

# Christian Schulz

## Curriculum Vitae

---

### Contact Information

Address: Am Fasanengarten 5, R. 208, 76131, Karlsruhe, Germany

Date of Birth: February 1984

Email: christian.schulz@kit.edu

### University Education

- March 2010– May 2013      KARLSRUHE INSTITUTE OF TECHNOLOGY.  
Ph.D., summa cum laude, Computer Science.  
Thesis: *High Quality Graph Partitioning*  
Advisor: *Prof. Dr. Sanders*
- October 2004– December 2009      KARLSRUHE INSTITUTE OF TECHNOLOGY.  
Diplom, with highest distinction, GPA 1.0/1.0, Mathematics.
- February 2010      Diplom, with highest distinction, GPA 1.1/1.0, Computer Science.

### Professional Experience

- January 2017– present      UNIVERSITY OF VIENNA.  
Researcher in the Group of Prof. Dr. Henzinger
- March 2010– present      KARLSRUHE INSTITUTE OF TECHNOLOGY.  
Researcher in the Group of Prof. Dr. Sanders
- October 2015– December 2015      TU VIENNA / VIENNA PHD SCHOOL OF INFORMATICS.  
Visiting Professor
- September 2015– February 2016      TU VIENNA.  
Researcher in the Group of Prof. Dr. Träff

### Further Experiences

- September 2011– October 2011      INTERNATIONAL SCHOOL ON MATHEMATICS.  
Summer School: Graph Theory, Algorithms and Applications
- April 2008– February 2010      KARLSRUHE INSTITUTE OF TECHNOLOGY, ITI Sanders & Wagner  
Student Research Assistant
- October 2004– June 2009      FZI RESEARCH CENTER, Karlsruhe  
Student Research Assistant

## Recent Short-term Visits

- March 2014      GOOGLE RESEARCH NEW YORK.  
Scientific Visit in the Group of Mirrokni, Ph.D.
- February 2014      TU VIENNA.  
Scientific Visit in the Group of Prof. Dr. Träff

## Honors and Awards

- 2014              KIT DOCTORAL AWARD IN THE AREA OF COMPETENCE  
“INFORMATION, COMMUNICATION AND ORGANIZATION”
- 2014              UNISERV DISSERTATION AWARD
- 2012              BEST SCORES IN GRAPH PARTITIONING SUBCHALLENGE OF THE  
10TH DIMACS IMPLEMENTATION CHALLENGE
- 2010              BEST STUDENT OF DEPARTMENT OF INFORMATICS (KIT)
- 2003              BEST STUDENT OF FRITZ-REUTER-OBERSCHULE

## Professional Service

*Program Committee Member* for 27th International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD 2015), High Performance Graph Data Management and Processing (HPGDMP 2016), 25th Annual European Symposium on Algorithms (ESA 2017), 10th International Conference on Contemporary Computing (IC3 2017).

*Reviewer* for JEA, TPDS, ALENEX, SPAA, IPDPS, DIMACS, ESA, SEA, Euro-Par, HiPC, TPDS, EGPGV, EAAI, TDSC, JPDC, SODA, CLUS, PARCO, TVCG, and JGAA.

## Grants

- [1] Michael Axtmann, Timo Bingmann, Peter Sanders, and Christian Schulz. Advanced Load Balancing for Complex Problems. JUQEEN access: Mai/15-April/16. Granted compute time: 5.0 Mio Core-H  $\approx$  43T Euro. Juelich Supercomputing Centre (JSC). 2015.
- [2] Michael Axtmann, Timo Bingmann, Peter Sanders, and Christian Schulz. Advanced Load Balancing for Complex Problems. SuperMUC access: Jul/15-Dec/16. Granted compute time: 8.0 Mio Core-H  $\approx$  77T Euro. Leibniz Supercomputing Centre (LRZ). 2015.
- [3] Michael Axtmann, Thomas Balyo, Peter Sanders, Lorenz Hübschle-Schneider and Christian Schulz. Advanced Load Balancing for Complex Problems. JUQEEN access: Mai/16-April/17. Granted compute time: 12.0 Mio Core-H  $\approx$  103T Euro. Juelich Supercomputing Centre (JSC). 2016.
- [4] Peter Sanders, Christian Schulz and Dorothea Wagner. Engineering Algorithms for Partitioning Large Graphs. DFG application for continuation of SA 933/10-1, SCHU 2567/1-2 and WA 654/19-1. Funded: 2 project members to be paid from the DFG fund.

