

Jasper van Doornmalen

Curriculum Vitae

Personal Information

Official name dr.ir. Michaël Johannes van Doornmalen
Nationality Dutch (Nederlander)
Residency Chile (temporal)
Date of birth May 18, 1995
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Education

- 2020–2024 **Doctor of Philosophy (PhD, dr.)**, *Eindhoven University of Technology*
Advised by Christopher Hojny and Frits Spieksma
Doctoral dissertation: [Propagation Algorithms for Handling Symmetries of Mathematical Programs](#), [Phd Thesis 1 (Research TU/e / Graduation TU/e), Mathematics and Computer Science]. Eindhoven University of Technology ISBN: 978-90-386-6041-7.
- 2016–2018 **Master of Science (MSc, ir.) on Industrial and Applied Mathematics**, *Eindhoven University of Technology*
Advised by Cor Hurkens
Cum laude
Thesis: [Mixed integer programming methods applied to practical scheduling problems: Exam scheduling optimization](#)
- 2013–2016 **Bachelor of Science (BSc, ing.) on Industrial and Applied Mathematics**, *Eindhoven University of Technology*
Advised by Jan Draisma
Thesis: [Determinantal representation of polynomials](#)
- 2013–2014 **Industrial and Applied Mathematics (Propedeuse)**, *Eindhoven University of Technology*
Propedeuse; **Cum laude**
- 2007–2013 **Voorbereidend Wetenschappelijk Onderwijs**, *Cambium College*, Zaltbommel
(Pre-university education, high school equivalent, level NLQF 4+ / EQF 4)
Average grade over graded exam components: 7.8 / 10
Final project: *Doorstroom in het schoolgebouw – Hoe functioneert de doorstroom in het Cambium College op de locatie Buys Ballot?* (Wiskunde B, graded 9 / 10)
(EN: *Studying throughput in the school building* (Mathematics, graded 9 / 10))
Rewarded with the Ineke Marree Prize 2012–2013 (second place)

Work Experience

- 2025–present **Postdoctoral Investigator**, *Pontificia Universidad Católica de Chile*, Santiago
Funded by the FONDECYT Postdoctorado grant no.3250132 starting April 2025
- 2024–2025 **Operations Reserach Investigator**, *Alicanto Labs SpA*, Santiago, (part-time 6hr/wk)
Researching mathematical optimization methods for optimizing problems in the mining industry
- 2024–2025 **Postdoctoral Investigator**, *Pontificia Universidad Católica de Chile, Instituto de Ingeniería Matemática y Computacional*, Santiago, (part-time 0.5FTE)
Contracted by Pontificia Universidad Católica de Chile from September 2024 to April 2025
- 2024–2025 **Operations Research Investigator**, *Alicanto Labs SpA*, Santiago, (part-time 0.5FTE)
Researching mathematical optimization methods for optimizing problems in the mining industry
- 2023 sep–dec **Research Visit**, [Center for Mathematical Modeling](#), *Universidad de Chile*, Santiago
Collaborating with the hosting researcher José Verschae

- 2020–2024 **PhD Student**, *Eindhoven University of Technology*, Eindhoven
 Advised by Christopher Hojny and Frits Spieksma
 Doctoral dissertation: *Propagation Algorithms for Handling Symmetries of Mathematical Programs*, [Phd Thesis 1 (Research TU/e / Graduation TU/e), Mathematics and Computer Science]. Eindhoven University of Technology ISBN: 978-90-386-6041-7.
- 2018–2020 **Operations Research Analyst**, *Advitiae Groep B.V.*, Eindhoven
 Developing and embedding mathematical optimization tools in software for university and highschool timetabling, with a focus on examination timetabling and detecting conflicts
- 2017–2018 **Internship**, *Sioux Lime*, Eindhoven
 Optimizing a pick-and-place machine optimizing circuit board component placements
- 2017 aug–nov **Tutor for Calculus C**, *Eindhoven University of Technology*, Eindhoven
 Assisting first year Applied Physics students with the Calculus course
- 2017 feb–may **Tutor for Mathematical Modeling**, *Eindhoven University of Technology*, Eindhoven
 Assisting second year students of various disciplines with the modeling course
- 2016 aug–nov **Tutor for Calculus A**, *Eindhoven University of Technology*, Eindhoven
 Assisting first year Industrial Design students with the Calculus course
- 2011–2017 **Various side jobs**

