

Alexandru Popa

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Current positions

- Associate Professor at University of Bucharest, Romania *from October 2016*
- Senior Researcher (CS II) at National Institute for Research and Development in Informatics, Romania *from February 2017*
- Deputy Director of Department of Modeling, Simulation, Optimization, National Institute for Research and Development in Informatics, Romania *from August 2017*

Past positions

- Interim Director of Department of Modeling, Simulation, Optimization, National Institute for Research and Development in Informatics, Romania *June - August 2017*
- Assistant Professor at Nazarbayev University, Kazakhstan *January 2015 - June 2016*
- Assistant Professor at Masaryk University, Czech Republic *September 2013 - January 2015*
- Post-doctoral researcher at Aalto University, Finland *October 2011 - August 2013*

Research interests

- Algorithms for NP-hard problems
- String algorithms and bioinformatics
- Interactive systems and parallel computing
- Classification problems for codes and designs

Education

- Habilitation, Faculty of Mathematics and Computer Science, University of Bucharest *21 June 2017*
- PhD in Computer Science, Department of Computer Science, University of Bristol *November 2011*
- B.S. in Computer Science, *July 2008*
(GPA 9.80/10 - ranked 3rd out of 104 graduates)
Faculty of Mathematics and Computer Science,
University of Bucharest.
B.S. Thesis (GPA 10/10): *Interactive systems with registers and voices and AGAPIA language*

Awards and grants

- Erasmus Award to visit Åbo Akademi, *June 2017*
- Nazarbayev University Research Grant (2 000 000 KZT \approx 10 000 EUR) *March 2015*.
- “Biocentrum Helsinki: Connecting Aalto University and University of Helsinki Scientists” research grant (5000 euros) - joint with Elodie Renvoisé - *13 December 2012*.
- Travel grant to attend the 12th Max Planck Advanced Course on the Foundations of Computer Science, Saarbrücken, Germany, *29 August - 2 September, 2011*.
- SIGACT Travel Grant to attend STOC 2011, San Jose, California, *6 - 8 June 2011*.
- Postgraduate Travel Grant awarded by the Alumni Foundation, University of Bristol, *25 November 2010*.
- Yahoo! Research student support to attend SPIRE 2010, Los Cabos, Mexico, *11-13 October 2010*.
- Studentship to attend the DIMAP Workshop on Extremal and Probabilistic Combinatorics, Petersfield, Hampshire, England, *18-25 July 2010*.
- Fellowship to attend 26th Annual British Colloquium on Theoretical Computer Science (BCTCS 2010), Edinburgh, *6-9 April 2010*.
- Fellowship to attend 25th Annual British Colloquium on Theoretical Computer Science (BCTCS 2009), Warwick, *6-9 April 2009*.
- Special prize at FameLab 2008 final Romania, Bucharest, Romania, *17 May 2008*.
- Third place at FameLab 2008 regional selection, Bucharest, Romania, *April 2008*.
- Erasmus study grant at University of Bristol, Department of Computer Science, *September 2007 - January 2008*.
- Special mention at Romanian National Olympiads in Informatics, *2004*.
- Special mention at Romanian National Informatics Contest “Great Prize of National Palace of Children”, *2004*.
- First prize at Romanian National Informatics Contest “Great Prize of National Palace of Children”, *2003*.

Publications

- 38 **Fully polynomial FPT algorithms for some classes of bounded clique-width graphs** (David Coudert, Guillaume Ducoffe and Alexandru Popa), *SODA* 2018.
- 37 **Hardness and Approximation of The Asynchronous Border Minimization Problem** (Cindy Y. Li, Alexandru Popa, Prudence W.H. Wong, Fencol C.C. Yung), *Discrete Applied Mathematics* 2017.
- 36 **On the (di)graphs with (directed) proper connection number two** (Guillaume Ducoffe, Ruxandra Marinescu-Ghemeci and Alexandru Popa), *LAGOS* 2017.
- 35 **SOBRA - Shielding Optimization for BRACHYtherapy** (Guillaume Blin, Marie Gasparoux, Sebastian Ordyniak, Alexandru Popa), *IWOCA* 2016.
- 34 **Better Bounds for the Maximum Edge q -Coloring Problem** (Anna Adamaszek, Alexandru Popa), *Journal of Discrete Algorithms* 2016.
- 33 **Making “Fast” Atomic Operations Computationally Tractable** (Antonio Fernández Anta, Nicolas Nicolaou, Alexandru Popa), *OPODIS* 2015.
- 32 **The Min-Max Edge q -Coloring Problem**, (Tommi Larjoomaa and Alexandru Popa), *Journal of Graph Algorithms and Applications* 2015, vol. 19, no. 1, pp. 507-528.

