# DR. TAMARA MCHEDLIDZE

**CONTACT**

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**EDUCATION**

- **Ph.D. in Applied Mathematics** School of Applied Mathematics & Physical Sciences. National Technical University of Athens. **Thesis:** Graph Theory Problems with Emphasis on Graph Drawing. **Supervisor:** Prof. Antonios Symvonis. Awarded in December 2011.
- **MS in «Mathematical Modeling in Modern Technologies and Financial Engineering»** School of Applied Mathematics & Physical Sciences. National Technical University of Athens. **GPA:** 8,74 (out of 10). Awarded in February 2009.
- **Diploma in Applied Mathematics and Physical Sciences.** School of Applied Mathematics & Physical Sciences. National Technical University of Athens. **Directions:** Computer Science, Statistics. **GPA:** 8,34 (out of 10). Awarded in August 2006.

**PROFESSIONAL EXPERIENCE**

**2012-Present:** Postdoc & Member of **Algorithmics Group**, Institute of Theoretical Informatics, **Karlsruhe Institute of Technology (KIT)**

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|---|---|---|
| February 2014 - May 2014: | Maternity leave |
| June 2014 - June 2015: | Part-time employment 50% |
| July 2015 - July 2016: | Part-time employment 75% |

**2003 - 2008 Software Developer at AMCO,** Athens, Greece.

**Member of Mathematical Olympiad Competition Committee** of the Hellenic Mathematical Society (E.M.E.)

**Deputy Leader** of the Greek Team in 14th and 15h Junior Balkan Mathematical Olympiads.

**RESEARCH INTERESTS**

Algorithmic Graph Theory, Network Visualization and Graph Drawing, Computational Geometry, Algorithms Engineering, Information Visualization and Human Computer Interaction.

**REFEREED JOURNAL PUBLICATIONS**

1. **Lower and Upper Bounds for Long Induced Paths in 3-connected Planar Graphs** Emilio Di Giacomo, Giuseppe Liotta, Tamara Mchedlidze, Theoretical Computer Science. To appear, 2016.

2. **Extending Convex Partial Drawings of Graphs** Tamara Mchedlidze , Martin Nöllenburg, Ignaz Rutter Tamara Mchedlidze , Martin Nöllenburg, Ignaz Rutter, Algorithmica, To appear, 2015

3. **Embedding Four-directional Paths on Convex Point Sets** O. Aichholzer, T. Hackl, S. Lutteropp, T. Mchedlidze, B. Vogtenhuber Journal of Graph Algorithms and Applications, To appear, 2015

4. **Monotone Simultaneous Embeddings of Upward Planar Digraphs** Oswin Aichholzer, Thomas Hackl, Sarah Lutteropp, Tamara Mchedlidze, Alexander Pilz, and Birgit Vogtenhuber, Journal of Computational Geometry, Theory and Applications, Vol. 19, number 1, pages 87-110, 2015.

5. **Bar 1-Visibility Graphs and their relation to other Nearly Planar Graphs** W. Evans, M. Kaufmann, W. Lenhart, T. Mchedlidze, and S. Wismath. Journal of Graph Algorithms and Applications, Vol. 18, no. 5, pages 721–739, 2014.

6. **Computing Upward Topological Book Embeddings of Upward Planar Digraphs** F. Giordano, G. Liotta, T. Mchedlidze, A. Symvonis, S.H. Whitesides. Journal of Discrete Algorithms, Vol. 30, pages 45–69, 2015.

7. **Fitting Planar Graphs on Planar Maps** Md. Jawaherul Alam, Michael Kaufmann, Stephen G. Kobourov and Tamara Mchedlidze. Journal of Graph Algorithms and Applications, In print.

8. **Universal point sets for planar graph drawings with circular arcs** Patrizio Angelini, Davis Eppstein, Fabrizio Frati, Michael Kaufmann, Sylvain Lazard, Tamara Mchedlidze, Monique Teillaud, and Alexander Wolff. Journal of Graph Algorithms and Applications, Vol. 18, no. 3, pages 313–324, 2014.

9. **Monotone drawings of graphs with fixed embedding** P.Angelini, W.Didimo, S.Kobourov, T.Mchedlidze, V. Roselli, A. Symvonis, and S. Wismath, Algorithmica, pp. 1-25, 2013.