Publications, Preprints and Outreach

- [1] J. van Doornmalen and C. Hojny, “A unified framework for symmetry handling,” *Mathematical Programming*, vol. 212, no. 1–2, pp. 217–271, Jun. 2024. [Online]. Available: <http://dx.doi.org/10.1007/s10107-024-02102-2>
- [2] —, “Efficient propagation techniques for handling cyclic symmetries in binary programs,” *INFORMS Journal on Computing*, jan 2024. [Online]. Available: <http://dx.doi.org/10.1287/ijoc.2022.0060>
- [3] J. van Doornmalen, C. Hojny, R. Lambers, and F. C. Spieksma, “Integer programming models for round robin tournaments,” *European Journal of Operational Research*, vol. 310, no. 1, pp. 24–33, oct 2023. [Online]. Available: <https://doi.org/10.1016%2Fj.ejor.2023.02.017>
- [4] K. Bestuzheva, M. Besançon, W.-K. Chen, A. Chmiela, T. Donkiewicz, J. van Doornmalen, L. Eifler, O. Gaul, G. Gamrath, A. Gleixner, L. Gottwald, C. Graczyk, K. Halbig, A. Hoen, C. Hojny, R. van der Hulst, T. Koch, M. Lübbecke, S. J. Maher, F. Matter, E. Mühmer, B. Müller, M. E. Pfetsch, D. Rehfeldt, S. Schlein, F. Schlösser, F. Serrano, Y. Shinano, B. Sofranac, M. Turner, S. Vigerske, F. Wegscheider, P. Wellner, D. Weninger, and J. Witzig, “Enabling research through the SCIP optimization suite 8.0,” *ACM Transactions on Mathematical Software*, vol. 49, no. 2, pp. 1–21, jun 2023. [Online]. Available: <https://doi.org/10.1145%2F3585516>
- [5] J. van Doornmalen, C. Hojny, R. Lambers, and F. Spieksma, “Integer programming formulations for compact single round robin tournaments,” in *Proceedings of the 13th International Conference on the Practice and Theory of Automated Timetabling-PATAT 2021*, vol. 3, 2022, pp. 208–210. [Online]. Available: <https://www.patatconference.org/patat2022/proceedings/>
- [6] K. Bestuzheva, M. Besançon, W.-K. Chen, A. Chmiela, T. Donkiewicz, J. van Doornmalen, L. Eifler, O. Gaul, G. Gamrath, A. Gleixner, L. Gottwald, C. Graczyk, K. Halbig, A. Hoen, C. Hojny, R. van der Hulst, T. Koch, M. Lübbecke, S. J. Maher, F. Matter, E. Mühmer, B. Müller, M. E. Pfetsch, D. Rehfeldt, S. Schlein, F. Schlösser, F. Serrano, Y. Shinano, B. Sofranac, M. Turner, S. Vigerske, F. Wegscheider, P. Wellner, D. Weninger, and J. Witzig, “The SCIP Optimization Suite 8.0,” Optimization Online, Technical Report, December 2021. [Online]. Available: http://www.optimization-online.org/DB_HTML/2021/12/8728.html
- [7] J. van Doornmalen, C. Hojny, R. Lambers, and F. Spieksma, “A hybrid model to find schedules for double round robin tournaments with side constraints,” in *Proceedings of the 13th International Conference on the Practice and Theory of Automated Timetabling-PATAT 2021*, vol. 2, 2021, pp. 412–419. [Online]. Available: <https://www.patatconference.org/patat2022/proceedings/>
- [8] A. Boralevi, J. van Doornmalen, J. Draisma, M. E. Hochstenbach, and B. Plestenjak, “Uniform determinantal representations,” *SIAM Journal on Applied Algebra and Geometry*, vol. 1, no. 1, pp. 415–441, jan 2017. [Online]. Available: <https://doi.org/10.1137%2F16m1085656>

- [9] F. Spieksma, “De ideale indeling van de tweede kamer: lam of leeuw?” *Wetenschap.nu*, 2021, A short news article for a general audience on applying mathematical optimization for finding a good seat arrangement in the Dutch Tweede Kamer (senate), based on the 2021 election results. [Online]. Available: <https://wetenschap.nu/de-ideale-indeling-van-de-tweede-kamer-lam-of-leeuw/>

Awards

- 2021 **Excellent Course Evaluation 2020 / 2021**, *Eindhoven University of Technology*
Awarded for the course *Integer Programming* (2MMD40), as teaching assistant.

