

## Davide Macario

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### Education

**University of Illinois, Chicago** Chicago, IL  
M.sc., Electrical and Computer Engineering. GPA: 4.0/4.0 August 2023 – Ongoing  
*M.sc. thesis:* applying Model-Distributed Inference to Large Language Models – Recurrent Pipelining

**Politecnico di Torino** Torino, Italy  
M.sc., ICT for Smart Societies (Telecommunications Engineering). GPA: 30.0/30.0 September 2022 – Ongoing  
*Double-degree program* with University of Illinois, Chicago.

**Politecnico di Torino** Torino, Italy  
B.sc., Electronics and Communications Engineering. GPA: 29.7/30.0 September 2019 – September 2022  
*Final grade:* 110/110 cum laude.

### Skills & Interests

**Technical:** Python, C, MATLAB, Bash, Lua, Statistical Analysis (Scipy, Scikit-learn, Numpy, Pandas), Machine Learning (PyTorch, Tensorflow), Computer Vision (OpenCV, Dlib), Git, Docker, Arduino, LaTeX.

**Language:** Italian (native speaker), English (IELTS score: 8.0), French (essential).

**Research:** Operations Research (3D bin-packing – ongoing), M.sc. thesis (Model-Distributed Inference applied to Large Language Models – ongoing)

**Interests:** Open-Source software, Linux, Artificial Intelligence, IoT, Cloud Computing, Edge Computing, Large-Language Models, Distributed Computing.

### Experience

**Department of Electrical and Computer Engineering, UIC** Chicago, IL  
**Graduate Research Assistant** January 2024 – Ongoing

- Master's thesis work.

**Department of Electronics and Telecommunications, Politecnico di Torino** Torino, Italy  
**Electronics Laboratory Assistant** September 2022 – January 2023

- Supporting younger students performing laboratory activities on analog and digital circuits.
- Hardware testing and calibration (oscilloscope, probes, power supplies, signal generators).

### Projects

**Master's Thesis – Model-Distributed Inference for Large Language Models** January 2024 – Ongoing

- Implementation of Model-Distributed Inference for running LLMs over a network of low-capability devices (Nvidia Jetson TX2) partitioning the model between the nodes.
- Focus on *recurrent pipelining* to minimize idle time and achieve low inference delay.
- Software: Python, PyTorch, Huggingface Transformers, CUDA, Linux.
- Hardware: Nvidia Jetson TX2, Nvidia Jetson Nano.

**OpenCV AI Competition 2023 [winner]** July 2023 – December 2023

- Winner of the OpenCV AI Competition (2023) with the project “FREISA – Four-legged Robot Ensuring Intelligent Sprinkler Activation.”

- Design and implementation of a computer vision-enabled quadruped robot with the task of automating water sprinkling on garden plants.
- Software: Python, PyTorch, YOLOv8, OpenCV, OpenVino, CUDA, Linux.
- Hardware: Raspberry Pi, Myriad X (OAK-D lite) camera.

### **Heuristic algorithm for the solution of the 3D bin-packing problem**

February 2023 – Ongoing

- Project for the “Operational Research” course at Politecnico di Torino.
- Creation and implementation of a heuristic algorithm for solving the 3D bin-packing problem, i.e., arrangement of packages in a truck container to minimize the used volume.
- Selected among the students for contributing to a scientific publication.
- Software: Python, Google OR Tools, Gurobi (optimizer).

### **Greenhouse 101**

September 2022 – March 2023

- Project for the “Programming for IoT Application” course at Politecnico di Torino.
- Creation of a microservices-based IoT application to automate greenhouse management.
- Software: Python, Docker, MongoDB, Linux.
- Hardware: Raspberry Pi, Arduino, Esp32, analog and digital sensors.

### **MATLAB Synthesizer**

February 2022 – June 2022

- Design and implementation of a digital audio synthesizer as part of the “Applied Signal Processing Laboratory” course, Politecnico di Torino.
- Software: MATLAB

## **Leadership & Activities**

### **Alta Scuola Politecnica**

Torino, Italy  
September 2022 – Ongoing

- Honor program for Master’s students of Politecnico di Torino and Politecnico di Milano.
- Extracurricular courses focusing on soft skills (effective communication, project management, public speaking).
- Transversal project: “AMBROSE – A Multisensor BRidge MOnitoring SystEm”; development of a distributed system for Structural Health Monitoring (SHM) of highway bridges in Italy, funded by the Metropolitan City of Turin.

### **IEEE Eta-Kappa-Nu (Mu-Nu chapter)**

Torino, Italy

#### **Member of IT area**

October 2021 – May 2023

- Member of IEEE Honor Society, Eta-Kappa-Nu.
- Worked on a project commissioned by Politecnico di Torino to create “smart” trash cans to monitor waste production and sorting using Arduino microcontrollers.

### **Percorso Giovani Talenti**

Torino, Italy  
September 2019 – July 2022

- Honor program for undergraduate students of Politecnico di Torino.
- Extracurricular courses focusing on small interdisciplinary projects.