10. **On Upward Point Set Embeddability** Michael Kaufmann, Tamara Mchedlidze, Antonis Symvonis, Journal of Computational Geometry, Theory and Applications, Vol. 46(6), pp. 774-804, 2013.

11. **Upward planar embedding of a n-vertex oriented path on $O(n^2)$ points** Tamara Mchedlidze, Journal of Computational Geometry, Theory and Applications, Volume 47, number 3, pages 493-498, 2014.

12. **Crossing-Optimal Acyclic HP-Completion for Outerplanar st-Digraphs** Tamara Mchedlidze, Antonios Symvonis, Journal of Graph Algorithms and Applications, Vol. 15, no. 3, pp. 373-415, 2011.

**REFEREED CONFERENCE PUBLICATIONS**

1. **Monotone Simultaneous Embeddings of Paths in d-dimensional Space** David Bremner, Olivier Devillers, Marc Glisse, Sylvain Lazard, Giuseppe Liotta, Tamara Mchedlidze, Sue Whitesides and Steve Wismath, Graph Drawing 2015, LNCS, Springer, To appear.

2. **Drawing Planar Graphs with Many Collinear Vertices** Giordano Da Lozzo, Vida Dujmovic, Fabrizio Frati, Tamara Mchedlidze and Vincenzo Roselli, Graph Drawing 2016, LNCS, Springer, To appear.

3. **Heuristic Picker for Book Drawings** Jonathan Klawitter and Tamara Mchedlidze. Poster, Graph Drawing 2016, LNCS, Springer, To appear.

4. **Strongly Monotone Drawings of Planar Graphs** Stefan Felsner, Alexander Igamberdiev, Philipp Kindermann, Boris Klemz, Tamara Mchedlidze, and Manfred Scheucher, 32nd International Symposium on Computational Geometry (SoCG 2016), To appear.

5. **Gestalt Principles in Graph Drawing** Stephen Kobourov, Tamara Mchedlidze and Laura Vonessen, Poster, Graph Drawing 2015, LNCS, Springer, To appear.

6. **A Universal Point Set for 2-Outerplanar Graphs** Till Bruckdorfer, Michael Kaufmann, Patrizio Angelini and Tamara Mchedlidze, Graph Drawing 2015, LNCS, Springer, To appear.

7. **Operating Power Grids with Few Flow Control Buses** Thomas Leibfried, Tamara Mchedlidze, Nico Meyer-Hübner, Martin Nöllenburg, Ignaz Rutter, Peter Sanders, Dorothea Wagner, Franziska Wegner, e-Energy 2015, ACM, pages 289-294.

8. **Embedding Four-directional Paths on Convex Point Sets** Oswin Aichholzer, Thomas Hackl, Sarah Lutteropp, Tamara Mchedlidze, Birgit Vogtenhuber, 22nd International Symposium on Graph Drawing (GD 2014), LNCS, Springer, volume 8871/2014, pages 355-366

9. **Minimum Tree Supports for Hypergraphs and Low-Concurrency Euler Diagrams Boris** Klemz, Tamara Mchedlidze and Martin Nöllenburg, 14th Scandinavian Symposium and Workshop on Algorithm Theory (SWAT'14), LNCS, Springer, volume 8503/2014, pages 265-276.

10. **Fitting Planar Graphs on Planar Maps** Md. Jawaherul Alam, Michael Kaufmann, Stephen G. Kobourov, Tamara Mchedlidze, 40th International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM 2014), LNCS, Springer, volume 8327/2014, pages 52-64.

11. **Monotone Simultaneous Embedding of Directed Paths** Oswin Aichholzer, Thomas Hackl, Sarah Lutteropp, Tamara Mchedlidze, Alexander Pilz, and Birgit Vogtenhuber. In Proc. 30th European Workshop on Computational Geometry EuroCG, 2014.

12. **Drawing Planar Graphs with a Prescribed Inner Face** Tamara Mchedlidze, Martin Nöllenburg and Ignaz Rutter, 21th International Symposium on Graph Drawing (GD 2013), LNCS, Springer, volume 8242/2013, pages 316-327.

13. **Universal point sets for planar graph drawings with circular arcs** Patrizio Angelini, Davis Eppstein, Fabrizio Frati, Michael Kaufmann, Sylvain Lazard, Tamara Mchedlidze, Monique Teillaud, and Alexander Wolff. 25th Canadian Conference on Computational Geometry, Waterloo, Canada, 2013.