- 31 **A Unifying Framework for Interactive Programming and Applications to Communicating Peer-to-peer Systems**, (Alexandru Popa, Iulia Teodora Banu-Demergian, Camelia Chira, Florian Mircea Boian and Gheorghe Stefanescu), *Embracing Global Computing in Emerging Economies (EGC)* 2015.
- 30 **A Parameterized Study of Generalized Function and Pattern Matching** (Sebastian Ordyniak, Alexandru Popa), *Algorithmica* 2015, pp. 1-26.
- 29 **Explaining a Weighted DAG with Few Paths for Solving Genome-Guided Multi-assembly**, (Alexandru Tomescu, Travis Gagie, Alexandru Popa, Romeo Rizzi, Anna Kuosmanen, Veli Makinen), *IEEE/ACM Transactions on Computational Biology and Bioinformatics* 2015.
- 28 **Parameterized Complexity of Asynchronous Border Minimization** (Robert Ganian, Martin Kronegger, Andreas Pfandler and Alexandru Popa), *Theory and Applications of Models of Computation (TAMC)* 2015.
- 27 **Approximation and Hardness Results for the Maximum Edges in Transitive Closure Problem** (Anna Adamaszek, Guillaume Blin, Alexandru Popa), *International Workshop on Combinatorial Algorithms (IWOCA)* 2014.
- 26 **A Parameterized Study of Generalized Function and Pattern Matching** (Sebastian Ordyniak, Alexandru Popa), *International Workshop on Parameterized and Exact Computation (IPEC)* 2014, pp. 270-281.
- 25 **Algorithmic and Hardness Results for the Colorful Components Problems** (Anna Adamaszek, Alexandru Popa), *Algorithmica*, 2014, pp. 1-8.
- 24 **The min-max edge q -coloring problem** (Tommi Larjoomaa, Alexandru Popa), *International Workshop on Combinatorial Algorithms (IWOCA)* 2014.
- 23 **The 2-Paths Min-Sum Orientation Problem** (Trevor Fenner, Oded Lachish, Alexandru Popa), *Theory of Computing Systems* 2014, pp. 1-17.
- 22 **Better lower and upper bounds for the minimum rainbow subgraph problem** (Alexandru Popa), *Theoretical Computer Science*, Volume 543, 2013, pp. 1-8.
- 21 **Enumeration of Steiner Triple Systems with Subsystems** (Petteri Kaski, Patric R. J. Östergård, Alexandru Popa), *Mathematics of Computation*.
- 20 **Algorithmic and Hardness Results for the Colorful Components Problems** (Anna Adamaszek, Alexandru Popa), *Latin American Theoretical Informatics Symposium (LATIN)* 2014, pp. 683-694.
- 19 **Enumerating Cube Tilings** (K Ashik Mathew, Patric R. J. Östergård, Alexandru Popa), *Discrete and Computational Geometry*, Volume 50, Issue 4, pp. 1112-1122.
- 18 **On the Shannon Capacity of Triangular Graphs** (K Ashik Mathew, Patric R. J. Östergård, Alexandru Popa), *Electronic Journal of Combinatorics*, Volume 20, Number 2, 2013 #P27.
- 17 **The 2-Paths Min-Sum Orientation Problem** (Trevor Fenner, Oded Lachish, Alexandru Popa), *Workshop on Approximation and Online Algorithms (WAOA)* 2013, pp 1-11.
- 16 **Modelling the Power Supply Network - Hardness and Approximation** (Alexandru Popa), *Theory and Applications of Models of Computation (TAMC)* 2013, pp. 62-71.
- 15 **Synthesizing Minimal Tile Sets for Complex Patterns in the framework of Patterned DNA Self-Assembly** (Eugen Czeizler, Alexandru Popa), *Theoretical Computer Science*, Volume 499, 2013, pp. 23-37.
- 14 **The Mendelsohn Triple Systems of Order 13** (Mahdad Khatirinejad, Patric R. J. Östergård, Alexandru Popa), *Journal of Combinatorial Designs*, 2013.
- 13 **Synthesizing Minimal Tile Sets for Complex Patterns in the framework of Patterned DNA Self-Assembly** (Eugen Czeizler, Alexandru Popa), *International Conference on DNA Computing and Molecular Programming (DNA)* 2012, pp. 58-72.

