ACQUADRO PATRIZIO

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EDUCATION

Visiting Student — Purdue University   **Aug 2025 - Present**
Selected as 1 of 3 from PoliMI's 4th-year CS MSc for a competitive Purdue exchange.
Completing a wide variety of classes across CS/ECE/ME with applied labs.
Ranking: THE 2025 #79 worldwide, CS #47, Engineering #30; QS 2026 #=88 worldwide.

Master's degree in 'Computer Science - Artificial Intelligence'   **Sep 2024 - Present**
Politecnico di Milano.
Full-English program, focused on AI engineering and robotics.
Ranking: QS 2026 #=98 worldwide (only italian university below 100), Engineering & Tech #21

Master degree in 'Artificial Intelligence for Science and Technology'   **Sep 2024 - Present**
University of Milano-Bicocca, University of Milan, University of Pavia.
Inter-university full-english course, focused on embedded smart systems.
Collaborated with leading research institutes and had access to different SOTA laboratories.

Bachelor's degree in 'Artificial Intelligence'   **Sep 2021 - June 2024**
University of Pavia, University of Milano-Bicocca, University of Milan.
Degree grade: 110/110; Full-English course.
University of Pavia is elected by CENSIS as the best university in Italy in 2023.

Maturità scientifica (Scientific High School Diploma)   **Sep 2016 - July 2021**
ITIS Q.Sella, Scientific High School of Applied Sciences of Biella.
Main subjects: Math, Physics, Informatics, Natural Sciences (Biology, Chemistry), Philosophy.
Conducted practical activities since the first year, like programming and physics labs.

École Hôtelière De La Vallée d'Aoste   **Sep 2014 - July 2016**
Admitted to 1 out of 6/60 available seats for out-of-region students.
Developed and applied relational, communication and creativity skills.
Intensive French program (6h per week/2 years), promoted by the region of the Aosta Valley.

WORK & RESEARCH EXPERIENCE

Visiting Research Student | Purdue University   **Jan 2026 - Present**
Research on sim-to-real VLA for precision bimanual manipulation, using a LEGO assembly task.
 • Built a MuJoCo benchmark and evaluation suite with rich-contact dynamics.
 • Implemented an EO-1-style decoder-only transformer policy (Qwen2.5-VL backbone).
 • Managed the full pipeline end-to-end (simulation, data/annotations, training, fine-tuning).
 • Deployment on Unitree H1 humanoid robot.

Generative AI Researcher | Politecnico di Milano   **Feb 2025 - Sep 2025**
Research project focused on optimizing LLMs for code generation in large-scale databases.
 • Employed CodeBERT, cosine with multi-hop (k_1=10→k_2=5), adaptive thresholds, dynamic-k.
 • Integrated a 4-bit NF4 DeepSeek-R1-Distill-Qwen-7B generator, testing different prompts.
 • Introduced Clean-Reference@k, Repo-Recall@k; also tracked BLEU/ChrF/CodeBLEU/API-Recall.
 • Collaboration with professors, PhD researchers, and peers in a multidisciplinary team.

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Generative AI Researcher & Re-Ranking Specialist | UNIMIB   **Mar 2024 - June 2024**

Co-developed a paper on enhancing search engines for clinical trials, focusing on RAG re-rank.
 • RAG: employed a novel pairwise approach to enhance results relevance, via LangChain.
 • LLMs: applied and experimented open-source LLMs and API models (GPTs).
 • Knowledge Base: built and integrated a Knowledge Base using UMLS.

AI Researcher Internship | Exprivia   **Apr 2024 - June 2024**

Engaged in a collaborative project with UNIMIB and G2Q Computing, analysing the potential and
the development of machine learning and deep learning algorithms on quantum platforms.
 • Designed and implemented generative AI models on quantum platforms.
 • Adapted and optimised deep neural networks in advanced computing contexts.
 • Detailed analysis of financial scenarios to test the applicability of AI algorithms.

