

Alexandru Popa

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Current positions

- Full Professor at University of Bucharest, Romania *from February 2020*
- Senior Researcher (CS II) at National Institute for Research and Development in Informatics, Romania *from February 2017*
- Member of the Senate of the University of Bucharest *from November 2023*
- Member of the Scientific Council of the University of Bucharest *from November 2023*

Past positions

- Erasmus Coordinator in the Faculty of Mathematics and Computer Science, University of Bucharest, Romania *March 2020 - October 2023*
- Associate Professor at University of Bucharest, Romania *October 2016 - February 2020*
- Deputy Director of Department of Modeling, Simulation, Optimization, National Institute for Research and Development in Informatics, Romania *August 2017 - November 2017*
- 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

- Combinatorial optimization
- Approximation algorithms
- Fixed parameter algorithms
- Heuristic algorithms for solving NP-hard problems

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, Faculty of Mathematics and Computer Science, University of Bucharest. GPA 9.80/10 - ranked 3rd out of 104 graduates *July 2008*

Awards and grants

- Responsible of the University of Bucharest in the project *Capacity building in the field of higher education (ERASMUS-EDU-2022-CBHE)* – “AfriConnect+” (2023-2026, 798 135 EUR), 13 universities - coordinated by D’Aix-Marseille University.
- Young Investigator Project, “Impact of fake news on rumours spreading ”, PN-III-P1-1.1-TE-2021-0253 2022-2024 (450 000 RON \approx 90 000 EUR)
- University of Bucharest Senate Awards 2021 for the best undergraduate thesis in exact sciences and engineering, author Andrei Popa, advisor Alexandru Popa.
- Award for top research publication, “LMAAS-IoT: Lightweight multi-factor authentication and authorization scheme for real-time data access in IoT cloud-based environment”, project no PN-III-P1-1.1-PRECISI-2021-64635.
- DAAD fellowship to visit Augsburg University through programme “Research Stays for University Academics and Scientists”, *August - September 2021*.
- Award for top research publication, “Tractable low-delay atomic memory ”, project no PN-III-P1-1.1-PRECISI-2020-41642.
- Third place at the sixth edition of “Rada Mihalcea award for Young Researchers in Science and Technology” (Premiile Rada Mihalcea pentru Tineri Cercetători în Știință și Inginerie) 2020
- Brâncuși Bilateral Project Romania - France, project no. PN-III-P3-3.1-PM-RO-FR-2019-0030 (53600 RON \approx 11000 EUR).
- Erasmus Award to visit TEI Crete, *April 2018*.
- Innovation Cheque “Optimization algorithms in banking systems”, project no. PN-III-P2-2.1-CI-2018-1518. – project for cooperation with a partner from industry, *September 2018 - December 2018*.
- Mobility project for researchers, project no. EEA-MG-RO-NO-2018-0093 (\approx 1500 EUR), *September 2018*.
- Award for top research publication, “Parameterized Complexity of Asynchronous Border Minimization”, project no. PN-III-P1-1.1-PRECISI-2018-22471.
- National coordinator of the COST Action CA 15210, “European Network for Collaboration on Kidney Exchange Programmes”, *since February 2018*.
- Mobility project for researchers, project no. PN-III-P1-1.1-MC-2017-0638 (22000 RON \approx 4500 EUR), *November 2017*.
- Erasmus Award to visit Instituto Superior Miguel Torga, *April 2018*.
- DAAD fellowship to visit Max-Planck-Institut für Informatik through programme “Research Stays for University Academics and Scientists”, *May - July 2018*.
- 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

