Hamidreza Validi

Curriculum Vitae

IMSE 213
Texas Tech University
Lubbock, TX 79409

email: hvalidi@ttu.edu
github: https://github.com/hamidrezavalidi
web: https://sites.google.com/site/hamidrezavalidi2

AFFILIATION

2022 - present **Assistant Professor**
Industrial, Manufacturing, and Systems Engineering
Texas Tech University, Lubbock, TX

2020 - 2022 **Postdoctoral Research Associate**
Computational Applied Mathematics and Operations Research
Rice University, Houston, TX

EDUCATION

2016 - 2020 **Doctor of Philosophy, Industrial Engineering & Management**
Oklahoma State University, Stillwater, OK
Dissertation: *Imposing Connectivity in Network Design Problems*
(Winner of the 2023 INFORMS Best Dissertation Award in the Telecom and Network Analytics)

2012 - 2014 **Master of Science, Industrial Engineering**
Sharif University of Technology, Tehran, Iran

2007 - 2012 **Bachelor of Science, Industrial Engineering**
Ferdowsi University of Mashhad, Mashhad, Iran

PUBLICATIONS

REFEREED JOURNAL PAPERS (*: MENTEE)

1. *A. Karagoz, *R. Liu, **H. Validi**. Strengthened MIP formulations for the liver region redesign models of Akshat et al. To appear at *Optimization Letters*, December 2024.

2. *S. Kroger, **H. Validi**, I. V. Hicks. Maximizing engagement in large-scale social networks. *INFORMS Journal on Optimization*, 6(3-4):196–213, 2024.

3. *F. Khoshbakhtian, **H. Validi**, M. Ventresca, D. Aleman. Optimal design of vaccination policies: A case study for Newfoundland and Labrador. *Operations Research Letters*, 55: 107140, 2024.

4. *S. Kroger, **H. Validi**, I. V. Hicks. A polytime preprocess algorithm for the maximum independent set problem. *Optimization Letters*, 18(2): 651-661, 2024.

5. *J. Zhang, **H. Validi**, A. Buchanan, I. V. Hicks. Linear-size formulations for connected planar graph partitioning and political districting. *Optimization Letters*, 18(1): 19-31, 2024.

6. *R. Cacao, *L. Cortez, *J. Forner, **H. Validi**, I. R. de Farias, I. V. Hicks. The set partitioning problem in a quantum context. *Optimization Letters*, 18(1): 1-17, 2024.

7. *R. Fakhimi, **H. Validi**, I. V. Hicks, T. Terlaky, L. Zuluaga. On relaxations of the max k-cut problem formulations. *Operations Research Letters*, 51.5: 521-527, 2023.

8. **H. Validi**, A. Buchanan. Political districting to minimize cut edges. *Mathematical Programming Computation*, 14: 623-672, 2022.

9. **H. Validi**, A. Buchanan, E. Lykhovyd. Imposing contiguity constraints in political districting models. *Operations Research*, 70(2): 867-892, 2022. (**Winner of the 2021 ICS Harvey J. Greenberg Research Award**)

10. **H. Validi**, A. Buchanan. The optimal design of low-latency virtual backbones. *INFORMS Journal on Computing*, 32(4): 952-967, 2020.

11. **H. Validi**, A. Buchanan. A note on "A linear-size zero-one programming model for the minimum spanning tree problem in planar graphs". *Networks*, 73(1): 135-142, 2019.

BOOK CHAPTERS (*: MENTEE)

◇ *R. Fakhimi, **H. Validi**. Quantum Approximate Optimization Algorithm (QAOA). Accepted for *Encyclopedia of Optimization*, March 2023.

PAPERS UNDER REVIEW (*: MENTEE)

1. *B. Alston, **H. Validi**, I. V. Hicks. Mixed integer linear optimization formulations for learning optimal binary classification trees. Under third revision at *INFORMS Journal on Computing*, September 2024.

2. *R. Fakhimi, **H. Validi**, I. V. Hicks, T. Terlaky, L. Zuluaga. A folding preprocess for the max k-cut problem. Under revision at *Optimization Letters*, November 2024.

3. *B. Burin, **H. Validi**, B. Lyu, I. V. Hicks. Compact mixed integer programming formulations for the minimum biclique cover problem. Under revision at *Networks*, December 2024.

4. *S. Kroger, **H. Validi**, I. V. Hicks, T. Perini. Bounding the number and the diameter of optimal compact Black-majority districts.

5. *P. V. Rocha, **H. Validi**. A cut-based mixed integer programming formulation for the hop-constrained cheapest path problem.

6. *J. Zhang, *L. Silveira, **H. Validi**, L. Smith, A. Buchanan, I. V. Hicks. Partitioning a graph into low-diameter clusters.

AWARDS & SCHOLARSHIPS

◇ Recipient, **2024 Most Influential Faculty Member**, awarded by Edward E. Whitacre Jr. College of Engineering, Texas Tech University, May 2024.

