Alexandru Popa

Facultatea de Matematica si Informatica
Universitatea din Bucuresti
Str. Academiei, nr. 14
Bucuresti 010014
Romania

Web: http://alexpopa.neocities.org
E-mail: alexpopa9@gmail.com

Current position
Associate Professor at University of Bucharest, Romania

Past positions
• 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
• PhD in Computer Science, Department of Computer Science, University of Bristol September 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
• Nazarbayev University Social Policy Grant (2 000 000 KZT ≈ 10 000 EUR) March 2015.
• “Biocentrum Helsinki: Connecting Aalto University and University of Helsinki Scientists” research grant (5 000 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

35 Making “Fast” Atomic Operations Computationally Tractable (Antonio Fernández Anta, Nicolas Nicolaou, Alexandru Popa), OPODIS 2015.
34 The Min-Max Edge q-Coloring Problem, (Tommi Larjomaa and Alexandru Popa), Journal of Graph Algorithms and Applications 2015, vol. 19, no. 1, pp. 507-528.
33 A Unifying Framework for Interactive Programming and Applications to Communicating Peer-to-peer Systems, (Alexandru Popa, Iulia Teodora Banu-Demergian, Camelia Chira, Florian Mirea Boian and Gheorghe Stefanescu), Embracing Global Computing in Emerging Economies (EGC) 2015.
32 A Parameterized Study of Generalized Function and Pattern Matching (Sebastian Ordyniak, Alexandru Popa), Algorithmica 2015, pp. 1-26.
31 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.
30 Parameterized Complexity of Asynchronous Border Minimization (Robert Ganian, Martin Kronegger, Andreas Pfandler and Alexandru Popa), Theory and Applications of Models of Computation (TAMC) 2015.
29 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.
28 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.
27 Algorithmic and Hardness Results for the Colorful Components Problems (Anna Adamaszek, Alexandru Popa), Algorithmica, 2014, pp. 1-8.
26 The min-max edge q-coloring problem (Tommi Larjomaa, Alexandru Popa), International Workshop on Combinatorial Algorithms (IWOCA) 2014.
25 The 2-Paths Min-Sum Orientation Problem (Trevor Fenner, Oded Lachish, Alexandru Popa), Theory of Computing Systems 2014, pp. 1-17.
24 Better lower and upper bounds for the minimum rainbow subgraph problem (Alexandru Popa), Theoretical Computer Science, Volume 543, 2013, pp. 1-8.
23 Enumeration of Steiner Triple Systems with Subsystems (Petteri Kaski, Patric R. J. Östergård, Alexandru Popa), Mathematics of Computation.
22 Algorithmic and Hardness Results for the Colorful Components Problems (Anna Adamaszek, Alexandru Popa), Latin American Theoretical Informatics Symposium (LATIN) 2014, pp. 683-694.

21 Enumerating Cube Tilings (K Ashik Mathew, Patric R. J. Östergård, Alexandru Popa), Discrete and Computational Geometry, Volume 50, Issue 4, pp. 1112-1122.

20 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.

19 The 2-Paths Min-Sum Orientation Problem (Trevor Fenner, Oded Lachish, Alexandru Popa), Workshop on Approximation and Online Algorithms (WAOA) 2013, pp 1-11.

18 Modelling the Power Supply Network - Hardness and Approximation (Alexandru Popa), Theory and Applications of Models of Computation (TAMC) 2013, pp. 62-71.

17 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.

16 The Mendelsohn Triple Systems of Order 13 (Mahdad Khatirinejad, Patric R. J. Östergård, Alexandru Popa), Journal of Combinatorial Designs, 2013.

15 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.

14 Approximating the Rainbow - Better Lower and Upper Bounds (Alexandru Popa), International Computing and Combinatorics Conference (COCOON) 2012, pp. 193-203.

13 On the Closest String via Rank Distance (Liviu Dinu, Alexandru Popa), Combinatorial Pattern Matching (CPM) 2012, pp. 413-426.

12 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.

11 Restricted Common Superstring and Restricted Common Supersequence (Raphaël Clifford, Zvi Gotthilf, Moshe Lewenstein, Alexandru Popa), Combinatorial Pattern Matching (CPM) 2011, pp. 467-478.

10 Maximum Subset Intersection (Raphaël Clifford and Alexandru Popa), Information Processing Letters, Volume 111, Number 7, 2011, pp. 323-325.

9 On Shortest Common Superstring and Swap Permutations (Zvi Gotthilf, Moshe Lewenstein, Alexandru Popa), String Processing and Information Retrieval Symposium (SPIRE) 2010, pp. 270-278.

8 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.

7 (In)approximability Results for Pattern Matching Problems (Raphaël Clifford and Alexandru Popa), Prague Stringology Conference (PSC) 2010, pp. 52-62.

6 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.

5 Generalised Matching (Raphaël Clifford, Aram Wettroth Harrow, Alexandru Popa, Benjamin Sach), String Processing and Information Retrieval Symposium (SPIRE) 2009, pp. 295-301.

4 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.
3 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.

