Dr. Frank de Meijer

Last update: January 2, 2026

CONTACT INFORMATION

Office 36.HB 04.230
Research group Discrete Mathematics and Optimization
Delft Institute of Applied Mathematics (DIAM)
Faculty Electrical Engineering, Mathematics and Computer Science
TU Delft
Mekelweg 4, 2628 CD Delft
Tel: +31623695418

`Homepage:` www.frankdemeijer.com
`Linkedin:` https://www.linkedin.com/in/frank-de-meijer
`E-mail:` f.j.j.demeijer@tudelft.nl

RESEARCH INTERESTS

Mathematical Modelling, Mathematical Optimization, Discrete Optimization, Conic Optimization, Semidefinite Programming, Network Optimization, (Distributionally) Robust Optimization, Operations Research in Healthcare

ACADEMIC POSITIONS

Postdoctoral Researcher at **TU Delft**, The Netherlands. august 2024–present

- My research focuses on stochastic and (distributionally) robust optimization approaches applied to scheduling problems in healthcare.
- Delft Institute of Applied Mathematics, TU Delft.
- Research group Discrete Mathematics and Optimization.
- Supervisor: Dr. ir. Theresia van Essen

Lecturer at **TU Delft**, The Netherlands. august 2023–present

- Delft Institute of Applied Mathematics.
- Research group Discrete Mathematics and Optimization.
- Teaching several courses in Calculus, Mathematical Analysis and Linear Algebra.

Research and Teaching Assistant at **Tilburg University**, The Netherlands. 2017–2023

- Department of Econometrics and Operations Research.
- Working on several research projects in linear and semidefinite optimization.
- Serving as TA in several courses in Mathematical Optimization, Operations Research and Linear Algebra.

EDUCATION

Ph.D. in Mathematical Optimization. 2019–2023

- Tilburg University, Department of Econometrics and Operations Research.
- Ph.D. topic: *Integrality and Cutting Planes in Semidefinite Programming Approaches for Combinatorial Optimization*.
- Supervisors: Prof. dr. ir. Renata Sotirov and Prof. dr. Dion Gijswijt.

Research Master in Business: track Operations Research. 2018–2019

- Tilburg University, Research Master in Business: track Operations Research. GPA: **9.6/10** – via 60 credits.
- Thesis: *Semidefinite Programming for the Quadratic Cycle Cover Problem*, grade: 9.5/10.
- Graduated Cum Laude.

Master Business Analytics and Operations Research. 2017–2018

- Tilburg University, Business Analytics and Operations Research. GPA: **9.4/10**– via 60 credits

- Thesis: *Bounds on the Minimum Reload Cycle Cover Problem*, grade: 10/10.
- Graduated Cum Laude.

Bachelor Econometrics and Operations Research. 2014–2017

- Tilburg University, Econometrics and Operations Research. GPA: **9.0/10**– via 180 credits
- Thesis: *Column Generation for the Vehicle Routing Problem with Time Windows*, grade: 9.5/10.
- Graduated Cum Laude.

Research Publications

Publications in Peer-Reviewed Journals:

- "Exploiting symmetries in optimal quantum circuit design", with Dion Gijswijt and Renata Sotirov. *Discrete Optimization*, 59:100925, 2026.
- "Spanning and splitting: Integer semidefinite programming for the quadratic minimum spanning tree problem", with Melanie Siebenhofer, Renata Sotirov and Angelika Wiegele. Accepted for publication in *European Journal of Operational Research*, 2025.
- "The Chvátal-Gomory procedure for integer SDPs with applications in combinatorial optimization", with Renata Sotirov. *Mathematical Programming, Series A*, 209:323–395, 2024.
- "On integrality in semidefinite programming for discrete optimization", with Renata Sotirov. *SIAM Journal on Optimization*, 34(1):1071-1096, 2024.
- "Automorphism groups of Cayley graphs generated by general transposition sets", with Dion Gijswijt. *The Electronic Journal of Combinatorics*, 31(3), 2024.
- "Partitioning through projections: Strong SDP bounds for large graph partition problems", co-authored with Renata Sotirov, Angelika Wiegele and Shudian Zhao. *Computers and Operations Research*, 151, March 2023.
- "SDP-based bounds for the Quadratic Cycle Cover Problem via cutting plane augmented Lagrangian methods and reinforcement learning", co-authored with Renata Sotirov. *INFORMS Journal on Computing*, 33(4), 1262–1276, 2021.
  - Winner of INFORMS Meritorious Paper Award 2021
- "The Quadratic Cycle Cover Problem: special cases and efficient bounds", co-authored with Renata Sotirov. *Journal of Combinatorial Optimization*, 39:1096–1128, 2020.

