

Katharina Anna Zweig née Lehmann

Name: Dr. Katharina Anna Zweig, née Lehmann
Place and date of birth: 22.5.1976 in Hamburg, Germany
Nationality: German
Marital status: Married, one daughter (8.1.2009)
Current position: Junior research group leader “Network analysis and graph theory”, at the Interdisciplinary Center for Scientific Computing (IWR), University of Heidelberg, Speyerer Straße 6, 69115 Heidelberg
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1982-1986 Primary school “Grundschule Breitenfelderstraße”, Hamburg.
1986-1995 Secondary school (Gymnasium) “Gelehrtenschule des Johanneums zu Hamburg”, Hamburg, Abitur in June 1995 (Grade 1,0).
09/1993-01/1997 Apprenticeship as “Chemical-Technical Assistant (CTA)”, parallel to the last three years of secondary school.
04/1997-07/2001 Study of Biochemistry, University of Tübingen (Grade 1,0), majors in physical chemistry and physiology; title of diploma thesis: “Untersuchung zur Überlebensfähigkeit der Hefe *Saccharomyces cerevisiae* in bidestilliertem Wasser” (Analysis of the Survival of *Saccharomyces cerevisiae* in Distilled Water), advisor: Professor Dr. Kai Fröhlich and Professor Dr. Francesco Madeo, University of Tübingen, results published in [A1].
10/1998-10/2006 Study of bioinformatics, University of Tübingen (Grade 1,0), major biochemistry; title of diploma thesis: “The structure of real-world SAT problems”, advisor: Professor Dr. Michael Kaufmann and Professor Dr. Wolfgang Küchlin, University of Tübingen.
01/2003-03/2008 Doctoral student at the faculty of Cognition Sciences, University of Tübingen, Department Computer Science, *Parallel Computing*, group leader and advisor: Professor Dr. Michael Kaufmann.
Summer 2005 Participant in the Santa Fe Complex System Summer School.
August, 2007 Graduated with summa cum laude, title: Dr. rer. nat.
October, 2007 Guest at the working group of Prof. Stephen Kobourov, University of Arizona, Arizona, USA.
04/2008-08/2009 Supported by a PostDoc scholarship of the Deutsche Akademie der Naturforscher Leopoldina (BMBF LPD 9901/8-182) at the Eötvös Loránd University, department of Biological Physics (Prof. T. Vicsek), Budapest, Hungary
05/2008 Organization of a three day DFG-Workshop: “Cut and Cycle Bases” (together with Prof. Horst W. Hamacher, University of Kaiserslautern).
since 09/2009 Leader of a junior research group at the Interdisciplinary Center for Scientific Computing (IWR) at the University of Heidelberg, Germany.

Further Education:

Module I and II of the Baden-Württemberg Certificate on university didactics. Finishing of modul III and thus obtaining the whole certificate is planned for summer 2009

Teaching:

1. Teaching assistant for lectures *Algorithms, Theoretical Informatic, Algorithms and Complexity I and II* (Prof. Kaufmann, Universität Tübingen),
2. Organization of various seminars: *Game Theory Evolving, Introduction to Probabilities, Concrete Mathematics, Complex Network Analysis, Ethic in Computer Science*, 2003-2007,
3. Lecture *Algorithms* (2007, together with Prof. Kaufmann, Universität Tübingen),
4. Lecture *Computational Complexity of Real-World Problems* (2008, 2009, interdisciplinary course for Ph.D. students from physics, mathematics and informatics, ELTE Universitt Budapest).
5. Lecture 'Algorithms and Data Structures', SS 2010, University of Heidelberg.

Award: [A7] was awarded best paper in track.

Highly accessed: [A16] was awarded the label 'highly accessed' four weeks after publication.

Acted as Reviewer for: Social Networks, Journal of Discrete Algorithms, Workshop on Graph Theory (WG'07), ACM Symposium on Discrete Algorithms (SODA'07), ALENEX'07, Symposium on Graph Drawing (GD'03-08), Symposium on Mathematical Foundations of Computer Science (MFCS), ISAAC'08, Algorithmica, Journal of Graph Algorithms and Applications.

