1 Current Preprints

1. Maria Bresich, Günther Raidl, Caspian Coleman, Pascal Welke, Steffen Limmer (2025):
   Search Space Reduction Through Machine Learning for the Electric Autonomous Dial-A-Ride Problem
   International Conference on Machine Learning, Optimization, and Data Science (LOD)
   (accepted for presentation)
   [pdf][conference]

2 Publications

2. Masahiro Negishi, Thomas Gärtner, Pascal Welke (2025):
   WILTing Trees: Interpreting the Distance Between MPNN Embeddings
   International Conference on Machine Learning (ICML)
   [pdf][poster][code][reviews][arxiv][conference]
3. Fouad Alkhoury, Sebastian Buschjäger, Pascal Welke (2025):
   Splitting Stump Forests: Tree Ensemble Compression for Edge Devices (Extended Version)
   Machine Learning (114)
   [pdf][code][doi][official free version][journal]
4. Veronica Lachi*, Alice Moallemy-Oureh*, Andreas Roth*, Pascal Welke* (2025):
   Expressive Pooling for Graph Neural Networks
   Transactions on Machine Learning Research (TMLR)
   [pdf][video][code][reviews][journal]
5. Dario Antweiler, Jan Pablo Burgard, Marc Harmening, Nicole Marheineke, Andre Schmeißer, Raimund Wegener, Pascal Welke (2025):
   A Regression-Based Predictive Model Hierarchy for Nonwoven Tensile Strength Inference
   Informed Machine Learning
   [pdf][code][doi][book]
6. Franka Bause*, Fabian Jogl*, Patrick Indri, Tamara Drucks, David Penz, Nils Morten Kriege, Thomas Gärtner, Pascal Welke, Maximilian Thiessen (2025):
   Maximally Expressive GNNs for Outerplanar Graphs
   Transactions on Machine Learning Research (TMLR)
   [pdf][poster][slides][video][code][reviews][journal]
7. Raffaele Paolino*, Sohir Maskey*, Pascal Welke, Gitta Kutyniok (2024):
   Weisfeiler and Leman Go Loopy: A New Hierarchy for Graph Representational Learning
   Advances in Neural Information Processing Systems (NeurIPS)
   (accepted as oral presentation)

[pdf][poster][slides][video][code][reviews][arxiv][conference]

8. Alexander Pluska, Pascal Welke, Thomas Gärtner, Sagar Malhotra (2024):
Logical Distillation of Graph Neural Networks
International Conference on Knowledge Representation and Reasoning (KR)
(honorable mention award at the Special Track on Reasoning, Learning, and Decision Making)
[pdf][poster][slides][code][doi][arxiv][conference]
9. Fouad Alkhoury, Pascal Welke (2024):
Splitting Stump Forests: Tree Ensemble Compression for Edge Devices
International Conference on Discovery Science (DS)
(Best Student Paper Award)
[pdf][slides][code][doi][conference]
10. Sebastian Müller, Vanessa Toborek, Katharina Beckh, Matthias Jakobs, Christian Bauckhage, Pascal Welke (2023):
An Empirical Evaluation of the Rashomon Effect in Explainable Machine Learning
European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECMLPKDD)
[pdf][code][doi][arxiv][conference]
11. Pascal Welke*, Maximilian Thiessen*, Fabian Jogl, Thomas Gärtner (2023):
Expectation-Complete Graph Representations with Homomorphisms
International Conference on Machine Learning (ICML)
[pdf][poster][slides][video][code][reviews][arxiv][conference]
12. Ramsés J. Sánchez, Lukas Conrads, Pascal Welke, Kostadin Cvejoski, César Ojeda (2023):
Hidden Schema Networks
Annual Meeting of the Association for Computational Linguistics (ACL)
[pdf][poster][slides][code][doi][arXiv][bibtex][conference]
13. Vanessa Toborek, Moritz Busch, Malte Boßert, Christian Bauckhage, Pascal Welke (2023):
A New Aligned Simple German Corpus
Annual Meeting of the Association for Computational Linguistics (ACL)
[pdf][poster][code][doi][arXiv][bibtex][conference]
14. Karishma Mohiuddin, Mirza Ariful Alam, Mirza Mohtashim Alam, Pascal Welke, Michael Martin, Jens Lehmann, Sahar Vahdati (2023):
Retention Is All You Need
International Conference on Information and Knowledge Management (CIKM)
[doi][arxiv][bibtex][conference]
15. Katharina Beckh, Sebastian Müller, Matthias Jakobs, Vanessa Toborek, Hanxiao Tan, Raphael Fischer, Pascal Welke, Sebastian Houben, Laura von Rüden (2023):
Harnessing Prior Knowledge for Explainable Machine Learning: An Overview
IEEE Conference on Secure and Trustworthy Machine Learning (SatML)
[pdf][video][doi][reviews][arXiv][bibtex][conference]

