

# Curriculum Vitae

Archontia C. Giannopoulou

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## Personal Information

First Name: Archontia  
Last Name: Giannopoulou  
Father's Name: Charalampos  
Mother's Name: Foteini  
Gender: Female  
Date of Birth: January 1, 1986  
Nationality: Hellenic

## Contact Information

Work address: Technische Universität Berlin  
Institut für Softwaretechnik und Theoretische Informatik  
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## Research Interests

**Graph Algorithms** Parameterized, Exact, and Approximation.

**Parameterized Algorithms and Complexity** Kernelization, Sub-exponential Algorithms, Structural Parameterizations, Lower Bounds.

**Structural Graph Theory** Graph Minors, Graph Decompositions, Graph Parameters, Graph Classes, Erdős-Pósa Properties, Graph Searching.

## Work Experience

**April 2016 - now:** Research Associate of the LaS<sup>1</sup> Group, Institute for Software Engineering and Theoretical Computer Science, Technische Universität Berlin, Germany.

**February 2015 - January 2016:** Post-doctoral Fellow, Faculty of Mathematics, Informatics and Mechanics, University of Warsaw, Poland (supported by WCMCS<sup>2</sup>).

**January 2014 - January 2015:** Research Associate of the ACiD<sup>3</sup> Group, School of Engineering and Computing Sciences, Durham University, UK.

**December 2012 - November 2013:** Researcher, Department of Informatics, University of Bergen, Norway.

## Studies

**March 2010 - October 2012** PhD in *Partial Orderings and Algorithms on Graphs*, Department of Mathematics, National and Kapodistrian University of Athens (UoA).  
Supervisor: Dimitrios M. Thilikos.  
Awarded on April 16, 2013.

**October 2007 - June 2009** M.Sc. Graduate Program in Logic, Algorithms and Computation<sup>4</sup>.  
M.Sc. Thesis: *Tree-depth of Graphs: Characterisations and Obstructions*.  
Advisor: Dimitrios M. Thilikos.  
Awarded on July 21, 2009.

**September 2003 - October 2007** B.Sc. in Mathematics.  
National and Kapodistrian University of Athens.  
Awarded on February 22, 2008.

## Distinctions

- Best Paper Award from IPEC 2016.
- 3-year scholarship for PhD studies from the Special Account for Research Grants of the National and Kapodistrian University of Athens, Greece
- Exceptional Academic Performance,  $\mu\text{Π}\lambda\forall$ , 2007 - 2008 (ranked 1<sup>st</sup>)

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<sup>1</sup>Logic and Semantics.

<sup>2</sup>Warsaw Center of Mathematics and Computer Science.

<sup>3</sup>Algorithms and Complexity in Durham.

<sup>4</sup> $\mu\text{Π}\lambda\forall$ .

## Papers

- **Published** (or accepted for publications to journals or conference proceedings) (19)

### Journals (11)

1. Title: *Uniform Kernelization Complexity of Hitting Forbidden Minors.*  
Authors: Archontia C. Giannopoulou, Bart M. P. Jansen, Daniel Lokshtanov, and Saket Saurabh.  
Journal: ACM Trans. Algorithms 13, 3, Article 35 (March 2017), 35 pages.  
[An extended abstract of a preliminary version of this paper has appeared in the proceedings of ICALP 2015. Conference proceedings: ICALP (1) 2015: 629-641.]
2. Title: *Packing and Covering Immersion-Expansions of Planar Sub-cubic Graphs.*  
Authors: Archontia Giannopoulou, O-Joung Kwon, Jean-Florent Raymond and Dimitrios Thilikos.  
Journal: Eur. J. Comb. 65: 154-167 (2017).  
[An extended abstract of a preliminary version of this paper titled “Packing and Covering Immersion Models of Planar Subcubic Graphs” has appeared in the proceedings of WG 2016. Conference proceedings: WG 2016: 74-84.]
3. Title: *Polynomial Fixed-Parameter Algorithms: A Case Study for Longest Path on Interval Graphs.*  
Authors: Archontia C. Giannopoulou, George B. Mertzios, and Rolf Niedermeier.  
Journal: Theor. Comput. Sci. 689: 67-95 (2017).  
[An extended abstract of a preliminary version of this paper has appeared in the proceedings of IPEC 2015. Conference proceedings: IPEC 2015: 102-113.]
4. Title: *Tree Deletion Set Has a Polynomial Kernel but No  $OPT^{O(1)}$  Approximation.*  
Authors: Archontia C. Giannopoulou, Daniel Lokshtanov, Saket Saurabh, and Ondrej Suchý.  
Journal: SIAM J. Discrete Math. 30(3): 1371-1384 (2016).  
[An extended abstract of a preliminary version of this paper has appeared in the proceedings of FSTTCS 2014. Conference proceedings: FSTTCS 2014: 85-96.]
5. Title: *New Geometric Representations and Domination Problems on Tolerance and Multitolerance Graphs.*  
Authors: Archontia C. Giannopoulou and George B. Mertzios.  
Journal: SIAM J. Discrete Math. 30(3): 1685-1725 (2016).  
[An extended abstract of a preliminary version of this paper has appeared in the proceedings of STACS 2015. Conference proceedings: STACS 2015: 354-366.]