ACADEMIC PROJECTS

Code Agent System & Mini-Transformer Benchmark   **May 2025 - July 2025**

Led agent design/integration: OpenAI/Gemini/OpenRouter; 5 Pydantic tools; LangChain pipeline.
Co-designed MiniTransformers 15 repo tasks with realistic dependencies and tests.

STM32N6 NPU on-device Transformer   **May 2025 - July 2025**

Deployed an INT8 encoder-only Transformer on, meeting Flash/SRAM & latency budgets.
Validated the STM32 Edge-AI toolchain (X-Cube-AI/CubeIDE, CubeProgrammer, AI Dev Cloud).

Transformer for Piano MIDI Files Generation   **June 2025 - July 2025**

Trained ~15M REMI Transformer (mixed precision, grad accum, AdamW, clipping, cos anneal).
Delivered inference + XAI (Integrated Gradients, SmoothIG, Attention Rollout, Occlusion).

Patient-Nurse-Room Scheduling via MILP   **Jan 2025 - Feb 2025**

Formulated a MILP minimizing admission delay under several constraints (capacity, staffing, …).
Solved 7×5×20×5 instances (700 x + 175 y + z) to optimality, implementing CBC via mip.

Student&Companies Platform (RASD & DD)   **Jan 2025 - Feb 2025**

Formalized RASD with scenarios/use cases, requirements, glossary, Alloy modeling/analysis.
Defined DD with logical/physical views (diagrams, data schema, API/UI specs, deployment view)

MongoDB & Elasticsearch on Unstructured Data   **Nov 2024 - Dec 2024**

Developed MongoDB pipelines for travel planning queries on 50,346 Yelp docs (flexible JSONs).
Implemented Elasticsearch analytics on 24,905 anime streaming rows (full-text search/analysis).

Comparative Analysis of Neural Models   **Jan 2024 - Feb 2024**

Compare FitzHugh-Nagumo and Hindmarsh-Rose Neural Models to model neural dynamics.
Explored data analysis techniques and models in computational neuroscience.

Medical Trials Search Engine   **Dec 2023 - Jan 2024**

Developed a search engine to deliver relevant clinical trials based on medical queries.
Used LLM (GPT-3.5T) for keyword extraction and knowledge base for document filtering.

Data Mining Project   **Oct 2023 - Jan 2024**

Developed a Data Warehouse and a Relational Database for a local library, focusing on the
conceptual and logical design, and on SQL queries, and knowledge extraction.

BIF Translator   **June 2023 - July 2023**

Developed an AI translator for my personal business, BIF, applying NLP and DL tools.
Employed both Transformers and Bidirectional GRU, to compare their performances.

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Client Review Prediction   **June 2023 - July 2023**
DL custom model to predict reviews rating, having available different features.
Combined a feedforward NN and a recurrent NN, to handle numerical and categorical data.

Employee Future Prediction   **Jan 2023 - Feb 2023**
ML project predicting if an employee will leave or not a company, using a Kaggle's dataset.
Used and compared different samplers, dimensionality reduction techniques and ML models.

Castle War   **July 2022 - Sep 2022**
Video-game developed in Python from scratch, using various libraries, in particular Pygame.
Involved gameplay design, algorithm development, and graphics implementation.

RDF Knowledge Graph   **Apr 2022 - July 2022**
Constructed an RDF Graph using RDFLib, starting from tabular data, to create and integrate
semantic relationships to enhance data interpretation and accessibility.

ENTREPRENEURSHIP PROJECTS

BIF (BiellaInFesta) Social Page, Founder   **July 2022 - Present**
Page which reports all the local events (disco, live) in the province of Biella for youth.
 • More than 8,500 followers in 3 years, with 550k monthly views, in a city of just 40k people.
 • Built sponsorship revenue from local businesses in excess of 10.5K €.
 • Formation of the team: supervised 4+ people with different skills across various domains.