16. Till Hendrik Schulz, Tamás Horváth, Pascal Welke, Stefan Wrobel (2022):
A generalized Weisfeiler-Lehman graph kernel
Machine Learning (111)
[pdf][code][doi][arxiv][bibtex][journal]
17. Dario Antweiler, Marc Harmening, Nicole Marheineke, Andre Schmeißer, Raimund Wegener, Pascal Welke (2022):
Machine learning framework to predict nonwoven material properties from fiber graph representations
Software Impacts (14)
[pdf][code][reproducible run][doi][bibtex][journal]
18. Dario Antweiler, Marc Harmening, Nicole Marheineke, Andre Schmeißer, Raimund Wegener, Pascal Welke (2022):
Graph-Based Tensile Strength Approximation of Random Nonwoven Materials by Interpretable Regression
Machine Learning with Applications (8)
[pdf][code][reproducible run][doi][journal]
19. Till Hendrik Schulz, Pascal Welke, Stefan Wrobel (2022):
Graph Filtration Kernels
AAAI Conference on Artificial Intelligence (AAAI)
[pdf][poster][slides][code][doi][arxiv][bibtex][conference]
20. Richard Palme, Pascal Welke (2022):
Frequent Generalized Subgraph Mining via Graph Edit Distances
IoT Streams for Predictive Maintenance (IoTStreams@ECMLPKDD)
[pdf][slides][code][doi][bibtex][workshop]
21. Janis Kalofolias, Pascal Welke, Jilles Vreeken (2021):
SUSAN: The Structural Similarity Random Walk Kernel
SIAM International Conference on Data Mining (SDM)
[pdf][slides][video][code][doi][bibtex][conference]
22. Pascal Welke (2020):
Efficient Frequent Subgraph Mining in Transactional Databases
International Conference on Data Science and Advanced Analytics (DSAA)
[pdf][slides][video][doi][bibtex][conference]
23. Pascal Welke, Fouad Alkhoury, Christian Bauckhage, Stefan Wrobel (2020):
Decision Snippet Features
International Conference on Pattern Recognition (ICPR)
[pdf][slides][video][code][doi][bibtex][conference]
24. Pascal Welke, Florian Seiffarth, Michael Kamp, Stefan Wrobel (2020):
HOPS: Probabilistic Subtree Mining for Small and Large Graphs
SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)
[pdf][slides][video][code][doi][bibtex][conference]
25. Alexander Mehler, Wahed Hemati, Pascal Welke, Maxim Konca, Tolga Uslu (2020):
Multiple Texts as a Limiting Factor in Online Learning: Quantifying (Dis-)similarities

of Knowledge Networks across Languages
Frontiers in Education | Digital Education
[pdf][doi][arXiv][bibtex][journal]

26. Pascal Welke, Tamás Horváth, Stefan Wrobel (2019):
Probabilistic and Exact Frequent Subtree Mining in Graphs Beyond Forests
Machine Learning (108)
[pdf][doi][bibtex][journal]
27. Pascal Welke, Tamás Horváth, Stefan Wrobel (2018):
Probabilistic Frequent Subtrees for Efficient Graph Classification and retrieval
Machine Learning (107)
[pdf][doi][bibtex][journal]
28. Till Hendrik Schulz, Tamás Horváth, Pascal Welke, Stefan Wrobel (2018):
Mining Tree Patterns with Partially Injective Homomorphisms
European Conference on Machine Learning and Knowledge Discovery in Databases (ECMLPKDD)
[pdf][slides][doi][bibtex][conference]
29. Pascal Welke, Alexander Markowetz, Torsten Suel, Maria Christoforaki (2016):
Three-hop Distance Estimation in Social Graphs
IEEE International Conference on Big Data (BigData)
[pdf][slides][doi][bibtex][conference]
30. Pascal Welke, Tamás Horváth, Stefan Wrobel (2016):
Min-Hashing for Probabilistic Frequent Subtree Feature Spaces
International Conference on Discovery Science (DS)
[pdf][poster][slides][doi][bibtex][conference]
31. Katrin Ullrich, Jennifer Mack, Pascal Welke (2016):
Ligand Affinity Prediction with Multi-pattern Kernels
International Conference on Discovery Science (DS)
[pdf][slides][doi][bibtex][conference]
32. Pascal Welke, Ionut Andone, Konrad Blaszkiewicz, Alexander Markowetz (2016):
Differentiating Smartphone Users by App Usage
International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp)
[pdf][slides][doi][bibtex][conference]
33. Pascal Welke, Tamás Horváth, Stefan Wrobel (2015):
Probabilistic Frequent Subtree Kernels
New Frontiers in Mining Complex Patterns (NFMCP@ECMLPKDD)
[pdf][slides][doi][bibtex][workshop]
34. Pascal Welke, Tamás Horváth, Stefan Wrobel (2014):
On the Complexity of Frequent Subtree Mining in Very Simple Structures
International Conference on Inductive Logic Programming (ILP)
[pdf][slides][doi][bibtex][conference]
35. Anne-Kathrin Mahlein, Till Rumpf, Pascal Welke, Heinz-Wilhelm Dehne, Ulrike

Steiner, Erich-Christian Oerke (2013):
Development of Spectral Indices for Detecting and Identifying Plant Diseases
Remote Sensing of Environment (128)
[doi][journal]