14. **Lower and Upper Bounds for Long Induced Paths in 3-connected Planar Graphs** Emilio Di Giacomo, Giuseppe Liotta and Tamara Mchedlidze, 39th International Workshop on Graph-Theoretic Concepts in Computer Science (WG 2013), LNCS, Springer, To appear.

15. **Point-Set Embeddability of 2-Colored Trees** Fabrizio Frati, Marc Glisse, William Lenhart, Giuseppe Liotta, Tamara Mchedlidze and Rahnuma Islam Nishat, 20th International Symposium on Graph Drawing (GD 2012), LNCS, Springer, Volume 7704/2013, pages 291-302.

16. **Universal Point Subsets for Planar Graphs** Patrizio Angelini, Carla Binucci, William Evans, Ferran Hurtado, Giuseppe Liotta, Tamara Mchedlidze, Henk Meijer, Yoshio Okamoto, 23rd International Symposium on Algorithms and Computation (ISAAC 2012), LNCS, Springer, Volume 7676/2012, pages 423-432.

17. **Upward planar embedding of a n-vertex oriented path into O(n^2) points** Tamara Mchedlidze, 28th European Workshop on Computational Geometry (EuroCG 2012).

18. **Drawing Graphs with Vertices at Specified Positions and Crossings at Large Angles** Martin Fink, Jan-Henrik Haunert, Tamara Mchedlidze, Joachim Spoerhase and Alexander Wolff, Proc. Workshop Algorithms Comput. (WALCOM'12), LNCS, Springer, Volume 7157/2012 , pages 186-197.

19. **Monotone Drawings of Graphs with Fixed Embedding** Patrizio Angelini, Walter Didimo, Stephen Kobourov, Tamara Mchedlidze, Vincenzo Roselli, Antonios Symvonis and Stephen Wismath, 19th International Symposium on Graph Drawing (GD '11), LNCS, Springer, Volume 7034/2012, pages 379-391.

20. **Small Point Sets for Simply-Nested Planar Graphs** Patrizio Angelini, Giuseppe Di Battista, Michael Kaufmann, Tamara Mchedlidze, Vincenzo Roselli and Claudio Squarcella, 19th International Symposium on Graph Drawing (GD '11), LNCS, Springer, Volume 7034/2012, pages 75-85.

21. **Upward Point Set Embeddability for Convex Point Sets is in P** Michael Kaufmann, Tamara Mchedlidze, Antonios Symvonis, 19th International Symposium on Graph Drawing (GD '11), LNCS, Springer, Volume 7034/2012, pages 403-414.

22. **Drawing Graphs with Vertices at Specified Positions and Crossings at Large Angles** Martin Fink, Jan-Henrik Haunert, Tamara Mchedlidze, Joachim Spoerhase and Alexander Wolff, Poster, 19th International Symposium on Graph Drawing (GD '11), LNCS, Springer, Volume 7034/2012, pages 441-442.

23. **Upward Point-Set Embeddability** Markus Geyer, Michael Kaufmann, Tamara Mchedlidze, Antonios Symvonis, 37th International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM'11), LNCS, Volume 6543, pages 272–283, Springer, 2011.

24. **Upward Geometric Graph Embeddings into Point Sets**, Patrizio Angelini, Fabrizio Frati, Markus Geyer, Michael Kaufmann, Tamara Mchedlidze, Antonios Symvonis, 18th Springer, 2010.

25. **Unilateral Orientation of Mixed Graphs** Tamara Mchedlidze, Antonios Symvonis, 36th International Conference on Current Trends in Theory and Practice of Computer Science International Symposium on Graph Drawing (GD '10), LNCS, Volume 6502, pages 25–37, (SOFSEM 2010), Špindlerův Mlýn, Czech Republic, January 23–29, 2010, **LNCS,** Volume 5901/2010, Springer, pages 588-599.

26. **Crossing-Free Acyclic Hamiltonian Path Completion for Planar st-Digraphs** Tamara Mchedlidze, Antonios Symvonis, Algorithms and Computation, 20th International Symposium, ISAAC 2009, Honolulu, Hawaii, USA, December 16-18, 2009, LNCS, Volume 5878/2009, Springer, pages 882-891.

27. **On r-constrained Upward Topological Book Embeddings** Tamara Mchedlidze, Antonios Symvonis, Poster, 17th International Symposium on Graph Drawing (GD 2009), Chicago, USA, 22-25 September, 2009, LNCS, Volume 5849/2010, Springer, pages 411-412.

