1 Current Preprints

1. 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]

2. Fouad Alkhoury, Pascal Welke (2024):
   Splitting Stump Forests
   International Conference on Discovery Science (DS)
   (Best Student Paper Award)
   [pdf][slides][code][doi][conference]

2 Publications

3. 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)
   (accepted for publication)
   [pdf][poster][slides][video][code][reviews][journal]

4. 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][code][reviews][arxiv][conference]

5. 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]

6. 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]

7. 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]

8. 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]

9. 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]

10. 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]

11. 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]

12. 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]

13. 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]

14. 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]

15. 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]

16. 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]

17. 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]

18. 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]

19. 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]

20. 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]

21. 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]

22. Pascal Welke, Tamás Horváth, Stefan Wrobel (2019):
    Probabilistic and Exact Frequent Subtree Mining in Graphs Beyond Forests
    Machine Learning (108)
    [pdf][doi][bibtex][journal]

23. Pascal Welke, Tamás Horváth, Stefan Wrobel (2018):
    Probabilistic Frequent Subtrees for Efficient Graph Classification and retrieval
    Machine Learning (107)
    [pdf][doi][bibtex][journal]

24. 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]

25. 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]

26. 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]

27. 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]

28. 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]

29. Pascal Welke, Tamás Horváth, Stefan Wrobel (2015):
    Probabilistic Frequent Subtree Kernels
    New Frontiers in Mining Complex Patterns (NFMCP@ECMLPKDD)
    [pdf][slides][doi][bibtex][workshop]

30. 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]

31. 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

32. 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]

33. 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]

34. Daniel Trabold, Pascal Welke, Nico Piatkowski (2020):
    Proceedings of the Conference "Lernen, Wissen, Daten, Analysen", Online, September 9-11, 2020

[bibtex][proceedings]

35. Pascal Welke (2019):
    Efficient Frequent Subtree Mining Beyond Forests
    Dissertations in Artificial Intelligence (348)
    [pdf][slides][code][bibtex][book]

4 Nonarchival Peer Reviewed Venues

36. Raffaele Paolino*, Sohir Maskey*, Pascal Welke, Gitta Kutyniok (2024):
    Weisfeiler and Leman Go Loopy: A New Hierarchy for Graph Representational Learn-
    ing
    Bridging the Gap Between Practice and Theory in Deep Learning (BGPT@ICLR)
    [pdf][poster][code][reviews][arxiv][workshop]

37. 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]

38. 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]

39. 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]

40. 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]

41. 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]

42. 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]

43. Pascal Welke*, Maximilian Thiessen*, Thomas Gärtner (2022):

Expectation Complete Graph Representations using Graph Homomorphisms
Learning on Graphs Conference (LoG)
[pdf][poster][code][reviews][conference]

44. 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]

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

46. 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]