

## Education

### Université Paris Dauphine - PSL (Paris Sciences & Lettres)

M.S. IN MATHEMATICS AND APPLICATIONS, MODO TRACK

Paris, France

Sep. 2025 – Jun. 2026

- Specialization: Modeling, Optimization, Decision, and Organization.

### École Polytechnique - IP Paris

M.S. IN APPLIED MATHEMATICS AND STATISTICS

Paris, France

Sep. 2024 – Jul. 2025

- GPA: Average Score: 16/20 (Ranked in the top 20%).
- Courses: Convex Optimization, Stochastic Processes, Functional Analysis, Mathematical Statistics, Python for Data Science, Introduction to Machine Learning, Markov Processes & Applications, Database Management Systems.

### Sun Yat-sen University

DUAL B.A./B.S. IN PHILOSOPHY (LOGIC) AND APPLIED MATHEMATICS

Guangzhou, China

Sep. 2018 – Jul. 2023

- GPA: Average Score: 87/100 (Ranked in the top 10%).
- Core Courses: Game Theory, Cognitive Psychology, Real Analysis, Probability Theory, Algebra, Database Systems.

### GRADUATION THESIS

- **Looking inside the black-box: Logic-based explanations for machine learning**

*Institute of Logic and Cognition*

- **Predicting Gene Expression from Promoter Sequences Based on Macaron Transformer Architecture**

*Department of Applied Mathematics*

## Experiences

### Institute of Biology, Genetics and Bioinformatics, Université Paris-Saclay

RESEARCH ASSISTANT

Paris, France

May 2025 - Present

- Engineered Hyperbolic VAEs to learn data-efficient representations of complex clinical data in hyperbolic space.
- Validated the model on the large-scale MIMIC-IV dataset, achieving SOTA performance in multi-task sepsis analysis (onset, mortality) and outperforming baselines by **up to 10%**.
- Designed a novel fine-tuning strategy that significantly improved downstream task performance, boosting cell type classification accuracy compared to standard methods.
- **Publication:** Authored a first-author paper detailing the HVAE framework and its applications, in preparation for submission to conferences.

### 2025 Spark Cup: iFLYTEK Large Model Application Innovation Competition

FINALIST & SOLE DEVELOPER

China

May 2025 - Present

- Engineered "Industry-Academic Bridge," an intelligent system leveraging LLMs to analyze media content for misinformation and bias by benchmarking against academic literature.
- Designed and built a robust, multi-provider LLM framework (Spark AI, OpenAI) from scratch, incorporating advanced content filtering, caching, and automatic fallback mechanisms.
- **Competition Achievement:** Ranked **Top 20 globally** in the preliminary round among 2054 teams, advancing to the finals as an independent developer.
- Built a complete full-stack web application with responsive UI and sophisticated content extraction algorithms, currently optimizing the system for expanding functionality for the upcoming final competition.

- Spearheaded the core algorithm development for an AI-powered medical imaging solution to enhance low-dose lung nodule CT scans to high-fidelity resolution.
- Architected a comprehensive evaluation pipeline using quantitative metrics (PSNR, SSIM) and a qualitative blind re-view protocol with radiologists to ensure clinical relevance.
- **Key Achievement:** The developed model achieved superior image enhancement, leading to its successful integration into the company's prototype Computer-Aided Diagnosis (CAD) system.

Department of Mathematics, Sun Yat-sen University

- Led an independent research project to predict gene expression value from DNA promoter sequences, managing the entire lifecycle from model design to final validation.
- Innovated a novel deep learning model combining a Macaron-style CNN architecture with a Transformer, effectively capturing both local motifs and long-range dependencies in DNA.
- **Thesis Publication:** The research culminated in a comprehensive undergraduate thesis, which received an **A grade** for its novel methodology and significant findings.

Publications

[1] **Fu, W.**, Hamidi, M. (2025). *Geometric Priors in Hyperbolic VAEs for Data-Efficient Sepsis Subphenotype Identification*. **(Working Paper, First Author)**

Skills

Languages	Chinese (Native), English (Fluent), French (Elementary)
Programming	Python, SQL
Technologies	Docker, Git, Pandas, PyTorch

Research Interests

- Operation Research:** Mathematical modeling and optimization for healthcare operations, logistics, and data-driven decision-making.
- Machine Learning for Healthcare:** Predictive modeling for clinical outcomes, sepsis analysis, and gene expression inference.
- Optimization and Statistical Learning:** Convex and stochastic optimization methods for reliable model training in high-dimensional settings.

Objectives and Availability

Actively seeking a **Ph.D. position starting Fall 2026**, with interests in **AI for Healthcare / Medicine, Data-efficient Representation Learning, Optimization / Decision with Uncertainty**, or other related areas where my skills can make an impact. As part of my master's program, I am also required to complete a **6-month research internship in Spring 2026**, and I am eager to align this internship with a **potential Ph.D. lab** to facilitate an early start and ensure a strong mutual fit.