

### Address

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### Areas of Specialization

Machine learning for graphs (graph neural networks, graph transformers, equivariant neural networks, graph kernels) from a theoretical as well as applied viewpoint, and its application in combinatorial optimization and the life and natural sciences.

### Education

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|-----------------|---|
| 06/2015–12/2019 | PhD in Computer Science, TU Dortmund University, Germany, final grade: 1.0 with highest distinction (best possible grade) |
| 01/2018–04/2018 | Research stay at Stanford, Infolab (Jure Leskovec)  |
| 04/2012–05/2015 | MSc in Computer Science, TU Dortmund University, Germany, final grade: 1.0 (best possible grade)                          |
| 10/2008–12/2011 | BSc in Computer Science, TU Dortmund University, Germany  |
| 08/1998–06/2007 | University Entrance Qualification, Erzbischöfliches St.-Angela-Gymnasium, Wipperfürth                                     |

### Employment

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|-----------------|--|
| 06/2022–present | Tenure-track assistant professor (“junior professorship” (W1 → W2)) at RWTH Aachen, Department of Computer Science   |
| 06/2021–06/2022 | Postdoctoral researcher at McGill University, Department of Computer Science, in the group of Siamak Ravanbakhsh (DAAD IFI scholarship) and member of the Mila – Quebec AI Institute, Montréal   |
| 03/2020–05/2021 | Postdoctoral researcher in the group of Andrea Lodi, Department of Mathematical and Industrial Engineering, Polytechnique Montréal   |
| 06/2015–12/2019 | PhD student and research associate, TU Dortmund University, Department of Computer Science, within the DFG Collaborative Research Center SFB 876, advised by Petra Mutzel (now University of Bonn) and Kristian Kersting (Technical University of Darmstadt) |
| 08/2007–04/2008 | Mandatory civil service (German Red Cross)   |

### Publications

#### Conference Papers

- [1] Luis Müller, Daniel Kusuma, Blai Bonet, Christopher Morris. *Towards Principled Graph Transformers*, Neural Information Processing Systems (NeurIPS), 2024.

- [2] Chendi Qian, Andrei Manolache, Christopher Morris, Mathias Niepert. *Probabilistic Graph Rewiring via Virtual Nodes*, Neural Information Processing Systems (NeurIPS), 2024.
- [3] Christopher Morris. *Towards a Theory of Machine Learning on Graphs and its Applications in Combinatorial Optimization*, International Joint Conference on Artificial Intelligence (IJCAI), 2024 (invited paper, early-career track).
- [4] Billy Joe Franks, Christopher Morris, Ameya Velingker, Floris Geerts. *Weisfeiler–Leman at the margin: When more expressivity matters*, International Conference on Machine Learning (ICML), 2024.
- [5] Luis Müller, Christopher Morris. *Aligning Transformers with Weisfeiler-Leman*, International Conference on Machine Learning (ICML), 2024.
- [6] Christopher Morris, Nadav Dym, Haggai Maron, Ismail Ilkan Ceylan, Fabrizio Frasca, Ron Levie, Derek Lim, Michael M. Bronstein, Martin Grohe, Stefanie Jegelka. *Future Directions in the Theory of Graph Machine Learning*, International Conference on Machine Learning (ICML), 2024.
- [7] Chendi Qian, Didier Chételat, Christopher Morris. *Exploring the Power of Graph Neural Networks in Solving Linear Optimization Problems*, International Conference on Artificial Intelligence and Statistics (AISTATS), 2024.
- [8] Chendi Qian, Andrei Manolache, Kareem Ahmed, Zhe Zeng, Guy Van den Broeck, Mathias Niepert, Christopher Morris. *Probabilistically Rewired Message-Passing Neural Networks*, International Conference on Learning Representations (ICLR), 2024.
- [9] Dominique Beaini, Shenyang Huang, Joao Alex Cunha, Zhiyi Li, Gabriela Moisesescu-Pareja, Oleksandr Dymov, Samuel Maddrell-Mander, Callum McLean, Ali Parviz, Luis Müller, Jama Hussein Mohamud, Frederik Wenkel, Michael Craig, Michał Koziarski, Jiarui Lu, Zhaocheng Zhu, Cristian Gabellini, Guillaume Rabusseau, Reihaneh Rabbany, Jian Tang, Christopher Morris, Mirco Ravanelli, Guy Wolf, Prudencio Tossou, Hadrien Mary, Błażej Banaszkewski, Chad Martin, Dominic Masters. *Towards Foundational Models for Molecular Learning on Large-Scale Multi-Task Datasets*, International Conference on Learning Representations (ICLR), 2024.
- [10] Jan Böker, Ron Levie, Ningyuan Teresa Huang, Soledad Villar, Christopher Morris. *Fine-grained Expressivity of Graph Neural Networks*, Neural Information Processing Systems (NeurIPS), 2023.
- [11] Christopher Morris, Floris Geerts, Jan Tönshoff, Martin Grohe. *WL meet VC*, International Conference on Machine Learning (ICML), 2023.
- [12] Pablo Barcelo, Mikhail Galkin, Christopher Morris, Miguel Romero Orth.<sup>†</sup> *Weisfeiler and Leman Go Relational*, Learning on Graphs Conference (LoG), 2022.
- [13] Chendi Qian, Gaurav Rattan, Floris Geerts, Christopher Morris, Mathias Niepert. *Ordered Subgraph Aggregation Networks*, Neural Information Processing Systems (NeurIPS), 2022.
- [14] Christopher Morris, Gaurav Rattan, Sandra Kiefer, Siamak Ravanbakhsh. *SpeqNets: Sparsity-aware permutation-equivariant graph networks*, International Conference on Machine Learning (ICML), 2022, spotlight presentation.
- [15] Elias B. Khalil\*, Christopher Morris\*, Andrea Lodi. *MIP-GNN: A data-driven framework for guiding combinatorial solvers*, AAAI Conference on Artificial Intelligence (AAAI), 2022, oral presentation.
- [16] Leonardo Cotta, Christopher Morris, Bruno Ribeiro. *Reconstruction for Powerful Graph Representations*, Neural Information Processing Systems (NeurIPS), 2021.

