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)
Email address:	zweig@cs.uni-kl.de

since 04/2012	Professor (W2) at the Technical University Kaiserslautern, head of the group "Graph Theory and Complex Network Analysis", Gottlieb-Daimler-Strasse 48/670, 67663 Kaiserslautern, Germany.
since 04/2010	Permanent guest of the Marsilius Kolleg, a center for advanced and interdisciplinary studies at the University of Heidelberg
09/2009-04/2012	Junior research group leader "Network analysis and graph theory", at the Interdisciplinary Center for Scientific Computing (IWR), University of Heidelberg
05/2008	Organization of a three day DFG-Workshop: "Cut and Cycle Bases" (together with Prof. Horst W. Hamacher, University of Kaiserslautern).
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
October, 2007	Guest at the working group of Prof. Stephen Kobourov, University of Arizona, Arizona, USA.
August, 2007	Graduated with summa cum laude, title: Dr. rer. nat.
11/2006	Organisation of an interdisciplinary DFG-Workshop: "Stable Network Structures in Dynamic Systems".
Summer 2005	Participant in the Santa Fe Complex System Summer School.
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.
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.
04/1996-07/2001	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].
09/1993-01/1996	Apprenticeship as "Chemical-Technical Assistant (CTA)", parallel to the last three years of secondary school.
1986-1995	Secondary school (Gymnasium) "Gelehrtenschule des Johanneums zu Hamburg", Hamburg, Abitur in June 1995 (Grade 1,0).

Further Education:
Module I and II of the Baden-Württemberg Certificate on university didactics.

Teaching:

1. Compact course on "Vernetzungen und Verstrickungen - Digital Humanities and the new science of complex networks" (together with Dr. M. Schich, ETH Zurich) at the Marsilius-Kolleg, University of Heidelberg, SS 2012.

2. Lecture "Formal foundations of programming", SS 2012.

3. Regular compact courses at the Heidelberg Graduate School for Mathematical and Computational Models for the Sciences (SS 2010- SS 2012).

4. Seminar/proseminar on 'Network Analysis' in WS 2010/11

5. Lecture 'Algorithms and Data Structures', SS 2010, University of Heidelberg.

6. Lecture *Computational Complexity of Real-World Problems* (2008, 2009, interdisciplinary course for Ph.D. students from physics, mathematics and informatics, ELTE University Budapest).

7. Lecture *Algorithms* (2007, together with Prof. Kaufmann, Universität Tübingen),

8. Organization of various seminars: *Game Theory Evolving*, *Introduction to Probabilities*, *Concrete Mathematics*, *Complex Network Analysis*, *Ethics in Computer Science*, 2003-2007,

9. Teaching assistant for lectures *Algorithms*, *Theoretical Computer Science*, *Algorithms and Complexity I and II* (Prof. Kaufmann, Universität Tübingen),

10. Two lectures on network analysis, one for computer scientists (Bachelor and Master), one together with Professor Glückler (Geography) in an interdisciplinary lecture as part of the Marsilius studies of the University of Heidelberg.

Awards:

Best paper in track: [A7] was awarded best paper in track at the Genetic and Evolutionary Computation Conference (GECCO'2005, Washington D.C., USA).
Highly accessed: [A16] was awarded the label 'highly accessed' four weeks after publication.
Best paper award 'Perception/Action category of the Computational Modeling Prizes' of the annual meeting of the Cognitive Science Society (CogSci'2011, Boston, USA) for [A23]

Acted as Reviewer for: Algorithmica, Journal of Graph Algorithms and Applications, PlosOne, Social Networks, Journal of Discrete Algorithms, Computer

Networks, 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, SASO'09-11.

Member of the Program Committee: SASO 2009, SASO 2010, ECCS 2011
Technical Progam Chair: SASO 2011
Member of Editorial Board: Social Network Analysis and Mining (Springer)
Section Editor "Current and Future Research Trends" in Springer's Encyclopedia on Social Network Analysis and Mining

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 (approx. $200,000$ Euro in total).

    (b) SPP 1307 (Algorithm Engineering): '**Str**uctur based **Al**gorithm **En**gineering for **SAT-S**olving (StrAlEnSATS)' (Project leaders Prof. Dr. Kaufmann, Prof. Dr. Küchlin (Tbingen), supported research assistant: Stephan Kottler); first proposal: 2008-2010 (approximately $100,000$ Euro in total).

2. PostDoc scholarship of the Akademie der Naturforscher Leopoldina (BMBF LPD 9901/8-182) for two years: 04/2008-03/2010 (approximately $85,000$ Euro).

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) (approx. $85,000$ Euro).

4. My position together with two positions for graduate students at the University of Heidelberg is funded with money from the German excellence initiative (300,000).

5. Guest of the Marsilius-Kolleg of the University of Heidelberg (year 2010/2011, $10,000$ Euro grant).

Acted as supervisor:
All theses in Tübingen were officially supervised by Prof. M. Kaufmann.

1. **Doctoral students**

    (a) Emőke-Ágnes Horvat (started April 2010).

