

# MATTEO ROSSI REICH

*I am passionate about experimentation and learning, with a particular fascination for image generation. To me, it's a blend of creativity and technology that feels almost magical.*

## EXPERIENCE

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### Junior Software Developer

*Beyond Security*

*Nov 2025 - Present*

*Bolzano, Italy*

Contributed to the full-stack development of AI-driven security platforms, focusing on the integration of computer vision algorithms and geospatial data visualization. Designed and maintained backend services to support real-time tracking and edge-computing capabilities for public space monitoring applications.

## ACADEMIC EXPERIENCE

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### Research Fellowship: “EquAI: Equitable Algorithms”, Italian PRIN project

*Nov 2024 - Oct 2025*

Conducted in-depth analysis of fairness metrics to assess human and algorithmic decision-making processes, focusing on fairness in decisions regarding asylum seeker applications. Leveraged Large Language Models (LLMs) and efficient small-LMs for automated extraction of key features from sensitive legal texts, developing and implementing a data processing pipeline incorporating RAG augmentation to manage a large document corpus. Developed and applied LLM-as-a-judge frameworks to systematically assess the accuracy and the type of the errors of LLM-based features extraction. Engaged in interdisciplinary collaboration with law researchers to define the features to be extracted as well as the guidelines for manual annotation. This led to the publishing of a paper at JURIX 2025.

*Cirsfid, Alma Mater Studiorum – Università di Bologna, Principal Investigator: Prof. Francesca Lagioia*

### Transnational Project Meeting of the MAI4CAREU in Cyprus

*May 2023*

Participated in the MAI4CAREU project meeting in Cyprus, prior to the meeting, collaborated with a team of students from the Universities of Bologna and Cyprus to develop a comprehensive report exploring the core concepts and methodologies of Sim2Real robot learning. The report explores core Sim2Real concepts and methodologies, including reinforcement learning, domain adaptation, and domain randomization techniques to bridge the reality gap between simulated training and real-world deployment.

*University of Cyprus, Nicosia*

## PUBLICATIONS

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### A Two-Dimensional Evaluation Framework for Factual and Reasoning Assessment of LLMs in Legal Question Answering

*Dec 2025*

*Sinan Gultekin, Matteo Rossi Reich, Francesca Galloni, Francesca Lagioia, Elena Consiglio, Giovanni Sartor, Sara Bagnato*

*JURIX 2025*

Deploying Large Language Models (LLMs) for legal question-answering requires ensuring factual accuracy and logical coherence. Current evaluation metrics inadequately capture legal reasoning complexity, while expert assessments lack scalability. We propose a two-dimensional framework that independently measures Truthfulness and Reasoning Soundness in model outputs, applied to Italian asylum proceedings requiring evidence-based analysis.

## EDUCATION

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### Master Degree in Artificial Intelligence and Machine Learning

*Sep 2021 - Mar 2024*

*Alma Mater Studiorum – Università di Bologna, Advisor: Prof. Michele Lombardi*

### Master Thesis: Hybrid Learning and Optimization for Routing Collaborative Robots

*- Tech: OR-Tools, REINFORCE*

Applied and evaluated the Unify framework for contextual optimization on a robot routing problem (TSP variant) with uncertainty. Trained a REINFORCE agent to inform a CP-SAT solver, generating feasible and context-adaptive routing plans considering complex operational constraints. Contributed to practical applications of contextual optimization.

### Bachelor Degree in Statistics

*Sep 2018 - Oct 2021*

*Alma Mater Studiorum – Università di Bologna, Advisor: Prof. Claudio Sartori*

## **Bachelor Thesis: Application of the POIROT methodology to restaurants' reviews**

- **Tech:** R, tm package, Latent Semantic Analysis (LSA), NLU techniques

Conducted thesis research applying the POIROT methodology to automatically extract explanations for phenomena from text. Processed and analyzed a Yelp review dataset, focusing on extremely negative reviews. Utilized LSA to create a latent semantic representation, performed visual identification of relevant document clusters, and iteratively built explanatory queries by selecting terms based on latent space proximity and statistical correlation with the target class (1-star reviews). Identified poor customer service as a primary driver.

## **ACHIEVEMENTS**

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### **Exchange Semester (Erasmus)**

*Sep 2020 - Jan 2021*

*Technische Universität, Wien*

### **Lead Summer Camp Counselor**

*Aug 2017 - Aug 2019*

Coordinated a team of 5 fellow counsellors, assigning tasks and managing schedules to organise daily activities for children aged 5-13. Planned and adapted activity programmes to engage a wide age range (5-13 years), ensuring enjoyment and suitability for all. Responsible for ensuring a safe, inclusive, and stimulating environment for young participants.

*Associazione "Il Girotondo" Onlus*

### **Exchange Semester in Germany**

*Set 2016 - Gen 2017*

*Lise-Meitner-Gymnasium, Böblingen*

## **PROJECT EXPERIENCE**

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### **Advanced Image Generation Workflows**

*2022 - Today*

- **Tech:** ComfyUI, IPAdapter, Redux, Controlnet, SDXL, Flux

Exploration of image generation AI, by designing and implementing advanced ComfyUI workflows to achieve precise control over the image generation processes. Leveraged tools for style replication, composition manipulation, inpainting, and high-resolution upscaling, ensuring high-quality and customizable outputs.

### **NFL Player Contact Detection**

*Aug 2023 - Dec 2023*

- **Tech:** torchvision, OpenCv

Developed a computer vision system for a Kaggle challenge (university course project) to detect NFL player contacts. Integrated multi-source data including multi-view video feeds, player tracking, and helmet bounding boxes. Implemented custom CNN architectures (inspired by Fast R-CNN/ResNet50) using ROI pooling on derived contact regions and tracking data.

### **Birdclef 2023**

*June 2023 - Nov 2023*

- **Tech:** librosa, torchaudio, nbdev

Developed an audio classification system for the Birdclef 2023 Kaggle challenge, identifying bird species in long field recordings from Kenya. Built a pipeline processing audio waveforms into Mel Spectrograms for CNN classification. Implemented Per-Channel Energy Normalization (PCEN) to enhance signal separation from background noise and addressed severe class imbalance using a targeted oversampling strategy. Leveraged W&B for experiment tracking and analysis.

## **TECHNICAL SKILLS**

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**Programming Languages:** *Advanced* R, Python, MiniZinc textit *Base* C++, SQL, Prolog,

**Frameworks:** Scikit-learn, Tensorflow, Pytorch, Docker, Git, ComfyUI, Automatic111, ControlNet, IPAdapter, OpenCV, RAG, Langchain, FAISS, llama.cpp, Huggingface, LLM-as-a-Judge, OR-Tools

## **LANGUAGE SKILLS**

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- **Italian:** native speaker

- **English:** full working proficiency

- **German:** proficient