

Curriculum Vitae

Ararat Harutyunyan

Personal:

<i>Year of Birth</i>	1984
<i>Citizenship</i>	Canadian
<i>Languages</i>	English (native fluency), Armenian (native fluency), French (advanced), Russian (intermediate)

Contact Details:

<i>Affiliation</i>	LAMSADE (Computer Science Department), Université Paris-Dauphine
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Academic Experience

<i>2017 –</i>	Maitre de Conférences (Assistant Professor), LAMSADE, Université Paris-Dauphine.
<i>2015 – 2017</i>	LabEx CIMI Research Fellow (Centre International de Mathématiques et Informatique de Toulouse).
<i>10/2014 – 09/2015</i>	Postdoctoral Researcher, Laboratoire de l'Informatique du Parallélisme, École Normale Supérieure de Lyon.
<i>10/2013 – 10/2014</i>	Postdoctoral Researcher, Mathematical Institute, University of Oxford.
<i>10/2012 – 10/2013</i>	Postdoctoral Researcher, Université Paris-Sud, Paris, France.
<i>09/2011 – 06/2012</i>	Postdoctoral Researcher and Instructor, Simon Fraser University, Vancouver, Canada.
<i>09/2008 – 06/2011</i>	PhD, Simon Fraser University, Vancouver, Canada.
<i>09/2006 – 08/2008</i>	MSc, McGill University, Montréal, Canada.
<i>09/2003 – 08/2006</i>	BSc (Honours), McGill University, Montréal, Canada.

Research Interests:

My research interests are in discrete mathematics: graph theory, applications of discrete probability and graph algorithms. In particular, I am interested in structural, probabilistic and extremal graph theory, random graphs, discharging and probabilistic methods, combinatorial and randomized algorithms. In recent years I have also become interested and have done some work in other areas of computer science such as social networks and social choice.

Editorial

Associate Editor: *Annals of Combinatorics*

Ph.D Thesis:

<i>Title</i>	Brooks type results for coloring of digraphs.
<i>Supervisor</i>	Professor Bojan Mohar (<i>Canada Research Chair (Tier 1) in Graph Theory</i>).
<i>Defense Date</i>	June 6, 2011.
<i>Defense Committee</i>	Prof. Bojan Mohar (Senior Supervisor, SFU) Prof. Matt DeVos (Supervisor, SFU) Prof. Pavol Hell (Internal Examiner , <i>Managing editor of Journal of Graph Theory</i> , SFU) Prof. Bruce Reed (External Examiner , <i>Canada Research Chair (Tier 1) in Graph Theory</i> , McGill).

MSc. Thesis:

<i>Title</i>	Probabilistic Methods and Domination Related Problems in Graphs.
<i>Supervisor</i>	Professors Jacques Verstraete (UC San Diego) and Dmitry Jakobson (McGill University)
<i>Thesis Examiner</i>	Professor Tibor Szabó (Berlin Free University)

Honors and Grants:

<i>2021 – 2025</i>	ANR (French National Research Agency) Young Researcher's Grant (PI), €234K Project DAGDigDec (<i>DAGs and Digraph Decompositions</i>).
<i>2021 –</i>	INS2I Research Grant, <i>Acyclicity in (Di)graphs</i> , 4-member team, (PI: P. Valicov), €7.5k
<i>2015 – 2018</i>	LabEx CIMI (Centre International de Mathematique et Informatique de Toulouse) Research Fellowship, (<i>Equipe Probabilité et Statistique</i> , Université Paul Sabatier)
<i>2013 – 2015</i>	FRQNT Postdoctoral Personal Grant, \$30K/year (1st among 4 recipients).
<i>2012 – 2013</i>	Postdoctoral Grant, Université Paris-Sud.
<i>2011</i>	Nominated for best PhD Award in Science, Faculty of Science, Simon Fraser University.
<i>2011</i>	President's PhD Research Stipend, Simon Fraser University, \$6K.
<i>2011</i>	Graduate Fellowship, Simon Fraser University, \$6K.
<i>2008 – 2011</i>	FQRNT Doctoral Grant, \$20K/year.
<i>2006 – 2008</i>	Research Assistantship, McGill University, \$9K.
<i>2004</i>	NSERC Undergraduate Summer Research Award, \$6K.

