Eleonora Vercesi

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Education

- 01-10-2023/present: **PostDoc** in Computational Methods for the Integrality Gap analysys IDSIA (USI - SUPS) & Università della Svizzera Italiana (USI). Advisor: Prof. Luca Maria Gambardella, Prof. Palmo Monaldo Mastrolilli.
- 01-10-2020/24-10-2023: **Ph.D. Candidate** in Computational Mathematics and Decision Sciences.
  International Ph.D. Program, University of Pavia (UniPv) & Università della Svizzera Italiana (USI). Supervisor: Prof. Stefano Gualandi (UniPv).
  Graduated with honors.
- 10-06-2020: **MSc** in Applied Mathematics, UniPv.
  Title of the thesis: "*The Gene Mover's Distance. Single Cell Similarity via Optimal Transport*". Supervisors: Prof. Stefano Gualandi (UniPv). Grade: 110/110 cum Laude.
- 2016–2020: **Collegio Nuovo - Fondazione Sandra ed Enea Mattei, Pavia, Italy.**
  Selected by merit and tests to Collegio Nuovo - accredited by MIUR as a Center of Educational Excellence by a decree of the President of the Italian Republic.
- 21-11-2017: **BSc** in Mathematics, UniPv.
  Title of the thesis: "*Azioni di gruppi finiti*". Supervisor: Prof. Paola Frediani (UniPv). Grade: 109/110.

Teaching

Main lecturer

- Deep Learning Lab - AY 2023–2024 - Università della Svizzera Italiana, Master in Artificial Intelligence
- Pre-requisite in Math - AYs 2020–2022 - University of Pavia - Bachelor in Economics

Teaching assistant

- **BSc in Mathematics - University of Pavia**
  - *TA in Python Programming* - AYs 2020–2021, 2021–2022;
  - *TA in Calculus 1 and 2 - University of Pavia* - AYs 2017–2018.
- **BSc in Pharmacy - University of Pavia**
  - *TA in Math* - AYs 2018–2019, 2019–2020.
- **BSc in Economics - University of Pavia**
  - *TA in Math* - AYs 2018–2022

Awards & Grants

- 2022, Dec. "Best Paper Award" for my submission at "Operations Research and Data Science in Public Services (6th AIROYoung Workshop)".
- 2022, Jun. 14th AIMMS-MOPTA Optimization Modeling Competition finalist.
  Team work with A. M. Bernardelli, L. Bonasera, D. Duma.
- 2022, May. Awarded the "2022 Research Award" by the Alumnae Association of Collegio Nuovo.
  Full coverage of the expenses to attend and present a poster to MIP2022.
- 2022, Travelling Grant GNAMPA.
- 2021, Mar. Winner of the "Department of Mathematics promotion of the merit" scholarship.
  Scholarship promoted by the Department of Mathematics of the University of Pavia, to reward outstanding MSc students.
- 2018, Jun. "Anna Maria Piccoli e Claudio Delli Santi" prize, Pavia, awarded by Collegio Nuovo Alumna Paola Delli Santi.
- From 2016 to 2020. "Alberto Gigli Berzolari" scolarship at Collegio Nuovo – Fondazione Sandra e Enea Mattei, Pavia.
  Awarded total exemption from Collegio Nuovo board, accommodation, and tuition fees.

Publications & Preprints

Published Articles

1. Bernardelli, A. M., Bonasera, L., Duma, D., Gualandi, S., & Vercesi, E. Multi-objective stochastic scheduling of inpatient and outpatient surgeries. To appear on Flexible Services and Manufactoring.

2. Vercesi, E., Gualandi, S., Mastrolilli, M., & Gambardella, L. M. (2023). On the generation of metric TSP instances with a large integrality gap by branch-and-cut. Mathematical Programming Computation, 15(2), 389-416.

3. Gambardella, L. M., Gualandi, S., Mastrolilli, M., & Vercesi, E. (2022, February). Predicting the Empirical Hardness of Metric TSP Instances. In Workshop on Operation Research and Data Science in Public Services (pp. 1-16). Cham: Springer International Publishing.

4. Gualandi, S., Vercesi, E., & Toscani, G. (2022). A kinetic description of the body size distribution of species. Mathematical Models and Methods in Applied Sciences, 32(14), 2853-2885.