## Teaching Experience

2017	ORGANIZER OF EXERCISES, ALGORITHMS AND DATA STRUCTURES
2016	LECTURER, ALGORITHMS II, 300 STUDENTS
2014-17	5xLECTURER, GRAPH PARTITIONING AND CLUSTERING
2013	ORGANIZER OF EXERCISES, ALGORITHMS I, 700 STUDENTS, 34 SAS
2012	ORGANIZER OF EXERCISES, PARALLEL ALGORITHMS
2010	ORGANIZER OF EXERCISES, ALGORITHMS I, 400 STUDENTS, 15 SAS
2010-16	5xINVITED LECTURER, ALGORITHM ENGINEERING
2011-14	BIG DATA, GRAPH PARTITIONING, ALGORITHM ENGINEERING SEMINARS

## Open Source Software

2017	VIM – VIENNA MAPPING AND SPARSE QUADRATIC ASSIGNMENT
2017	PARHIP – PARALLEL HIGH QUALITY PARTITIONING
2017	KALP – KARLSRUHE LONGEST PATHS
2015	KAMIS – KARLSRUHE MAXIMUM INDEPENDENT SET
2015	KADRAW – KARLSRUHE GRAPH DRAWING
2013	KAHIP – KARLSRUHE HIGH QUALITY PARTITIONING

## Research Interests

Graph Partitioning and Clustering, Parallel Algorithms, Combinatorial Optimization, Big Data

## Supervised Theses

Maximilian Schuler (BA), Jonas Fietz (MA), Marcel Birn (MA), Florian Ziegler (BA), Andreas Wagner (MA), Klaus Lukas Hübner (BA), Michael Wegner (BA), Sebastian Lamm (BA), Vitali Henne (MA), Jakob Dahlum (BA), Jan Ebbing (BA), Sebastian Lamm (MA), Robert Williger (BA), Marvin Samson (BA), Demian Hesse (MA), Robin Andre (BA), Yani Kolev (BA), Daniel Seemaier (BA), Sonja Biedermann (BA). *Currently running student projects:* Robin Andre (BA), Yani Kolev (BA), Daniel Seemaier (BA), Sonja Biedermann (BA).

## Supervised Student Research Assistants

Mihal Djurev, Sebastian Lamm, Michael Wegner, Jan Ebbing, Robert Williger, Tobias Ribizel

## Book Chapters and Lecture Notes

- [1] David Bader, Andrea Kappes, Henning Meyerhenke, Peter Sanders, Christian Schulz and Dorothea Wagner. Benchmarking for Graph Clustering and Partitioning. In *Encyclopedia of Social Network Analysis and Mining*, 2014. Updated article to appear 2017.
- [2] Christian Schulz and Sebastian Korbinian Bayer, Fellipe Bernardes-Lima, Jan Jacob, Robert Hangu, Sergey Hayrapetyan, Demian Hesse, Christoph Hess, Sebastian Lamm, Eike Röhrs, Henning Schulz, Christian Steiger, Matthias Stumpp, Marvin Teichmann. Graph Partitioning and Graph Clustering in Theory and Practice. Lecture Notes. Karlsruhe Institute of Technology and Vienna PhD School of Informatics. 2015.
- [3] Aydin Buluc, Henning Meyerhenke, Ilya Safro, Peter Sanders, Christian Schulz. Recent Advances in Graph Partitioning. Accepted as chapter in *Algorithm Engineering: Selected Results and Surveys*. Volume 9220 of Lecture Notes in Computer Science. Springer-Verlag. 2016.