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<sup>†</sup>Equal contribution.

- [17] Quentin Cappart, Didier Chételat, Elias Khalil, Andrea Lodi, Christopher Morris, Petar Veličković.<sup>†</sup> *Combinatorial Optimization and Reasoning with Graph Neural Networks*, International Joint Conference on Artificial Intelligence (IJCAI), 2021.
- [18] Christopher Morris, Matthias Fey, Nils M. Kriege. *The Power of the Weisfeiler-Leman Algorithm for Machine Learning with Graphs*, International Joint Conference on Artificial Intelligence (IJCAI), 2021,
- [19] Christopher Morris, Gaurav Rattan, Petra Mutzel. *Weisfeiler and Leman Go Sparse: Towards Scalable Higher-order Graph Neural Networks*, Neural Information Processing Systems (NeurIPS), 2020.
- [20] Matthias Fey, Jan E. Lenssen, Christopher Morris, Jonathan Masci, Nils M. Kriege. *Deep Graph Matching Consensus*, International Conference on Learning Representations (ICLR), 2020.
- [21] Lutz Oettershagen, Nils Kriege, Christopher Morris, Petra Mutzel. *Temporal Graph Kernels for Classifying Dissemination Processes*, SIAM International Conference on Data Mining (SDM), 2020.
- [22] Christopher Morris, Martin Ritzert, Matthias Fey, William L. Hamilton, Jan Eric Lenssen, Gaurav Rattan, Martin Grohe. *Weisfeiler and Leman Go Neural: Higher-order Graph Neural Networks*, AAAI Conference on Artificial Intelligence (AAAI), 2019.
- [23] Rex Ying, Jiaxuan You, Christopher Morris, Xiang Ren, William L. Hamilton, Jure Leskovec. *Hierarchical Graph Representation Learning with Differentiable Pooling*, Neural Information Processing Systems (NeurIPS), 2018, spotlight presentation.
- [24] Nils M. Kriege, Christopher Morris, Anja Rey, Christian Sohler.<sup>†</sup> *A Property Testing Framework for the Theoretical Expressivity of Graph Kernels*, International Joint Conference on Artificial Intelligence (IJCAI), 2018.
- [25] Christopher Morris, Kristian Kersting, Petra Mutzel. *Glocalized Weisfeiler-Lehman Graph Kernels: Global-Local Feature Maps of Graphs*, IEEE International Conference on Data Mining (ICDM), 2017, full paper.
- [26] Christopher Morris, Nils M. Kriege. *Recent Advances in Kernel-Based Graph Classification*, European Conference on Machine Learning & Principles and Practice of Knowledge Discovery in Databases (ECML PKDD), 2017.
- [27] Christopher Morris, Nils M. Kriege, Kristian Kersting, Petra Mutzel. *Faster Kernels for Graphs with Continuous Attributes via Hashing*, IEEE International Conference on Data Mining (ICDM), 2016.

