Quentin Velard

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Education

Ecole des Mines Engineering School, September 2021 - June 2025
MSc in Applied Mathematics

- *Applied maths department course work:* Quantitative Finance - Stochastic calculus - Time series Analysis: Stationary and Non-Stationary Models - Monte-Carlo Methods - Data Analysis (PCA, statistics) - Partial Differential Equations - Machine Learning (regression, ridge, lasso, K-means, Bayesian classifier, SVM, GAN) - LLM - Deep Learning (CNN, RNN, padding, backpropagation, regularization)

- *Common core courses:* Numerical analysis - Quantum Mechanics - Statistical Physics - Continuum Mechanics

University of Lorraine, September 2024 - June 2025
MSc in Data Science

- *Common Core Courses:* Statistical Modeling - Signal Processing - Spatial Statistics - Convex Optimization - Reinforcement Learning -Operations Research

CPGE Lycée Pasteur - Sorbonne University, September 2018 - June 2021
Bachelor of Science

- Preparatory Coursework for Engineering Schools. Three years of intensive and advanced courses in mathematics, physics and chemistry dedicated to the preparation for the highly competitive entrance examinations to French Engineering schools. Ranking: 676 out of 3494 candidates (Mines-Ponts PC).

Experience

Quantum Machine Learning Intern, March 2024 – July 2024
RMIT University – Melbourne, Australia

- Co-author (2024), ***QILLER: Quantum Incremental Learning for Lifelong Erosion Resilience in Variational Quantum Algorithms***, *IEEE Transactions on Neural Networks and Learning Systems*, currently under peer review.
- Transposed a classical incremental learning algorithm into a quantum algorithm within an MLOps framework to address the issue of "catastrophic forgetting" when training a model on new data.
- Currently under peer review, available **here** (Google Drive link).

R&D Analyst Intern, June 2023 – December 2023
Bpifrance – Paris, France

- Venture capital for digital R&D projects supporting French government strategies on energy transition and reindustrialization. Involved in executing and integrating emerging technologies like electronics, blockchain, cloud, 5G, quantum, AI, and cybersecurity into France's financial strategies.

Projects

Generation of Biomolecules using GANs and Diffusion models September 2024 - Febuary 2025

- Research project aimed at developing Deep Learning tools to create new biomolecules with antioxidant and anti-inflammatory properties, targeting the pharmaceutical sector. GAN, diffusion models and LLM architectures are trained to generate biomolecules over a enhanced and growing database.

Barrier Option Pricing uses Branching Processes September 2022 - June 2023

- 9-month academic project on vanilla and exotic options, focusing on barrier option pricing and numerical simulation. Based on works by Nicolas Privault and Georgi Mitov. **Tools:** Python & Excel used to simulate Galton-Watson process and branching process in random environments.

Skills

Technologies: Python *(Numpy, Pandas, Matplotlib, Scikit-learn, Qiskit, PaddlePaddle, Beautifulsoup)*, Machine learning on PyTorch and Tensorflow, R, Microsoft Office Suite, MATLAB, SQL, Excel-VBA, Git/Github
Languages: French (native speaker), English (IELTS 7/9)

Position of Responsibility and Hobbies

Sport and Music: Half marathon, gym, trekking, mountaineering, electronic music production
Interests: Participation in a student and industry professionals' convention on hydrogen, cryptocurencies, blockchain, AGI