

CONTACT INFORMATION	<p>Department of Industrial and Systems Engineering, P.C. Rossin College of Engineering & Applied Science 200 W Packer Ave, Mohler Lab Bethlehem, PA 18015-1518, USA</p>	<p>Website febattista.github.io Email feb223@lehigh.edu</p>
RESEARCH INTERESTS	<p>Discrete optimization with contributions spanning theory, methodology, and computation toward more effective solution approaches for complex mixed-integer linear problems and the development of open-source tools for the community.</p> <p>Combinatorial optimization, particularly the design of strong relaxations for graph problems, such as, the maximum clique/independent set and graph coloring.</p>	
ACADEMIC EXPERIENCE	<p>Lehigh University, Dept. of Industrial and Systems Engineering, Bethlehem, PA, USA</p> <p>Postdoctoral Researcher under Ted Ralphs <i>February 2023 – Present</i></p>	
EDUCATION	<p>Università di Roma Sapienza Dept. of Computer, Control, and Management Engineering, Rome, Italy</p> <p>Ph.D in Operations Research <i>November 2019 – January 2023</i></p> <p>Thesis: On Semidefinite Lift-and-Project of Combinatorial Optimization Problems</p> <p>Advisors: Marianna De Santis, Fabrizio Rossi, Stefano Smriglio</p> <p>Alpen-Adria-Universität Institut für Mathematik, Klagenfurt, Austria</p> <p>Visiting Ph.D student under Angelika Wiegele <i>February 2022 – July 2022</i></p> <p>Università degli Studi dell'Aquila Dept. of Inf. Eng., Computer Science and Mathematics, L'Aquila, Italy</p> <p>Master's degree in Computer Science, <i>Magna Cum Laude</i> <i>July 2019</i></p> <p>Bachelor's degree in Computer Science, <i>Magna Cum Laude</i> <i>October 2017</i></p>	
REFEREED PUBLICATIONS	<p>[1] F. Battista and M. De Santis. <i>Dealing with Inequality Constraints in Large-Scale Semidefinite Relaxations for Graph Coloring and Maximum Clique Problems</i>. In: <i>4OR. A Quarterly Journal of Operations Research</i> (2024), pp. 1–31. DOI: 10.1007/s10288-024-00569-5.</p> <p>[2] F. Battista. <i>On Semidefinite Lift-and-Project of Combinatorial Optimization Problems</i>. PhD thesis. Università di Roma Sapienza, 2023. HDL: 11573/1668673. URL: https://hdl.handle.net/11573/1668673.</p>	
WORKING PAPERS	<p>[3] F. Battista and T. K. Ralphs. <i>Improving Directions in Mixed Integer Bilevel Linear Optimization</i>. arXiv preprint. COR@L Laboratory, Lehigh University, 2025. URL: https://doi.org/10.48550/arXiv.2511.03566.</p> <p>[4] F. Battista, F. Rossi, and S. Smriglio. <i>Application of the Lovász-Schrijver Operator to Compact Stable Set Integer Programs</i>. arXiv preprint. Università di Roma Sapienza, 2025. URL: https://doi.org/10.48550/arXiv.2407.19290. <i>Accepted to Mathematical Programming Computation (2025+)</i>.</p> <p>[5] S. Fallah, F. Battista, and T. K. Ralphs. <i>A Branch-and-Bound Algorithm for Multiobjective Mixed Integer Linear Optimization</i>. Working paper. COR@L Laboratory, Lehigh University, 2025. <i>Submitted</i>.</p>	

SOFTWARE

- [6] F. **Battista**, F. Rossi, and S. Smriglio. *SDP_lift_and_project* (2025). URL: https://github.com/febattista/SDP_lift_and_project. *Maintainer*.
- [7] F. **Battista** and M. De Santis. *ADAL-ineq* (2024). URL: <https://github.com/febattista/ADAL-ineq>. *Maintainer*.
- [8] S. DeNegre, T. Ralphs, and S. Tahernejad. *MibS Version 1.2* (2024). URL: <https://github.com/coin-or/MibS>. *Contributor*.
- [9] T. Ralphs, M. Güzelsoy, and A. Mahajan. *SYMPHONY Version 5.7* (2023). URL: <https://github.com/coin-or/SYMPHONY/>. *Contributor*.

STUDENTS

Doctoral Students Mentorship

- Shannon Kelley, Lehigh University, ISE, Advisor: Ted Ralphs 2023 – Present
- Samira Fallah, Lehigh University, ISE, Advisor: Ted Ralphs 2023 – Present
- Hesam Shaelaie, Lehigh University, ISE, Advisor: Ted Ralphs 2023 – Present
- Suresh Bolusani, Lehigh University, ISE, Advisor: Ted Ralphs 2023 – Present

TEACHING EXPERIENCE

Teaching Assistant

- *ISE 418* Integer Programming, Ph.D. course, Lehigh University 2024
- Operations Research Laboratory, B.Sc. course, Università Roma Sapienza 2020
- Advanced Calculus, B.Sc. course, Università Roma Sapienza 2020

TALKS

- [1] F. **Battista**, T. K. Ralphs, and S. Fallah. *The Restricted Value Function of MILPs and Its Construction with SYMPHONY*. In: *18th INFORMS Computing Society (ICS) Conference* (2025).
- [2] F. **Battista** and T. K. Ralphs. *A Branch-and-Cut Algorithm for Mixed-Integer Bilevel Linear Optimization Based on Improving Directions*. In: *International Symposium on Mathematical Programming* (2024).
- [3] F. **Battista** and T. K. Ralphs. *Exploiting Dual Functions in Mixed Integer Bilevel Linear Programs*. In: *INFORMS Annual Meeting* (2023).
- [4] F. **Battista**, F. Rossi, and S. Smriglio. *Application of the Lovász-Schrijver Operator to Representative Formulation for Graph Coloring Problem*. In: *International Symposium on Combinatorial Optimization* (2022).
- [5] F. **Battista** et al. *On Semidefinite Lift-and-Project Relaxations for Combinatorial Optimization Problems*. In: *University of Pavia* (2022).
- [6] F. **Battista** and M. De Santis. *Dealing with Inequalities in Large Scale Semidefinite Programs*. In: *International Conference on Optimization and Decision Science* (2021).

SERVICE

Editorial Board (Associate Editor)

- *Operations Research* (Area: Data, Software, and Computation) 2025 – Present