## Journal Articles

- [28] Luis Müller, Mikhail Galkin, Christopher Morris, Ladislav Rampásek. *Attending to Graph Transformers*, Transaction on Machine Learning Research (TMLR), 2024.
- [29] Christopher Morris, Yaron Lipman, Haggai Maron, Bastian Rieck, Nils M. Kriege, Martin Grohe, Matthias Fey, Karsten Borgwardt. *Weisfeiler and Leman go Machine Learning: The Story so far*, Journal of Machine Learning Research (JMLR), 2023.
- [30] Quentin Cappart, Didier Chételat, Elias Khalil, Andrea Lodi, Christopher Morris, Petar Veličković.<sup>†</sup> *Combinatorial Optimization and Reasoning with Graph Neural Networks*, Journal of Machine Learning Research (JMLR), 2023, largely extended version of [7].

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<sup>†</sup>Alphabetical author order.

- [31] Lutz Oettershagen, Nils M. Kriege, Christopher Morris, and Petra Mutzel. *Classifying Dissemination Processes in Temporal Graphs*, Big Data 8 (5), 2020.
- [32] Nils M. Kriege, Fredrik D. Johansson, Christopher Morris.<sup>†</sup> *A Survey on Graph Kernels*, Applied Network Science 5 (1), 2020.
- [33] Nils M. Kriege, Marion Neumann, Christopher Morris, Kristian Kersting, Petra Mutzel. *A Unifying View of Explicit and Implicit Feature Maps for Structured Data: Systematic Studies of Graph Kernels*, Data Mining and Knowledge Discovery 33 (6), 2019.
- [34] Fritz Bökler, Mathias Ehrgott, Christopher Morris, Petra Mutzel.\* *Output-sensitive Complexity of Multiobjective Combinatorial Optimization*, Journal of Multicriteria Decision Analysis 24 (1-2), 2017.

### Book Chapters

- [35] Nils Kriege, Christopher Morris. *The Weisfeiler-Leman Method for Machine Learning with Graphs*, in *Structured Data*, in *Volume 1 Fundamentals*, edited by Katharina Morik, Peter Marwedel, in *Machine Learning under Resource Constraints*, edited by Nico Piatkowski, Katharina Morik, Nils Kriege, Christopher Morris, Matthias Fey, Frank Weichert, Nico Bertram, Jonas Ellert, Johannes Fischer, Lukas Pfahler, De Gruyter, 2023.
- [36] Christopher Morris. *Graph Neural Networks: Graph Classification*, in *Graph Neural Networks: Foundations, Frontiers, and Applications*, edited by Peng Cui, Jian Pei, Lingfei Wu, Liang Zhao, Springer, 2021. Book was also translated into Chinese.
- [37] Christopher Morris. *Lernen mit Graphen: Kern- und neuronale Methoden*, in *Ausgezeichnete Informatikdissertationen 2019*, edited by Steffen Hölldobler, Sven Apel, Felix Freiling, Hans-Peter Lehnhof, Gustaf Neumann, Rüdiger Reischuk, Kai U. Römer, Björn Scheuermann, Nicole Schweikardt, Myra Spiliopoulou, Sabine Süsstrunk, Klaus Wehrle, LNI, D-19, Gesellschaft für Informatik (GI), 2020.