Preprints:

- "Lagrangian duality for mixed-integer semidefinite programming: Theory and algorithms", with Renata Sotirov. July 2025, in first review round for publication in *Journal of Optimization Theory and Applications*.

Dissertation:

- "Integrality and cutting planes in semidefinite programming approaches for combinatorial optimization", Doctoral thesis, TiSEM Dissertation series, CentER, November 2023.

Work in Progress:

- "Semidefinite programming relaxations for ternary optimization problems", with Veronica Piccialli, Renata Sotirov and Antonio Sudoso.
- "On improved SDP relaxations for the quadratic traveling salesman problem via cutting planes", single-authored.
- "Distributionally robust operational surgery scheduling under unified uncertainty", with Theresia van Essen.
- "Distributionally robust chance-constraints in MILPs via augmented Lagrangian methods", single-authored.

Publications in Non-Refereed Journals:

- "Facial reduction for Semidefinite Programming Problems", single-authored. *Nekst*, Triangle, 28:2, 2019.
- "Bounds on the Minimum Reload Cost Cycle Cover Problem", single-authored. *Nekst*, Practical Report, 27:1, 2018.
- "Recognizing DNA patterns by solving the quadratic traveling salesman problem", single-authored. *Nekst*, Triangle, 29:4, 2021.

Academic Presentations

Conference Talks:

- European Conference on Operational Research (EURO) 2025, invited minisymposium

  Title: Integer Lagrangian duality for mixed-integer semidefinite programming and its applications
  Date: June 25, 2025.
  Location: University of Leeds, Leeds, United Kingdom.

- European Conference on Operational Research (EURO) 2024, invited minisymposium

  Title: Exploiting Symmetries for Optimal Quantum Circuit Design
  Date: July 3, 2024.
  Location: Technical University of Denmark (DTU), Copenhagen, Denmark.

- SIAM Conference on Optimization (OP23), invited minisymposium

  Title: Integer semidefinite programming formulations for combinatorial optimization problems and applications
  Date: June 2, 2023.
  Location: The Sheraton Grand Seattle, Seattle, WA, USA.

- International Conference on Continuous Optimization 2022 (ICCOPT2022), invited minisymposium

  Title: The Chvátal-Gomory procedure for integer SDPs with applications in combinatorial optimization
  Date: July 25, 2022
  Location: Lehigh University, Bethlehem, PA, USA.

- SIAM Conference on Optimization (OP20), invited minisymposium

  Title: Discrete Semidefinite Programming Techniques for the Quadratic Traveling Salesman Problem
  Date: July 21, 2021
  Location: Virtual

- LNMB Conference 2021

  Title: A cutting plane augmented Lagrangian method to solve SDP relaxations of binary quadratic problems
  Date: January 22, 2021
  Location: Virtual

Seminars:

- Discrete Optimization Seminar, Technische Universität Dortmund, Department of Mathematics

  Title: Chvátal-Gomory cuts for integer SDPs with applications in combinatorial optimization
  Date: February 8, 2023
  Location: Technische Universität Dortmund, Dortmund, Germany.