2. **Diploma and master theses**

   (a) Hendrik Post, Tübingen (2006)

   (b) Stephan Kottler, Tübingen (2007)

   (c) Volker Menrad, Tübingen (2007)

   (d) Ying Gu, Heidelberg (since September 2010)

3. **Bachelor theses and project theses**

   (a) Agata Krasowski, Tübingen (2005)

   (b) Volker Menrad, Tübingen (2005)

   (c) Nina Hmmerle, Tübingen (2005)

   (d) Sonja Boldt, Tübingen (2006)

   (e) Christian Zielke, Tübingen (2007)

   (f) Sebastian Burg, Tübingen (2008)

   (g) Lyubov Nakryykov, Heidelberg (2011)

   (h) Tilmann Wittl, Heidelberg (2011)

   (i) Michael Haas (2011)

Talks and Invitations:
01/2006: "Trends in social network analysis", Prof. Vicsek, Vortrag an der ELTE Universität, Budapest, Ungarn
03/2006: Bertinoro Workshop on Graph Drawing
03/2007: Bertinoro Workshop on Graph Drawing
01/2008: "New Upper Bound on the Length of Weakly Fundamental Cycle Bases", Graduiertenkolleg Mathematik, Prof. Hamacher, University of Kaiserslautern
03/2008: Bertinoro Workshop on Graph Drawing
09/2009: Dagstuhl Seminar 09371 "Algorithmic Methods for Distributed Cooperative Systems"
11/2009: "Self-organizing evolution of networks", Oberseminar of the FG Prof. Scheideler, University Paderborn
5/2010: "Soziale Netzwerkanalyse" in the Leibniz-Graduiertenschule at the IWM, Prof. Cress, University Tübingen
3/2011: "One plus one makes three for social networks", talk for the group of Professor Brandes, University of Constanze
5/2011: Dagstuhl Seminar 11191 "Graph Drawing with Algorithm Engineering Methods"
6/2011: "How to forget the second side of the story" for the graduate students of the Graduiertenkolleg "Explorative Analysis and Visualization of Large Information Spaces" of the University of Constance
7/2011: "How to lie with statistics", a compact course for the graduate students of the BIOMS excellence cluster at the University of Freiburg
7/2011: "How to forget the second side of the story", invited talk at the BIOMS excellence cluster at the University of Freiburg
1/2012: "How to forget the second side of the story", Colloquium of the working group of Prof. Kurt Mehlhorn (Algorithms and Complexity)

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, cylces, 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 Anna Zweig, and Gergely Zahoránszky-Köhalmi. Breaking the hierarchy - a new cluster selection mechanism for hierarchical clustering methods. *Algorithms for Molecular Biology*, 4(1):12, 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)*, volume 5849 of *LNCS*, pages 292–303, 2010.

[A19] Katharina A. Zweig, Gergely Palla, and Tamás Vicsek. What makes a phase transition? Analysis of the random satisfiability problem. *Physical Review A*, 389:1501–1511, 2010.

[A20] Katharina A. Zweig. How to forget the second side of the story: A new method for the one-mode projection of bipartite graphs. In Nasrullah Memon and Reda Alhajj, editors, *Proceedings of the 2010 International Conference on Advances in Social Networks Analysis and Mining ASONAM 2010*, pages 200–207, 2010.

[A21] Katharina A. Zweig. Good versus optimal: Why network analytic methods need more systematic evaluation. *Central European Journal of Computer Science*, 1:137–153, 2011.

[A22] Katharina A. Zweig and Michael Kaufmann. A systematic approach to the one-mode projection of bipartite graphs. *Social Network Analysis and Mining*, 1(3):187–218, 2011.

[A23] S. R. Sudarshan Iyengar, Katharina Zweig, Abhiram Natarajan, and C. E. Veni Madhavan. A network analysis approach to understand human-wayfinding problem. In *Proceedings of the 33rd annual meeting of the Cognitive Science Society*, 2011.

[A24] Stefan Uhlmann, Heiko Mannsperger, Jitao David Zhang, Emke gnes Horvat, Christian Schmidt, Moritz Kblbeck, Aoife Ward, Ulrich Tschulena, Katharina Zweig, Ulrike Korf, Stefan Wiemann, and zgr Sahin. Global miRNA regulation of a local protein network: Case study with the EGFR-driven cell cycle network in breast cancer. *Molecular Systems Biology*, 8:570, 2012.

[A25] Emőke-Ágnes Horvát, Michael Hanselmann, Fred A. Hamprecht, and Katharina Anna Zweig. One plus one makes three (for social networks). *PLoS ONE*, 7(4):e34740, 2012.

[A26] Isadora Dorn, Andreas Lindenblatt, and Katharina A. Zweig. The trilemma of social network analysis. In *Proceedings of the 2012 IEEE/ACM international conference on Advances in Social Network Analysis and Mining, Istanbul*, 2012.

Theses and Books

[B27] Katharina A. Lehmann. The structure of real-world SAT-problems. Master's thesis, University of Tübingen, 2006.

[B28] 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.

[B29] Jürgen Lerner, Dorothea Wagner, and Katharina Zweig, editors. *Algorithmics of Large and Complex Networks*. Springer Verlag, 2009.

[B30] Katharina A. Zweig. *Network Analysis Literacy*. Springer Verlag, Wien, Austria, to be published in 2012.

Book chapters

[C31] 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.

[C32] 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.

[C33] Dirk Koschützki, Katharina A. Lehmann, Dagmar Tenfelde-Podehl, and Oliver Zlotowski. *Network Analysis - Methodological Foundations*, chapter Advanced Centrality Concepts. Springer Verlag, 2005.

[C34] 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.

[C35] Michael Kaufmann and Katharina Anna Zweig. *Algorithmics of Large and Complex Networks*, chapter Modeling and Designing Real–World Networks. Springer Verlag, 2009.

Technical Reports

[D36] 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.

[D37] 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.

[D38] 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.