014 – Dec 2015

Research Project Collaborator:

Responsible for the development of a library which could determine the possibility of radio emission detections from extensive air showers induced by cosmic rays.

Educational Qualifications

- **MSc in Physics (2017).** School of Exact & Natural Sciences. University of La Plata (Study of phase transitions of an Ising-type model with spin oriented dependent interaction parameters).
- **Computer Technician (2009).** San Juan XXIII High School, Buenos Aires.

Programming and Software

- **Backend Technologies:** C/C++/C#, Julia, Python, FORTRAN, R, Node.js, etc.
- **Frontend Technologies:** HTML, CSS, JavaScript, React, etc.
- **DataBases:** MySQL, SQLite, MongoDB, PostgreSQL.
- **APIs:** RestAPIs and GraphQL.
- **DevOps:** Git (CI/CD), Docker, etc.
- **Cloud:** AWS, Heroku, etc.
- **Messaging:** RabbitMQ, ZMQ, etc.
- **Others:** Scripting, LaTeX, GNU Octave, Matlab, Mathematica, etc.
- Development and collaborations in many open source projects (my [GitHub](#) account).