- 12 **Approximating the Rainbow - Better Lower and Upper Bounds** (Alexandru Popa), *International Computing and Combinatorics Conference (COCOON)* 2012, pp. 193-203.
- 11 **On the Closest String via Rank Distance** (Liviu Dinu, Alexandru Popa), *Combinatorial Pattern Matching (CPM)* 2012, pp. 413-426.
- 10 **Hardness and Approximation of The Asynchronous Border Minimization Problem - (Extended Abstract)** (Alexandru Popa, Prudence W.H. Wong, Fencol C.C. Yung), *Theory and Applications of Models of Computation (TAMC)* 2012, pp. 164-176.
- 9 **Restricted Common Superstring and Restricted Common Supersequence** (Raphaël Clifford, Zvi Gotthilf, Moshe Lewenstein, Alexandru Popa), *Combinatorial Pattern Matching (CPM)* 2011, pp. 467-478.
- 8 **Maximum Subset Intersection** (Raphaël Clifford and Alexandru Popa), *Information Processing Letters*, Volume 111, Number 7, 2011, pp. 323-325.
- 7 **On Shortest Common Superstring and Swap Permutations** (Zvi Gotthilf, Moshe Lewenstein, Alexandru Popa), *String Processing and Information Retrieval Symposium (SPIRE)* 2010, pp. 270-278.
- 6 **Approximation and Hardness Results for the Maximum Edge q-Coloring Problem** (Anna Adamaszek, Alexandru Popa), *International Symposium on Algorithms and Computation (ISAAC)* 2010, Part 2, pp. 132-143.
- 5 **(In)approximability Results for Pattern Matching Problems** (Raphaël Clifford, Alexandru Popa), *Prague Stringology Conference (PSC)* 2010, pp. 52-62.
- 4 **Undecidability Results for Finite Interactive Systems** (Alexandru Sofronia, Alexandru Popa, Gheorghe Stefanescu), *Romanian Journal of Information Science and Technology (ROMJIST)*, Volume 12, Number 2, 2009, pp. 265-279.
- 3 **Generalised Matching** (Raphaël Clifford, Aram Wettroth Harrow, Alexandru Popa, Benjamin Sach), *String Processing and Information Retrieval Symposium (SPIRE)* 2009, pp. 295-301.
- 2 **Undecidability Results for Finite Interactive Systems** (Alexandru Sofronia, Alexandru Popa, Gheorghe Stefanescu), *International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC)* 2008, pp. 366-369.
- 1 **High-level Structured Interactive Programs with Registers and Voices** (Alexandru Popa, Alexandru Sofronia, Gheorghe Stefanescu), *Journal of Universal Computer Science (JUCS)*, Volume 13, Number 11, 2007, pp. 1722-1754.

Academic visits

- Åbo Akademi *June 2017*
Host: Dr. Eugen Czeizler
- TU Vienna *April 2017*
Host: Dr. Sebastian Ordyniak
- University of Copenhagen *October 2015*
Host: Dr. Anna Adamaszek
- IMDEA Networks, Madrid *June 2015*
Host: Prof. Antonio Fernández Anta
- A.P. Ershov Institute of Informatics Systems, Novosibirsk *March 2015*
Host: Prof. Nikolay Shilov
- LaBRI CS Lab, Bordeaux University *December 2014*
Host: Prof. Guillaume Blin
- Max-Planck-Institut für Informatik *May 2014*
Host: Dr. Anna Adamaszek

- TU Vienna *May 2014*
Host: Univ. Ass. Dipl.-Ing. Andreas Pfandler
- Comenius University *October 2013*
Host: Dr. Broňa Brejová
- Max-Planck-Institut für Informatik *July 2013*
Host: Dr. Anna Adamaszek
- Marne-la-Vallée University *October 2012*
Host: Dr. Guillaume Blin
- Tsinghua University *May 2012*
- University of Liverpool *March 2011*
Host: Dr. Prudence W. H. Wong
- KTH Royal Institute of Technology *September 2010*
Host: Prof. Johan Håstad
- University of Bar-Ilan *May 2010*
Host: Prof. Moshe Lewenstein
- University of Warwick *February 2010*
Host: Dr. Anna Adamaszek
- University of Warwick *August 2009*
Host: Dr. Oded Lachish
- University of Illinois at Urbana-Champaign *January 2009*
Host: Prof. Gheorghe Ștefănescu