Under Review

5. Barta, J., Gambardella, L.M, Gualandi, S., Mastrolilli M., & E. Vercesi, On The Integrality Gap of Small Asymmetric TSPs: a Polyhedral and Computational Approach.

6. Bernardelli, A. M., Vercesi, E., Gambardella, L.M, Gualandi, S., & Mastrolilli M., On the integrality gap of the Complete Metric Steiner Tree Problem via a novel formulation.

Preprint

7. Bellazzi, R., Codegoni, A., Gualandi, S., Nicora, G., & Vercesi, E. (2021). The Gene Mover's Distance: Single-cell similarity via Optimal Transport. arXiv preprint arXiv:2102.01218.

Workshops & Conferences

- 2023, Feb. *7^{th} AIROYoung Workshop, Operations Research Beyond Frontier*, Milano, Accepted talk: "On the generation of Metric TSP instances with a large integrality gap by branch-and-cut".

- 2022, Nov. *Workshop "Matematica per l'intelligenza artificiale e il Machine Learning - Giovani Ricercatori"*, Torino, Contributed talk: "Computing Disease-Specific Gene Embeddings via Constrained Optimization".

- 2022, Jul. *ZIB Seminars*, Berlin, Invited Talk: "On the generation of Metric TSP instances with a large integrality gap by branch-and-cut".

- 2022, May. *2022 Mixed Integer Programming Workshop 2022*, DIMACS, Rutgers University, Accepted poster: "On the generation of Metric TSP instances with a large integrality gap by branch-and-cut".

- 2022, Mar. *PhD Spring Workshop 2022*, Pavia, Contributed talk: "Hardness of TSP instances: a computational study".
- 2022, Feb. *OT-SDM 2022: The 1st International Workshop on Optimal Transport and Structured Data Modeling*, Online, Contributed talk: "The Gene Mover's Distance: single-cell similarity via optimal transport".
- 2022, Feb. *6^{t}h AIRO Young Workshop "Operations Research and Data Science in Public Service"*, Rome, Contributed talk: "Hardness of Metric TSP instances: a computational study".
- 2021, Sep. *1st Young Applied Mathematicians Conference*, Santa Maria di Leuca, Contributed talk: "A new family of hard-to-solve instances for the metric TSP".
- 2021, Feb. *5th AIRO Young Workshop "Optimization and Data Science: Trends and Application"*, Online, Contributed talk: "The Gene Mover's Distance: single-cell similarity via optimal transport".

Reserach Visiting & Abroad Experiences

- **Visiting student** at Università della Svizzera Italiana (USI), October 2022 - May 2023. Advisor: Prof. Luca Maria Gambardella.
- **Visiting student** at Free University of Berlin, Konrad-Zuse Zentrum für Informationstechnik Berlin, as part of the "Graduate-level Research in Industrial Projects for Students" program, May - August 2022.
- **Optimization Intern**, SATALIA, London, as part of the Erasmus Traineeship program, March - June 2019.

Thesis co-supervision

- Ignacio Utrilla Mas, "Il Problema del commesso viaggiatore Asimmetrico" (SUPSI), 2023. Co-supervision with Palmo Monaldo Mastrolilli (IDSIA).
- G. Maggiorano, "Cell-cell similarity measures via optimal transport and principal component analysis for clustering", 2021. Co-supervision with S. Gualandi.
  BSc in Mathematics at University of Pavia.
- A Cirelli, "Minumum distortion embedding and application to genomics", 2021. Co-supervision with S. Gualandi.
  BSc in Mathematics at University of Pavia.

Languages

- Italian (mother tongue).
- English (fluent, IELTS Certified in 2018).

Computer Skills

- Windows, Ubuntu, MacOS: good knowledge.
- C, C++, MATLAB, Python, Julia, Java, R: good knowledge.
- Optimizaion tools: Gurobi, CPLEX, Minizinc, SCIP.
- Git, SLURM: good knowledge.

Referee Activity

- The 38th Annual AAAI Conference on Artificial Intelligence
- Optimization Letters
- INFORMS Journal on Computing

Miscellanea

- I strongly believe in actively being part of the community where I live. Thus I volunteer in the Animal Refugee of Voghera during the weekend, and I have co-funded both Help2Help and MyPhDMentor associations.
- I love to stay with people and have an active life: I have always played volleyball in different teams at different levels. I also practice ultimate frisbee, ski, windsurf, beach volley, and pole dance at an amateur level.

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