

CONTACT INFORMATION	<p>Department of Industrial and Systems Engineering, P.C. Rossin College of Engineering &amp; Applied Science 200 W Packer Ave, Mohler Lab Bethlehem, PA 18015-1518, USA</p>	<p>Website <a href="https://github.com/febattista">febattista.github.io</a> Email <a href="mailto:feb223@lehigh.edu">feb223@lehigh.edu</a></p>
RESEARCH INTERESTS	<p><b>Discrete optimization</b> with contributions spanning theory, methodology, and computation toward more effective solution approaches for complex <b>mixed-integer linear problems</b> and the development of open-source tools for the community.</p> <p><b>Combinatorial optimization</b>, particularly the design of strong relaxations for graph problems, such as, the <b>maximum clique/independent set</b> and <b>graph coloring</b>.</p>	
ACADEMIC EXPERIENCE	<p><b>Lehigh University</b>, Dept. of Industrial and Systems Engineering, Bethlehem, PA, USA</p> <p>Postdoctoral Researcher under <a href="#">Ted Ralphs</a> <span style="float: right;">February 2023 – Present</span></p>	
EDUCATION	<p><b>Università di Roma Sapienza</b> Dept. of Computer, Control, and Management Engineering, Rome, Italy</p> <p>Ph.D in <a href="#">Operations Research</a> <span style="float: right;">November 2019 – January 2023</span></p> <p>Thesis: <a href="#">On Semidefinite Lift-and-Project of Combinatorial Optimization Problems</a></p> <p>Advisors: Marianna De Santis, Fabrizio Rossi, Stefano Smriglio</p> <p><b>Alpen-Adria-Universität</b> Institut für Mathematik, Klagenfurt, Austria</p> <p>Visiting Ph.D student under <a href="#">Angelika Wiegele</a> <span style="float: right;">February 2022 – July 2022</span></p> <p><b>Università degli Studi dell'Aquila</b> Dept. of Inf. Eng., Computer Science and Mathematics, L'Aquila, Italy</p> <p><a href="#">Master's degree in Computer Science</a>, <i>Magna Cum Laude</i> <span style="float: right;">July 2019</span></p> <p><a href="#">Bachelor's degree in Computer Science</a>, <i>Magna Cum Laude</i> <span style="float: right;">October 2017</span></p>	
REFEREED PUBLICATIONS	<p>[1] F. <b>Battista</b> 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. <b>Battista</b>. <i>On Semidefinite Lift-and-Project of Combinatorial Optimization Problems</i>. PhD thesis. Università di Roma Sapienza, 2023. HDL: 11573/1668673. URL: <a href="https://hdl.handle.net/11573/1668673">https://hdl.handle.net/11573/1668673</a>.</p>	
WORKING PAPERS	<p>[3] F. <b>Battista</b> and T. K. Ralphs. <i>Improving Directions in Mixed Integer Bilevel Linear Optimization</i>. arXiv preprint. COR@L Laboratory, Lehigh University, 2025. URL: <a href="https://doi.org/10.48550/arXiv.2511.03566">https://doi.org/10.48550/arXiv.2511.03566</a>.</p> <p>[4] F. <b>Battista</b>, 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: <a href="https://doi.org/10.48550/arXiv.2407.19290">https://doi.org/10.48550/arXiv.2407.19290</a>. Accepted to <i>Mathematical Programming Computation</i> (2025+).</p> <p>[5] S. Fallah, F. <b>Battista</b>, 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. Submitted.</p>	
SOFTWARE	<p>[6] F. <b>Battista</b>, F. Rossi, and S. Smriglio. <i>SDP_lift_and_project</i> (2025). URL: <a href="https://github.com/febattista/SDP_lift_and_project">https://github.com/febattista/SDP_lift_and_project</a>. <i>Maintainer</i>.</p> <p>[7] S. DeNegre, T. Ralphs, and S. Tahernejad. <i>MibS Version 1.2</i> (2024). URL: <a href="https://github.com/coin-or/MibS">https://github.com/coin-or/MibS</a>. <i>Contributor</i>.</p> <p>[8] T. Ralphs, M. Güzelsoy, and A. Mahajan. <i>SYMPHONY Version 5.7</i> (2023). URL: <a href="https://github.com/coin-or/SYMPHONY/">https://github.com/coin-or/SYMPHONY/</a>. <i>Contributor</i>.</p>	

## 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