- Title: *Computing Tree-depth Faster Than  $2^n$ .*
6. Authors: Fedor V. Fomin, Archontia C. Giannopoulou, and Michał Pilipczuk.  
Journal: *Algorithmica* 73(1): 202-216 (2015).  
[An extended abstract of a preliminary version of this paper has appeared in the proceedings of IPEC 2013. Conference proceedings: IPEC 2013: 137-149.]
- Title: *Forbidding Kuratowski Graphs as Immersions.*
7. Authors: Archontia C. Giannopoulou, Marcin Kamiński, and Dimitrios M. Thilikos.  
Journal: *Journal of Graph Theory* 78(1): 43-60 (2015).
- Title: *Effective Computation of Immersion Obstructions for Unions of Graph Classes.*
8. Authors: Archontia C. Giannopoulou, Iosif Salem, and Dimitris Zoros.  
Journal: *J. Comput. Syst. Sci.* 80(1): 207-216 (2014).  
[An extended abstract of a preliminary version of this paper has appeared in the proceedings of SWAT 2012. Conference proceedings: SWAT 2012: 165-176.]
- Title: *Optimizing the Graph Minors Weak Structure Theorem.*
9. Authors: Archontia C. Giannopoulou and Dimitrios M. Thilikos.  
Journal: *SIAM J. Discrete Math.* 27(3): 1209-1227 (2013).  
[This paper has been presented in the 2nd Workshop on Graph Decompositions: Theoretical, Algorithmic and Logical Aspects, October 18 - 22, 2010, titled “Fast Trinity Lemma”.]
- Title: *LIFO-search: A Min-max Theorem and a Searching Game for Cycle-rank and Tree-depth.*
10. Authors: Archontia C. Giannopoulou, Paul Hunter, and Dimitrios M. Thilikos.  
Journal: *Discrete Applied Mathematics* 160(15): 2089-2097 (2012).  
[An extended abstract of a preliminary version of this paper titled “A min-max theorem for LIFO-search” has appeared in the proceedings of EUROCOMB 2011. Conference proceedings: *Electronic Notes in Discrete Mathematics* 38: 395-400 (2011).]
- Title: *Forbidden Graphs for Tree-depth.*
11. Authors: Zdeněk Dvořák, Archontia C. Giannopoulou, and Dimitrios M. Thilikos.  
Journal: *Eur. J. Comb.* 33(5): 969-979 (2012).  
[An extended abstract of a preliminary version of this paper titled “Obstructions for Tree-depth” has appeared in the proceedings of EUROCOMB 2009. Conference proceedings: *Electronic Notes in Discrete Mathematics* 34: 249-253 (2009).]

**Conference proceedings that have not yet been published in a journal (8)**

- Title: *Matching Connectivity: Matching Connectivity: On the Structure of Graphs with Perfect Matchings*
1. Authors: Archontia C. Giannopoulou, Stephan Kreutzer, and Sebastian Wiederrecht.  
Conference: *Electronic Notes in Discrete Mathematics* 61: 505-511 (2017).