## Journal Articles

- [4] Ilya Safro, Peter Sanders, and Christian Schulz. Advanced Coarsening Schemes for Graph Partitioning. *ACM Journal of Experimental Algorithms*. Volume 19, Article No. 2.2, 2015.
- [5] Heiko Papenfuß, Peter Sanders, and Christian Schulz. Turbo für Graphdatenbanken: Graphpartitionierung mit KaHIP. *JavaSPEKTRUM 01/2015*.
- [6] Roland Glantz, Henning Meyerhenke, and Christian Schulz. Tree-based Coarsening and Partitioning of Complex Networks. *ACM Journal of Experimental Algorithms*. Volume 21, Article No. 1, 2016.
- [7] Peter Sanders and Christian Schulz. Scalable Generation of Scale-free Graphs. *Information Processing Letters*. Volume 116, Article No. 7, pages 489–491, 2016.
- [8] Henning Meyerhenke, Peter Sanders and Christian Schulz. Partitioning (Hierarchically Clustered) Complex Networks via Size-Constrained Graph Clustering. *ACM Journal of Heuristics*, Volume 22, Issue 5, pages 759–782, 2016.
- [9] Henning Meyerhenke, Peter Sanders and Christian Schulz. Parallel Graph Partitioning for Complex Networks. *IEEE Transactions on Parallel and Distributed Systems*, to appear. 2017.
- [10] Henning Meyerhenke, Martin Nöllenburg and Christian Schulz. Drawing Large Graphs by Multilevel Maxent-Stress Optimization. *IEEE Transactions on Visualization and Computer Graphics*, to appear. 2017.
- [11] Christian Schulz, Darren Strash, Sebastian Lamm, Peter Sanders and Renato F. Werneck. Finding Near-Optimal Independent Sets at Scale. *ACM Journal of Heuristics*, to appear. 2017.

## Conference Articles

- [12] Daniel Delling, Robert Görke, Christian Schulz and Dorothea Wagner. Orca Reduction and ContrAction Graph Clustering. In *Proceedings of the 5th International Conference on Algorithmic Aspects in Information and Management (AAIM)*, volume 5564 of Lecture Notes in Computer Science, pages 152–165. Springer, 2009.
- [13] Manuel Holtgrewe, Peter Sanders and Christian Schulz. Engineering a Scalable High Quality Graph Partitioner. In *24th IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, 2010.
- [14] Vitaly Osipov, Peter Sanders, Christian Schulz and Manuel Holtgrewe. Engineering State-of-the-Art Graph Partitioning Libraries @KIT. In *Proceedings of the Workshop on Computational Methods in Science and Engineering (SimLabs@KIT)*, KIT Scientific Publishing, pages 117–130. 2010.
- [15] Peter Sanders and Christian Schulz. Engineering Multilevel Graph Partitioning Algorithms. In *Proceedings of the 19th European Symposium on Algorithms (ESA)*, volume 6942 of Lecture Notes in Computer Science, pages 469–480. Springer, 2011.
- [16] Peter Sanders and Christian Schulz. Distributed Evolutionary Graph Partitioning. In *Proceedings of the 12th Workshop on Algorithm Engineering and Experimentation (ALENEX)*, pages 16-19, 2012.
- [17] Ilya Safro, Peter Sanders and Christian Schulz. Advanced Coarsening Schemes for Graph Partitioning. In *Proceedings of the 11th Symposium on Experimental Algorithms (SEA)*, volume 7276 of Lecture Notes in Computer Science, pages 369–380. Springer, 2012.
- [18] Vitaly Osipov, Peter Sanders and Christian Schulz. Engineering Graph Partitioning Algorithms. In *Proceedings of the 11th Symposium on Experimental Algorithms (SEA)*, volume 7276 of Lecture Notes in Computer Science, pages 18–26. Springer, 2012.
- [19] Jonas Fietz, Matthias Krause, Peter Sanders, Christian Schulz and Vincent Heuveline. Optimized Hybrid Parallel Lattice Boltzmann Fluid Flow Simulations on Complex Geometries. In *Proceedings of the 18th International European Conference on Parallel Computing (Euro-Par)*, volume 7484 of Lecture Notes in Computer Science, pages 818–829. Springer, 2012.
- [20] Peter Sanders and Christian Schulz. High Quality Graph Partitioning. In *Proceedings of the 10th DIMACS Implementation Challenge Workshop: Graph Partitioning and Clustering*, pages 1–17, AMS, 2013.
- [21] Peter Sanders and Christian Schulz. Think Locally, Act Globally: Highly Balanced Graph Partitioning. In *Proceedings of the 12th Symposium on Experimental Algorithms (SEA)*, volume 7933 of Lecture Notes in Computer Science, pages 164–175. Springer, 2013.
- [22] Marcel Birn, Vitaly Osipov, Peter Sanders, Christian Schulz and Nodari Sitchinava. Efficient Parallel and External Matchings. In *Proceedings of the 19th International European Conference on Parallel Computing (Euro-Par)*, volume 8097 of Lecture Notes in Computer Science, pages 659–670. Springer, 2013.