**Preprints**

2 Hardness and Approximation of The Asynchronous Border Minimization Problem (Cindy Y. Li, Alexandru Popa, Prudence W.H. Wong, Fencol C.C. Yung)

1 Better Bounds for the Maximum Edge \(q\)-Coloring Problem (Anna Adamaszek, Alexandru Popa)

**Academic visits**

- University of Copenhagen
  Host: Dr. Anna Adamaszek  
  *October 2015*

- TU Vienna
  Host: Dr. Sebastian Ordyniak  
  *July 2015*

- IMDEA Networks, Madrid
  Host: Prof. Antonio Fernández Anta  
  *June 2015*

- A.P. Ershov Institute of Informatics Systems, Novosibirsk
  Host: Prof. Nikolay Shilov  
  *March 2015*

- LaBRI CS Lab, Bordeaux University
  Host: Prof. Guillaume Blin  
  *December 2014*

- Max-Planck-Institut für Informatik
  Host: Dr. Anna Adamaszek  
  *May 2014*

- TU Vienna
  Host: Univ. Ass. Dipl.-Ing. Andreas Pfandler  
  *May 2014*

- Comenius University
  Host: Dr. Broňa Brejová  
  *October 2013*

- Max-Planck-Institut für Informatik
  Host: Dr. Anna Adamaszek  
  *July 2013*

- Marne-la-Vallée University
  Host: Dr. Guillaume Blin  
  *October 2012*

- Tsinghua University
  *May 2012*

- University of Liverpool
  Host: Dr. Prudence W. H. Wong  
  *March 2011*

- KTH Royal Institute of Technology
  Host: Prof. Johan Håstad  
  *September 2010*

- University of Bar-Ilan
  Host: Prof. Moshe Lewenstein  
  *May 2010*

- University of Warwick
  Host: Dr. Anna Adamaszek  
  *February 2010*

- University of Warwick
  Host: Dr. Oded Lachish  
  *August 2009*

- University of Illinois at Urbana-Champaign
  Host: Prof. Gheorghe Ştefănescu  
  *January 2009*
Talks

- 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=EN9iaP5o2lA)
- 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.
• Permutated 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.
• Colouring 3-Colourable Graphs Using SDP. Theory of Computing Reading Group, University of Bristol, 4 December 2009.
• 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.
• Bourgain’s Embedding Theorem. Theory of Computing Reading Group. University of Bristol, 23 July 2009.
• Fairytales about Hardness. Theory of Computing Reading Group, University of Bristol, 4 June 2009.
• Generalized Matching. BCTCS 2009, University of Warwick, 6-9 April 2009.
• Generalized Matching. Departmental Seminar, University of Bristol, 2 April 2009.
• Tree Embeddings. Theory of Computing Reading Group, University of Bristol, 19 February 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.
• Interactive Systems with Registers and Voices. Students Communications Session, Bucharest, June 2008.
• Interactive Programs with Registers and Voices - Foundations. GlobalComp Workshop, Technical University Cluj-Napoca, Romania, 26 February 2008.
• High Level Structured Programs with Registers and Voices: Agapia v0.2 Language. GlobalComp Workshop, Technical University Cluj-Napoca, Romania, 26 February 2008.

Student supervision
• Katarina Martinova, Masaryk University, MSc 2015.
• K Ashik Mathew, Aalto University, doctoral student (co-supervisor).
• Tommi Larjomaa, Aalto University, MSc 2013.
• Ioannis Marcoullis, University of Bristol, MSc 2011.
Teaching

- Nazarbayev University
  - CS Track Core - Theory (Lecturer) \textit{Fall 2015}
  - Networks and Security (Lecturer) \textit{Spring 2015}
  - Programming for Scientists and Engineers (Lecturer) \textit{Spring 2015}

- Masaryk University
  - Graph Theory (TA) \textit{Fall 2014}
  - Computational Logic (TA) \textit{Fall 2014}
  - Mathematical Foundations of Computer Science (TA) \textit{Fall 2014}
  - String algorithms (Lecturer) \textit{Spring 2014}
  - Algorithms and Data Structures (TA) \textit{Spring 2014}
  - Computational Logic (TA) \textit{Fall 2013}
  - Graph Theory (TA) \textit{Fall 2013}
  - Mathematical Foundations of Computer Science (TA) \textit{Fall 2013}

- University of Bristol
  - Theory of Computation (TA) \textit{Spring 2011}
  - Theory of Computation (TA) \textit{Spring 2010}
  - Theory of Computation (TA) \textit{Spring 2009}
  - Advanced Algorithms (TA) \textit{Fall 2009}
  - Theory of Computation (TA) \textit{Spring 2009}
  - Advanced Algorithms (TA) \textit{Fall 2008}

Community service

- Program committee member, The Third Algebra Across the Borders Workshop, Astana & Almaty, Kazakhstan \textit{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, \textit{September 22 - September 25, 2014}.

- Program committee member, The Fifth International Conference on Future Computational Technologies and Applications (FUTURE COMPUTING 2013), Valencia, Spain, \textit{May 27 - June 1, 2013}.

- Program committee member, The Fifth International Conference on Creative Content Technologies (CONTENT 2013), Valencia, Spain, \textit{May 27 - June 1, 2013}.

- Program committee member, The Fourth International Conference on Creative Content Technologies (CONTENT 2012), Nice, France, \textit{July 22-27, 2012}.

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

Personal

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