### Workshop Papers (Peer-reviewed)

- [38] Luis Müller, Daniel Kusuma, Blai Bonet, Christopher Morris. *Towards Principled Graph Transformers*, Workshop on Mathematics of Modern Machine Learning (M3L, NeurIPS 2024), also accepted at NeurIPS 2024.
- [39] Billy Joe Franks, Christopher Morris, Ameya Velingker, Floris Geerts. *Weisfeiler-Leman at the margin: When more expressivity matters*, Workshop on Bridging the Gap Between Practice and Theory in Deep Learning (BGPT, ICLR 2024), also accepted at ICML 2023.
- [40] Luis Müller, Daniel Kusuma, Christopher Morris. *Towards Principled Graph Transformers*, Workshop on Bridging the Gap Between Practice and Theory in Deep Learning (BGPT, ICLR 2024).
- [41] Christopher Morris, Floris Geerts, Jan Tönshoff, Martin Grohe. *WL meet VC*, Learning on Graphs Conference (LoG), oral presentation, 2023, also accepted at ICML 2023.
- [42] Chendi Qian, Andrei Manolache, Kareem Ahmed, Zhe Zeng, Guy Van den Broeck, Mathias Niepert, Christopher Morris. *Probabilistic Task-Adaptive Graph Rewiring*, Differentiable Almost Everything: Differentiable Relaxations, Algorithms, Operators, and Simulators (ICML 2023).
- [43] Christopher Morris, Gaurav Rattan, Sandra Kiefer, Siamak Ravanbakhsh. *SpeqNets: Sparsity-aware permutation-equivariant graph networks*, Geometrical and Topological Representation Learning (GT-RL, ICLR 2022), also accepted at ICML 2022.

- [44] Christopher Morris, Gaurav Rattan, Petra Mutzel. *Weisfeiler and Leman go sparse: Towards scalable higher-order graph embeddings*, Graph Representation Learning and Beyond (GRL+, ICML 2020), also accepted at NeurIPS 2020.
- [45] Christopher Morris, Nils M. Kriege, Franka Bause, Kristian Kersting, Petra Mutzel, Marion Neumann. *TUDataset: A collection of benchmark datasets for learning with graphs*, Graph Representation Learning and Beyond (GRL+, ICML 2020).
- [46] Rex Ying, Jiaxuan You, Christopher Morris, Xiang Ren, William L. Hamilton, Jure Leskovec. *Hierarchical Graph Representation Learning with Differentiable Pooling*, KDD Deep Learning Day 2018, also accepted at NeurIPS 2018.

## Thesis

- [47] Christopher Morris. *Learning with Graphs: Kernel and Neural Approaches*, PhD thesis, TU Dortmund University, 2019.
- [48] Christopher Morris. *Enumeration Complexity of Multicriteria Linear Optimization*, MSc thesis, TU Dortmund University, 2015.

## Edited Workshop and Competition Proceedings

- [49] Martin Grohe, Stephan Günnemann, Stefanie Jegelka, Christopher Morris.<sup>†</sup> *Graph Embeddings: Theory meets Practice (Dagstuhl Seminar 22132)*, Dagstuhl Reports 12 (3), 2022.
- [50] Maxime Gasse, Quentin Cappart, Jonas Charfreitag, Laurent Charlin, Didier Chételat, Antonia Chmiela, Justin Dumouchelle, Ambros Gleixner, Aleksandr M. Kazachkov, Elias Khalil, Pawel Lichocki, Andrea Lodi, Miles Lubin, Chris J. Maddison, Christopher Morris, Dimitri J. Papageorgiou, Augustin Parjadis, Sebastian Pokutta, Antoine Prouvost, Lara Scavuzzo, Giulia Zarpellon, Linxin Yang, Sha Lai, Akang Wang, Xiaodong Luo, Xiang Zhou, Haohan Huang, Shengcheng Shao, Yuanming Zhu, Dong Zhang, Tao Quan, Zixuan Cao, Yang Xu, Zhewei Huang, Shuchang Zhou, Chen Binbin, He Minggui, Hao Hao, Zhang Zhiyu, An Zhiwu, Mao Kun. *The Machine Learning for Combinatorial Optimization Competition (ML4CO): Results and Insights*, NeurIPS 2021 Competitions and Demonstrations Track, PMLR 176:220-231, 2022.