- Title: *Neighborhood Complexity and Kernelization for Nowhere Dense Classes of Graphs.*
2. Authors: Kord Eickmeyer, Archontia C. Giannopoulou, Stephan Kreutzer, O-joung Kwon, Michał Pilipczuk, Roman Rabinovich, and Sebastian Siebertz.  
Conference: ICALP 2017: 63:1-63:14.
- Title: *Linear Kernels for Edge Deletion Problems to Immersion-closed Graph Classes.*
3. Authors: Archontia C. Giannopoulou, Michał Pilipczuk, Jean-Florent Raymond, Dimitrios M. Thilikos, and Marcin Wrochna.  
Conference: ICALP 2017: 57:1-57:15.
- Title: *Cutwidth: Obstructions and Algorithmic Aspects.*
4. Authors: Archontia Giannopoulou, Michał Pilipczuk, Jean-Florent Raymond, Dimitrios Thilikos, and Marcin Wrochna.  
Conference: IPEC 2016: 15:1-15:13.
- Title: *FPT Algorithms for Plane Completion Problems.*
5. Authors: Dimitris Chatzidimitriou, Archontia C. Giannopoulou, Spyridon Maniatis, Clément Requilé, Dimitrios M. Thilikos, and Dimitris Zoros.  
Conference: MFCS 2016: 26:1-26:13.
- Title: *The Structure of  $W_4$ -immersion-free Graphs.*
6. Authors: Rémy Belmonte, Archontia C. Giannopoulou, Daniel Lokshtanov, and Dimitrios M. Thilikos.  
Conference: ICGT 2014.
- Title: *Excluding Graphs as Immersions in Surface Embedded Graphs.*
7. Authors: Archontia C. Giannopoulou, Marcin Kamiński, and Dimitrios M. Thilikos.  
Conference: WG 2013: 274-285.
- Title: *New Lower Bound on Max-Cut of Hypergraphs with an Application to  $r$ -SET SPLITTING.*
8. Authors: Archontia C. Giannopoulou, Sudeshna Kolay, and Saket Saurabh.  
Conference: LATIN 2012: 408-419.

## Research Visits

- University of Warsaw, Department of Mathematics, Computer Science, and Mechanics, May 13 - 24, 2013 (Prof. Marcin Kamiński).
- Charles University in Prague, Department of Applied Mathematics, Classes of Combinatorial Objects: from Structure to Algorithms (CCOSA), October 1, 2011 - March 31, 2012 (Prof. Daniel Kral', mentor: Prof. Zdeněk Dvořák).

- University of Bergen, Institute of Informatics, Algorithms Research Group, May 15 - 21, 2011 (Prof. Fedor Fomin).
- Institute of Mathematical Sciences Chennai, Department of Theoretical Computer Science, February 2 - April 17, 2011 (Prof. Saket Saurabh).
- Goethe University Frankfurt am Main, Institute for Computer Science, October 11 - 17, 2010 (Prof. Isolde Adler).

## Teaching Experience

As **main instructor**:

**Parameterized Complexity and Algorithms** (graduate course)  
 Graduate Program in Logic, Algorithms and Computation ( $\mu\Pi\lambda\forall$ ),  
 Spring Semester **2015-2016**.

As **teaching assistant**:

**Informatics I** (undergraduate course),  
 Department of Mathematics, UoA, Winter Semester **2010-2011, 2009-2010**.

**Graph Theory and Applications** (undergraduate course),  
 Department of Mathematics, UoA, Winter Semester **2010-2011, 2009-2010**.

**Informatics II** (undergraduate course),  
 Department of Mathematics, UoA, Winter Semester **2009-2010**.

**Recursive Functions** (undergraduate course),  
 Department of Mathematics, UoA, Winter Semester **2009-2010**.

**Computational Complexity** (undergraduate course),  
 Department of Mathematics, UoA, Winter Semester **2009-2010**.

**Mathematical Logic** (graduate course), joint course in  
 Graduate Program in Logic, Algorithms and Computation ( $\mu\Pi\lambda\forall$ ) and  
 Graduate Program in Pure Mathematics in the Department of Mathematics, UoA,  
 Spring Semester **2008-2009**.

**Reviewer for the journals:**

- Journal of Combinatorial Theory, Series B,
- SIAM Journal on Discrete Mathematics,
- Electronic Journal of Combinatorics,
- Algorithmica,

- European Journal of Combinatorics,
- Discrete Mathematics,
- Discrete Applied Mathematics, and
- Theoretical Computer Science.