Member of the Program Committee: SASO 2009, SASO 2010

Grants:

1. Under the supervision of Prof. Dr. Michael Kaufmann (Tbingen) I designed two projects within so-called special interest programs of the DFG. Both projects were accepted and supported:
 - (a) SPP 1126 (Algorithms for Large and Complex Networks): 'Evolution of Complex Networks' (Project leader Prof. Dr. Kaufmann, supported research assistants: K. A. Zweig, M. Geyer (Tübingen)); First proposal: 2003-2005, second proposal: 2005-2007.
 - (b) SPP 1307 (Algorithm Engineering): '**Structur** based **Al**gorithm **En**gineering for **SAT**-Solving (StrAlEnSATS)' (Project leaders Prof. Dr. Kaufmann, Prof. Dr. Küchlin (Tbingen), supported research assistant: Stephan Kottler); first proposal: 2008-2010.

2. PostDoc scholarship of the Akademie der Naturforscher Leopoldina (BMBF LPD 9901/8-182) for two years: 04/2008-03/2010.
3. Research scholarship of the DFG for the same time interval with an additional 4000 Euro travel budget (ZW-179/1 und ZW-170/2).

Talks and Invitations:

Jan 2006: Talk at the ELTE University, Budapest, Ungarn
 2006, 2007, 2008, 2009: Bertinoro Workshop on Graph Drawing
 09/2009: Dagstuhl seminar 09371 “Algorithmic Methods for Distributed Cooperative Systems”

Publications

Peer-reviewed Journals and Proceedings

- [A1] Eva Herker, Helmut Jungwirth, Katharina Anna Lehmann, Corinna Maldener, Kai-Uwe Fröhlich, Silke Wissing, M. Fehr, S. Sigrist, and Frank Madeo. Chronological aging leads to apoptosis in yeast. *Journal of Cell Biology*, 164(4):501–507, 2004.
- [A2] Sandor Fekete, Michael Kaufmann, Alexander Kroeller, and Katharina Lehmann. A new approach for boundary recognition in geometric sensor networks. In *Proceedings of the 17th Canadian Conference on Computational Geometry, 2005*, 2005.
- [A3] Michael Kaufmann, Katharina A. Lehmann, and Andreas Gerasch. Area-optimal hv-like tree drawings with a fixed aspect ratio. In *Proceedings of the 31st Conference on Current Trends in Theory and Practice of Computer Science*, 2005.
- [A4] Michael Kaufmann, Katharina A. Lehmann, and Hendrik Post. On small-world generating models. In *Proceedings of the 2nd European Conference on Complex Systems (ECCS'05)*, 2005.
- [A5] Olaf Landsiedel, Klaus Wehrle, and Katharina A. Lehmann. T-DHT: Topology based distributed hash tables. In *Proceedings of the 5th International IEEE Conference on Peer-to-Peer-Computing, Konstanz, Germany*, 2005.
- [A6] Katharina A. Lehmann. Why simulating evolutionary processes is just as interesting as applying them. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO'05)*, pages 370–373, 2005.
- [A7] Katharina A. Lehmann and Michael Kaufmann. Evolutionary algorithms for the self-organized evolution of networks. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO'05)*, pages 563–570, 2005.
- [A8] Guiseppe DiBattista, P. Francesco Cortese, Francesco Frati, Luca Grilli, Katharina A. Lehmann, Guiseppe Liotta, Maurizio Patrignani, Ian Tollis, and Francesco Trotta. On the topologies of local minimum spanning trees. In *Proceedings of the 3rd Workshop on Combinatorial and Algorithmic Aspects of Networking (CAAN'06)*, Chester, UK, 2006.
- [A9] Michael Kaufmann, Jan Kratochvíl, Katharina A. Lehmann, and Amarendran Subramanian. Max-tolerance graphs as intersection graphs: Cliques, cycles, and recognition. In *Proceedings of the 17th ACM Symposium on Discrete Algorithms (SODA'06)*, 2006.
- [A10] Katharina A. Lehmann, Michael Kaufmann, Stephan Steigele, and Kay Nieselt. On the maximal cliques in c-max tolerance graphs and their application in clustering molecular sequences. *Algorithms for Molecular Biology*, 1:9, 2006.
- [A11] Katharina A. Lehmann, Hendrik D. Post, and Michael Kaufmann. Hybrid graphs as a framework for the small-world effect. *Physical Review E*, 73:056108, 2006.
- [A12] Katharina A. Lehmann and Stephan Kottler. Visualizing large and complex networks. In *Proceedings of the 14th International Symposium on Graph Drawing (GD'06)*, 2007.