28. **Crossing-optimal acyclic HP-completion for outerplanar st-digraphs** Tamara Mchedlidze, Antonios Symvonis, 15th International Computing and Combinatorics Conference (COCOON'2009) New York, U.S.A., July 13-15, 2009, LNCS, Volume 5609/2009, Springer, pages 76-85.

29. **Crossing-Optimal Acyclic Hamiltonian Path Completion and its Application to Upward Topological Book Embedding** Tamara Mchedlidze, Antonios Symvonis, The 3rd International Workshop on Algorithms and Computation (WALCOM 2009), Kolkata, India, February 18-20, 2009, LNCS, Volume 5431/2009, Springer, pages 250-261.

30. **Spine Crossing Minimization in Upward Topological Book Embeddings** Tamara Mchedlidze, Antonios Symvonis, Poster, 16th International Symposium on Graph Drawing (GD 2008), Heraklion, Crete, 21-24 September, 2008, , LNCS, Volume 5417/2009, Springer, pages 445-446.

31. **Computing Upward Topological Book Embedding of Upward Planar Digraphs,** Francesco Giordano, Giuseppe Liotta, Tamara Mchedlidze, Antonios Symvonis, 18th International Symposium on Algorithms and Computation, (ISAAC 2007), Sendai, Japan, December 17-19, 2007, LNCS, Volume 4835/2007, Springer, pages 172-183.

32. **Analysis of the Greek Web-Space** Tamara Mchedlidze, Antonios Symvonis, Manolis Tzagarakis, 11th Panhellenic Conference in Informatics (PCI 2007), Patra, Greece, May 18-20, 2007, In Proceeding of Current Trends in Informatics, Vol. A, pages 651-660.

## HONORS SCHOLARSHIPS GRANTS

**2016** Graph Drawing 2016 Contest Award. Joint work with Jonathan Klawitter.

**2016** Graph Drawing 2016 Best Poster Award. Joint work with Jonathan Klawitter.

**2015** Graph Drawing Contest Award. Contest hold at GD2015.

**2015-2018** DFG grant for project "Generalization and Interaction in Graph Drawing" together with Ignaz Rutter and Dorothea Wagner

**2014** First place in "Graph Drawing" challenge-automatic category. Hold at GD 2014.

**2011** IRCSET postdoctoral Fellowship at IBM Research, Ireland (Declined)

**2011** Research Funding: Heracleitus II (European Social Fund)

**2011** DAAD short-term research grants for young researchers. Host institution: University of Tübingen, Germany.

**2008-2011** Scholarship for Research based on Academic Merit of National Technical University of Athens.

**2009** Thomaidio Award for "Advancements of Sciences and Arts" for publication during undergraduate studies. National Technical University of Athens.

**2006-2007** Scholarship for highest GPA. MS program «Mathematical Modeling in Modern Technologies and Financial Engineering». National Technical University of Athens.

**2000- 2006** Scholarship from Ministry of Foreign Affairs for undergraduate studies.


## TEACHING

Seminar "**Algorithmic Methods in Humanities**", with Gregor Betz and Ignaz Rutter at KIT. Summer term 2016.

**Computational Geometry,** MSc course, with Darren Strash, Benjamin Niedermann at KIT. Winter term 2015-2016.

**Practical Course on Graph Visualization**, MSc course, with Dr. Martin Nöllenburg at KIT. Summer term 2014-2015.

**Algorithms for Planar Graphs**, Bachelor course, with Prof. Dorothea Wagner at KIT. Summer term 2013-2014.

**Graph Drawing**, MSc course at KIT, some years taught with Dr. Martin Nöllenburg, Dr. Ignaz Rutter. Winter terms 2012-2013, 2013-2014, 2014-2015. 2016-2017.

**Practical Course on Software Engineering (PSE).** Karlsruhe Institute of Technology (KIT), Institute of Theoretical Informatics. Summer term 2011-2012, 2012-2013.

**Elementary Algebra.** 4th Mathematics Summer School of Hellenic Mathematical Society (E.M.E.). July 2010.

**Data Structures, Teaching Assistant.** School of Applied Mathematics & Physical Sciences. National Technical University of Athens. Academic year 2009-2010.

**Algorithms and Complexity, Teaching Assistant.** School of Applied Mathematics & Physical Sciences. National Technical University of Athens. Academic years 2009-2010, 2010-2011.