### **Reviewer for the Conferences:**

- ACM-SIAM Symposium on Discrete Algorithms (SODA),
- International Colloquium on Automata, Languages and Programming (ICALP),
- European Symposium on Algorithms (ESA),
- International Symposium on Theoretical Aspects of Computer Science (STACS),
- International Workshop on Graph-Theoretic Concepts in Computer Science (WG),
- International Symposium on Parameterized and Exact Computation (IPEC),
- International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM),
- Latin American Theoretical Informatics Symposium (LATIN),
- International Symposium on Fundamentals of Computation Theory (FCT),
- International Workshop on Combinatorial Algorithms (IWOCA),
- International Conference on Algorithmic Aspects in Information and Management (AAIM), and
- International Conference on Algorithms and Complexity (CIAC).

### **Participation in Conferences and Workshops (24)**

#### **Participation to invitation-only workshops and seminars (15)**

**GRASTA 2017:** 8th workshop on GRAPh Searching, Theory & Applications, April 10–13, 2017, Anogia, Crete, Greece.

**GROW 2015:** 7th Workshop on Graph Classes, Optimization, and Width Parameters, October 11 - 15, 2015, Aussois, France.

**Title of talk:** *Fixed Parameter Algorithms for Completion Problems on Planar Graphs.*

**Algorithmic Graph Theory on the Adriatic Coast,** June 16 - 19, 2015, UP FAMNIT, Koper, Slovenia.

**Title of talk:** *Uniform Kernelization Complexity of Hitting Forbidden Minors.*

**CIRM workshop on Graph decompositions**, January 19 - 23, 2015, Centre International de Rencontres Mathématiques, Marseille, France.

**Title of talk:** *Uniform Kernelization Complexity of Hitting Forbidden Minors.*

**Dagstuhl Seminar 14071:** Graph Modification Problems, February 9 - 14, 2014, Schloss Dagstuhl - Leibniz-Zentrum für Informatik, Wadern, Germany.

**Title of talk:** *Polynomial kernel for Tree Deletion Set.*

**GROW 2013:** Workshop on Graph Classes, Optimization, and Width Parameters, October 9 - 11, 2013, Santorini, Greece.

**WorKer 2013:** Workshop on Kernelization, April 9 - 12, 2013, University of Warsaw, Warsaw, Poland.

**Dagstuhl Seminar 13121:** Bidimensional Structures: Algorithms, Combinatorics and Logic, March 17 - 22, 2013, Schloss Dagstuhl - Leibniz-Zentrum für Informatik, Wadern, Germany.

**Title of talk:** *Exclusion Theorems for Immersions on Surface Embedded Graphs.*

**Perspectives in Discrete Mathematics**, June 24 - 29, 2012, Centre de Recerca Matemàtica, Bellaterra, Spain<sup>5</sup>.

**Title of poster:** *Effective Computation of Immersion Obstructions for Unions of Graph Classes.*

**Dagstuhl Seminar 12241:** Data Reduction and Problem Kernels, June 10 - 15, 2012, Schloss Dagstuhl - Leibniz-Zentrum für Informatik, Wadern, Germany.

**WorKer 2011:** Workshop on Kernelization, September 2 - 4, 2011, Vienna University of Technology, Vienna, Austria.

**Treewidth Workshop 2011**, May 19 - 20, 2011, VilVite Center, Bergen, Norway.

**WorKer 2010:** Workshop on Kernelization, November 8 - 12, 2010, Lorentz Center, Leiden, Netherlands.

**2nd Workshop on Graph Decompositions:** Theoretical, Algorithmic and Logical Aspects, October 18 - 22, 2010, Centre International de Rencontres Mathématiques, Marseille, France.

**Title of talk:** *Fast Trinity Lemma.*

**BWAG 2009:** Bertinoro Workshop on Algorithms and Graphs, December 7 - 11, 2009, University Residential Center, Bertinoro, Italy.

**Title of talk:** *Forbidden Graphs for Tree-depth.*

#### Participation to conferences (9)

**MFCS 2016:** International Symposium on Mathematical Foundations of Computer Science, August 22 - 26, 2016, Krakow, Poland.

**Title of talk:** *FPT Algorithms for Plane Completion Problems.*

**WG 2016:** International Workshop on Graph-Theoretic Concepts in Computer Science, June 22 - 24, 2016, Istanbul, Turkey.

**Title of talk:** *Packing and Covering Immersion Models of Planar Subcubic Graphs.*

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<sup>5</sup>Participation with approval only.