- [A13] J. Putzke, T. Seehawer, K.A. Zweig, and K. Fischbach. Patent citation and corporate market value – a study using social network analysis. In *4th Conference on Applications of Social Networks Analysis (ASNA)*, 2007.
- [A14] Katharina Anna Zweig. To cluster or not to cluster - a meta-analytic approach. In *Proceedings of the 5th European Conference on Complex Systems (ECCS'08)*, 2008.
- [A15] Katharina Anna Zweig and Karin Zimmermann. Wanderer between the worlds – self-organized network stability in attack and random failure scenarios. In *Proceedings of the Second IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO'08)*, 2008.
- [A16] László András Zahoránszky, Gyula Y. Katona, Péter Hári, András Málnási-Csizmadia, Katharina A. Zweig, and Gergely Zahoránszky-Kóhalmi. Breaking the hierarchy - a new cluster selection mechanism for hierarchical clustering methods. *Algorithms for Molecular Biology*, page openAccess, 2009.
- [A17] Telikepalli Kavitha, Christian Liebchen, Kurt Mehlhorn, Dimitrios Michail, Romeo Rizzi, Torsten Ueckerdt, and Katharina A. Zweig. Cycle bases in graphs: characterization, algorithms, complexity, and applications. *Computer Science Review*, 3(4):199–243, 2009.
- [A18] Carla Binucci, Ulrik Brandes, Giuseppe Di Battista, Walter Didimo, Marco Gaertler, Pietro Palladino, Maurizio Patrignani, Antonios Symvonis, and Katharina Zweig. Drawing trees in a streaming model. In *Proceedings of the 17th International Symposium on Graph Drawing (GD09)*, 2010.
- [A19] Katharina A. Zweig, Gergely Palla, and Tamás Vicsek. What makes a phase transition? Analysis of the random satisfiability problem. *Physical Review A*, in press (doi:10.1016/j.physa.2009.12.051), 2010.

Theses and Books

- [B20] Katharina A. Lehmann. The structure of real-world SAT-problems. Master's thesis, University of Tübingen, 2006.
- [B21] Katharina A. Zweig. *On Local Behavior and Global Structures in the Evolution of Complex Networks*. PhD thesis, University of Tübingen, Wilhelm-Schickard-Institut für Informatik, 2007.
- [B22] Jürgen Lerner, Dorothea Wagner, and Katharina Zweig, editors. *Algorithmics of Large and Complex Networks*. Springer Verlag, 2009.

Book chapters

- [C23] Riko Jacob, Dirk Koschützki, Katharina A. Lehmann, Leon Peeters, and Dagmar Tenfelde-Podehl. *Network Analysis - Methodological Foundations*, chapter Algorithms for Centrality Indices. Springer Verlag, 2005.
- [C24] Dirk Koschützki, Katharina A. Lehmann, Leon Peeters, Stefan Richter, Dagmar Tenfelde-Podehl, and Oliver Zlotowski. *Network Analysis - Methodological Foundations*, chapter Centrality Indices. Springer Verlag, 2005.
- [C25] Dirk Koschützki, Katharina A. Lehmann, Dagmar Tenfelde-Podehl, and Oliver Zlotowski. *Network Analysis - Methodological Foundations*, chapter Advanced Centrality Concepts. Springer Verlag, 2005.
- [C26] Katharina A. Lehmann and Michael Kaufmann. *Peer-to-Peer Systems and Applications*, chapter Random Graphs, Small Worlds, and Scale-Free Networks, pages 57–76. Springer Verlag, 2005.
- [C27] Michael Kaufmann and Katharina Anna Zweig. *Algorithmics of Large and Complex Networks*, chapter Modeling and Designing Real-World Networks. Springer Verlag, 2009.

Technical Reports

- [D28] Katharina A. Lehmann and Michael Kaufmann. Decentralized algorithms for evaluating centrality in complex network. Technical report, Technical Report of the Wilhelm-Schickard-Institute, University Tübingen, WSI-2003-10, ISSN 0946-3852, 2003.
- [D29] Katharina A. Lehmann, Hendrik Post, and Michael Kaufmann. On small-world generating models. Technical report, Technical Report of the Wilhelm-Schickard-Institute, University Tübingen, WSI-2005-17, ISSN 0946-3852, 2005.
- [D30] Katharina A. Lehmann and Stephan Kottler. Visualizing large and complex networks. Technical Report WSI-2006-06, ISSN 0946-4852, Wilhelm-Schickard-Institute, University of Tuebingen, 2006.