- 81 **Exact and Approximation Algorithms for Covering Timeline in Temporal Graphs**, (Riccardo Dondi, Alexandru Popa), *Annals of Operations Research 2024*
- 80 **Algorithms on a path covering problem with applications in transportation**, (Ruxandra Marinescu-Ghemeci, Alexandru Popa, Tiberiu Sirbu), *COCOA 2023*
- 79 **Approximating Maximum Edge 2-Coloring by Normalizing Graphs**, (Tobias Mömke, Alexandru Popa, Aida Roshany Tabrizi, Michael Ruderer and Roland Vincze), *WAOA 2023*
- 78 **Approximation and fixed parameter algorithms for the approximate cover problem**, (Guillaume Blin, Alexandru Popa, Mathieu Raffinot and Raluca Uricaru), *SPIRE 2023*
- 77 **Exact and Approximation Algorithms for Synthesizing Specific Classes of Optimal Block-Structured Processes**, (Costin Badică and Alexandru Popa), *Simulation Modelling Practice and Theory 2023*
- 76 **String Factorization via Prefix Free Families**, (Matan Kraus, Moshe Lewenstein, Alexandru Popa, Ely Porat and Yonathan Sadia), *CPM 2023*
- 75 **Faster algorithms for computing the hairpin completion distance and minimum ancestor**, (Itai Boneh, Dvir Fried, Adrian Miclăuş and Alexandru Popa), *CPM 2023*
- 74 **Timeline Cover in Temporal Graphs: Exact and Approximation Algorithms**, (Riccardo Dondi, Alexandru Popa), *IWOCA 2023*
- 73 **Approximate and exact results for the harmonious chromatic number**, (Ruxandra Marinescu-Ghemeci, Camelia Obreja, Alexandru Popa), *Discussiones Mathematicae Graph Theory 2022*
- 72 **Models and algorithms for social distancing in order to stop the spread of COVID-19**, (Alexandru Popa), *Acta Cybernetica 2022*
- 71 **Fixed parameter algorithms and hardness of approximation results for the Structural Target Controllability problem**, (Eugen Czeizler, Alexandru Popa, Victor Popescu), *Scientific Annals of Computer Science 2022*

- 70 **Covering a Graph with Densest Subgraphs** (Riccardo Dondi and Alexandru Popa), *CALDAM 2022*
- 69 **Detecting news influence in a country: one step forward towards understanding fake news**, Book Chapter in “Combating Fake News With Computational Intelligence Techniques”, Book Series “Studies in Computational Intelligence”, *Springer Nature 2021*.
- 68 **LMAAS-IoT: Lightweight multi-factor authentication and authorization scheme for real-time data access in IoT cloud-based environment** (Ahmed Yaser Fahad Alsahlani and Alexandru Popa), *Journal of Network and Computer Applications 2021*
- 67 **Polynomial Algorithms for Synthesizing Specific Classes of Optimal Block-Structured Processes** (Costin Badică and Alexandru Popa), *International Conference on Computational Collective Intelligence (ICCCI) 2021*
- 66 **Analysis of lightweight and secure two-factor authentication scheme for wireless body area networks in healthcare IoT** (Ahmed Yaser Fahad Alsahlani and Alexandru Popa), *International Wireless Communications and Mobile Computing Conference (IWCMC) 2021*
- 65 **Efficient algorithms for counting gapped palindromes** (Andrei Popa and Alexandru Popa), *Combinatorial Pattern Matching (CPM) 2021*
- 64 **The use of a pruned modular decomposition for Maximum Matching algorithms on some graph classes** (Guillaume Ducoffe and Alexandru Popa), *Discrete Applied Mathematics 2021*.
- 63 **The b-Matching problem in distance-hereditary graphs and beyond** (Guillaume Ducoffe and Alexandru Popa), *Discrete Applied Mathematics 2021*.
- 62 **A novel algorithm for clearing financial obligations between companies - an application within the Romanian Ministry of Economy** (Lucian-Ionuț Gavriță, Alexandru Popa), *Algorithmic Finance 2020*
- 61 **Analyzing of LAM-CIoT: Lightweight Authentication Mechanism in Cloud-based IoT Environment** (Ahmed Yaser Fahad Alsahlani and Alexandru Popa), *IEEE Symposium Series on Computational Intelligence (SSCI 2020)*.
- 60 **IP Solutions for International Kidney Exchange Programmes** (Péter Biró, Márton Gyetvai, Radu-Stefan Mincu, Alexandru Popa and Utkarsh Verma), *Central European Journal of Operations Research (CJOR) 2020*.
- 59 **Complexity of Computing the Anti-Ramsey Numbers for Paths** (Saeed Akhoondian Amiri, Alexandru Popa, Mohammad Roghani, Golnoosh Shahkarami, Reza Soltani and Hossein Vahidi), *International Symposium on Mathematical Foundations of Computer Science (MFCS) 2020*.
- 58 **Tractable low-delay atomic memory** (Antonio Fernández Anta, Theophanis Hadjistasi, Nicolas Nicolaou, Alexandru Popa, Alexander A. Schwarzmann), *Distributed Computing 2020*.
- 57 **The Maximum Equality-Free String Factorization Problem: Gaps vs. No Gaps** (Radu-Ștefan Mincu and Alexandru Popa), *International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM) 2020*.
- 56 **NewsCompare – A novel application for detecting news influence in a country** (Cristian Pop and Alexandru Popa), *SoftwareX 2019*.
- 55 **On the (di)graphs with (directed) proper connection number two** (Guillaume Ducoffe, Ruxandra Marinescu-Ghemeci and Alexandru Popa), *Discrete Applied Mathematics 2019*.
- 54 **The graceful chromatic number for some particular classes of graphs** (Radu Mincu, Camelia Obreja and Alexandru Popa), *SYNASC 2019*.

