Francesco **Pivi**

PHD STUDENT

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About me

I was born in 2001 in Forlì, Italy. After completing high school, I enrolled in a Bachelor's degree in Physics in Bologna. During my academic journey, I developed a keen interest in the computational aspects of this field. This led me to pursue a Master's program in Computer Engineering, specializing in Artificial Intelligence. In 2015, I achieved third place in the Italian karate championship and first place in the Emilia-Romagna regional one. I also hold a first-level diploma in classical guitar from Rimini's Conservatory. This year, I completed 146 km of Alta Via No. 1, which traverses France, Italy, and Switzerland.

Work Experience

Ferrari S.P.A
Maranello, Italy

PHD FELLOW IN COMPUTER SCIENCE
Nov. 2024 - Present

- Researching interpretable flow-matching frameworks by constraining generative trajectories to physically meaningful equilibrium states, using encoder-decoder architectures with temperature-conditioned vector fields and differentiable projection networks for thermodynamically consistent generation. Submitted to ICLR 2026.
- Collaboration for development an intelligent waitlist management system integrating CatBoost classification (F1: 0.93), SHAP-based interpretability, and LLaMA 3-8B retrieval-augmented generation for customer retention strategies, processing 50,000+ global contracts. Submitted to AAAI 2026.
- Developing a production-grade application for automotive design, enabling parametric control of vehicle shapes and geometries.
- Implementing LoRA-based fine-tuning pipelines for Flux diffusion models, empowering designers to train custom generative models.
- Exploring 3D generation and ray-tracing pipelines, including Microsoft Trellis, Neural Radiance Fields (NeRF), Neural Surface Reconstruction (NeuS), and Neuralangelo for photorealistic rendering and geometric reconstruction.

Innovation labs, SACMI Group
Imola, Italy

NLP RESEARCH ENGINEER
April 2024 - Today

- Developing a new RAG (Retrieval-Augmented Generation) model to enhance resume processing.
- Focused on mitigating hiring biases in large language models.
- Collaborated with a multidisciplinary team to improve NLP solutions for HR applications. Accepted to AAAI 2025 workshop AIGOV.

INFN internship
Bologna , Italy

DATA ANALYST INTERN
Nov. 2021 - Sept. 2022

- Contributed to the FOOT experiment aimed at enhancing adrotherapy techniques for localized tumor treatment.
- Analyzed detector interactions and selected events for precise proton cross-section measurements on silicon detectors.
- Under Professor Mauro Villa's guidance, I uncovered novel anomalies that aided future experiments.
- C++ integrated with ROOT-CERN for data analysis and modeling.

Education

Alma Mater Studiorum, University of Bologna
Bologna and Maranello, Italy

PHD IN COMPUTER SCIENCE
Nov. 2024 - Present

- Researching reinforcement learning algorithms to learn optimal sailing routes for America's Cup racing under variable wind conditions and dynamic start constraints.
- Serving as tutor for Artificial Intelligence course at the Department of Informatics.
- Serving as tutor for Statistical and Mathematical Methods for Artificial Intelligence course at the Department of Computer Engineering.

Alma Mater Studiorum, University of Bologna
Bologna, Italy

M.S. IN COMPUTER SYSTEMS ENGINEERING-ARTIFICIAL INTELLIGENCE , **110/110 WITH HONOURS**
Sept. 2022 - Oct. 2024

- Average: **29.6/30**
- Deeplearning: implemented tansformer like architecture in a competition on sentence reordering, 2° place.
- Combinatorial decision making and optimization: project on multiple travelling salesman problem. My favourite project.
- Statistical and mathematical methods for AI: implementation from scratch of GD, SGD and simple layers.

Alma Mater Studiorum, University of Bologna
Bologna, Italy

B.S IN PHYSICS, **110/110 WITH HONOURS**
Sept. 2019 - Sept. 2022

- Thesis on: Study of interactions in the detector and event selection in cross-section measurements in the FOOT experiment.
- Computer science: Developed a pandemic simulator written in C++ based on SFML open-source graphic library, based on SIR model.

Scientific High School Fulcieri Paulucci di Calboli

Forlì, Italy and Gloucester, Massachusetts, USA

Scientific High School Diploma: 100/100

Sept. 2014 - May 2019

- Achieved perfect score of 100/100 in final examination.
- Recipient of Gianpaolo Picari Poetry Award.
- Winner of a scholarship for a two-month exchange program at Gloucester High School, Massachusetts, USA (Aug. 2018 - Oct. 2018).

Publications

On the Flow Matching Interpretability

Anonymous submission

Under review at ICLR 2026

- Proposed a novel framework constraining flow-matching models to traverse physically meaningful equilibrium states of the 2D Ising model.
- Developed encoder-decoder architecture with temperature-conditioned vector fields achieving physical fidelity preservation across multiple lattice sizes.

Intelligent Waitlist Management for Luxury Automakers: A Customer Retention Framework

A. Ghibellini, F. Pivi, A. Miotto, M. Coletto, L. Bononi, M. Gabbrielli

Under review at AAAI 2026

- Designed interpretable ML pipeline achieving F1 score of 0.83 (0.93 on real-world data) for contract cancellation prediction using CatBoost and SHAP values.
- Integrated retrieval-augmented LLaMA 3-8B model for generating tailored dealership recommendations, processing 50,000+ global contracts.

INTEGRA: INclusive Technology for Enhanced Gradation and Review of Applicants

AAAI 2025 Workshop on AI Governance (AIGoV)

F. Pivi, E. Rimondi, M. Lombardi, R. Calegari

2025

- Developed RAG-Fusion architecture with bias filtering for resume screening, achieving compliance with EU AI Act and GDPR using open-weight LLMs.
- Evaluated bias mitigation across gender, race, age, illness, pregnancy, and employment gaps using LLaMA 3-8B, Mistral-7B, and Zephyr-7B on 20,520 augmented resumes.