## Academic Honors

|      |   |
|------|---|
| 2024 | DFG Heinz Maier-Leibnitz-Preis (200 000 €)  |
| 2022 | DFG Emmy Noether fellow   |
| 2020 | Dissertation award of TU Dortmund University (awarded for best Computer Science PhD thesis in 2020)                                 |
| 2020 | Nominated (by TU Dortmund University) for the dissertation award of the German computer science association (GI Dissertationspreis) |

## Invited Talks

|         |  |
|---------|--|
| 09/2024 | University of Münster, Department of Mathematics and Computer Science,<br><i>Machine Learning on Graphs: From Theory to Practice</i> |
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| 07/2024 | International Joint Conference on Artificial Intelligence 2024 (invited paper/talk, early-career track), <i>Towards a Theory of Machine Learning on Graphs and its Applications in Combinatorial Optimization</i>   |
| 04/2024 | University of San Diego, Department of Computer Science (virtual), <i>WL meet VC: Generalization abilities of graph neural networks</i>   |
| 03/2024 | DFG Research Unit ADYN seminar (virtual), University of Frankfurt, <i>WL meet VC: Generalization abilities of graph neural networks</i>   |
| 03/2024 | Workshop on Foundational Aspects of Neursymbolic Computing (FANeSy), Santiago de Chile, <i>Generalization Abilities of Graph Neural Networks</i>  |
| 02/2024 | Symposium on Sparsity and Singular Structures 2024, Minisymposia, RWTH Aachen University, <i>Weisfeiler and Leman go sparse: Expressive and scalable graph neural networks</i>  |
| 02/2024 | Workshop on Algorithmic Aspects of Neural Networks, University of Cologne, <i>Generalization Abilities of Graph Neural Networks</i>   |
| 12/2023 | Keynote at the LoG Munich Meetup, TU Munich, <i>Weisfeiler and Leman go Machine Learning: Expressivity and Generalization Abilities of GNNs</i>   |
| 11/2023 | Keynote at the LoG Paris Meetup, École Polytechnique, Inria & Centrale-Supélec, <i>Weisfeiler and Leman go Machine Learning: Expressivity and Generalization Abilities of GNNs</i>  |
| 10/2023 | ILCC/CDT NLP Seminar Series, School of Informatics, University of Edinburgh, <i>Weisfeiler and Leman go Machine Learning: Expressivity and Generalization Abilities of GNNs</i>   |
| 06/2023 | Keynote at the satellite Conference “Deep Learning with Higher-Order Network Model” at the International School and Conference on Network Science (NetSci) 2023, Vienna, <i>Weisfeiler and Leman go Machine Learning: Expressivity and Generalization Abilities of GNNs</i> |
| 04/2023 | GIBU Jahrestreffen, Dagstuhl, <i>Machine Learning with Graphs: From Theory to Applications</i>  |
| 03/2023 | Geometric Deep Learning Reading Group at Mila, Mila – Quebec AI Institute (virtual), <i>Weisfeiler and Leman go Machine Learning: Expressivity and Generalization Abilities of GNNs</i>   |
| 12/2022 | Institute for Artificial Intelligence, Peking University (PKU) and the AI Pharma Seminar at the Institute of Natural Science (INS), Shanghai Jiao Tong University (SJTU) (virtual), <i>Towards Understanding Expressivity and Generalization of Graph Networks</i>          |
| 11/2022 | ELLIIT Hybrid AI Workshop, Linköping University, <i>Graph Neural Networks for Data-driven Optimization</i>  |
| 09/2022 | Mini-symposium on “Advances in Learning for Graphs, Manifolds, and Geometric Data - Part I of II” at the SIAM Conference on Mathematics of Data Science (MDS22) (virtual), San Diego, <i>Learning with Graphs: Graph Neural Networks and the Weisfeiler-Leman algorithm</i> |
| 07/2022 | Banff International Research Station for Mathematical Innovation and Discovery (BIRS) workshop “Deep Exploration of non-Euclidean Data with Geometric and Topological Representation Learning”, <i>Towards Understanding the Expressive Power of Graph Networks</i>         |
| 02/2022 | University of Windsor (virtual), <i>Learning with Graphs: From Theory to Applications</i>   |

