Ilaria Ciocci

WORK EXPERIENCE

🏢 *Sapienza University of Rome* – Rome, Italy

City: Rome | **Country:** Italy

PhD student in Operations Research

[1 Nov 2024 – Current]

Research interests:
- Optimization methods for machine learning
- Mixed-integer programming for interpretable models

EDUCATION AND TRAINING

Master's Degree in Management Engineering

Sapienza University of Rome [Oct 2022 – Jul 2024]

City: Rome | **Country:** Italy | **Final grade:** Cum Laude | **Level in EQF:** EQF level 7 | **Thesis:** Block Decomposition Methods for training Deep Neural Networks

Thesis: *Block Decomposition Methods for training Deep Neural Networks*
Developed a block-decomposed version of a watchdog-controlled minibatch algorithm using PyTorch, starting with layer-wise decomposition and evolving into a block-decomposition approach. The implementation included dynamic control mechanisms to select blocks of variables to update, leading to improvements in computational efficiency.

Implementation projects (python):
- *Optimization Methods for Machine Learning*: MLP and RBF Neural Networks to solve a regression problem; SVM to solve an image classification problem
- *Complex Systems Optimization*: Implementation and analysis of an Augmented Lagrangian Method for nonlinear constrained optimization problems
- *Continuous Optimization*: Newton's Method for local optimization; Sequential Penalty Algorithm for constrained optimization; Simulated Annealing for global optimization

Relevant Courses: Optimization Methods for Machine Learning, Continuous Optimization, Complex Systems Optimization, Combinatorial Optimization, Machine Learning for Industrial Engineering, Modeling and Identification

Bachelor's Degree in Management Engineering

Sapienza University of Rome [Oct 2019 – Oct 2022]

City: Rome | **Country:** Italy | **Final grade:** Cum Laude

SKILLS

Programming languages and Optimization tools

Python (computer programming) / Gurobi Optimization / AMPL for Operational Research / SQL

Python libraries

Gurobipy / Python DSci/ML Libraries (Numpy, Pandas, Sklearn, Scipy) / Pandas / Matplotlib / Numpy

Software

Latex / Microsoft Office package: Microsoft Word, Excel, PowerPoint, Access

Core competences

operational research / machine learning / Interpretable Machine Learning / deep learning / Mixed Integer Programming

CONFERENCES AND SEMINARS

[29 Jun 2025 – 2 Jul 2025] University of Southampton, UK
22nd EUROPT Conference on Advances in Continuous Optimization Delivered a talk *Margin Optimal Regression Trees*

[26 Feb 2025 – 28 Feb 2025] University of Pavia, Italy
9th AIRO Young Workshop Delivered a talk *Effects of Block Decomposition on Deep Neural Network Training Efficiency*

HONOURS AND AWARDS

[Jul 2024] Sapienza University of Rome
Management Engineering Excellence Program Ranked 1st among top-performing students in Management Engineering and awarded participation in the *Excellence Program* of my faculty (March-July 2024).

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English	Spanish
LISTENING B2 **READING** C1 **WRITING** B2	**LISTENING** A2 **READING** A2 **WRITING** A2
SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2	**SPOKEN PRODUCTION** A2 **SPOKEN INTERACTION** A2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

PUBLICATIONS

[2025]
Random Forest-driven Heuristic for Margin Optimal Regression Trees

Authors: I. Ciocci, V. Marcelli, M. Monaci, L. Palagi | **Publisher**: Department of Computer, Control and Management Engineering (DIAG), Sapienza University of Rome

[2024]
Block Layer decomposition applied to a watchdog controlled minibatch algorithm

Authors: I. Ciocci, C. Coppola, L. Palagi, L. Papa | **Publisher**: Department of Computer, Control and Management Engineering (DIAG), Sapienza University of Rome

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9 Oct 2025