Selected talks

- TEDx Talk. "There are no bad countries, only bad people". *4 March 2016*
- Feasible Algorithms for NP-hard Problems, Antalya International University. Turkey, *25 January 2016*
- The Maximum Generalized Pattern Matching Problem. University of Copenhagen. Denmark, *15 October 2015*
- The Maximum Edge q-coloring Problem. IMDEA. Madrid, Spain, *24 June 2015*
- Algorithmic and Hardness Results for the Colorful Components Problems. TU Vienna. Austria, *4 July 2015*
- AGAPIA: A unifying framework for interactive programming. A.P. Ershov Institute of Informatics Systems. Novosibirsk, Russia, *26 March 2015*
- Algorithmic and Hardness Results for the Colorful Components Problems. Sobolev Institute of Mathematics. Novosibirsk, Russia, *25 March 2015*
- A unifying framework for interactive programming and applications to communicating peer-to-peer systems. EGC 2015, Almaty, Kazakhstan, *26-28 February 2015*
- Approximation and Hardness Results for the Maximum Edges in Transitive Closure Problem. IWOCA 2014, Duluth, USA, *15-17 October 2014*
- A Parameterized Study of Generalized Function and Pattern Matching. IPEC 2014, Wroclaw, Poland, *10-12 September 2014*
- Overview of problems and algorithms in stringology. Bioinformatics summer school *Theoretical and practical aspects of processing and analysis of sequencing data*, Brno, Czech Republic, *4-7 June 2014*.
- Generalized Function Matching. Vienna University of Technology, *8 May 2014*.
- Power of approximation algorithms, Masaryk University, Brno, Czech Republic, *29 April 2014*.

- Algorithmic and Hardness Results for the Colorful Components Problems. LATIN 2014, Montevideo, Uruguay, *31 March - 4 April 2014*.
- Min-Sum 2-Paths Problems. University of Helsinki, Helsinki, Finland, *28 November 2013*.
- The Border Minimization Problem. Comenius University, Bratislava, Slovakia, *11 October, 2013*.
- The 2-Paths Min-Sum Orientation Problem. WAOA 2013, Sophia Antipolis, France, *5-6 September 2013*.
- The Asynchronous Border Minimization Problem. MPI, Saarbrücken, Germany, *16 July, 2013*.
- The Mendelsohn Triple Systems of Order 13. NORCOM 2013, Stockholm, *17-19 June 2013*.
- Modelling the Power Supply Network - Hardness and Approximation. TAMC 2013, Hong Kong, *20-22 May 2013*.
- The maximum edge q -coloring problem. Masaryk University, Brno, Czech Republic, *16 January, 2013*.
- Instant Scientific Talk Contest - Aalto University Science Day (random talk). Espoo, Finland, *20 September 2012*. (<http://www.youtube.com/watch?v=EN9iaP5o2IA>)
- The Asynchronous Border Minimization Problem. Marne-la-Vallée University, Champs-sur-Marne, France, *2 October, 2012*.
- Approximating the Rainbow - Better Lower and Upper Bounds. COCOON 2012, Sydney, Australia, *20-22 August, 2012*.
- Hardness and Approximation of The Asynchronous Border Minimization Problem. TAMC 2012, Beijing, China, *16-21 May, 2012*.
- Computers are nothing without maths! Science SLAM, Helsinki, Finland, *13 December, 2011*. (<http://vimeo.com/34192922>)
- The maximum edge q -coloring problem. University of Helsinki, Helsinki, Finland, *2 December, 2011*.
- The maximum edge q -coloring problem. University of Liverpool, Liverpool, UK, *17 March, 2011*.
- Approximation and hardness results for the maximum edge q -coloring problem. ISAAC 2010, Jeju Island, Korea, *15-17 December, 2010*.
- On Shortest Common Superstring and Swap Permutations. SPIRE 2010, Los Cabos, Mexico, *11-13 October 2010*.
- Approximation and hardness results for the maximum edge q -coloring problem. KTH Royal Institute of Technology, Stockholm, Sweden, *24 September, 2010*.
- (In)approximability results for pattern matching problems. Prague Stringology Conference 2010, Prague, Czech Republic, *30 August - 1 September, 2010*.
- Tree Decomposition of Graphs. DIMAP Workshop on Extremal and Probabilistic Combinatorics, Petersfield, Hampshire, England, *18-25 July 2010*.
- Permuted Common Supersequence. BCTCS 2010, University of Edinburgh, *6-9 April 2010*.
- (In)approximability results for problems inspired from biology. University of Bucharest, *29 March 2010*.
- Online Computation and Competitive Analysis. Theory of Computing Reading Group, University of Bristol, *16 October 2009*.
- Generalized Matching. SPIRE 2009, Saariselkä, Finland, *25-27 August 2009*.
- Generalized Matching. BCTCS 2009, University of Warwick, *6-9 April 2009*.
- Scheduling Processes on Machines. Theory of Computing Reading Group, University of Bristol, *27 November 2008*.

