

# Daniel Mock

*PhD Student in Theoretical Computer Science*

★ 15 December 1995

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## Profile

I am a PhD student at the Theoretical Computer Science group at RWTH Aachen University, supervised by Peter Rossmanith. My research focuses on parameterized algorithms and graph theory, especially on sparsity in graphs and algorithmic applications of and to logic.

## Education

2020–ongoing **PhD in Theoretical Computer Science**, *RWTH Aachen University*

Title: *Algorithms on Structurally Sparse Graphs*,

Supervisor: Peter Rossmanith,

Supported by the Deutsche Forschungsgemeinschaft (DFG).

2017–2020 **Master in Computer Science**, *RWTH Aachen University*, Grade: 1.3

Thesis: *Algorithms Based on Weak Coloring Numbers*,

Supervisors: Jan Dreier and Peter Rossmanith,

Supported by the Deutschlandstipendium.

Fall 2017 **Erasmus Exchange program**, *École polytechnique fédérale de Lausanne (EPFL)*, Lausanne (Switzerland)

2014–2017 **Bachelor in Computer Science**, *RWTH Aachen University*, Grade: 1.2

Thesis: *Algorithms Computing the Fixing Number of Planar Graphs*,

Supervisors: Pascal Schweitzer and Sandra Kiefer.

## Publications

TOCS 2025 **Online Unbounded Knapsack**, with Hans-Joachim Böckenhauer, Matthias Gehnen, Juraj Hromkovic, Ralf Klasing, Dennis Komm, Henri Lotze, Peter Rossmanith and Moritz Stocker

<https://doi.org/10.1007/s00224-025-10215-0>

MFCS 2025 **Solving Partial Dominating Set and Related Problems Using Twin-Width**, with Jakub Balabán and Peter Rossmanith

<https://doi.org/10.4230/LIPIcs.MFCS.2025.13>

SWAT 2024 **Solving a Family Of Multivariate Optimization and Decision Problems on Classes of Bounded Expansion**, with Peter Rossmanith

<https://doi.org/10.4230/LIPIcs.SWAT.2024.35>

COCOON 2023 **Delaying Decisions and Reservation Costs**, with Elisabet Burjons, Fabian Frei, Matthias Gehnen, Henri Lotze and Peter Rossmanith:

[https://doi.org/10.1007/978-3-031-49190-0\\_27](https://doi.org/10.1007/978-3-031-49190-0_27)

- ESA 2023 **Evaluating Restricted First-Order Counting Properties on Nowhere Dense Classes and Beyond**, with Jan Dreier and Peter Rossmanith  
<https://doi.org/10.4230/LIPIcs.ESA.2023.43>
- MFCS 2023 **The Online Simple Knapsack Problem with Reservation and Removability**, with Elisabet Burjons, Matthias Gehnen, Henri Lotze and Peter Rossmanith:  
<https://doi.org/10.4230/LIPIcs.MFCS.2023.29>
- COCOON 2021 **The Secretary Problem with Reservation Costs**, with Elisabet Burjons, Matthias Gehnen, Henri Lotze and Peter Rossmanith  
[https://doi.org/10.1007/978-3-030-89543-3\\_46](https://doi.org/10.1007/978-3-030-89543-3_46)

**In submission**

**Testing H-freeness on sparse graphs, the case of bounded expansion**, with Samuel Humeau, Mamadou Kanté, Timothé Picavet and Alexandre Vigny

## Teaching

**Lectures as assistant**

- Summer 2024 **Datenstrukturen and Algorithmen**, *Data Structures and Algorithms*, 2nd Bachelor semester
- Summer 2023 **Formale Systeme, Automaten und Prozesse**, *Automata Theory*, 2nd Bachelor semester
- Winter 2022 **Analysis of Algorithms**, *also as guest lecturer*, advanced lecture
- Winter 2021 **Parameterized Algorithms**, Master lecture
- Summer 2021 **Formale Systeme, Automaten und Prozesse**, *Automata Theory*, 2nd Bachelor semester
- Winter 2020 **Analysis of Algorithms**, Master lecture
- Summer 2020 **Formale Systeme, Automaten und Prozesse**, *Automata Theory*, 2nd Bachelor semester

**Seminars**

- 2023 Computers and Ethics
- 2022 Dynamic Algorithms
- 2022 Certifying Algorithms
- 2021 Proofs from the Book
- 2021 Helping Donald Knuth
- 2020 Computers and Music

**Labs**

- 2023–2025 Competitive Programming

**Supervision**

Master students: Niklas Berndt, Lars Göttgens  
 and 6 Bachelor students.

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## Participation in Invitation-based Scientific Events

### Research Visits

- Sep 2024 **LIMOS**, *University Clermont-Auvergne*, France  
Research topic: Property Testing on Sparse Graphs,  
Hosts: Alexandre Vigny and Mamadou Kante,  
Supported by the Highlights Extended Stay Support Scheme Travel Grant.
- Jan 2024 **Algorithms and Didactics**, *ETH Zürich*, Switzerland  
Research topic: Online Algorithms with Untrusted Predications,  
Host: Dennis Komm  
Supported by the IDEA League Travel Grant.
- Feb–Mar 2023 **Algorithms and Didactics**, *ETH Zürich*, Switzerland  
Research topic: Online Algorithms,  
Host: Dennis Komm.

### Workshops

- Nov 2025 LogAlg Workshop, TU Wien, Austria
- Jul 2025 Mountain Research Workshop, Schruns, Austria
- Jul 2024 Mountain Research Workshop, Gashurn, Austria
- Nov 2023 LogAlg Workshop, University Warsaw, Poland

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## Other Professional Activities

### Reviewing Activities

- Conferences Reviewer of SOFSEM (2025, 2024), MFCS (2024, 2021), IWOCA 2023, ISAAC 2025, CMCT 2023, COCOON (2023, 2021)
- Journals Reviewer of Information and Computation

### Competitive Programming

Supervising lab courses about competitive programming and organizing the local student meet-up.

Hosting the local contest sites for the Wintercontest and GCPC (German Collegiate Programming Contest) at RWTH Aachen.

Co-organizing a competitive programming competition for beginners at RWTH Aachen (70+ Teams).

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## Languages

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|-------------------|--------------------------|
| ◦ German: native  | ◦ Polish: fluent         |
| ◦ English: fluent | ◦ French: basic (fading) |