Matteo Francesco Vitellaro

Master in Informational Computer Science | University of Luxembourg

Master's student in Computer Science specializing in AI and Reliable Software, with a focus on secure, trustworthy AI systems. Multilingual and experienced in intercultural environments. Co-Founder of the University of Luxembourg Cinema Club.

Work experience

Flow - Plataforma de pagos - Chile *09/2024 - ongoing*

Remote Part-time AI Engineer

- Developed a RAG-based SQL assistant, within a broader multi-agent framework, implementing access control and automated query handling in Python.
- Scaled LLM-driven solutions, building secure, production-ready pipelines with Langchain, Faiss, and Redshift for enterprise-grade data processing.

SNT - Esch sur Alzette *02/2024 - 06/2024*

PHD Research Assistant

- Developed a federated learning framework for distributed multi-agent UAVs.
- Improved scalability by replacing reinforcement learning with a neural network approach, contributing to multi-objective optimization and swarm intelligence research.

Flow - Plataforma de pagos - Chile *07/2024 - 09/2024*

Internship

- Developed a RAG-based support chatbot prototype and an automatic LLM evaluation tool to assess response quality.
- Designed and evaluated LLMs and custom knowledge bases using AWS Bedrock, focusing on prompt engineering and inference optimization.

Projects

Enabling Federated Learning Across Distributed UAV Swarms *(02/2024 - 06/2024)*

- Designed a decentralized federated learning framework using PyTorch for distributed cluster analysis.
- Implemented K-hop clustering algorithms to enable efficient, privacy-preserving model training across multiple clients.
- Developed multi-threaded leader-client coordination for model aggregation without central authority.

Blockly-based educational programming application *(02/2023 - 07/2023)*

- Developed an educational programming application in Flutter with Google Blockly integration.
- Enabled teachers to design, assign, and validate custom programming tasks through a visual interface.
- Implemented debugging features and multi-level tutorials to support progressive learning.

Adaptive Refusal Mechanisms for Safer Large Language Models *(03/2025 - 08/2025)*

- Extended the Circuit Breakers framework to develop dynamic refusal mechanisms for open-source LLMs.
- Designed a risk scoring module using semantic similarity and classification on public datasets.
- Built an evaluation pipeline comparing static vs. adaptive refusal strategies on safety and clarity metrics.

Contact

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Education

2020 - 2023

University of Luxembourg
Master in Information and Computer Science
Focus: AI, Reliable Software, Formal Methods (TLA+, Alloy, Model Checking)

2022 - 2023

Waseda University- Tokyo
Faculty of Science and Engineering
Global Exchange Program

2023 - 2025

University of Luxembourg
Bachelor in Applied Information Technology
Top Student Prize Scholarship for Japanese Language Studies (Sophia University)
Final grade 17.7/20

Skills

Concepts

- LLMs
- Model Checking
- Property Specification
- RAG (Faiss)
- Federated Learning
- Backend Development
- Prompt Engineering
- Metamodeling
- AI Agents
- Reinforcement Learning
- AI Optimization
- Deep Learning

Programming Languages

Python, Java, C and C++, Swift, Assembly, Bash/Shell, Typescript, SQL, HTML, CSS, JavaScript

Frameworks & Tools

- Git
- Alloy Analyzer
- Docker
- PyTorch
- AWS, Lambda
- Flutter
- CI/CD Pipelines
- EMF

Languages

- **German, Italian**: Native
- **English**: Fluent
- **French**: Conversational (B2)
- **Spanish**: Basic Comprehension (B1)
- **Japanese:** Elementary (A1)