- Counting problems. Theory of Computing Reading Group, University of Bristol, *6 November 2008*.
- High Level Structured Programs with Registers and Voices: Agapia v0.2 Language. Global-Comp Workshop, Technical University Cluj-Napoca, Romania, *26 February 2008*.

Student supervision

- Vlad-Mihai Panait, University of Bucharest, BSc 2017.
- Alexandra Trăilă, University of Bucharest, BSc 2017.
- Daniel Maxim, University of Bucharest, BSc 2017.
- Katarina Martinova, Masaryk University, MSc 2015.
- K Ashik Mathew, Aalto University, PhD 2015 (co-supervised with Patric Östergård).
- Tommi Larjomaa, Aalto University, MSc 2013.
- Ioannis Marcoullis, University of Bristol, MSc 2011.

Current PhD students

- Radu-Ștefan Mincu
- Camelia Obreja
- Alexandru Gheorghită (co-supervised with Prof. Florin Pop)

Teaching

- **University of Bucharest:** Algorithms and Data Structures.
- **Nazarbayev University:** Performance and Data Structures, Networks and Security, CS Track Core - Theory, Networks and Security, Programming for Scientists and Engineers.
- **Masaryk University:** Graph Theory, Computational Logic, Mathematical Foundations of Computer Science, String algorithms, Algorithms and Data Structures, Computational Logic.
- **University of Bristol:** Theory of Computation, Advanced Algorithms.

Community service

- Program committee member, The Third Algebra Across the Borders Workshop, Astana & Almaty, Kazakhstan *8 - 13 September 2015*.
- Reviewer for Mathematical Reviews.
- Program committee member, 16th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC 2014), Timisoara, Romania, *September 22 - September 25, 2014*.
- Program committee member, The Fifth International Conference on Future Computational Technologies and Applications (FUTURE COMPUTING 2013), Valencia, Spain, *May 27 - June 1, 2013*.
- Program committee member, The Fifth International Conference on Creative Content Technologies (CONTENT 2013), Valencia, Spain, *May 27 - June 1, 2013*.
- Program committee member, The Fourth International Conference on Creative Content Technologies (CONTENT 2012), Nice, France, *July 22-27, 2012*.
- Reviewer for the following journals: Theoretical Computer Science, Algorithmica, Journal of Discrete Algorithms, Discrete Applied Mathematics, Information Processing Letters, Discussiones Mathematicae Graph Theory.
- Reviewer for the following conference: ICDCS 2014, STACS 2014, LATIN 2014, MFCS 2013, ISAAC 2013, UCNC 2013, WABI 2012, COCOON 2012, CCS 2011, ICALP 2011

Relevant activities

- Participant at the 3rd Science SLAM contest, Helsinki, Finland, *13 December 2011*
- 12th Max Planck Advanced Course on the Foundations of Computer Science, Saarbrücken, Germany, *August 29 - September 2, 2011*.
- DIMAP Workshop on Extremal and Probabilistic Combinatorics, Petersfield, Hampshire, England, *18-25 July 2010*.
- DIMAP Summer School on Approximation and Randomized Algorithms, University of Warwick, England, *12-16 July 2010*.
- 10th Max Planck Advanced Course on the Foundations of Computer Science, Saarbrücken, Germany, *14-18 September 2009*.
- LMS-EPSRC Short Course *Probabilistic Combinatorics*, Cambridge, *12-17 July 2009*.
- Beautiful Science Networking Event, Istanbul, Turkey, *23-26 October 2008*.
- Member of Romanian National Team of Informatics, *2005*.
- Finalist at Informatics contest Bursele Agora: fourth place in the final round, *2005*.
- Participant at Romanian National Olympiads in Informatics, *2003*.

Personal

Born in Bucharest, Romania on 9 December 1986. Romanian citizen.