Stefano **Racca**

Software Developer · ML/AI Student

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Education

University of Trento   *Trento, Italy*

Master's Degree in Artificial Intelligence Systems - current gpa 28 / 30   *Sep. 2024 - Pres.*

- **Key Courses:** Machine Learning, Deep Learning, Applied NLP, Computer Vision

University of Turin   *Turin, Italy*

Bachelor's Degree in Computer Science - final grade 110 / 110   *Sep. 2021 - Jul. 2024*

- **Key Courses:** Algorithms and Data Structures, Databases, Website Development

I.I.S. *Arimondi-Eula*   *Racconigi (Cuneo), Italy*

Scientific High School Diploma   *Sep. 2015 - Jun. 2020*

Projects

ExplainableCNN   *App | Code*

Python, PyTorch, TorchCam, Captum, Streamlit   *2025*

- Developed an end-to-end CNN training pipeline for common vision datasets (Fashion-MNIST, MNIST, CIFAR-10) with YAML-based configuration and CLI overrides.
- Integrated explainability methods (Grad-CAM, Grad-CAM++) via TorchCam and Captum to visualize class-discriminative heatmaps.
- Built an interactive Streamlit app to load checkpoints, run inference, and visualize explanations in real time.
- Implemented logging, metrics tracking, and checkpoint management with TensorBoard and Lightning.

Smart Delivery Agents (SDA): Multi-Agent Delivery System   *Code*

Node.js, JavaScript, PDDL, Single/Multi Agent, BDI System   *2025*

- We develop a multi-agent delivery system for Deliveroo using a BDI (Belief-Desire-Intention) architecture with MASTER/SLAVE coordination.
- Implemented adaptive planning (PDDL + BFS fallback), coordinated decision-making, and guidance protocols between agents in a competitive environment against other agent teams.

Language Modeling & Natural Language Understanding   *Code*

PyTorch, LSTMs, BERT, NLP   *2025*

- Implemented LSTM-based language models on Penn Treebank, experimenting with dropout, weight tying, variational dropout, and NT-ASGD for regularization.
- Developed joint intent classification and slot filling models on the ATIS dataset using BiLSTM and fine-tuned BERT encoders.
- Compared baseline architectures, advanced regularization techniques, and pre-trained models to evaluate trade-offs in performance and generalization.

Facial Emotion Recognition   *Code*

Python, OpenCV, MediaPipe, DeepFace   *2024*

- Developed a Jupyter notebook with two complementary pipelines for facial emotion recognition: a rule-based method using MediaPipe Face Mesh landmarks and an AI-based approach with DeepFace pretrained CNNs.
- Implemented real-time and recorded-video processing with OpenCV Haar Cascade face detection, supporting visualization and comparison of both methods.

Portfolio Website   *Site | Code*

Next.js, Tailwind CSS   *2025*

- Developed a fast and accessible personal portfolio using Next.js App Router and Tailwind CSS.
- Integrated a server-action contact form with Nodemailer for structured email delivery via environment-configurable SMTP.

Handmade Catalog Website   *Code*

Next.js, Database, Tailwind CSS   *2025*

- Built a full-stack e-commerce catalog for handmade products with Next.js App Router, Supabase (Postgres, Auth, Storage), and Tailwind CSS.
- Implemented an admin dashboard to manage categories, products, images, product options, and site configuration.
- Integrated optional Snipcart support for cart/checkout and deployed the application with Supabase backend.