- [23] Roland Glantz, Henning Meyerhenke and Christian Schulz. Tree-based Coarsening and Partitioning of Complex Networks. In *Proceedings of the 13th Symposium on Experimental Algorithms (SEA)*, volume 8504 of Lecture Notes in Computer Science, pages 364–375. Springer, 2014.
- [24] Henning Meyerhenke, Peter Sanders and Christian Schulz. Partitioning Complex Networks via Size-constrained Clustering. In *Proceedings of the 13th Symposium on Experimental Algorithms (SEA)*, volume 8504 of Lecture Notes in Computer Science, pages 351–363. Springer, 2014.
- [25] Yaroslav Akhremtsev, Peter Sanders and Christian Schulz. (Semi-)External Algorithms for Graph Partitioning and Clustering. In *Proceedings of the 15th Workshop on Algorithm Engineering and Experimentation (ALENEX)*, pages 33-43, 2015.
- [26] Henning Meyerhenke, Peter Sanders and Christian Schulz. Parallel Graph Partitioning for Complex Networks. In *29th IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, 2015.
- [27] Michael Axtmann, Timo Bingmann, Peter Sanders and Christian Schulz. Practical Massively Parallel Sorting. In *Proceedings of the 27th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, pages 13-23. ACM, 2015.
- [28] Sebastian Lamm, Peter Sanders and Christian Schulz. Graph Partitioning for Independent Sets. In *Proceedings of the 14th Symposium on Experimental Algorithms (SEA)*, volume 8504 of Lecture Notes in Computer Science, pages 68–81. Springer, 2015.
- [29] Henning Meyerhenke, Martin Nöllenburg and Christian Schulz. Drawing Large Graphs by Multilevel Maxent-Stress Optimization. In *Proceedings of the 23rd International Symposium on Graph Drawing & Network Visualization (GD)*, volume 9411 of Lecture Notes in Computer Science, pages 30-43. Springer, 2015.
- [30] Nitin Ahuja, Matthias Bender, Peter Sanders, Christian Schulz and Andreas Wagner. Incorporating Road Networks into Territory Design. In *Proceedings of the 23rd International Conference on Advances in Geographic Information Systems (GIS)*. ACM Press, 2015.
- [31] Sebastian Schlag, Vitali Henne, Tobias Heuer, Henning Meyerhenke, Peter Sanders and Christian Schulz.  $k$ -way Hypergraph Partitioning via  $n$ -Level Recursive Bisection. In *Proceedings of the 16th Workshop on Algorithm Engineering and Experimentation (ALENEX)*, pages 53-67. 2016.
- [32] Sebastian Lamm, Peter Sanders, Christian Schulz, Darren Strash and Renato F. Werneck. Finding Near-Optimal Independent Sets at Scale. In *Proceedings of the 16th Workshop on Algorithm Engineering and Experimentation (ALENEX)*, pages 138-150. 2016.
- [33] Jakob Dahlum, Sebastian Lamm, Peter Sanders, Christian Schulz, Darren Strash and Renato F. Werneck. Accelerating Local Search for the Maximum Independent Set Problem. In *Proceedings of the 15th Symposium on Experimental Algorithms (SEA)*, volume 9685 of Lecture Notes in Computer Science, pages 118–133. Springer, 2016.