- Tutte Colloquium, University of Waterloo, Department of Combinatorics and Optimization

  Title: The Chvátal-Gomory procedure for integer SDPs with applications in combinatorial optimization
  Date: May 21, 2022
  Location: Virtual

- TU/e seminar on Combinatorial Optimization, Eindhoven University of Technology, Department of Mathematics and Computer Science. Research Group Statistics, Probability and Operations Research

  Title: The Chvátal-Gomory procedure for integer SDPs with applications in combinatorial optimization
  Date: May 13, 2022
  Location: Eindhoven University of Technology, Eindhoven, The Netherlands.

- Doctoral Seminar, Alpen-Adria Universität Klagenfurt, Department of Mathematics

  Title: SDP-based bounds for the Quadratic Cycle Cover Problem via cutting plane augmented Lagrangian methods and reinforcement learning
  Date: June 16, 2021
  Location: Virtual

- OR Seminar, Tilburg University, Department of Econometrics and Operations Research

  Title: SDP-based bounds for the Quadratic Cycle Cover Problem via cutting plane augmented Lagrangian methods and reinforcement learning
  Date: May 20, 2021
  Location: Virtual

Poster Presentations:

- Integer Programming and Combinatorial Optimization (IPCO2022)

  Title: The Chvátal-Gomory procedure for integer SDPs with applications in combinatorial optimization
  Date: June 27-29, 2022
  Location: Eindhoven University of Technology, Eindhoven, The Netherlands

- CRM/DIMACS Workshop on Mixed-Integer Nonlinear Programming

  Title: Semidefinite Programming for the Quadratic Cycle Cover Problem
  Date: October 7, 2019
  Location: École Polytechnique de Montréal, Montréal, Canada

Research Activities

Attended Workshops:

- 50th LNMB Conference on Mathematics of Operations Research

  Date: January 13-15, 2025
  Location: Soesterberg, Utrecht, Netherlands.

- ICCOPT Summer School 2022

  Date: July 23-24, 2022
  Location: Lehigh University, Bethlehem, PA, USA.

- Summer School Integer Programming and Combinatorial Optimization (IPCO2022)

  Date: June 25-26, 2022
  Location: Eindhoven University of Technology, Eindhoven, The Netherlands

- Mixed Integer Programming Workshop (MIP2021)

  Date: May 24-27, 2021.
  Location: Virtual

- POEMA Online Workshop 2

  Date: October 20, November 26, December 11, 2020.
  Location: Virtual

- CRM/DIMACS Workshop on Mixed-Integer Nonlinear Programming

  Date: October 7-10, 2019
  Location: École Polytechnique de Montréal, Montréal, Canada

Research Visits:

- University of Waterloo, Department of Combinatorics and Optimization

  Period: July 13-22, 2022.
  Host: Henry Wolkowicz.

- Alpen-Adria Universität Klagenfurt, Department of Mathematics

  Period: June 15-18, 2021.
  Host: Angelika Wiegele.