◇ Recipient, **2023 INFORMS Best Dissertation Award in the Telecommunication and Network Analytics section**, October 2023.

◇ Recipient, **2021 INFORMS Computing Society Harvey J. Greenberg Research Award**, August 2021.

◇ Recipient, **2020 Outstanding Graduate Student Award**, College of Engineering, Architecture, and Technology, Oklahoma State University, May 2020.

◇ Recipient, **Spring 2020 Honorary Graduate Commencement Marshal**, Oklahoma State University, April 2020.

◇ Recipient, **2019-2020 Distinguished Graduate Fellowship**, Oklahoma State University, August 2019.

◇ Poster finalist, **Mixed Integer Programming Workshop 2019**, MIT, MA, July 2019.

◇ Recipient, **2019-2020 John L. Imhoff Scholarship**, awarded by Institute of Industrial and Systems Engineers.

⋄ Recipient, **2019 Phoenix Award for Outstanding Graduate Teaching Assistant**, awarded by Graduate and Professional Student Government Association at Oklahoma State University, April 2019.

⋄ Recipient, **2018-2019 E.J. Sierleja Memorial Fellowship**, awarded by Institute of Industrial and Systems Engineers.

⋄ Recipient, **NSF travel grant to attend Mixed Integer Programming Workshop 2018**, Greenville, SC, April 2018.

⋄ Sixth place of **M.Sc. National Entrance Exam** among 8,862 participants, Iran, August 2012.

⋄ Recipient, **Best Researchers Award** at Ferdowsi University of Mashhad, Iran, December 2012.

⋄ Recipient, **Best Researchers Award** at Ferdowsi University of Mashhad, Iran, December 2011.

⋄ First place for **Manufacturing Firm Design Competition** at Ferdowsi University of Mashhad, Iran, March 2011.

PhD Students

⋄ Gabriel Teodoro   Texas Tech University (Fall 2024 - present)

Undergraduate Students

⋄ Thiago Barbosa   Military Institute of Engineering, Brazil (Fall 2024 - present)

⋄ Pedro Vieira   Military Institute of Engineering, Brazil (Fall 2024 - present)

⋄ Bruno Burin   Military Institute of Engineering, Brazil (Fall 2023-present)

⋄ Lucas Silveira   Military Institute of Engineering, Brazil (Fall 2022-present)

Mentees

⋄ Jack Zhang   Undergraduate student at Rice University (Fall 2021 – present)

⋄ Charlie Liu   Undergraduate student at Rice University (Spring 2023 – present)

⋄ Aysenur Karagoz   PhD student at Rice University (Spring 2022 – present)

⋄ Samuel Kroger   PhD student at Rice University (Fall 2020 – present)

⋄ Ramin Fakhimi   PhD candidate at Lehigh University (Fall 2020 – Spring 2023)

⋄ Rafael Cacao   PhD candidate at Texas Tech University (Spring 2022 – Spring 2023)

⋄ Lucas Cortez   PhD candidate at Texas Tech University (Spring 2022 – Spring 2023)

⋄ Jackson Forner   PhD student at Rice University (Spring 2022 – Fall 2023)

⋄ Brandon Alston   PhD student at Rice University (Fall 2020 – Summer 2022)

⋄ Faraz Khoshbakhtian   PhD student at University of Toronto (Spring 2022 – Summer 2023)

⋄ Elizabeth Bunting   Undergraduate student at Oklahoma State University (Fall 2018 – Spring 2019)
                                    Project: *Optimizing the compactness of political districts in Oklahoma*

Teaching

GRADUATE TEACHING

◇ Mixed Integer Programming (PhD course, full responsibility), Texas Tech University, Fall 2023.

◇ Principles of Operations Research (MS & PhD course, full responsibility), Texas Tech University, Fall 2023, Fall 2024.

◇ Network Optimization (PhD course, full responsibility), Texas Tech University, Spring 2023.

◇ Graph Theory (PhD course, full responsibility), Rice University, Spring 2022.

◇ Computational Prescriptive Analytics (MS course, Guest lecturer), Computational and Applied Mathematics, Rice University, Spring 2021.

◇ Analysis 1 (PhD course, full responsibility), Computational and Applied Mathematics, Rice University, Fall 2020.

UNDERGRADUATE TEACHING

◇ Deterministic Operations Research (full responsibility), Texas Tech University, Fall 2023, Fall 2024.

◇ Computing for Industrial Engineers (full responsibility), Texas Tech University, Fall 2022.

◇ Graph Theory (full responsibility), Rice University, Spring 2022.

◇ Probability and Statistics for Engineers 1 (full responsibility), Oklahoma State University, Fall 2019.

◇ Probability and Statistics for Engineers 1 (full responsibility), Oklahoma State University, Fall 2018.

CONFERENCE PRESENTATIONS/INVITED TALKS

◇ Compact mixed integer programming formulations for the minimum biclique cover problem.

    ○ 2024 INFORMS Annual Meeting, Seattle, WA, October 20, 2024.
    ○ 2024 INFORMS Telecommunications and Network Analytics, May 16, 2024 (Online).