- 53 **The graceful chromatic number for some particular classes of graphs** (Radu Mincu, Camelia Obreja and Alexandru Popa), *Cologne-Twente Workshop on Graphs & Combinatorial Optimization (CTW)* 2019.
- 52 **Some Remarks on the Translocation Distance** (Maria Constantin and Alexandru Popa), *International Conference on Knowledge-Based and Intelligent Information & Engineering Systems (KES)* 2019.
- 51 **P-FPT algorithms for bounded clique-width graphs** (David Coudert, Guillaume Ducoffe and Alexandru Popa), *ACM Transactions on Algorithms* 2019.
- 50 **An output-sensitive algorithm for the minimization of 2-dimensional String Covers** (Alexandru Popa and Andrei Tănăsescu), *Theory and Applications of Models of Computation (TAMC)* 2019.
- 49 **Algorithms for closest and farthest string problems via rank distance** (Liviu Dinu, Bogdan Dumitru and Alexandru Popa), *Theory and Applications of Models of Computation (TAMC)* 2019.
- 48 **IP Solutions for International Kidney Exchange Programmes** (Péter Biró, Márton Gyetvai, Radu-Stefan Mincu, Alexandru Popa and Utkarsh Verma), *VOCAL Optimization Conference: Advanced Algorithms (VOCAL)* 2018.
- 47 **Heuristic algorithms for the Longest Filled Common Subsequence Problem** (Radu-Ştefan Mincu and Alexandru Popa), *International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC)* 2018.
- 46 **Extremal Graphs with respect to the Modified First Zagreb Connection Index** (Guillaume Ducoffe, Ruxandra Marinescu-Ghemeci, Camelia Obreja, Alexandru Popa and Rozica Maria Tache), *International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC)* 2018.
- 45 **The b-Matching problem in distance-hereditary graphs and beyond** (Guillaume Ducoffe and Alexandru Popa), *International Symposium on Algorithms and Computation (ISAAC)* 2018.
- 44 **The use of a pruned modular decomposition for Maximum Matching algorithms on some graph classes** (Guillaume Ducoffe and Alexandru Popa), *International Symposium on Algorithms and Computation (ISAAC)* 2018.
- 43 **Better Heuristic Algorithms for the Repetition Free LCS and Other Variants** (Radu-Ştefan Mincu and Alexandru Popa), *String Processing and Information Retrieval Symposium (SPIRE)* 2018.
- 42 **Heuristic algorithms for the min-max edge 2-coloring problem** (Radu-Ştefan Mincu and Alexandru Popa), *International Computing and Combinatorics Conference (COCOON)* 2018.
- 41 **Extremal Graphs with respect to the Modified First Zagreb Connection Index** (Guillaume Ducoffe, Ruxandra Marinescu-Ghemeci, Camelia Obreja, Alexandru Popa and Rozica Maria Tache), *Cologne-Twente Workshop on Graphs & Combinatorial Optimization (CTW)* 2018.
- 40 **Parameterized Complexity of Asynchronous Border Minimization** (Robert Ganian, Martin Kronegger, Andreas Pfandler and Alexandru Popa), *Algorithmica* 2018.
- 39 **Fixed Parameter Algorithms and Hardness of Approximation Results for the Structural Target Controllability Problem** (Eugen Czeizler, Alexandru Popa and Victor Popescu), *International Conference on Algorithms for Computational Biology (AlCoB)* 2018.
- 38 **Fully polynomial FPT algorithms for some classes of bounded clique-width graphs** (David Coudert, Guillaume Ducoffe and Alexandru Popa), *ACM-SIAM Symposium on Discrete Algorithms (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), *Latin and American Algorithms, Graphs and Optimization Symposium (LAGOS)* 2017.
- 35 **SOBRA - Shielding Optimization for BRACHYtherapy** (Guillaume Blin, Marie Gasparoux, Sebastian Ordyniak, Alexandru Popa), *International Workshop on Combinatorial Algorithms (IWOCA)* 2016.
- 34 **Better Bounds for the Maximum Edge q -Coloring Problem** (Anna Adamaszek, Alexandru Popa), *Journal of Discrete Algorithms* 2016.
- 33 **Min-Sum 2-Paths Problems** (Trevor Fenner, Oded Lachish, Alexandru Popa), *Theory of Computing Systems* 2016.
- 32 **Making “Fast” Atomic Operations Computationally Tractable** (Antonio Fernández Anta, Nicolas Nicolaou, Alexandru Popa), *International Conference on Principles of Distributed Systems (OPODIS)* 2015.
- 31 **The Min-Max Edge q -Coloring Problem**, (Tommi Larjomaa and Alexandru Popa), *Journal of Graph Algorithms and Applications* 2015.
- 30 **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.
- 29 **A Parameterized Study of Generalized Function and Pattern Matching** (Sebastian Ordyniak, Alexandru Popa), *Algorithmica* 2015.
- 28 **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.
- 27 **Parameterized Complexity of Asynchronous Border Minimization** (Robert Ganian, Martin Kronegger, Andreas Pfandler and Alexandru Popa), *Theory and Applications of Models of Computation (TAMC)* 2015.
- 26 **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.
- 25 **A Parameterized Study of Generalized Function and Pattern Matching** (Sebastian Ordyniak, Alexandru Popa), *International Workshop on Parameterized and Exact Computation (IPEC)* 2014.
- 24 **Algorithmic and Hardness Results for the Colorful Components Problems** (Anna Adamaszek, Alexandru Popa), *Algorithmica* 2014.
- 23 **The min-max edge q -coloring problem** (Tommi Larjomaa, Alexandru Popa), *International Workshop on Combinatorial Algorithms (IWOCA)* 2014.
- 22 **Better lower and upper bounds for the minimum rainbow subgraph problem** (Alexandru Popa), *Theoretical Computer Science* 2013.
- 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.

