

Arthus Goujon

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Education

École Polytechnique – Institut Polytechnique de Paris

Sep 2026 – June 2027

Master in Economics

- Relevant coursework: Advanced Econometrics, Time Series Analysis, Macroeconomics
- Auditing selected graduate-level courses from Sorbonne University's **MS2A Master's program**, including **Statistical Learning and Optimization for Machine Learning**.

Aix-Marseille Université

Sep 2025 – June 2026

M1 Mathematics and Applications

- Relevant coursework: Probability and Measure Theory, Stochastic Processes, Partial Differential Equations, Analysis, Algebra
- Master's thesis: optimal routing across CFMM networks using convex optimization; Python/CVXPY implementation improved execution by up to **22 bps** on a three-pool Uniswap V2 network.

HEC Paris

Sep 2023 – May 2027

Master in Management, “Grande École” Program

- Completed a Bachelor's degree in Mathematics in parallel with the HEC curriculum.
- Relevant coursework: Data Science, Statistics, Macroeconomics, Microeconomics

Institution des Chartreux

Sep 2020 – May 2023

Classes Préparatoires – Mathematics & Economics

Research Experience

Télécom Paris – Paris, France

Sep 2026 – Present

Research Project – Quantitative Finance & Market Microstructure

Advisor: *Michele Fabi*

- Study mean-field game models of limit order book dynamics to characterize strategic interactions, equilibrium behavior and liquidity formation among heterogeneous market participants.

CNRS – HEC Paris – Paris, France

March 2026 – August 2026

Research Intern – Applied Mathematics & Game Theory

Advisor: *Marie Laclau*

- Developed a dynamic Bayesian model of strategic scoring under imperfect information and probabilistic auditing; characterized truthful, pooling and interior stationary equilibria.
- Derived incentive and stability thresholds linking score reliability, endogenous exposure and strategic discipline.

Selected Machine Learning Projects

Tricky Turntable Learning – Bayesian Learning, Reinforcement Learning & Online Adaptation

- Extended an analytically solved Mario Party game into an adaptive-agent benchmark with **60M+ simulated interactions**, comparing Bayesian opponent modeling, online adaptation and tabular Q-learning.
- State-conditioned Bayesian learning achieved near-oracle performance against reactive opponents; under concept drift, sliding-window inference adapted **5.3× faster** than model-free Q-learning and reduced post-change regret by **89%** versus full-history Bayesian updating.

PartyFormer – Transformer-Based Opponent Modeling

- Built a compact **5.3k-parameter Transformer in PyTorch** to predict opponent actions from sequences of strategic interactions using learned token and positional embeddings and multi-head self-attention.
- Reached **84% test accuracy** under hidden strategy changes and adapted from **37% to 88% accuracy within four observations** after concept drift; converted predicted action distributions into game-theoretic best responses.

Technical Skills

Programming – Python (PyTorch, NumPy, pandas, scikit-learn, statsmodels, CVXPY, matplotlib), SQL

Machine Learning – Deep Learning, Transformers, Bayesian Learning, Reinforcement Learning, Online Learning, Statistical Learning

Mathematics – Probability, Stochastic Processes, Statistics, Linear Algebra, Convex Optimization, Game Theory

Languages – French (native), English (fluent)