

Stefan Neumann

Curriculum Vitae

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*PostDoc at KTH Royal Institute of Technology.
Broadly interested in algorithmic aspects of data science.*

Research Interests

- Algorithmic data analysis
- Theory for data mining problems
- (Dynamic) graph algorithms
- Knowledge discovery

Education

- 2016–2020 **PhD in Computer Science**, University of Vienna, Austria.
▸ Focused on algorithms for data analysis with provable guarantees
▸ Thesis: “Provably Finding and Exploiting Patterns in Data”
▸ Supervised by Monika Henzinger
- 2013–2015 **Master in Computer Science**, Max Planck Institute for Computer Science and Saarland University.
- 2010–2013 **Bachelor in Mathematics**, Friedrich-Schiller-University Jena, Germany.

Work Experience

- Since 2020 **Postdoctoral Researcher**, *KTH Royal Institute of Technology*, Stockholm, Sweden.
▸ Hosted by Aristides Gionis
- 2019 **Visiting Researcher**, *Brown University*, Providence, RI, USA.
▸ Hosted by Eli Upfal for 6 months
- 2016–2020 **Research and Teaching Assistant**, *University of Vienna*, Vienna, Austria.
▸ Hosted by Monika Henzinger

Grants and Awards

- 2020 *Award of Excellence* for my PhD thesis from the Austrian Ministry of Education, Science and Research (the award is granted to the 40 best dissertations of the year across all fields)
- 2020 PhD in computer science *with distinction*
- 2019 An extended abstract of *Bipartite Stochastic Block Models with Tiny Clusters* [3] was presented in *Best of Data Science Made in Germany, Austria and Switzerland* at GI 2019 (see [12])
- 2018 One out of four PhD students worldwide with a single-authored paper [3] at NeurIPS 2018
- 2016 Our paper *What You Will Gain By Rounding: Theory and Algorithms for Rounding Rank* [5] was a best paper candidate at ICDM 2016
- 2015 MSc in computer science awarded *with distinction*
- 2014–2015 Scholarship from the Saarbrücken Graduate School of Computer Science

Scientific Activities

- Program Committees SIROCCO 2021, SDM 2021, ECML PKDD 2020
- Reviewer NeurIPS 2020, ICDM 2020, KDD 2020, ICALP 2020, SWAT 2020, WWW 2020, WSDM 2020, ICDM 2019, CIKM 2019, ECML PKDD 2019, ICALP 2019, STACS 2019, STOC 2018, SWAT 2018, ICALP 2017, WADS 2017, ICALP 2016, ESA 2016
- Visits *University of Eastern Finland*, Host: Pauli Miettinen, Sep. 2019
Brown University, Host: Eli Upfal, Jan.–Jun. 2019
- Workshops *Computation and Statistics in Data Science* in Bertinoro, Italy, Sep 30 – Oct 4, 2019
Data Science in Low-dimensional Spaces at ICERM, Providence, RI, USA, May 13–17, 2019
- Talks/Posters *Biclustering and Boolean Matrix Factorization in Data Streams*, VLDB 2020
Dynamic Approximate Maximum Independent Set of Intervals, Hypercubes and Hyperrectangles, SoCG 2020
Finding Tiny Clusters in Bipartite Graphs, Workshop on Computation and Statistics in Data Science, Bertinoro, 2019
Finding Tiny Clusters in Bipartite Graphs, INFORMATIK 2019
Bipartite Stochastic Block Models with Tiny Clusters, University of Eastern Finland, 2019
Efficient Distributed Workload (Re-)Embedding, SIGMETRICS 2019
Bipartite Stochastic Block Models with Tiny Clusters, NeurIPS 2018
Ranking the Teams in European Football Leagues With Agony, MLSA@ECML PKDD 2018
What You Will Gain By Rounding: Theory and Algorithms for Rounding Rank, ICDM 2016
Incremental and Fully Dynamic Subgraph Connectivity For Emergency Planning, ESA 2016
- Conferences VLDB 2020, SoCG 2020, GI 2019, SIGMETRICS 2019, NeurIPS 2018, ECML PKDD 2018, HALG 2018, ESA 2017, SODA 2017, ICDM 2016, ESA 2016, HALG 2016, ECML PKDD 2014
- Summer Schools ADFOCS Summer School 2016 on Distributed Computing at Max Planck Institute
- Technologies Python, C, C++, Objective-C, JavaScript, PHP, Matlab, MySQL, L^AT_EX, git, svn, vim