- ALGO 2015**, September 14 - 18, 2015, University of Patras, Patras, Greece.
- WG 2013**: International Workshop on Graph-Theoretic Concepts in Computer Science, June 19 - 21, 2013, Lübeck, Germany.  
**Title of talk**: *Excluding Graphs as Immersions in Surface Embedded Graphs*.
- SWAT 2012**: 13th Scandinavian Symposium and Workshops on Algorithm Theory, July 4-6, 2012, University of Helsinki, Helsinki, Finland.  
**Title of talk**: *Effective Computation of Immersion Obstructions for Unions of Graph Classes*.
- EuroComb 2011**: European Conference on Combinatorics, Graph Theory and Applications, August 29 - September 2, 2011, Erdős - Rényi Institute, Budapest, Hungary.  
**Title of talk**: *A min-max Theorem for LIFO-Search*.
- ACAC 2011**: 6th Athens Colloquium on Algorithms and Complexity, August 25 - 26, 2011, National Technical University of Athens, Athens, Greece.
- WG 2010**: International Workshop on Graph-Theoretic Concepts in Computer Science, June 28 - 30, 2010, Zaros, Greece.
- EuroComb 2009**: European Conference on Combinatorics, Graph Theory and Applications, September 7 - 11, 2009, University of Bordeaux 1, Bordeaux, France.  
**Title of talk**: *Obstructions for Tree-depth*.

### Seminar Talks (9)

1. Host: Logic and Semantics Research Group, Institute for Software Engineering and Theoretical Computer Science, Technische Universität Berlin, Germany.  
Seminar: Research Seminar on Current Topics of Logic and Algorithmic Graph Theory.  
**Title of talk**: Packing and Covering Immersion Models of Planar Subcubic Graphs.  
Date: 15th of June 2016.
2. Host: Faculty of Mathematics, Informatics, and Mechanics, University of Warsaw, Poland.  
Seminar: ZAA Seminar.  
**Title of talk**: Uniform Kernelization Complexity of Hitting Forbidden Minors.  
Date: 26th of February 2015.
3. Host: Mathematics Institute, Warwick, UK.  
Seminar: Combinatorics 2014-15.  
**Title of talk**: New Geometric Representations and Domination Problems on Tolerance and Multitolerance Graphs.  
Date: 5th of December 2014.
4. Host: Engineering and Computing Sciences, Durham University, UK.  
Seminar: Computer Science Junior Seminars 2014/15.  
**Title of talk**: Graph Minors and Algorithms.  
Date: 12th of November 2014.

5. Host: Engineering and Computing Sciences, Durham University, UK.  
Seminar: Computer Science Junior Seminars 2013/14.  
**Title of talk:** Computing Tree-depth Faster Than  $2^n$ .  
Date: 3rd of March 2014.
6. Host: Institute of Informatics, University of Bergen, Norway.  
Seminar: Algorithms seminar series.  
**Title of talk:** Polynomial Kernel for Tree Deletion Set.  
Date: 8th of November 2013.
7. Host: Institute of Informatics, University of Bergen, Norway.  
Seminar: Algorithms seminar series.  
**Title of talk:** Lifo-search on (Di)graphs.  
Date: 14th of December 2012.
8. Host: Department of Applied Mathematics, Charles University, Czech Republic.  
Seminar: Noon Seminar.  
**Title of talk:** LIFO-search on Graphs and Digraphs.  
Date: 10th of November 2011.
9. Host: Institute of Mathematical Sciences, Chennai, India.  
Seminar: Parameterized Complexity Journal Club.  
**Title of talk:** The Optimized Graph Minors Weak Structure Theorem and Algorithmic Applications.  
Date: 3rd of March 2011.

## Languages

**Greek** Native

**English** Cambridge Proficiency, Michigan Proficiency

## Other Activities

- I was a member of the **organizing committee** of the 36th International Workshop on Graph Theoretic Concepts in Computer Science (**WG 2010**) and of the 6th workshop on Graph Classes, Optimization, and Width Parameters (**GROW 2013**).
- I attended CCOSA (Classes of Combinatorial Objects: from Structure to Algorithms) Fall School 2011, October 13 - 16, 2011, Beroun, Czech Republic.
- I attended NoNA Spring School on Algorithms, March 12 - 15, 2009, Istanbul, Turkey.