

Martin Schirneck

Short CV

✉ martin.schirneck@univie.ac.at
🌐 hpi.de/friedrich/people/martin-schirneck

Research Interests

My interests cover a broad range of topics in mathematics and computer science. I have been working on the following subjects.

- Fault-tolerant data structures
- Enumeration algorithms and complexity
- Evolutionary computation
- Parameterized complexity
- Time series analysis
- Algorithmic learning theory

Positions

2022 – today

Postdoctoral Researcher, University of Vienna, Austria,
in the group of Monika Henzinger.

Education

2015 – 2022

2022

Ph.D. in Computer Science, Hasso Plattner Institute, Potsdam, Germany,
Supervisor: Tobias Friedrich
Grade: summa cum laude (highest distinction)
Thesis: *Enumeration Algorithms in Data Profiling*
Defense: June 16 2022

2012 – 2015

2015

M.Sc. in Computer Science, Friedrich Schiller University, Jena, Germany,
Grade: 1.0 (top of class)
Thesis: *On Restrictions in Computational Language Learning*
2016 Dean's Prize for Best Thesis

2009 – 2012

2012

B.Sc. in Computer Science, Friedrich Schiller University, Jena, Germany,
Grade: 1.5 (very good)
Thesis: *Betrachtungen über ein distanzbasiertes Klassifikationsverfahren*
(About a Distance-Based Classification Method)

Selected Publications

The author lists are sorted alphabetically.

- Journal articles
- T. Friedrich, T. Kötzing, A. Radhakrishnan, L. Schiller, **M. Schirneck**, G. Tennigkeit, S. Wietheger *Crossover for Cardinality Constrained Optimization*, ACM Transactions on Evolutionary Learning and Optimization, 2:1–32, 2023
- T. Bläsius, T. Friedrich, **M. Schirneck**
The Complexity of Dependency Detection and Discovery in Relational Databases, Theoretical Computer Science, 900:79–96, 2022
- T. Bläsius, T. Friedrich, J. Lischeid, K. Meeks, **M. Schirneck**
Efficiently Enumerating Hitting Sets of Hypergraphs Arising in Data Profiling, Journal of Computer and System Sciences, 124:192–213, 2022

- J. Birnick, T. Bläsius, T. Friedrich, F. Naumann, T. Papenbrock, **M. Schirneck**
Hitting Set Enumeration with Partial Information for Unique Column Combination Discovery, Proceedings of the VLDB Endowment, 13:2270–2283, 2020
- T. Friedrich, T. Kötzing, G. Lagodzinski, F. Neumann, **M. Schirneck**
Analysis of the (1+1) EA on Subclasses of Linear Functions under Uniform and Linear Constraints, Theoretical Computer Science, 832:3–19, 2020
- Conference proceedings D. Bilò, S. Chechik, K. Choudhary, S. Cohen, T. Friedrich, S. Krogmann, **M. Schirneck**
Approximate Distance Sensitivity Oracles in Subquadratic Space, STOC, 1396–1409, 2023
- D. Bilò, K. Choudhary, S. Cohen, T. Friedrich, S. Krogmann, **M. Schirneck**
Fault-Tolerant ST-Diameter Oracles, ICALP, 24:1–24:20, 2023
- K. Casel, T. Friedrich, **M. Schirneck**, S. Wietheger
Fair Correlation Clustering in Forests, FORC, 9:1-9:12, 2023
- T. Friedrich, T. Kötzing, A. Radhakrishnan, L. Schiller, **M. Schirneck**, G. Tennigkeit, S. Wietheger
Crossover for Cardinality Constrained Optimization, GECCO, 1399–1407, 2022, **Best Paper Award (Theory Track)**
- D. Bilò, K. Choudhary, S. Cohen, T. Friedrich, **M. Schirneck**
Deterministic Sensitivity Oracles for Diameter, Eccentricities and All Pairs Distances, ICALP, 68:1–68:19, 2022
- D. Bilò, K. Casel, K. Choudhary, S. Cohen, T. Friedrich, G. Lagodzinski, **M. Schirneck**, S. Wietheger
Fixed-Parameter Sensitivity Oracles, ITCS, 23:1–23:18, 2022
- D. Bilò, S. Cohen, T. Friedrich, **M. Schirneck**
Near-Optimal Deterministic Single-Source Distance Sensitivity Oracles, ESA, 18:1–18:17, 2021
- T. Bläsius, T. Friedrich, **M. Schirneck**
The Minimization of Random Hypergraphs, ESA, 80:1–80:15, 2020
- T. Kötzing, **M. Schirneck**, K. Seidel
Normal Forms in Semantic Language Identification, ALT, 493–516, 2017
- T. Bläsius, T. Friedrich, **M. Schirneck**
The Parameterized Complexity of Dependency Detection in Relational Databases, IPEC, 6:1–6:13, 2016
- T. Kötzing, **M. Schirneck**
Towards an Atlas of Computational Learning Theory, STACS, 47:1–47:13, 2016

All publications A comprehensive list of my publications can be found on [my publication page](#) or [DBLP](#).