- 19 **Enumerating Cube Tilings** (K Ashik Mathew, Patric R. J. Östergård, Alexandru Popa), *Discrete and Computational Geometry* 2013.
- 18 **On the Shannon Capacity of Triangular Graphs** (K Ashik Mathew, Patric R. J. Östergård, Alexandru Popa), *Electronic Journal of Combinatorics* 2013.
- 17 **The 2-Paths Min-Sum Orientation Problem** (Trevor Fenner, Oded Lachish, Alexandru Popa), *Workshop on Approximation and Online Algorithms (WAOA)* 2013.
- 16 **Modelling the Power Supply Network - Hardness and Approximation** (Alexandru Popa), *Theory and Applications of Models of Computation (TAMC)* 2013.
- 15 **Synthesizing Minimal Tile Sets for Complex Patterns in the framework of Patterned DNA Self-Assembly** (Eugen Czeizler, Alexandru Popa), *Theoretical Computer Science* 2013.
- 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.
- 12 **Approximating the Rainbow - Better Lower and Upper Bounds** (Alexandru Popa), *International Computing and Combinatorics Conference (COCOON)* 2012.
- 11 **On the Closest String via Rank Distance** (Liviu Dinu, Alexandru Popa), *Combinatorial Pattern Matching (CPM)* 2012.
- 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.
- 9 **Restricted Common Superstring and Restricted Common Supersequence** (Raphaël Clifford, Zvi Gotthilf, Moshe Lewenstein, Alexandru Popa), *Combinatorial Pattern Matching (CPM)* 2011.
- 8 **Maximum Subset Intersection** (Raphaël Clifford and Alexandru Popa), *Information Processing Letters* 2011.
- 7 **On Shortest Common Superstring and Swap Permutations** (Zvi Gotthilf, Moshe Lewenstein, Alexandru Popa), *String Processing and Information Retrieval Symposium (SPIRE)* 2010.
- 6 **Approximation and Hardness Results for the Maximum Edge q-Coloring Problem** (Anna Adamaszek, Alexandru Popa), *International Symposium on Algorithms and Computation (ISAAC)* 2010.
- 5 **(In)approximability Results for Pattern Matching Problems** (Raphaël Clifford, Alexandru Popa), *Prague Stringology Conference (PSC)* 2010.
- 4 **Undecidability Results for Finite Interactive Systems** (Alexandru Sofronia, Alexandru Popa, Gheorghe Stefanescu), *Romanian Journal of Information Science and Technology (ROMJIST)* 2009.
- 3 **Generalised Matching** (Raphaël Clifford, Aram Wettroth Harrow, Alexandru Popa, Benjamin Sach), *String Processing and Information Retrieval Symposium (SPIRE)* 2009.
- 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.
- 1 **High-level Structured Interactive Programs with Registers and Voices** (Alexandru Popa, Alexandru Sofronia, Gheorghe Stefanescu), *Journal of Universal Computer Science (JUCS)* 2007.