Adunet WebApp, Founder   **April 2025 - May 2025**
Mobile-first interactive map centralizing all events and services specific for a citywide festival.
 • End-to-end Next.js/React; focus on frontend-backend, security, server's performance, domain.
 • Adoption: 50+ venues, 90+ POIs; 15k flyers; sustained high traffic across 3 days.
 • Conducted door-to-door venue onboarding, generating €4.5K+ in contributions.
 • Led 10-person team: sprint planning, delegation, on-call, resulting in smooth live operations.

CubeWar Minecraft Server, Co-founder   **May 2018 - July 2019 (sold)**
Custom game modality in a Minecraft Server, with users from all over Italy.
 • Programmed plugins in Java; rented and configured servers in Milan.
 • Oversaw the budget and generated revenues (more than 2.3K €) in this free-access game.
 • Managed a team of programmers and game designers, in key phases of the development.

SKILLS

IT: Python, R, MATLAB, Java (basics), C# (basics), PostgreSQL, SQL, MetaBase, SPARQL,
Protégé, HTML, CSS, JavaScript.
Lib: Keras, TensorFlow, PyTorch, ScikitLearn, PyTerrier, NLTK, Pandas, NumPy, seaborn,
Matplotlib, SciPy, RDFlib, LangChain.
Languages: Italian (native), English (fluent), French (intermediate).
Soft skills: Perseverance, Creativity, Problem Solving, Leadership, Emotional Intelligence.

EXTRACURRICULAR ACTIVITIES

JCI (Junior Chamber International) Biella   **July 2025 - Present**
Led comms/budgets, sponsor outreach in a team of 14; launched 2 events, supported 2 others.

Guest Speaker - "Chiediamolo all'AI"   **June 2025**
Discussed an intro to AI/LLMs with live demos, an adoption playbook, and ethics/work/law panel.

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Guest Speaker - ASL Biella   **April 2025**
Delivered a pragmatic AI-in-Neuropsychiatry playbook and led clinician Q&A on 90-day pilot design and ROI.

L'Oréal Brandstorm (You-Réal)   **Feb 2025 - Mar 2025**
Led tech concept/UX for AI smart mirror + app; ran market research; collaborated in a team of 3.

IELTS Academic 7.5   **Apr 2024**
Achieved a 7.5 in the English test, demonstrating high linguistic competence.

Google Cloud Skills Boost: Introduction to Generative AI   **Mar 2024**
Completed this GenAI course, learning Google tools to develop generative models.

Training Course and Volunteer of the Italian Red Cross   **Nov 2023 - Dec 2023**
Course of 14 hours with an exam, to become a volunteer of the Italian Red Cross.

Galileo Science Festival   **Sep 2022**
Selected from Italian students to attend this festival about tech and science.

Homemade electric bike   **Feb 2021- July 2021**
Converted a traditional bike into an electric one, using a hoverboard engine, electrical components and a transformer from a microwave, to assemble the battery pack.

Normale Superiore di Pisa   **May 2021**
Attended lectures held by Prof. R. Barbieri, on the main theories of quantum mechanics.

Politecnico di Torino   **Jan 2021**
Completed an intensive training course in mathematics and physics.

Udemy Course: Java Course for Beginners with Practical Examples   **May 2020**
Course to learn the fundamentals of Java, with theoretical and practical lectures.

Udemy Course: Artificial Intelligence A-Z   **Nov 2017 - Feb 2018**
Introduction to the field of AI to learn the underlying mathematical concepts and principles.

OTHER INFORMATION

Interests   **Present**
Biking, swimming, philosophy, fantasy books, cinema and product design.

Swimming (Competitive Team)   **Feb 2011- July 2017**
Contributed to the success of my team in weekly competitions with other Italian teams.
Showcased discipline, competitive spirit and dedication.

Rock Climbing (Regional Competition)   **May 2015**
Achieved success in regional climbing competitions, after surpassing provincial selections.
Demonstrated endurance, determination and route planning.

Cross-Country Running (Provincial Competition)   **April 2015**
Competed in provincial cross-country running competitions, after passing school selections.
Exhibited consistent commitment, resilience and ability to make strategic decisions.

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