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| 01/2022 | RWTH Aachen University (virtual), <i>Learning with Graphs: From Theory to Applications</i>                                    |
| 12/2021 | RWTH Aachen University (virtual), <i>Learning with Graphs: From Theory to Applications</i>                                    |
| 10/2021 | University of Oxford (virtual), <i>Learning with Graphs: Graph Neural Networks and the Weisfeiler-Leman algorithm</i>         |
| 07/2021 | Saarland University (virtual), <i>Machine Learning with Graphs: From Theory to Applications in Science and Engineering</i>    |
| 07/2021 | University of Hannover (virtual), <i>Machine Learning with Graphs: From Theory to Applications in Science and Engineering</i> |
| 11/2020 | McGill University (virtual), <i>Limits of Graph Neural Networks and the Weisfeiler-Leman algorithm</i>                        |
| 11/2020 | INFORMS Annual Meeting (virtual), <i>Limits Of Graphs Neural Networks For Combinatorial Optimization</i>                      |
| 10/2019 | IBM Research, Zürich, <i>Graph Classification: Kernel and Neural Approaches</i>   |
| 05/2019 | NEC Research, Heidelberg, <i>Graph Classification: Kernel and Neural Approaches</i>   |
| 03/2018 | Stanford University, SNAP, Infolab, <i>Learning Higher-order Graph Embeddings: Theory and Practice</i>                        |
| 07/2017 | RWTH Aachen University, Chair of Logic and the Theory of Discrete Systems, <i>Graph Classification: Kernels and Beyond</i>    |

### Supervised PhD students

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|---------------------|--------------------|
| 01/2024–<br>present | Antonios Vasileiou |
| 12/2023–<br>present | Antoine Siraudin   |
| 02/2023–<br>present | Chendi Qian        |
| 10/2022–<br>present | Luis Müller        |

### Visiting PhD students

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|---------|---|
| 08/2024 | Ben Finkelshtein (University of Oxford) |
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### PhD examination board memberships

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| 03/2023 | Leslie O’Bray, ETH Zürich |
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### Supervised Bachelor and Master students (acting as first supervisor only)

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|------|---|
| 2024 | Jonathan Léon du Mesnil de Rochemont, <i>Mixed-Resolution Tokenization for Graph Transformers</i> , Master thesis, RWTH Aachen University |
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| 2024 | Abhishek Nadgeri, <i>In-Context Learning on Molecular Graphs</i> , Master thesis, RWTH Aachen University  |
| 2024 | Darius Weber, <i>Exploring the power of graph neural networks in solving convex optimization problems</i> , Bachelor thesis, RWTH Aachen University                                       |
| 2024 | Timo Stoll, <i>Investigating the Expressive Power of Graph Transformers</i> , Master thesis, RWTH Aachen University   |
| 2024 | Joana Schmidt, <i>Graph Neural Networks Under Structural Noise</i> , Bachelor thesis, RWTH Aachen University  |
| 2024 | Rafayel Ghandilyan, <i>The Expressivity and Generalization Properties of Graph Neural Networks with Mean Aggregation</i> , Bachelor thesis, RWTH Aachen University                        |
| 2023 | Eric T. Bill, <i>A Theoretical and Empirical Investigation into the Equivalence of Graph Neural Networks and the Weisfeiler–Leman Algorithm</i> , Bachelor thesis, RWTH Aachen University |
| 2023 | Chetan Prakash, <i>Distributed Active Voltage Control with GNN-based MARL Policy</i> , Master thesis, RWTH Aachen University  |
| 2023 | Timothy Borrell, <i>The Expressive Power of Variants of the Weisfeiler–Leman Algorithm</i> , Master thesis, RWTH Aachen University  |
| 2023 | Antonios Vasileiou, <i>The Expressive Power of Set-based Higher-order Graph Neural Networks</i> , Master thesis, TU Delft   |
| 2023 | Antoine Origer, <i>Improving the generalization performance of the Weisfeiler–Lehman subtree kernel</i> , Bachelor thesis, RWTH Aachen University   |
| 2019 | Nina K. Runde, <i>Evaluation von Varianten des k-dimensionalen Weisfeiler-Leman Algorithmus</i> , Bachelor thesis, TU Dortmund University   |
| 2019 | Jannis D. Junge, <i>Algorithm Engineering zur Approximation des Spektrums von Graphen in der Praxis</i> , Master thesis, TU Dortmund University   |
| 2019 | Frederik Stehli, <i>Approximation des Optimal Assignment Kernels durch explizite Merkmalsvektoren</i> , Bachelor thesis, TU Dortmund University   |
| 2017 | Franka Bause, <i>Approximation der Editierdistanz für Graphen in linearer Zeit</i> , Bachelor thesis, TU Dortmund University  |
| 2016 | Marcel Walker, <i>Systematisierung von neuronalen Netzen auf Graphen</i> , Master thesis, TU Dortmund University  |
| 2016 | Christopher Osthues, <i>Experimenteller Vergleich von Labeling-Verfahren für Graphkerne</i> , Bachelor thesis, TU Dortmund University   |
| 2016 | Serdar Ayaz, <i>Approximation des Weisfeiler-Lehman-Isomorphie-Tests durch Sampling</i> , Bachelor thesis, TU Dortmund University   |
| 2016 | Marcel Walker, <i>Dimensionsreduktion von expliziten Graphkernen durch Hashing</i> , Bachelor thesis, TU Dortmund University  |