Selected academic visits

- University of Bergamo
Host: Prof. Riccardo Dondi *September 2022*
- University of Bar-Ilan
Host: Prof. Moshe Lewenstein *June 2022*
- University of Bar-Ilan
Host: Prof. Moshe Lewenstein *Apr 2022*
- University of Bar-Ilan
Host: Prof. Moshe Lewenstein *January 2022*
- University of Bordeaux, France
Host: Prof. Guillaume Blin *November 2019*
- Corvinus University, Hungary
Host: Dr. Péter Biró *September 2019*
- TEI Crete, Greece
Host: Prof. Giorgos Papadourakis *May 2019*
- Corvinus University, Hungary
Host: Dr. Péter Biró *March 2019*
- Reykjavik University, Iceland
Host: Prof. Magnús Halldórsson *September 2018*
- Corvinus University, Hungary
Host: Dr. Péter Biró *April 2018*
- Instituto Superior Miguel Torga, Portugal
Host: Dr. Frederico Fonseca *March 2018*
- NISER, India
Host: Dr. Anisur Rahaman Molla *January 2018*
- West University of Timisoara, Romania
Host: Dr. Gabriel Istrate *October 2017*
- Åbo Akademi, Finland
Host: Dr. Eugen Czeizler *June 2017*
- TU Vienna
Host: Dr. Sebastian Ordyniak *April 2017*
- University of Copenhagen
Host: Dr. Anna Adamaszek *October 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 *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

- Optimization problems with applications in kidney transplants, finance and social networks. University of Craiova, *24 May 2019*.
- Optimization problems with applications in medicine and finance. TEI Crete, *13 May 2019*.
- An output-sensitive algorithm for the minimization of 2-dimensional String Covers. TAMC 2019, Kitakyushu, Japan, *13-16 April 2019*.
- Algorithms for closest and farthest string problems via rank distance. TAMC 2019, Kitakyushu, Japan, *13-16 April 2019*.
- Better Heuristic Algorithms for the Repetition Free LCS and Other Variants. SPIRE 2018, Lima, Peru, *9-11 October 2018*.
- The Maximum Edge q-coloring Problem. Reykjavik University. Iceland *4 September 2018*
- 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. IWCCA 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 Univerisy, 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