Teaching

- Teaching Assistant *Algorithms and Data Structures* (Summer 2020)
Algorithms and Data Structures 2 (Winter 2019)
Mathematical Foundations of Computer Science 1 (Winter 2018, Winter 2017, Summer 2017, Winter 2016)

Extracurricular Activities

- 2013–2015 *First President and Co-Founder* of the Debating Society of Saarland University
- 2011–2013 *Chairman and Elected Member* of Students' Representatives Council of Mathematics at University of Jena

Publications

Note that the publication culture in computer science is to publish mostly in conferences and that papers in conference proceedings are fully refereed publications. In data mining and machine learning, authors are usually ordered by contribution; in algorithms, authors are ordered alphabetically.

Data Mining and Machine Learning

- [1] Pauli Miettinen and Stefan Neumann. Recent Developments in Boolean Matrix Factorization. In *IJCAI*, pages 4922–4928, 2020. Survey Article.
- [2] Stefan Neumann and Pauli Miettinen. Biclustering and boolean matrix factorization in data streams. *Proc. VLDB Endow.*, 13(10):1709–1722, 2020.
- [3] Stefan Neumann. Bipartite Stochastic Block Models with Tiny Clusters. In *NeurIPS*, pages 3871–3881, 2018.
- [4] Stefan Neumann and Pauli Miettinen. Reductions for Frequency-Based Data Mining Problems. In *ICDM*, pages 997–1002, 2017.
- [5] Stefan Neumann, Rainer Gemulla, and Pauli Miettinen. What You Will Gain By Rounding: Theory and Algorithms for Rounding Rank. In *ICDM*, pages 380–389, 2016. *Best paper candidate*.

Algorithms

- [6] Monika Henzinger, Stefan Neumann, Harald Räcke, and Stefan Schmid. Tight Bounds for Online Graph Partitioning. In *SODA*, 2021. To appear.
- [7] Monika Henzinger, Stefan Neumann, and Andreas Wiese. Dynamic Approximate Maximum Independent Set of Intervals, Hypercubes and Hyperrectangles. In *SoCG*, pages 51:1–51:14, 2020.
- [8] Monika Henzinger, Stefan Neumann, and Andreas Wiese. Explicit and Implicit Dynamic Coloring of Graphs with Bounded Arboricity. *CoRR*, abs/2002.10142, 2020. Manuscript.
- [9] Monika Henzinger, Stefan Neumann, and Stefan Schmid. Efficient Distributed Workload (Re-)Embedding. *POMACS*, 3(1):13:1–13:38, 2019. Conference version in *SIGMETRICS'19*.
- [10] Monika Henzinger, Andrea Lincoln, Stefan Neumann, and Virginia Vassilevska Williams. Conditional Hardness for Sensitivity Problems. In *ITCS*, pages 26:1–26:31, 2017.
- [11] Monika Henzinger and Stefan Neumann. Incremental and Fully Dynamic Subgraph Connectivity for Emergency Planning. In *ESA*, pages 48:1–48:11, 2016.

Workshops, National Conferences and Football

- [12] Stefan Neumann. Finding Tiny Clusters in Bipartite Graphs. In *INFORMATIK*, pages 253–254, 2019. Session *Best of Data Science Made in Germany, Austria and Switzerland*.
- [13] Stefan Neumann, Julian Ritter, and Kailash Budhathoki. Ranking the Teams in European Football Leagues with Agony. In *MLSA@PKDD/ECML*, pages 55–66, 2018.
- [14] Stefan Neumann and Andreas Wiese. This House Proves That Debating is Harder Than Soccer. In *FUN*, pages 25:1–25:14, 2016.