Journal Articles:

Selected Papers marked by ()*

- [1] A. Harutyunyan, M. Lampis, V. Lozin, and J. Monnot. Maximum independent sets in subcubic graphs: new results. *Theoretical Computer Science*, 846:16–26, 2020.
- [2] * A. Harutyunyan, P. Horn, and J. Verstraete. Independent dominating sets in graphs of girth five. *Combinatorics, Probability and Computing*, 30(3):344–359, 2021.
- [3] * A. Harutyunyan, L. Pastor, and S. Thomassé. Disproving the normal graph conjecture. *Journal of Combinatorial Theory (Ser. B)*, 147:238–251, 2021.
- [4] T. Denat, A. Harutyunyan, and V. Paschos. Average-case complexity of a branch-and-bound algorithm for min dominating set. *Discrete Mathematics*, submitted.
- [5] * A. Harutyunyan, T.-N. Le, A. Newman, and S. Thomassé. Coloring dense digraphs. *Combinatorica*, 39(5):1021–1053, 2019.
- [6] * N. Bousquet, L. Esperet, A. Harutyunyan, and R. de Joannis de Verclos. Exact distance coloring in trees. *Combinatorics, Probability and Computing*, 28(2):177–186, 2019.
- [7] * A. Harutyunyan, T.-N. Le, S. Thomassé, and H. Wu. Coloring tournaments: from local to global. *Journal of Combinatorial Theory (Ser. B)*, 138:166–171, 2019.
- [8] * J. Bensmail, A. Harutyunyan, T.-N. Le, and S. Thomassé. Edge-partitioning a graph into paths: beyond the Bárat-Thomassen conjecture. *Combinatorica*, 39(2):239–263, 2019.
- [9] A. Beynier, Y. Chevaleyre, L. Gourvès, A. Harutyunyan, J. Lesca, N. Maudet, and A. Wilczynski. Local envy-freeness in house allocation problems. *Autonomous Agents and Multi-Agent Systems*, 33(5):591–627, 2019.
- [10] A. Harutyunyan, T.-N. Le, A. Newman, and S. Thomassé. Domination fractional domination in digraphs. *Electronic Journal of combinatorics*, 25(3):P3.32, 2018.
- [11] * J. Bensmail, A. Harutyunyan, and N.-K. Le. List coloring digraphs. *Journal of Graph Theory*, 87(4):492–508, 2018.
- [12] * J. Bensmail, A. Harutyunyan, T.-N. Le, M. Merker, and S. Thomassé. A proof of the Bárat-Thomassen conjecture. *Journal of Combinatorial Theory (Ser. B)*, 124:39 – 55, 2017.
- [13] J. Bensmail, A. Harutyunyan, N.-K. Le, B. Li, and N. Lichiardopol. Disjoint cycles of different lengths in graphs and digraphs. *Electronic Journal of Combinatorics*, 24(4):P4.37, 2017.
- [14] F. Foucaud, A. Harutyunyan, P. Hell, S. Legay, Y. Manoussakis, and R. Naserasr. The complexity of tropical graph homomorphisms. *Discrete Applied Mathematics*, 229:64–81, 2017.
- [15] * A. Harutyunyan and B. Mohar. Planar digraphs of digirth five are 2-colorable. *Journal of Graph Theory*, 84(4):408 – 427, 2017.
- [16] J.A. Angles d’Auriac, N. Cohen, A. El Maftouhi, A. Harutyunyan, Legay S., and Y. Manoussakis. Connected tropical subgraphs in vertex-colored graphs. *Discrete Mathematics and Theoretical Computer Science*, 17(3):327–348, 2016.

- [17] A. Harutyunyan, R. Naserasr, M. Petrushevski, R. Skrekovski, and Q. Sun. Mapping planar graphs into the Coxeter graph. *Discrete Mathematics*, 339:839 – 849, 2016.
- [18] A. Harutyunyan and S. Legay. Linear time algorithms for weighted offensive and powerful alliances in trees. *Theoretical Computer Science*, 582:17–26, 2015.
- [19] H. El Maftouhi, A. Harutyunyan, and Y. Manoussakis. Weak-balance in random graphs. *Internet Mathematics*, 11(2):143–154, 2015.
- [20] J. Bensmail, A. Harutyunyan, H. Hocquard, and P. Valicov. Strong edge colorings of planar graphs of girth 6. *Discrete Applied Mathematics*, 179:229–234, 2014.
- [21] A. Harutyunyan. Global offensive alliances in graphs and random graphs. *Discrete Applied Mathematics*, 164:522–526, 2014.
- [22] A. Harutyunyan. Some bounds on global alliances in trees. *Discrete Applied Mathematics*, 161(12):1739–1746, 2013.
- [23] A. Harutyunyan, M. Kayll, B. Mohar, and L. Rafferty. Uniquely D -colorable digraphs with large girth. *The Canadian Journal of Mathematics*, 64:1310–1328, 2012.
- [24] A. Harutyunyan and B. Mohar. Planar graphs have exponentially many 3-arboricities. *SIAM Journal on Discrete Mathematics*, 26(3):1269–1280, 2012.
- [25] A. Harutyunyan and B. Mohar. Two results on the digraph chromatic number. *Discrete Mathematics*, 312(10):1823–1826, 2012.
- [26] * A. Harutyunyan and B. Mohar. Gallai’s theorem for list coloring of digraphs. *SIAM Journal on Discrete Mathematics*, 25(1):170–180, 2011.
- [27] A. Harutyunyan and B. Mohar. Strengthening Brooks’ Theorem for digraphs of girth at least three. *The Electronic Journal of Combinatorics*, 18(1):P#195, 2011.