Talks

- 2025, mar **Presentation**, *Eurandom workshop on Symmetry Handling for Satisfiability and Optimization*, Eindhoven University of Technology, Eindhoven
Presented “Symmetry Handling in Mathematical Programming Solving”
- 2025, feb **Presentation**, *Meet the expert event at Ghent University*, Faculty of Economics and Business Administration, Ghent University, Ghent
Presented “Symmetry Handling in Mathematical Programming Solving” (invited)
- 2025, jan **Participant**, *Santiago Summer Workshop on Combinatorial Optimization (SUMCOPT) 2025*, Pontificia Universidad Católica de Chile, Santiago
Presented “Propagation Algorithms for Handling Symmetries of Mathematical Programs”
- 2024, dec **Participant**, *Workshop en Optimización y Algoritmos (WOA) 2024*, Reñaca
Presented “Propagation Algorithms for Handling Symmetries of Mathematical Programs”
- 2024, nov **Presentation**, *Seminario Instituto de Ingeniería Matemática y Computacional*, Pontificia Universidad Católica de Chile, Santiago
Presented “Propagation Algorithms for Handling Symmetries of Mathematical Programs” (invited)
- 2023, oct **Presentation**, *Algorithms, Combinatorics, Game Theory and Optimization Seminar (AGCO)*, Universidad de Chile, Santiago
Presented “A Unified Framework for Symmetry Handling” (invited)
- 2023, apr **Presentation**, *SAP-FAU-SCIP Workshop*, Berlin
Presented “A Unified Framework for Symmetry Handling” (invited)
- 2023, apr **Participant**, *DIAMANT*, Utrecht
Presented “A Unified Framework for Symmetry Handling”
- 2023, apr **Participant**, *Nederlands Mathematisch Congres (NMC)*, Utrecht
Poster presentation “A Unified Framework for Symmetry Handling”
- 2023, jan **Participant**, *48th conference on the Mathematics of Operations Research (LNMB)*, Soesterberg
Presented “A Unified Framework for Symmetry Handling”
- 2022, nov **Participant**, *Let's SCIP it! A workshop to celebrate 20 years of Solving Constraint Integer Programs*, Zuse Institute Berlin
Presented “Symmetry handling in binary programs through propagation” (invited)
- 2022, sep **Participant**, *25th Workshop on Future Research in Combinatorial Optimization (FRICO)*, Universität Bonn, Bonn
Presented “Integer programming formulations for compact single round robin tournaments”
- 2022, aug **Participant**, *13th International Conference on the Practice and Theory of Automated Timetabling (PATAT)*, KU Leuven
Presented “Integer programming formulations for compact single round robin tournaments”
- 2022, jul **Participant**, *EURO*, Aalto University Espoo
Presented “Symmetry handling in binary programs through propagation” (invited)
- 2022, jun **Participant**, *12rd Conference on Integer Programming and Combinatorial Optimization (IPCO)*, Eindhoven University of Technology
Poster presentation “Efficient propagation techniques for handling cyclic symmetries in binary programs”
- 2022, may **Presentation**, *Dutch Seminar on Optimization*, Online
Presented “Symmetry handling in binary programs through propagation” (video available)

- 2022, mar **Presentation**, *SCIP Developers Meeting*, Online
Presented “Symmetry handling in binary programs through propagation” (invited)
- 2021, nov **Participant**, *DIAMANT*, Utrecht
Presented “Symmetry handling in binary programs through propagation”
- 2021, sep **Participant**, *24th Workshop on Future Research in Combinatorial Optimization (FRICO)*, Technische Universität München, Munich
Presented “Symmetry handling in binary programs through propagation”

Service

- 2023, aug **Main Organizer**, *26th Workshop on Future Research in Combinatorial Optimization (FRICO)*, Eindhoven University of Technology
- 2021–2023 **Co-organizer**, *Combinatorial Optimization Group Seminar*, Eindhoven University of Technology
Assisting professor Aida Abiad-Monge in organizing the Combinatorial Optimization Group lunch seminar. The seminar is hosted (roughly) every second week. My tasks comprised of contacting external invited speakers, inviting local speakers, managing room reservations, managing catering reservations, setting up online streaming, and providing assistance to the speaker.
- 2020–2025 **Member**, *SCIP solver development team*
Implementing and maintaining symmetry-related plug-ins in the open-source SCIP constraint integer programming solver.