- PhD:
 1. Ahmed Al Sahlani, University of Bucharest, PhD 2023.
 2. Camelia Obreja, University of Bucharest, PhD 2022.
 3. Radu-Ştefan Mincu, University of Bucharest, PhD 2019.
 4. K Ashik Mathew, Aalto University, PhD 2015 (co-supervised with Patric Östergård).
 5. Maria Constantin (expected graduation 2023).
 6. Tiberiu Sîrbu (expected graduation 2024).
 7. Adrian Miclăuş (expected graduation 2027)
- Master:
 1. Adrian Miclaus, University of Bucharest, MSc 2023
 2. Steluta Talpau, University of Bucharest, MSc 2021
 3. Bogdan Damaschin, University of Bucharest, MSc 2020
 4. Stefan Leonte, University of Bucharest, MSc 2019.
 5. Katarina Martinova, Masaryk University, MSc 2015.
 6. Tommi Larjomaa, Aalto University, MSc 2013.
 7. Ioannis Marcoullis, University of Bristol, MSc 2011.
- Bachelor:
 1. Stelian Chichirim, University of Bucharest, BSc 2022
 2. Madalina Badescu, University of Bucharest, BSc 2022
 3. Andrei Popa, University of Bucharest, BSc 2020
 4. Dimitrie Vatra, University of Bucharest, BSc 2020
 5. David Irimia, University of Bucharest, BSc 2020.
 6. Robert Emanuel Banu, University of Bucharest, BSc 2019.
 7. Tiberiu Popa, University of Bucharest, BSc 2019.
 8. Cristian Pop, University of Bucharest, BSc 2019.
 9. Claudiu Gatina, University of Bucharest, BSc 2018.
 10. Irina Hulea, University of Bucharest, BSc 2018.
 11. Andrei Chirica, University of Bucharest, BSc 2018.
 12. Vlad-Mihai Panait, University of Bucharest, BSc 2017.
 13. Alexandra Trăilă, University of Bucharest, BSc 2017.
 14. Daniel Maxim, University of Bucharest, BSc 2017.

Teaching

- **University of Bucharest:** Algorithmic Efficiency, Algorithms and Data Structures, Advanced Programming Techniques, Graph Theory.
- **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

- Member of the Editorial Board of *The Computer Journal*, Oxford Academic, (since February 2023)
- Program committee member International Conference on Innovations in Intelligent Systems and Applications (INISTA 2024) Craiova, Romania 4-6 September 2024
- Program committee member European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD 2024), Vilnius, Lithuania 9-13 September 2024
- Program committee member International Joint Conference on Theoretical Computer Science Frontier of Algorithmic Wisdom (IJTCS-FAW 2024), Hong Kong, July 29-August 2, 2024
- Reviewer for National Research, Development and Innovation Office of Hungary (2021 and 2023)
- Program committee member, IEEE Symposium on Computational Intelligence in Cyber Security (IEEE CICS 2021), Orlando, Florida, USA, 4-7 December 2021.
- Program committee member, 47th International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM 2021), Bolzano, Italy, 25-28 January 2021.
- Program committee member, 46th International Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM 2020), Limassol, Cyprus, 20-24 January 2020.
- Program committee member, 30th International Workshop on Combinatorial Algorithms (IWCA 2019), Pisa, Italy, 23-25 July 2019.
- Reviewer for Netherlands Organisation for Scientific Research (NWO) (2018 and 2019)
- Member of Board of Examiners for adjudicating the Ph.D. thesis of R.Senthil Amutha, Bharathiar University India, 2018.
- Program committee member, 21st IEEE International Conference on Computational Science and Engineering, Faculty of Automatic Control and Computers, University Politehnica of Bucharest, Romania, 29-31 October 2018.
- 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*.

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*.

Description of the research group

The research group led by **Prof. Dr. Alexandru Popa** is an active and interdisciplinary research team working at the intersection of algorithms, combinatorial optimization, graph theory, and artificial intelligence, with a growing emphasis on bio-inspired computation and intelligent optimization methods. The group includes PhD students, master and undergraduate students, as well as several long-term collaborators from academia and industry.