- [34] Peter Sanders and Christian Schulz. Advanced Multilevel Node Separator Algorithms. In *Proceedings of the 15th Symposium on Experimental Algorithms (SEA)*, volume 9685 of Lecture Notes in Computer Science, pages 294–309. Springer, 2016.
- [35] Peter Sanders, Christian Schulz, Darren Strash and Robert Williger. Distributed Evolutionary  $k$ -way Node Separators. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO)*, to appear. 2017.
- [36] Christian Schulz and Jesper Larson Träff. Better Process Mapping and Sparse Quadratic Assignment Problems. In *Proceedings of the 16th Symposium on Experimental Algorithms (SEA)*, to appear. 2017.
- [37] Orlando Moreira, Merten Popp and Christian Schulz. Graph Partitioning with Acyclicity Constraints. In *Proceedings of the 16th Symposium on Experimental Algorithms (SEA)*, to appear. 2017.

## **Technical Reports, Workshop Papers and Posters**

- [38] Manuel Holtgrewe, Peter Sanders and Christian Schulz. Engineering a Scalable High Quality Graph Partitioner. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2010. (arXiv:0910.2004)
- [39] Peter Sanders and Christian Schulz. Engineering Multilevel Graph Partitioning Algorithms. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2011. (arXiv:1012.0006)
- [40] Peter Sanders and Christian Schulz. Distributed Evolutionary Graph Partitioning. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2012. (arXiv:1110.0477)
- [41] Ilya Safro, Peter Sanders and Christian Schulz. Advanced Coarsening Schemes for Graph Partitioning. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2011. (arXiv:1201.6488)
- [42] Peter Sanders and Christian Schulz. Think Locally, Act Globally: Perfectly Balanced Graph Partitioning. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2012. (arXiv:1210.0477)
- [43] Marcel Birn, Vitaly Osipov, Peter Sanders, Christian Schulz and Nodari Sitchinava. Efficient Parallel and External Matchings. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2013. (arXiv:1302.4587)
- [44] Peter Sanders and Christian Schulz. KaHIP v0.6 – Karlsruhe High Quality Partitioning – User Guide. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2013. (arXiv:1311.1714)
- [45] Aydin Buluc, Henning Meyerhenke, Ilya Safro, Peter Sanders and Christian Schulz. Recent Advances in Graph Partitioning. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2013. (arXiv:1311.3144)

- [46] Roland Glantz, Henning Meyerhenke and Christian Schulz. Tree-based Coarsening and Partitioning of Complex Networks. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2014. (arXiv:1402.2782)
- [47] Henning Meyerhenke, Peter Sanders and Christian Schulz. Partitioning Complex Networks via Size-constrained Clustering. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2014. (arXiv:1402.3281)
- [48] Yaroslav Akhremtsev, Peter Sanders and Christian Schulz. (Semi-)External Algorithms for Graph Partitioning and Clustering. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2014. (arXiv:1404.4887)
- [49] Henning Meyerhenke, Peter Sanders and Christian Schulz. Parallel Graph Partitioning for Complex Networks. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2014. (arXiv:1404.4797)
- [50] Roland Glantz, Henning Meyerhenke, Peter Sanders and Christian Schulz. Improving Coarsening for Multilevel Partitioning of Complex Networks. Workshop Paper, The Sixth SIAM Workshop on Combinatorial Scientific Computing, 2014.
- [51] Michael Axtmann, Timo Bingmann, Peter Sanders and Christian Schulz. Practical Massively Parallel Sorting – Basic Algorithmic Ideas. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2014. (arXiv:1410.6754)
- [52] Sebastian Lamm, Peter Sanders and Christian Schulz. Graph Partitioning for Independent Sets. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2015. (arXiv:1502.01687)
- [53] Peter Sanders and Christian Schulz. KaHIP – Karlsruhe High Quality Graph Partitioning. Invited Poster, German-American Frontiers of Engineering Symposium, National Academy of Engineering and Alexander von Humboldt Foundation, Potsdam, 2015.
- [54] Vitali Henne, Henning Meyerhenke, Peter Sanders, Sebastian Schlag and Christian Schulz.  $n$ -level Hypergraph Partitioning. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2015. (arXiv:1505.00693)
- [55] Nitin Ahuja, Matthias Bender, Peter Sanders, Christian Schulz and Andreas Wagner. Incorporating Road Networks into Territory Design. Technical report, ITI Sanders, Department of Informatics, Karlsruhe Institute of Technology, 2015. (arXiv:1504.07846)
- [56] Henning Meyerhenke, Martin Nöllenburg and Christian Schulz. Drawing Large Graphs by Multilevel Maxent-Stress Optimization. Technical report, ITI, Department of Informatics, Karlsruhe Institute of Technology, 2015. (arXiv:1506.04383)
- [57] Peter Sanders and Christian Schulz. Advanced Multilevel Node Separator Algorithms. Technical report, ITI, Department of Informatics, Karlsruhe Institute of Technology, 2015. (arXiv:1509.01190)