Reviewing

- 2025 **Reviewer**, *IPCO 2025*
- 2024 **Reviewer**, *LATIN 2024*
- 2023 **Reviewer**, *LAGOS 2023*
- 2022 **Reviewer**, *ISAAC 2022*
- 2021 **Reviewer**, *LAGOS 2021*

Student supervision

- 2022–2023 **Master Thesis Supervision**, *Eindhoven University of Technology*
Iris Verwegen, *Strengthening the Matching Formulation of a Single Round Robin Integer Program*

Additional qualifications

- 2020, sep–nov **Student**, *Networks and Semidefinite Programming course*, Online
Grade: 9/10

Further attendance

- 2025, feb **Research Visit**, Ghent
Visited David Van Bulck for research collaboration on decomposition methods applied to sports scheduling problems at the Faculty of Economics and Business Administration, Department of Business Informatics and Operations Management (EB24) of UGhent.
- 2023, apr **Participant**, *DIAMANT*, Utrecht
- 2023, jul **Participant**, *Seminar Visions of Scheduling*, Maastricht University
- 2022, nov **Participant**, *Symposium Hiking in the Scheduling Landscape*, Maastricht University
- 2022, nov **Participant**, *DIAMANT*, Utrecht
- 2022, jun **Participant**, *Integer Programming and Combinatorial Optimization (IPCO), Summer School*, Eindhoven University of Technology
- 2022, apr **Participant**, *Dutch Day of Combinatorics*, Eindhoven
- 2022, apr **Participant**, *DIAMANT*, Utrecht
- 2022, apr **Participant**, *Nederlands Mathematisch Congres (NMC)*, Utrecht
- 2022, jan **Participant**, *47th conference on the Mathematics of Operations Research (LNMB)*, Soesterberg

- 2021, may **Participant**, *Mixed Integer Programming Workshop 2021*, Online
- 2021, may **Participant**, *Integer Programming and Combinatorial Optimization (IPCO)*, London School of Economics (Online)
- 2021, may **Participant**, *Integer Programming and Combinatorial Optimization (IPCO), Summer School*, London School of Economics (Online)
- 2021, apr **Participant**, *DIAMANT*, Online
- 2021, jan **Participant**, *46th conference on the Mathematics of Operations Research (LNMB)*, Online
- 2020, sep **Participant**, *CO@Work*, Online
- 2020, jan **Participant**, *45th conference on the Mathematics of Operations Research (LNMB)*, Lunteren, industry day only
- 2019, jul **Participant**, *ACP Summer School*, Vienna
- 2018, nov **Training**, *Gurobi Training Event*, Brussels

Teaching Activities

- 2024, apr–jun **Integer Programming (2MMD40)**, *Eindhoven University of Technology*
Teaching assistant. Master course for Industrial and Applied Mathematics students.
- 2024, apr–jun **Mathematics 2 (2DD50)**, *Eindhoven University of Technology*
Teaching assistant. Bachelor course for Industrial Engineering students.
- 2023, apr–jun **Integer Programming (2MMD40)**, *Eindhoven University of Technology*
Teaching assistant and replacement lecturer. Master course for Industrial and Applied Mathematics students.
- 2022, nov–jan **Mathematics 2 (2DD50)**, *Eindhoven University of Technology*
Teaching assistant. Bachelor course for Industrial Engineering students.
- 2022, apr–jun **Integer Programming (2MMD40)**, *Eindhoven University of Technology*
Teaching assistant. Master course for Industrial and Applied Mathematics students.
- 2021, nov–jan **Mathematics 2 (2DD50)**, *Eindhoven University of Technology*
Teaching assistant. Bachelor course for Industrial Engineering students.
- 2021, apr–jun **Integer Programming (2MMD40)**, *Eindhoven University of Technology*
Rewarded with an excellent course evaluation.
Teaching assistant. Master course for Industrial and Applied Mathematics students.
- 2020, nov–jan **Mathematics 2 (2DD50)**, *Eindhoven University of Technology*
Teaching assistant. Bachelor course for Industrial Engineering students.

Skills

- Languages Dutch (native), English (professional), German (basic), Spanish (basic)
- Programming and software
- Python *Default resorting language for experiments*
 - C (C99) *Various contributions to SCIP*
 - C# *Software contributions to Advitae*
 - C++ *For software contributions to Alicanto Labs SpA*
 - JAVA, JavaScript (TypeScript), PHP *Basic proficiencies*
 - Mathematica, MatLab, PariGP, SageMath, Julia, R *Basic proficiencies*
 - Linux (Ubuntu, Debian), Windows Server, Databases *Basic system administration proficiencies*
- Skills Scrum, Agile