Invited Talks

- 2020 Technical University Berlin,
Minimal Hitting Set Extension is $W[3]$ -complete
- 2019 Humboldt University Berlin,
Engineering Hitting Set Enumeration Algorithms
- 2018 Dagstuhl Seminar on Algorithmic Enumeration,
Efficiently Enumerating Hitting Sets of Hypergraphs Arising in Data Profiling
- 2018 University of Glasgow,
On the Enumeration of Minimal Hitting Sets in Lexicographical Order
- 2016 Friedrich Schiller University Jena,
Grenzen Algorithmischen Lernens (Limits of Algorithmic Learning)

Teaching (University of Vienna)

As Supervisor

- Bachelor theses
- Marc Dollmann, *Graph Clustering: A Comparison of Louvain and Leiden*, Winter 2022/23

As Lecturer

- Lectures
- Mathematical Foundations of Computer Science
Summer 2023 & Winter 2023/24
 - Advanced Algorithms
Winter 2022/23

As Teaching Assistant

- Exercises
- Mathematical Foundations of Computer Science I
Winter 2022/23, Summer 2023 & Winter 2023/24

Teaching (Hasso Plattner Institute)

As Co-Advisor

- Master theses
- Simon Wietheger, *Fair Correlation Clustering in Forests*, Winter 2022/23
 - Benjamin Feldmann, *Distributed Unique Column Combinations Discovery*, Winter 2019/20
 - Philipp Fischbeck, *On the Effectiveness of Data Reduction for Covering Problems in Real-World Transit Networks*, Winter 2017/18
- Bachelor theses
- Linus Heinzl, *Analysis of the Parameter Configuration of the Ramer-Douglas-Peucker Algorithm for Time Series Compression*, Summer 2019
 - Felix Mujkanovic, *Explaining the Predictions of Any Time Series Classifier*, Summer 2019
 - Julius Lischeid, *Lexicographic Enumeration of Hitting Sets in Hypergraphs*, Summer 2018
- Project seminars & Bachelor projects
- Theory of Crossover-Based Optimization
Winter 2021/22
 - Fault Tolerant Algorithms
Summer 2021
 - Lossy Compression of Time Series Data
Academic Year 2018/19
 - Distributed Evolutionary Search
Winter 2016/17

As Guest Lecturer

- MOOC
 - o Data Profiling (Lecture: Discovery of Unique Column Combinations via Hitting Sets), Winter 2020/21

As Teaching Assistant

- Seminars
 - o Theorie der Künstlichen Intelligenz (Theory of Artificial Intelligence) Winter 2020/21 & Winter 2019/20
 - o Wahrscheinlichkeitstheorie (Probability Theory) Summer 2020, Summer 2018 & Summer 2017
 - o Algorithmic Hits of the 80s and 90s Winter 2016/17
 - o Algorithmic Gems Summer 2016
- Lectures
 - o Randomisierte Algorithmen II (Randomized Algorithms II) Winter 2016/17
 - o Randomisierte Algorithmen (Randomized Algorithms) Summer 2016

Reviewing

- Conferences
 - European Symposium on Algorithms (ESA), 2023
 - Intern. Colloquium on Automata, Languages and Programming (ICALP), 2023 & 2020
 - Symposium on Discrete Algorithms (SODA), 2023
 - Symposium on Theoretical Aspects of Computer Science (STACS), 2023 & 2021
 - Workshop on Graph-Theoretic Concepts in Computer Science (WG), 2023
- Journals
 - Theoretical Computer Science, 2023

Third Party Funding (Travel Grants)

WEPA 2019	National Institute of Informatics Japan (NII)	1800€	(\$2000)
ADFOCS 2018	Max Planck Institute for Informatics (MPII)	300€	(\$350)
FOGA 2017	Association for Computing Machinery (ACM)	350€	(\$400)
GECCO 2016	German Academic Exchange Service (DAAD)	1900€	(\$2150)
GECCO 2016	Association for Computing Machinery (ACM)	450€	(\$500)