3 Books

36. Michael Kamp et al. (2021):
Machine Learning and Principles and Practice of Knowledge Discovery in Databases - International Workshops of ECML PKDD 2021, Virtual Event, September 13-17, 2021, Proceedings, Part I
[doi][bibtex][workshop proceedings]
37. Michael Kamp et al. (2021):
Machine Learning and Principles and Practice of Knowledge Discovery in Databases - International Workshops of ECML PKDD 2021, Virtual Event, September 13-17, 2021, Proceedings, Part II
[doi][bibtex][workshop proceedings]
38. Daniel Trabold, Pascal Welke, Nico Piatkowski (2020):
Proceedings of the Conference "Lernen, Wissen, Daten, Analysen", Online, September 9-11, 2020
[bibtex][proceedings]
39. Pascal Welke (2019):
Efficient Frequent Subtree Mining Beyond Forests
Dissertations in Artificial Intelligence (348)
[pdf][slides][code][bibtex][book]

4 Nonarchival Peer Reviewed Venues

40. Franka Bause*, Fabian Jogl*, Patrick Indri, Tamara Drucks, David Penz, Nils Morten Kriege, Thomas Gärtner, Pascal Welke, Maximilian Thiessen (2025):
Maximally Expressive GNNs for Outerplanar Graphs
European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD) Nectar Track
[pdf][code][conference]
41. Masahiro Negishi, Thomas Gärtner, Pascal Welke (2025):
WILTing Trees: Interpreting the Distance Between MPNN Embeddings
International School and Conference on Network Science (NetSci)
(extended abstract)
[pdf][poster][code][conference]
42. Fabian Jogl, Pascal Welke, Thomas Gärtner (2024):
Is Expressivity Essential for the Predictive Performance of Graph Neural Networks?

Workshop on Scientific Methods for Understanding Deep Learning (SciForDL@NeurIPS) (accepted as poster presentation)
[pdf][poster][code][reviews][workshop]

43. Raffaele Paolino*, Sohir Maskey*, Pascal Welke, Gitta Kutyniok (2024):
Weisfeiler and Leman Go Loopy: A New Hierarchy for Graph Representational Learning
Bridging the Gap Between Practice and Theory in Deep Learning (BGPT@ICLR)
[pdf][poster][code][reviews][arxiv][workshop]
44. Alexander Pluska, Pascal Welke, Thomas Gärtner, Sagar Malhotra (2024):
Logical Distillation of Graph Neural Networks
Mechanistic Interpretability Workshop (MI@ICML)
[pdf][poster][code][arxiv][workshop]
45. Veronica Lachi*, Alice Moallemy-Oureh*, Andreas Roth*, Pascal Welke* (2023):
Graph Pooling Provably Improves Expressivity
New Frontiers in Graph Learning (GLFrontiers@NeurIPS)
[pdf][poster][reviews][workshop]
46. Franka Bause*, Fabian Jogl*, Patrick Indri, Tamara Drucks, David Penz, Nils Morten Kriege, Thomas Gärtner, Pascal Welke, Maximilian Thiessen (2023):
Maximally Expressive GNNs for Outerplanar Graphs
New Frontiers in Graph Learning (GLFrontiers@NeurIPS)
[pdf][poster][code][reviews][workshop]
47. Franka Bause*, Fabian Jogl*, Pascal Welke, Maximilian Thiessen (2023):
Maximally Expressive GNNs for Outerplanar Graphs
Learning on Graphs Conference (LoG)
(Extended Abstract)
[pdf][poster][code][reviews][conference]
48. Andrei Dragos Brasoveanu, Fabian Jogl, Pascal Welke, Maximilian Thiessen (2023):
Extending Graph Neural Networks with Global Features
Learning on Graphs Conference (LoG)
(Extended Abstract)
[pdf][poster][code][reviews][conference]
49. Maximilian Thiessen*, Pascal Welke*, Thomas Gärtner (2022):
Expectation Complete Graph Representations using Graph Homomorphisms
New Frontiers in Graph Learning Workshop (GLFrontiers@NeurIPS)
[pdf][poster][code][reviews][workshop]
50. Pascal Welke*, Maximilian Thiessen*, Thomas Gärtner (2022):
Expectation Complete Graph Representations using Graph Homomorphisms
Learning on Graphs Conference (LoG)
[pdf][poster][code][reviews][conference]
51. Dario Antweiler, Pascal Welke (2020):
Temporal Graph Analysis for Outbreak Pattern Detection in COVID-19 Contact Tracing Networks

Machine Learning in Public Health Workshop (MLPH@NeurIPS)
[pdf][slides][workshop]

52. Till Hendrik Schulz, Pascal Welke (2018):
On the Necessity of Graph Kernel Baselines
Graph Embedding and Mining Workshop, (GEM@ECMLPKDD)
[pdf][poster][workshop]

53. Pascal Welke (2017):
Simple Necessary Conditions for the Existence of a Hamiltonian Path with Applications to Cactus Graphs
Computer Science Conference for University of Bonn Students (CSCUBS)
[pdf][arXiv][bibtex][workshop]