Maxime Meyer

+33 6 51 13 38 63 | maxime.meyer@u.nus.edu

Summary Statement

Enthusiastic and motivated student conducting a PhD in the Department of Mathematics of NUS. I am particularly interested in approximation theory and the mathematical foundations of transformers. My most recent work consists in formally demonstrating and characterizing the memory limitations of prompt tuning in transformers.

Education

PhD in Mathematics Feb. 2025 – Dec. 2028 (Expected)
National University of Singapore Singapore
- Supervised by Vincent Tan and Caroline Chaux
- Approximation Theory of Transformer Models

Master of Science by Research in Mathematics Aug. 2023 – Jan. 2025
National University of Singapore - GPA : 4.5/5.0 Singapore
- Master Thesis with Patrick Rebentrost on Online Learning of Quantum States
- Pure Maths classes : Lie Theory, Representation Theory, Set Theory, Commutative and Homological Algebra

French Engineering School Aug. 2021 – Jan. 2025
ENSTA Paris - GPA : 3.7/4.0 Saclay, France
- Equivalent of a Master of Science
- Specialized in Probabilities and Stochastic Calculus: Markov chains and Martingales, Monte Carlo methods, Itô calculus, Mathematics Models for Finance, Time-Series Analysis

Master Year 1 Applied Mathematics and Statistics Aug. 2022 – Aug. 2023
Institut Polytechnique de Paris - GPA : 3.8/4.0 Saclay, France

Preparatory courses MPSI-MP* Sep. 2019 – June 2021
Lycée Louis Le Grand - GPA : 4.0/4.0 Paris, France
- Equivalent of a Bachelor of Science in Maths and Physics

Work Experience

Research Assistant - Online Learning of Quantum States Oct. 2024 – Jan. 2025
CQT, *Centre for Quantum Technologies* Singapore
- Supervised by Patrick Rebentrost
- Studied the online learning setting for quantum tomography. Challenged the widely held assumption that pure states are easier to learn than mixed states and showed that both are equally complex in the online framework. Also introduced smooth analysis in the online quantum state learning problem, which allows for an interpolation between the worst-case and the average-case scenarios.
- Paper under review: Online Learning of Pure States is as Hard as Mixed States, https://arxiv.org/abs/2502.00823

Research Scientist Intern - Monte Carlo methods for Rare Probability Events May 2023 – July 2023
Paris Saclay - SOLsTIS Research Team, INRAE Saclay, France
- Supervised by Gabriel Lang and Pierre Gloaguen
- On the First Hitting Time Density of an Ornstein Uhlenbeck Process
- Designed and implemented two algorithms estimating the hitting time of an OU Process (similar to a Brownian Motion). The main hurdles encountered were a very long hitting time expectation (which makes standard Monte Carlo methods impractical), and explicit formulas that are particularly hard to estimate.

Other Skills

Coding
- Python
- C++
- R, Matlab, Prolog, C

Languages
- French - native
- English - fluent
- German, Chinese - beginner

Activities and Associations

Head of ENSTA's boxing team
Medals at the Regional University Championships of 2022 and 2023 and qualification for nationals.
Organized a boxing event gathering a couple hundred spectators
Coached in several associations
Vice Champion of Singapore in Sport Sambo
Participated in the 2024 Chessboxing World Championships in Armenia
Head of ENSTA's theatre company