◇ On relaxations of the max k-cut problem formulations.

    ○ 2023 INFORMS Annual Meeting, Phoenix, AZ, October 2023.

◇ MIP formulations for partitioning a graph into low-diameter clusters.

    ○ 2024 INFORMS Optimization Society, Houston, Texas, March 22, 2024.
    ○ 2022 INFORMS Annual Meeting, Indianapolis, Indiana, October 17, 2022.
    ○ 2021 INFORMS Annual Meeting, Anaheim, CA, October 26, 2021.

◇ Formulations of the max k-cut problem on classical and quantum computers.

    ○ Department of Industrial and Systems Engineering, University of Florida, March 17, 2022.
    ○ 2022 INFORMS Optimization Society, Greenville, SC, March 13, 2022.

◇ Mixed integer programming in the era of quantum computing and machine learning. CAAM Colloquium, Department of Computational and Applied Math, Rice University, November 29, 2021.

◇ The Bin Packing Problem: Skip Branches of the B&B Tree with SCIP. 17th Iranian International Industrial Engineering Conference, February 4, 2021 (in Persian).

◇ Polyhedral study of k connected components. 2020 INFORMS Annual Meeting, November 9, 2020.

◇ Imposing contiguity constraints in political districting models.

- ○ 2020 INFORMS Annual Meeting, November 10, 2020.
- ○ CAAM Colloquium, Department of Computational and Applied Math, Rice University, October 12, 2020.
- ○ Mixed Integer Programming Workshop 2020, May 18, 2020. (Poster presentation)
- ○ GAMMA Seminar, Department of Industrial and Systems Engineering, University at Buffalo, Buffalo, NY, March 26, 2020.
- ○ 2019 INFORMS Annual Meeting, Seattle, WA, October 20-23, 2019.
- ○ Seminar Series, School of Industrial Engineering & Management, Oklahoma State University, Stillwater, OK, October 16, 2019.
- ○ Voting Rights Data Institute 2019, Tufts University, MA, July 17, 2019.
- ○ Mixed Integer Programming Workshop 2019, MIT, MA, July 15, 2019. (Poster presentation)

◇ A note on "A linear-size zero-one programming model for the minimum spanning tree problem in planar graphs".

- ○ 2018 INFORMS Annual Meeting, Phoenix, AZ, November 6, 2018.
- ○ Mixed Integer Programming Workshop 2018, Greenville, SC, June 18, 2018. (Poster presentation)

◇ The optimal design of low-latency virtual backbones.

- ○ ACM International Workshop on Critical Infrastructure Network Security, June 14, 2021.
- ○ 2018 INFORMS Optimization Society, Denver, CO, March 23, 2018.
- ○ 2017 INFORMS Annual Meeting, Houston, TX, October 22, 2017.

PROFESSIONAL EXTERNAL SERVICE

◇ Journal and Conference Referee

○ *Operations Research*	○ *IISE Transactions*
○ *Scientific Reports*	○ *Naval Research Logistics*
○ *INFORMS Journal on Computing*	○ *European Journal of Operational Research*
○ *INFORMS Journal on Applied Analytics*	○ *IPCO 2023*
○ *Networks*	○ *Theoretical Computer Science*
○ *Discrete Applied Mathematics*	○ *Political Research Quarterly*
○ *Optimization Letters*	○ *IEEE/ACM Transactions on Networking*
○ *Journal of Global Optimization*	○ *Annals of Operations Research*
○ *Service Science*	○ *Computers and Operations Research*

◇ Member of the 2024 INFORMS Computing Society Harvey J. Greenberg Research Award Committee.

◇ Member of INFORMS Meetings Committee, January 2022- present.

◇ Member of Council, INFORMS Section on Telecommunications and Network Analytics, 2022–present.

◇ Cluster Chair, Telecommunications & Network Analytics: INFORMS 2022, INFORMS 2023.

◇ Poster Referee, INFORMS Annual Meeting 2023.

◇ Session Chair: INFORMS Annual Meeting (2018, 2019, 2020, 2021, 2022), IOS 2022.

◇ Committee member of Ph.D. student Samuel Kroger at Rice University, Spring 2024.

PROFESSIONAL INTERNAL SERVICE

- ⋄ TeMPO Fellow, Texas Tech University, Fall 2024-present.

- ⋄ Member of the graduate committee, Texas Tech University, Fall 2023-present.

- ⋄ Graduate seminar coordinator, Texas Tech University, Fall 2023-present.

- ⋄ Committee member of Ph.D. students at Texas Tech University: Rafael Cacao (2023), Andrea Arriet (2023), Eric Bediako (2024), Henry Johnston, Gabriel Cacao, Thanakrit Piyachayawat.

- ⋄ President of INFORMS Student Chapter, Oklahoma State University, Fall 2018.

- ⋄ Graduate Vice President of INFORMS Student Chapter, Oklahoma State University, Spring 2018.