- [58] Sebastian Schlag, Vitali Henne, Tobias Heuer, Henning Meyerhenke, Peter Sanders and Christian Schulz. *k*-way Hypergraph Partitioning via *n*-Level Recursive Bisection. Technical report, ITI, Department of Informatics, Karlsruhe Institute of Technology, 2015. (arXiv:1511.03137)
- [59] Sebastian Lamm, Peter Sanders, Christian Schulz, Darren Strash and Renato F. Werneck. Finding Near-Optimal Independent Sets at Scale. Technical report, ITI, Department of Informatics, Karlsruhe Institute of Technology, 2015. (arXiv:1509.00764)
- [60] Jakob Dahlum, Sebastian Lamm, Peter Sanders, Christian Schulz, Darren Strash and Renato F. Werneck. Accelerating Local Search for the Maximum Independent Set Problem. Technical report, ITI, Department of Informatics, Karlsruhe Institute of Technology, 2016. (arXiv:1602.01659)
- [61] Peter Sanders and Christian Schulz. Scalable Generation of Scale-free Graphs. Technical report, ITI, Department of Informatics, Karlsruhe Institute of Technology, 2016. (arXiv:1602.07106)
- [62] Peter Sanders, Christian Schulz, Darren Strash and Robert Williger. Distributed Evolutionary *k*-way Node Separators. Technical report, ITI, Department of Informatics, Karlsruhe Institute of Technology and Department of Computer Science, University of Vienna, 2017. (arXiv:1702.01692)
- [63] Christian Schulz and Jesper Larson Träff. Better Process Mapping and Sparse Quadratic Assignment Problems. Technical report, ITI, Department of Informatics, Karlsruhe Institute of Technology, Department of Computer Science, University of Vienna and Technical University of Vienna, 2017. (arXiv:1702.04164)
- [64] Tomas Balyo, Kai Fieger and Christian Schulz. Optimal Longest Path Search by Dynamic Programming. Technical report, ITI, Department of Informatics, Karlsruhe Institute of Technology and Department of Computer Science, University of Vienna, 2017. (arXiv:1702.04170)
- [65] Orlando Moreira, Merten Popp and Christian Schulz. Graph Partitioning with Acyclicity Constraints. Technical report, ITI, Department of Informatics, Karlsruhe Institute of Technology, Department of Computer Science, University of Vienna and Intel Corporation, Eindhoven, The Netherlands, 2017 (arXiv:1704.00705).

## Theses

- [66] Christian Schulz. High Quality Graph Partitioning. Ph.D. Thesis, Karlsruhe Institute of Technology, 2013.
- [67] Christian Schulz. Scalable Parallel Refinement of Graph Partitions. Diplomarbeit, Universität Karlsruhe (TH), Fakultät für Informatik, 2009.
- [68] Christian Schulz. Design and Experimental Evaluation of a Local Graph Clustering Algorithm. Studienarbeit, Universität Karlsruhe (TH), Fakultät für Informatik, 2008.