## Teaching

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|---------|--|
| SS 2024 | Bachelor/Master course <i>Machine Learning with Graphs: Foundations and Applications</i>   |
| WS 2023 | Master seminar <i>Foundations of Supervised Machine Learning with Graphs</i><br>Bachelor proseminar <i>Maschinelles Lernen mit Graphen</i> |
| SS 2023 | Master course & exercise <i>Machine Learning with Graphs: Foundations and Applications</i>   |



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|              | Bachelor proseminar <i>Maschinelles Lernen mit Graphen</i>  |
| WS 2022      | Master seminar <i>Foundations of Supervised Machine Learning with Graphs</i><br>Master seminar <i>Machine Learning for Combinatorial Optimization</i>                           |
| 03/2022      | Lecture <i>Introduction to Graph Neural Networks: Machine Learning with Graphs</i> in the <i>Dataninja Spring School</i> organized by the University of Bielefeld               |
| 11/2021      | Guest lecture <i>Introduction to Graph Neural Networks</i> in the <i>Applied Machine Learning</i> class, McGill University  |
| SS 2019      | Proseminar <i>Graph Algorithms</i> (supervised students and helped with organization)   |
| SS 2018      | Seminar <i>Algorithm Engineering</i> (supervised students and helped with organization)   |
| SS 2017      | Seminar <i>Algorithm Engineering</i> (supervised students and helped with organization)   |
| WS 2016/17   | Student project group <i>Algorithm Engineering for Graph Data Mining</i> (co-organizer), Seminar <i>Algorithms Unplugged</i> (supervised students and helped with organization) |
| SS 2016      | Seminar <i>Algorithm Engineering</i> , Seminar <i>Graph Mining</i> (supervised students and helped with organization)   |
| WS 2016/17   | Student project group <i>Algorithm Engineering for Graph Data Mining</i> (co-organizer), Seminar <i>Algorithms Unplugged</i> (supervised students and helped with organization) |
| SS 2016      | Seminar <i>Algorithm Engineering</i> , Seminar <i>Graph Mining</i> (supervised students and helped with organization)   |
| As a student | Programming tutorials for engineering students, teaching assistant for a course on theoretical computer science   |
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## Service to the Profession

Panellist at *Graph Learning: Principles, Challenges, and Open Directions* (ICML 2024 tutorial)

Co-organizer of a workshop at RWTH Aachen University *Workshop on Machine Learning Methods* (May 31)

Reviewer for the Swiss National Science Foundation (SNSF) ( $1 \times 2023$ ,  $1 \times 2024$ ), reviewer for the German Research Foundation (DFG) ( $1 \times 2023$ ,  $1 \times 2024$ )

Panellist at the *Workshop on Geometrical and Topological Representation Learning* (ICLR 2022 workshop)

Co-organizer of the graph machine learning reading group at Mila – Quebec AI Institute ([grlmila.github.io](https://grlmila.github.io))

Co-organizer of the NeurIPS 2021 competition *Machine Learning for Combinatorial Optimization* ([www.ecole.ai/2021/ml4co-competition](http://www.ecole.ai/2021/ml4co-competition))

Co-organizer of the Dagstuhl seminar *Graph Embeddings: Theory Meets Practice* (March 27–30 2022, Dagstuhl Seminar 22132, together with Martin Grohe (RWTH Aachen University), Stephan Günnemann (TU Munich), Stefanie Jegelka (MIT))

Initiator of [www.graphlearning.io](http://www.graphlearning.io), a large collection of benchmark datasets for graph classification and regression

