Quentin FRUYTIER

Ph.D. Candidate

UT Austin

M.Sc. & B.Sc. Graduate

McGill University

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Personal Website

Ph.D. Supervisors

Aryan Mokhtari

Sujay Sanghavi

M.Sc. Supervisors

Abbas Khalili

Tim Hoheisel

Patents

Latent Distribution Shaping:
App No. 19/337202 2026

Programming Skills

Python (PyTorch & TensorFlow), C, C++, Matlab, and R.

Languages

Bilingual French (native) and English

Nationalities

United States, Canada, Belgium

Domain Knowledge

Optimization & Theory: EM, Mirror Descent, SGD, non-convex convergence analysis.
Statistical ML: mixture models, kernel methods (MMD), time-series forecasting, disentanglement.
Architectures: Transformers / ViT, Autoencoders, Mixtures of Experts, Diffusion (continuous & discrete) .

Education

UT Austin • Ph.D. in Electrical Engineering • 4.0/4.0 GPA — Expected 2028

McGill University • Masters in Mathematics • 4.0/4.0 GPA — August 2023

McGill University • Joint Honours Math & Comp. Sci. • 3.8/4.0 GPA — June 2021

Publications

Sculpting the Latent Space With MMD (accepted at SDM 2026) 2026
Introduced the Latent Predictability Score, an unsupervised lower bound on latent entanglement, showing VAE- and adversarial-based baselines fail to learn statistically independent representations. Used Maximum Mean Discrepancy to sculpt the aggregate posterior toward arbitrary target priors — **70% reduction in detected entanglement** over the leading baseline with no reconstruction trade-off.

Learning Mixtures of Experts with EM (accepted at ICML 2025) 2025
Proved a novel equivalence between EM and Projected Mirror Descent for Mixtures of Experts, establishing matching local linear convergence rates for both EM and SGD; in small-scale experiments, EM reached a better optimum in fewer iterations than SGD

Projects

Quantitative ETF Forecasting App 2026
A Public, self-hosted ETF app: an LLM committee allocates capital from zero-shot Chronos-2 forecasts + classical signals (momentum, SMA, realized vol, macro), backed by a reproducible rigorous backtest analysis suite — cone calibration, cross-sectional IC, rolling-window validation, Sharpe/drawdown. Code fully open.

Statistical Ranking for n-vs-n Games 2024
Elo/Glicko-style rating algorithms recovering latent skill from noisy pairwise outcomes.

Work Experience

Machine Learning Research Intern Summer 2025
InterDigital Communications AI Lab *Los Altos, CA*
Developed a Maximum Mean Discrepancy framework to shape neural latent spaces to arbitrary target distributions — independence, semantic alignment, prescribed geometry — with provable guarantees; filed as U.S. patent *Latent Distribution Shaping* and accepted at SDM 2026. Applied to **wireless CSI representation learning and cross-model interoperability**.

Data Science Intern at Nectar Summer 2021
Nectar Technologies Data Science *Montreal, QC*
RNN and AE training on time series sensor data collected from within beehives.

Software Engineer Intern at Matrox/Akamai Summers 2019/2020
Akamai Technologies Image Manager *Montreal, QC/Ottawa, ON*

Teaching Experience

Graduate Teaching Assistant 2026
Graduate topics course on Generative Models in Machine Learning
UT Austin Electrical and Computer Engineering Department *Austin, TX*

Teaching Assistant 2019-2022
Principles of Statistics 1, Calculus 2, Foundations of Programming (Python/ Java)
McGill University Department of Mathematics and Statistics *Montreal, QC*

Awards

ICML 2026 Silver Reviewer Award May 2026

Basdall Gardner Memorial Graduate Fellowship in Engineering 2023 - 2026
UT Austin fellowship for academic excellence

Graduate Excellence Fellowship Award May 2022
McGill University award for academic excellence