Teaching Experience

- **Linear Algebra I**, *(Responsible Lecturer)*, undergraduate
  - 1st year BA Mechanical and Maritime Engineering, 1st year BA Civil Engineering, TU Delft.
  - Lecturer: 2023-2024, 2024-2025, 2025-2026.
- **Linear Algebra II**, *(Responsible Lecturer)*, undergraduate
  - 1st year BA Mechanical and Maritime Engineering, 1st year BA Civil Engineering, TU Delft.
  - Lecturer: 2023-2024, 2024-2025, 2025-2026.
- **Calculus I**, undergraduate
  - 1st year BA Mechanical and Maritime Engineering, TU Delft.
  - Lecturer: 2023-2024, 2024-2025, 2025-2026.
- **Calculus II**, undergraduate
  - 1st year BA Mechanical and Maritime Engineering, BA Applied Earth Sciences, TU Delft.
  - Lecturer: 2023-2024, 2024-2025, 2025-2026.
- **Analysis I**, undergraduate
  - 1st year BA Aerospace Engineering, TU Delft.
  - Lecturer: 2023-2024.
- **Calculus II for Engineering**, undergraduate
  - Various pre-master programmes, TU Delft.
  - Lecturer: 2023-2024.
- **Advanced Linear Algebra**, undergraduate
  - 2nd year BA Econometrics and Operations Research, Tilburg University.
  - TA: 2022-2023.
- **Linear Algebra**, undergraduate
  - 1st year BA Econometrics and Operations Research, Tilburg University.
  - TA: 2019-2020, 2020-2021, 2021-2022, 2022-2023.
- **Operations Research Methods**, undergraduate
  - 3rd year bachelor Econometrics and Operations Research, Tilburg University.
  - SA: 2017-2018, 2018-2019, TA: 2019-2020, 2020-2021, 2021-2022, 2022-2023.
- **Wiskunde**, undergraduate
  - 1st year BA Business Economics, BA Fiscal Economics, BA Economics and Business Economics, Tilburg University.
  - TA: 2019-2020, 2020-2021, 2021-2022.
- **Combinatorial Optimization**, undergraduate
  - 1st year BA Econometrics and Operations Research, Tilburg University.
  - SA: 2017-2018, 2018-2019.
- **Quantitative Methods in Business and Economics**, undergraduate
  - 2nd year BA Liberal Arts and Sciences, Tilburg University.
  - SA: 2017-2018, 2018-2019.

Awards and Scholarships

Awards:

- Excellent Teacher Award 2022-2023, Course: Advanced Linear Algebra
  Price awarded by Tilburg School of Economics and Management (TiSEM) to educational personel based on total student evaluation scores.
- INFORMS Meritorious Paper Award 2021
  Price awarded by editor-in-chief of INFORMS Journal on Computing for papers that are recognized as "truly superior in their field".
- Jan Brouwer Thesis Award 2019
  National prize for the best Master's thesis of the Netherlands in the field Economics awarded by the Royal Dutch Society of Sciences and Humanities (Dutch: Koninklijke Hollandsche Maatschappij der Wetenschappen).
- Socrates Award 2014
  Nominated for prize for the best Dutch student on secondary education in the class of 2014 based on overall GPA.

Scholarships:

- Contract Extension via Excellence PhD Program, 2022-2023
  Offered by CentER Graduate School.
- Koopmans Scholarship 2018-2019
  Offered by CentER Graduate School.

Skills

Computer: Python (advanced), Matlab (advanced), Julia (advanced), Microsoft Excel (advanced), Microsoft Office (advanced), Aimms (intermediate), R (intermediate), Arena (intermediate), Stata (intermediate), SQL (intermediate).

Language: Dutch (fluent), English (fluent), German (intermediate).

Other activities

- Participant in University Teaching Qualification (UTQ/BKO) track at TU Delft. Expected end date: January 13, 2026.
- Participant in Integrated Healthcare Timetabling Competition 2024, in collaboration with Cindy Pistorius.
- Member of Socrates Honours Society, 2014-present
  Society consisting of top 10% students graduated secondary education
- Giving tutorships in Mathematics, Physics and Chemistry, 2012-2020
  Tutor in Physics and Chemistry to secondary education students and tutor in Mathematics to secondary education students and undergraduate university students.

References

Prof. dr. ir. **Renata Sotirov**
Department of Econometrics and Operations Research, Tilburg University.
E-mail: r.sotirov@tilburguniversity.edu

Prof. dr. **Dion Gijswijt**
Delft Institute of Applied Mathematics, TU Delft.
E-mail: d.c.gijswijt@tudelft.nl

Prof. dr. **Angelika Wiegele**
Department of Mathematics, Alpen-Adria Universität Klagenfurt.
E-mail: angelika.wiegele@aau.at

Dr. ir. **Theresia van Essen**
Delft Institute of Applied Mathematics, TU Delft.
E-mail: j.t.vanessen@tudelft.nl