Marco Caoduro

Postdoctoral Research Fellow in Combinatorial Optimization

✉ marco.caoduro@ubc.ca
🖥 marcocaoduro.com

Previous Positions

Dec 2022 – **Postdoctoral Research Fellow**, *Sauder School of Business, UBC, Canada.*
Nov 2024 Advisors: *Joseph Paat (Sauder School of Business, UBC) and Bruce Shepherd (CS Department, UBC).*

Oct 2019 – **PhD Researcher**, *Laboratoire G-SCOP, Univ. Grenoble Alpes (UGA), France,*
Nov 2022 PhD Title: *Geometric challenges in Combinatorial Optimization: packing, hitting, and coloring rectangles,*
Supervisors: *András Sebő (Lab. G-SCOP, UGA) and Matěj Stehlík (Lab. IRIF, Université Paris Cité).*

Publications

Dec 2024 **Packing, hitting, and colouring squares**,
Journal of Computational Geometry, Volume 15, No.1,
with András Sebő, link.

Oct 2023 **Boxicity and Interval-Orders: Petersen and the Complements of Line Graphs**,
The 31st International Symposium on Graph Drawing and Network Visualization, Isola delle Femmine,
with András Sebő, link.

Sep 2023 **A lower bound for constant-size local certification**,
Theoretical Computer Science, Volume 971, 114068,
with Virginia Ardévol Martínez, Laurent Feuilloley, Jonathan Narboni, Pegah Pournajafi, and Jean-Florent
Raymond, link.

Sep 2023 **On the independence number of intersection graphs of axis-parallel segments**,
Journal of Computational Geometry, Volume 14, No. 1,
with Jana Cslovjecsek, Michał Pilipczuk, and Karol Węgrzycki, link.

May 2023 **On the Boxicity of Kneser Graphs and Complements of Line Graphs**,
Discrete Mathematics, Volume 346, Issue 5, 113333,
with Lyuben Lichev, link.

Preprints

Jan 2024 **On the Boxicity of Line Graphs and of Their Complements**,
to appear on arXiv,
with András Sebő, link.

Dec 2024 **A characterization of unimodular hypergraphs with disjoint hyperedges**,
arXiv:2411.10593,
with Meike Neuwohner and Joseph Paat, link.

Nov 2022 **Geometric challenges in combinatorial optimization: packing, hitting, and coloring rectangles**,
PhD Thesis, link.

Selected Talks

Oct 2024 **2024 INFORMS Annual Meeting**, *Seattle, USA,*
Title: *A characterization of unimodular hypergraphs with disjoint hyperedges.*

Sep 2024 **Discrete Math Seminar**, *University of Victoria, Canada,*
Title: *Boxicity: Representing graphs with low-dimensional boxes.*

Feb 2024 **Institute of Applied Mathematics Seminar**, *University of British Columbia, Canada,*
Title: *Algorithmic Challenges Surrounding Colorful Carathéodory's Theorem.*

Jun 2023	**CanaDAM 2023**, *University of Manitoba and University of Winnipeg, Canada*, Title: *On the boxicity of the Kneser Graph K(n,2)*.
Jul 2022	**11th International Colloquium on Graph Theory and combinatorics (ICGT 2022)**, *Université de Montpellier, France*, Title: *On the Hitting/Packing Ratio of Axis-Parallel Segments*.
Nov 2021	**Distributed Algorithms and Graphs Seminar**, *Lab. IRIF, Université Paris Cité, France*, Title: *Hitting and packing squares*.
Nov 2021	**Journées Graphes et Algorithmes**, *French-speaking community of graph theory, ONLINE*, Title: *Hitting and packing rectangles with a bounded aspect ratio*.

Student Supervision

Dec 2023 – Apr 2024	**PIMS Virtual Experimental Mathematics Lab**, *PIMS, Canada*, Supervised three undergraduate and one graduate students on the project *Exploring Boxicity: Graph Representations in Multidimensional Spaces*.
May 2021 – Sep 2021	**Edge-coloring problems for geometric intersection graphs**, *Univ. Grenoble Alpes, France*, Supervised Thomas Boudier, a Master's Student at IMAG.

Teaching Experience

Summer 2024	**Logistics and Operations Management**, *UBC Sauder School of Business, Canada*.
Spring 2022	**Algorithms and Data Structure**, *Master's degree ENSIMAG, Grenoble INP, France*.
Fall 2021	**Graphs and Applications**, *Master's degree PHELMA, Grenoble INP, France*.
Fall 2020	**Algorithms and programming in Python**, *Bachelor's degree PCM-int, Department of Science and Technology Licence, Univ. Grenoble Alpes, France*.
Spring 2018	**Operations Research (practical course)**, *Bachelor's degree in Applied Mathematics, Università degli Studi di Verona, Italy*.

Education

Mar 2021 – Sep 2021	**Teaching education**, *Università degli Studi di Verona, Italy*, Courses: Teaching Methodology, Pedagogy, Anthropology, Psychology.
Oct 2017 – Sep 2019	**Master's degree in Mathematics, 110/110 with honors**, *Department of Computer Science, Università degli Studi di Verona, Italy*, Thesis Title: *Dypergraph connectivity augmentation: an uncrossing approach*, Supervisors: Giuseppe Mazzuoccolo and András Frank.
Feb 2019 – Aug 2019	**Erasmus+ for Traineeship**, *Egerváry Research Group on Combinatorial Optimization, ELTE, Budapest, Hungary*.
Sep 2018 – Feb 2019	**Erasmus+ for Studying**, *Facultad de Matemáticas, Universidad de Murcia, Spain*.
Oct 2014 – Sep 2017	**Bachelor's Degree in Applied Mathematics, 110/110 with honors**, *Department of Computer Science, Università degli Studi di Verona, Italy*, Thesis Title: *A Markov Chain approach to dependent opinions analysis with residuals treatment*, Supervisors: Luca Di Persio.

Professional skills

Languages	Italian (native), English (IELTS score: $8.0/9.0$), French (fluent), Spanish (intermediate)
Programming	LaTeX, Python, SageMath, MatLab