The overarching goal of the group is to develop efficient algorithmic methods for computationally hard problems, especially NP-hard optimization problems arising in modern applications such as computational biology, networks, transportation, and AI. To address these challenges, the group combines theoretical algorithm design (approximation algorithms, fixed-parameter algorithms, graph algorithms) with practical computational techniques, including heuristics, mathematical optimization, machine learning, and increasingly bio-inspired methods such as evolutionary computation and nature-inspired metaheuristics.

At present, the core of the research group is formed by the following active students:

Adrian Miclăuș (PhD student) works on algorithmic and optimization problems in graph theory and combinatorial optimization, with particular interest in practical methods for solving computationally difficult problems.

Rareș Mateiu (PhD student) focuses on artificial intelligence and advanced optimization techniques, especially on integrating machine learning and intelligent search strategies for hard combinatorial problems.

Andrei Popa (Master student) is an outstanding young researcher working on algorithmic problems in discrete mathematics and theoretical computer science. His recent work includes new, more efficient algorithms for counting gapped palindromes in strings, demonstrating strong potential for future doctoral research.

The group also benefits significantly from former and senior students who remain scientifically active and continue collaborating:

Maria Constantin (PhD student/alumna) works in computational biology, studying algorithmic problems related to genome rearrangements and evolutionary distance. Her work naturally connects discrete optimization with biologically inspired computational questions.

Tiberiu Sîrbu (PhD student/alumnus) focuses on optimization and control, particularly on vehicle routing, transportation systems, and related large-scale optimization problems.

These ongoing collaborations provide continuity, mentoring capacity, and a strong scientific environment for visiting researchers.

More broadly, the group has a strong mentoring tradition: several former students now hold academic or research positions and remain active collaborators. This creates a vibrant and supportive environment where junior researchers can interact not only with current students, but also with a wider international network.

For a visiting SPECIES scholar, this environment offers excellent opportunities to engage in research related to bio-inspired AI, including evolutionary algorithms, heuristic optimization, biologically motivated computational models, and intelligent systems for complex decision-making problems.

Description of the work carried out by the student

As a host, I aim to provide a flexible and supportive research environment in which the visiting PhD student can pursue a topic that is both scientifically motivating and aligned with the guidance of their home institution supervisor. While the exact project will be adapted to the student's background and interests, all proposed directions will explicitly connect to the themes of bio-inspired artificial intelligence, particularly through the use of evolutionary computation, nature-inspired optimization, and biologically motivated computational models.

I envisage the following possible research directions:

1. Student-proposed research topic in bio-inspired AI or optimization

The visiting PhD student may propose their own research topic, provided it aligns with the broad themes of bio-inspired AI, combinatorial optimization, or intelligent systems. This allows the student to build directly on their doctoral work while benefiting from collaboration within my research group.

2. Collaborative project with one of my PhD students

My research group includes several PhD students working on topics related to graph algorithms, optimization, and computational intelligence, offering multiple collaboration opportunities. For example, the visiting student may work with *Maria Constantin* on designing heuristic and evolutionary algorithms for estimating the evolutionary distance between genomes by identifying the minimum number of genome rearrangements required to transform one genome into another. This topic naturally connects algorithmic optimization with biological inspiration and computational biology, making it highly relevant to the SPECIES mission.

3. Independent research on bio-inspired metaheuristics for hard optimization problems

Another option is for the student to work independently on developing bio-inspired metaheuristics for challenging NP-hard problems that I have previously studied from a theoretical perspective (including approximation and parameterized algorithms). Potential application domains include payment networks, where optimization techniques inspired by biological systems can be used to improve routing, robustness, and efficiency in decentralized monetary transfer systems.

More broadly, I expect the visiting student to contribute to the design and analysis of novel biologically inspired computational methods for solving complex real-world optimization problems, combining theoretical rigor with practical algorithmic innovation. This aligns strongly with the interdisciplinary mission of SPECIES to advance research in bio-inspired computing and intelligent systems.