Area chair for LoG Conference 2022 (Learning on Graphs Conference), Senior program committee member for AAAI 2023, Area chair for LoG Conference 2023 (Learning on Graphs Conference), Area chair for AAAI 2024, Area chair for NeurIPS 2024, Area chair for LoG Conference 2024 (Learning on Graphs Conference)

Program committee member for IJCAI 2019, NeurIPS 2019, AAAI 2020, ICML 2020, IJCAI 2020, ECML-PKDD 2020, NeurIPS 2020, ICLR 2021, AAAI 2021, ICML 2021, IJCAI 2021, NeurIPS 2021, ICLR 2022, ICML 2022, NeurIPS 2022 Competition Track, NeurIPS 2022, ICLR 2023, ICML 2023, NeurIPS 2023 (*Top reviewer award*), NeurIPS 2023 Competition Track, NeurIPS 2023 Datasets and Benchmarks Track, ICLR 2024, ICML 2024

Program committee member for *Representation Learning on Graphs and Manifolds* (ICLR 2019 workshop), *Learning and Reasoning with Graph-Structured Data* (ICML 2019 workshop), *Graph Representation Learning* (NeurIPS 2019 workshop), *Graph Representation Learning and Beyond* (ICML 2020 workshop), *Graphs and more Complex Structures for Learning and Reasoning* (AAAI 2021 workshop), *Workshop on Graph Learning Benchmarks* (The Web Conference 2021 workshop), *Graphs and more Complex Structures for Learning and Reasoning* (AAAI 2022 workshop), GroundedML: Workshop on Anchoring Machine Learning in Classical Algorithmic Theory (ICLR 2022 workshop), *Workshop on Graph Learning Benchmarks* (The Web Conference 2022 workshop), *Mining and Learning with Graphs* (ECML 2022 workshop), GLFrontiers Workshop (NeurIPS 2022 workshop)

(Sub-)Reviewer for WALCOM 2017, ISAAC 2018, ALENEX 2019, ESA 2018, ICALP 2020

Member of the editorial board of reviewers of JMLR (since 2024), occasional reviews for Transactions on Machine Learning Research ( $2 \times 2022$ ,  $2 \times 2023$ ), IEEE Transactions on Pattern Analysis and Machine Intelligence ( $2 \times 2020$ ), Journal of Machine Learning Research (2020, 2021, 2023), Bioinformatics (2022), IEEE Transactions on Knowledge and Data Engineering (2021), INFORMS Journal on Computation (2022), INFORMS Journal on Optimization (2021), ACM Transactions on Knowledge Discovery from Data (2019), IEEE Transactions on Mobile Computing (2020), Elsevier Signal Processing (2021)

Member of the appointment commission for the professorship *Data Mining* (TU Dortmund University, 2017)

## Grants

DFG Emmy Noether grant (individual grant 970 460 + 776 460 €)

RWTH Junior Principal Investigator Fellowship (individual grant 958 918 €)

Principal investigator of the DFG graduate school “UnRAVeL – UNcertainty and Randomness in Algorithms, VERification and Logic” (3 PhD years, 239 400 €)

Associated principal investigator of the Helmholtz School for Data Science in Life, Earth and Energy (HDS-LEE) graduate school (1.5 PhD years, 119 700 €)

DAAD IFI postdoc scholarship for a 13 month stay at the Mila–Quebec AI Institute (own funding 38 909 €)

Research associate and PhD student within the Collaborative Research Center SFB 876, assisted in preparing the grant proposal for project A6 *Resource-efficient Graph Mining*

## Academic Outreach

Capital (German-language monthly business magazine), *Top 40 unter 40* (2024)

Interview with the German national newspaper Tagesspiegel on my research and being awarded the DFG Heinz Maier-Leibnitz-Preis (2024)

Interview with the daily German newspaper Aachener Zeitung on my research and starting a new group at RWTH Aachen University (2023)

Talk and plenary session at the German Academic International Network (GAIN) meeting 2022

Interview for the DAAD magazine on my experience of moving back to Germany to continue my research career

## Other

**Computational Skills** Python, C++,  $\LaTeX$ , NumPy, Scikit-learn, PyTorch, PyTorch Geometric

**Languages** German (native), English (fluent)

**Citizenship** German and British

## References

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