Christopher Morris

Address

Dr. Christopher Morris
Université de Montréal
André Aisenstadt Building,
2920 Chemin de la Tour,
Montréal, QC, Canada
E-mail: chris@christophermorris.info
Homepage: http://www.christophermorris.info

Areas of Specialization

Graph embeddings (graph kernels, graph neural networks, invariant neural networks) from a theoretical as well as applied viewpoint, and their application in combinatorial optimization.

Education

2015–2019	PhD in Computer Science, TU Dortmund University, final grade: 1.0 with distinction (best possible grade)
2012–2015	M. Sc. in Computer Science, TU Dortmund University, final grade: 1.0 (best possible grade)
2008–2012	B. Sc. in Computer Science, TU Dortmund University
1997–2007	University Entrance Qualification, Erzbischöfliches St.-Angela-Gymnasium, Wipperfürth

Employment

Since 2020	Postdoc in the group of Andrea Lodi, Polytechnique Montréal
2015–2019	PhD student and research associate, TU Dortmund University, within the Collaborative Research Center SFB 876
2007–2008	Mandatory civil service

Publications

Conference Papers

[1] Matthias Fey, Jan E. Lenssen, Christopher Morris, Jonathan Masci, Nils M. Kriege. *Deep Graph Matching Consensus*, Conference on Learning Representations (ICLR) 2020.

[2] Lutz Oettershagen, Nils Kriege, Christopher Morris, Petra Mutzel. *Temporal Graph Kernels for Classifying Dissemination Processes*, SIAM International Conference on Data Mining (SDM) 2020.

[3] 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.

[4] 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.

[5] Nils M. Kriege, Christopher Morris, Anja Rey, Christian Sohler. *A Property Testing Framework for the Theoretical Expressivity of Graph Kernels*, International Joint Conference on Artificial Intelligence (IJCAI) 2018.

[6] 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.

[7] 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.

[8] 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

[9] Nils M. Kriege, Fredrik D. Johansson, Christopher Morris. *A Survey on Graph Kernels*, *Applied Network Science*, 2020.

[10] 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*, 2019.

[11] Fritz Bökler, Mathias Ehrgott, Christopher Morris, Petra Mutzel. *Output-sensitive Complexity of Multiobjective Combinatorial Optimization*, Journal of Multicriteria Decision Analysis, 2017.

Workshop Papers

[12] Weisfeiler and Leman go sparse: Towards scalable higher-order graph embeddings. Christopher Morris, Gaurav Rattan, Petra Mutzel, Graph Representation Learning and Beyond (GRL+, ICML 2020).

[13] TUDataset: A collection of benchmark datasets for learning with graphs. Christopher Morris, Nils M. Kriege, Franka Bause Kristian Kersting, Petra Mutzel, Marion Neumann, Graph Representation Learning and Beyond (GRL+, ICML 2020).

[14] 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.

Preprints

[15] Christopher Morris, Petra Mutzel. *Towards a practical k-dimensional Weisfeiler-Leman algorithm*, `https://arxiv.org/abs/1904.01543`.

Thesis

[16] Christopher Morris. *Learning with Graphs: Kernel and Neural Approaches*, PhD thesis, TU Dortmund University, 2019.

[17] Christopher Morris. *Enumeration Complexity of Multicriteria Linear Optimization*, M. Sc. thesis, TU Dortmund University, 2019.

Invited Talks

10/2019	IBM Research, Zürich, *Graph Classification: Kernel and Neural Approaches*
05/2019	NEC Research, Heidelberg, *Graph Classification: Kernel and Neural Approaches*
03/2018	Stanford, SNAP, Infolab, *Learning Higher-order Graph Embeddings: Theory and Practice*
07/2017	RWTH Aachen, Chair of Logic and the Theory of Discrete Systems, *Graph Classification: Kernels and Beyond*

Teaching

Supervised eight bachelor and master thesis, one intern

SS 2019	Proseminar *Graph Algorithms*
WS 2017/18	Seminar *Algorithm Engineering*
SS 2017	Seminar *Algorithm Engineering*
WS 2016/17	Student project group *Algorithm Engineering for Graph Data Mining*, Seminar *Algorithms Unplugged*
SS 2016	Seminar *Algorithm Engineering*, Seminar *Graph Mining*
WS 2015/16	Seminar *Algorithm Engineering*
As a student	Programming tutorials for engineering students, teaching assistant for a course on theoretical computer science

Service to the Profession

Program committee member for IJCAI 2019, NeurIPS 2019, AAAI 2020, ICML 2020, , IJCAI2020, ECML-PKDD 2020, NeurIPS 2020, ICLR 2021

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)

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

Occasional reviews for IEEE Transactions on Pattern Analysis and Machine Intelligence, Journal of Machine Learning Research, ACM Transactions on Knowledge Discovery from Data, IEEE Transactions on Cybernetics, IEEE Transactions on Mobile Computing

Initiator of `www.graphlearning.io`, a large collection of benchmark datasets for graph classification and regression

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

Other

Computational Skills Python, C++, LaTeX, Scikit-learn, NumPy, PyTorch, PyTorch Geometric
Languages German (native), English (fluent)
Citizenship German and British

Referees

Prof. Petra Mutzel
Computational Analytics,
Department of Computer Science,
University of Bonn
petra.mutzel@cs.uni-bonn.de

Prof. Kristian Kersting
Machine Learning Group,
Department of Computer Science,
TU Darmstadt
kersting@cs.tu-darmstadt.de

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