



Corrado Coppola

EDUCATION AND TRAINING

PHD Program in Automatic Control, Bioengineering and Operations Research

Sapienza University of Rome [1 Nov 2021 – Current]

City: Rome | **Country:** Italy | **Field(s) of study:** Operations Research | **Level in EQF:** EQF level 8 | **Thesis:** "Controlled minibatch algorithms for large-scale optimization in deep learning"

Large-scale optimization for Deep Learning, Deep Reinforcement Learning, Computer Vision, Machine Learning for Mixed-Integer Programming

MS in Management Engineering

Sapienza University of Rome [Sep 2019 – Oct 2021]

City: Rome | **Country:** Italy | **Field(s) of study:** Decisional Models and Optimization | **Final grade:** 110/110 cum Laude | **Level in EQF:** EQF level 7 | **Thesis:** "Heuristics for the Traveling Salesperson Problem based on Deep Reinforcement Learning"

Operations Research, Statistics, Optimization methods for Machine Learning, Derivative-Free and Combinatorial Optimization, Games and Equilibria.

BS in Management Engineering

Sapienza University of Rome [Sep 2016 – Jul 2019]

City: Rome | **Country:** Italy | **Final grade:** 110/110 cum Laude | **Thesis:** Solving a black-box production scheduling problem

WORK EXPERIENCE

Visiting Research Scientist

University of Oxford [Jan 2024 – Apr 2024]

City: Oxford | **Country:** United Kingdom

Under the supervision of Prof. Coralia Cartis, I am a member of the Numerical Analysis group, where I am studying the worst-case complexity of the optimization methods I have developed during my PhD.

Teaching assistant

Sapienza University of Rome [Jan 2022 – Current]

City: Rome | **Country:** Italy

I tutored MS students for the course of "Optimization Methods for Machine Learning" in a.y. 2022/2023 and 2023/2024, covering MLP, deep neural networks, SVM, and the use of Python for machine learning.

I also tutored BS students for the course of "Calculus 1" in a.y. 2022/2023 and 2023/2024.

MS thesis student

SINTEF Digital Research Institute [Mar 2021 – Oct 2021]

City: Oslo | **Country:** Norway

I have developed my MS thesis project on Deep Reinforcement Learning applied to the Traveling Salesperson Problem in collaboration with the department of applied mathematics of Sintef Digital Research Institute (Oslo, Norway). The solution I proposed achieved promising results and has been further developed with other two MS students I tutored.

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English

LISTENING C1 **READING** C1 **WRITING** C1

SPOKEN PRODUCTION C1 **SPOKEN INTERACTION** C1

Russian

LISTENING C2 **READING** C2 **WRITING** C2

SPOKEN PRODUCTION C2 **SPOKEN INTERACTION** C2

French

LISTENING C1 **READING** C1 **WRITING** B1

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2

German

LISTENING B1 **READING** B1 **WRITING** A2

SPOKEN PRODUCTION B1 **SPOKEN INTERACTION** B1

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

DIGITAL SKILLS

Core competencies

Deep Learning / Operations Research / Data Analytics

Computer skills

Python / AMPL / Microsoft Office / Latex / Gurobi / C++

Python libraries

Numpy / Tensorflow / Lightning / Pytorch

PUBLICATIONS

[2024]

Convergence of ease-controlled Random Reshuffling gradient Algorithms under Lipschitz smoothness Submitted to "Computational Optimization and Application".

C. Coppola, G. Liuzzi, L. Palagi

[2024]

CMA Light: a novel Minibatch Algorithm for large-scale non convex finite sum optimization Submitted to "Journal of Machine Learning Research".

C. Coppola, G. Liuzzi, L. Palagi

[2024]

Computational issues in Optimization for Deep networks Submitted to "TOP", minor revision ongoing.

C. Coppola, L. Papa, M. Boresta, I. Amerini, L. Palagi

[2023]

Solving the vehicle routing problem with deep reinforcement learning Technical report.

S. Foa, C. Coppola, G. Grani, L. Palagi

[2022]

PUSH: a primal heuristic based on Feasibility PUMP and SHifting Technical report.

G. Grani, C. Coppola, V. Agasucci

[2021]

Heuristics for the Traveling Salesperson Problem based on Reinforcement Learning Technical report.

C. Coppola, G. Grani, M. Monaci, L. Palagi

CONFERENCES AND SEMINARS

[20 Feb 2024 – 20 Feb 2024] University of Oxford, Oxford, UK

Numerical Analysis Seminars Invited speaker. Delivered a seminar "CMA Light: a novel Minibatch Algorithm for large-scale non convex finite sum optimization".

[22 Aug 2023 – 26 Aug 2023] Corvinus University, Budapest, Hungary

20th Workshop on Advances in Continuous Optimization Delivered a talk "CMA Light: an objective function-free method for large-scale optimization".

[23 Jul 2023 – 27 Jul 2023] University of Aveiro, Aveiro, Portugal

Optimization2023 Delivered a talk "Block-decomposition methods for the training of large-scale neural models".

[28 Jul 2022 – 1 Aug 2022] SST Nova, Lisbon, Portugal

19th Workshop on Advances in Continuous Optimization Delivered a talk "Solving the vehicle routing problem with deep reinforcement learning".

[22 Feb 2022 – 26 Feb 2022] Rome, Roma Tre University

AIRO Young Delivered a talk "Heuristics for the Traveling Salesperson Problem based on Deep Reinforcement Learning".

HONOURS AND AWARDS

[Oct 2023] Sapienza University of Rome

Funding for Research Initiation Projects – Sapienza University of Rome Awarded a funding to initiate research on the project: "Large scale optimization for Artificial Intelligence"

[Sep 2023] Sapienza University of Rome

PhD Mobility Scholarship Awarded a PhD mobility scholarship to conduct a research period at the University of Oxford under the supervision of Prof. Coralia Cartis

[2023] Sapienza University of Rome

Tutoring Scholarship Awarded a working scholarship position at the I3S Department of Engineering as tutor assistant for the following courses:

- 1) "Calculus I" course, a.y. 2022/23 and 2023/24
- 2) "Operations Research" course, a.y. 2022/23 and 2023/24
- 3) "Optimization Methods for Machine Learning" course, a.y. 2022/23 and 2023/24

[2021] Sapienza University of Rome

Three-year PhD Scholarship

[2021] Sapienza University of Rome

MS Excellence Program I have been ranked first among the highest achieving students of the Engineering Faculty and attended the excellence program.

PROJECTS

[2022 – Current]

CoAdvisor of MS Thesis I had the opportunity to assist in the academic supervision of the following MS thesis:

- 1) "A linesearch-based method for the optimization of large-scale neural architectures". With Prof. Laura Palagi and Prof. Irene Amerini, Mar 2024 - ongoing.
- 2) "Block-decomposition method for the optimization of large-scale neural networks". With Prof. Laura Palagi.
- 4) "Solving the Vehicle Routing Problem with Deep Reinforcement Learning". With Prof. Laura Palagi and Dr. Giulia Grani.

[May 2023 – Jul 2023]

Tutoring Assistance for Students - Scholarship I have been awarded a scholarship to support the foreign students of the "Operations Research" course at Civil Engineering faculty, under the supervision of Prof. Laura Palagi.