**Introduction to Combinatorics.** 3rd Mathematics Summer School of Hellenic Mathematical Society (E.M.E.). July 2009.

**Combinatorics and Introduction to Graph Theory.** Hellenic Mathematical Society. Preparation for the International Mathematical Olympiad. December 2010, May 2009, May 2008.

**Design and Development of Software Applications in Java, Teaching Assistant.** School of Applied Mathematics & Physical Sciences. National Technical University of Athens. Academic year 2008-2009.

**Introduction to Programming (Java), Teaching Assistant.** School of Applied Mathematics & Physical Sciences. National Technical University of Athens. Academic year 2008-2009, 2010-2011.

## SUPERVISED STUDENTS

**Sarah Lutteropp**, bachelor thesis. Topic: On Layered Drawings of Planar Graphs.

**Sarah Lutteropp**, undergraduate research project funded by "Stipendium der Begabtenstiftung Informatik" Topic: Direction Consistent Point Set Embedding.

**Boris Klemz,** student thesis, Topic: Drawability of Euler Diagrams.

**Franziska Wegner,** master's thesis, Topic: Algorithmic Aspects in Power Flow Calculation.

**Fabian Klute**, master's thesis, Topic: Connecting Points with Low-Complexity Polynomial Curves in a Polygon.

**Denis Knöpfle**, master's thesis. Topic: On drawing planar triangulations with bends.

**Jonatthan Klawitter,** master's thesis. Topic: Experimenting with book embeddings.

**Hannes Wächter**, master's thesis. Topic: Impact of the shape of a graph layout on its attractiveness. In progress.

**Sebastian Schlund,** master's thesis. Topic: On smoothing paths in layered graph drawing. In progress.

## PROGRAM COMMITTEE SERVICE

**GD15** 24th International Symposium on Graph Drawing & Network Visualization

**IISA16** 7th International Conference on Information, Intelligence, Systems and Applications

**IISA15** 6th International Conference on Information, Intelligence, Systems and Applications

**IISA14** 5th International Conference on Information, Intelligence, Systems and Applications

## PEER-REVIEW ACTIVITIES

- Algorithmica
- Journal of Applied Mathematics and Computing
- The Computer Journal
- Journal of Discrete Mathematics
- Journal of Graph Algorithms and Applications
- Journal of Computational Geometry: Theory and Applications
- Journal of Discrete & Computational Geometry
- Journal of Discrete Algorithms
- Information Processing Letters
- External Reviewer in Conferences: COCOON, GD, PACIFICVIS, SODA, WG.

## PARTICIPATION IN WORKSHOPS

- 11**th Bertinoro Workshop on Graph Drawing**, March 2016. University Residential Center of Bertinoro.
- **INRIA-McGill-Victoria Workshop on Problems in Computational Geometry,** Bellairs Research Institute, McGill University in Barbados, January 2016.
- **10th Bertinoro Workshop on Graph Drawing**, March 2015. University Residential Center of Bertinoro.
- **Dagstuhl Seminar: "Empirical Evaluation of Graph Drawing".** January 2015.
- **Dagstuhl Seminar: "Drawing Graphs and Maps with Curves".** April 2013.
- **8th Bertinoro Workshop on Graph Drawing**, March 2013. University Residential Center of Bertinoro.
- **INRIA-McGill-Victoria Workshop on Problems in Computational Geometry,** Bellairs Research Institute, McGill University in Barbados, January 2013.
- **7th Bertinoro Workshop on Graph Drawing**, March 2012. University Residential Center of Bertinoro.
- **INRIA-McGill-Victoria Workshop on Problems in Computational Geometry,** Bellairs Research Institute, McGill University in Barbados, January 2012.
- **Dagstuhl Seminar: "Graph Drawing with Algorithm Engineering Methods".** May 2011.
- **6th Bertinoro Workshop on Graph Drawing**, March 2011. University Residential Center of Bertinoro.

**SKILLS**

- **Programming Environments:** Borland Delphi, Microsoft Visual Studio.
- **Programming Languages :** Java, Object Pascal.
- **Data Bases:** MSAccess, PostgreSQL, MySQL.
- **Math &Statistical Software:** Mathematica, Matlab, Minitab.
- **Social Networks Analysis Software:** Pajek, VisOne, yEd.
- **Graph Drawing Library:** yFiles.