Conference Articles:

- [1] * A. Harutyunyan, M. Lampis, and N. Melissinos. Digraph coloring and distance to acyclicity. In *STACS 2021*, volume 41, 2021.
- [2] L. Gourvès, A. Harutyunyan, M. Lampis, and N. Melissinos. Filling crosswords is very hard. In *ISAAC 2021*, volume 36, 2021.
- [3] A. Harutyunyan, M. Lampis, V. Lozin, and J. Monnot. Maximum independent sets in subcubic graphs: new results. In *WG 2019*, pages 40–52, 2019.
- [4] A. Harutyunyan. Global offensive alliances in graphs via degree sequences. In *VI Latin-American Algorithms, Graphs and Optimization Symposium (LAGOS 2011)*, 2011.
- [5] A. Harutyunyan. A fast algorithm for powerful alliances in trees. In *Proceedings of the 4th International Conference on Combinatorial Optimization and Applications (COCOA 2010)*, volume 6508 of *LNCS*, pages 31–40, 2010.
- [6] A. Harutyunyan. Some bounds on alliances in trees. In *The 9th Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW 2010)*, 2010.

Selected Conference Talks and Workshops:

- DAGs and Distance to Acyclicity International Conference on Operations Research (OR 2021), August 31- September 3, 2021.
- First Armenian Workshop on Graph Theory, Probability and applications to Machine Learning Dzoraget, Armenia, June 1-8, 2019.
- Coloring dense digraphs, Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM), Toronto, Canada, June 12-16, 2017.
- Proof of the Barat-Thomassen Conjecture, Bordeaux Graph Workshop, Bordeaux, France, November 7-10, 2016.
- Proof of the Barat-Thomassen Conjecture, SIAM conference on Discrete Mathematics, Atlanta, USA, June 6-10, 2016.
- Proof of the Barat-Thomassen Conjecture (**Invited talk**), Advanced Mathematics for Network Analysis, Luchon, France, May 1-4, 2016.
- Connections between colorings of graphs and digraphs, Spectrum of Random Graphs, CIRM, Marseille France, January 4-8, 2016.
- A disproof of the Normal Graph Conjecture, Journées Graphes et Algorithmes, November 4-6, 2015, Orléans.
- Partitioning a graph into paths: beyond Barat-Thomassen Conjecture, Connections in Discrete Mathematics (in honor of Ron Graham's 80th birthday), Vancouver, Canada, June 15-19, 2015.
- Balance in Random Graphs, Bordeaux Graphs Workshop, Bordeaux, France, November 19-22, 2014.
- Recent results in digraph colorings, SIAM conference on Discrete Mathematics, Minneapolis, USA, June 16 - 19, 2014.
- Some results on sparsity, high chromatic number and homomorphisms, Journées Graphes et Algorithmes (JGA 2013), Orsay, France, November 13-15, 2013.
- Some problems on the dichromatic number of digraphs, Utrecht Graphs Workshop, Utrecht, Netherlands, October 31 - November 1, 2013.
- Colorings and acyclic sets in planar graphs and digraphs, 2nd Bordeaux Graph Theory Workshop (BGW 2012), Bordeaux, France, November 21 - November 24, 2012.
- Gallai's Theorem for list coloring of digraphs, 3rd Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM) 2011, Victoria, Canada, May 31 - June 3, 2011.
- A fast algorithm for powerful alliances in trees, 4th International Conference on Combinatorial Optimization and Applications (COCOA 2010), Hawaii, USA, December 18-20, 2010.
- Some bounds on alliances in Trees, 9th Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW 2010), Cologne, Germany, May 25-27, 2010.

Selected Seminars and Presentations:

- Some recent progress in digraph coloring, Karlsruhe Institute of Technology, April 2021.
- Disproof of the Normal Graphs Conjecture, Lamsade Seminar, Paris, December 2017.
- List Coloring Digraphs, I3S seminar, Nice, February 2017.
- List Coloring Digraphs, G-SCOP seminar, Grenoble, January 2017.
- Proof of the Barat-Thomassen Conjecture, CWI, Amsterdam, April 2016.
- Proof of the Barat-Thomassen Conjecture, LIF seminar, Aix-Marseille Université, February, 2016.
- A disproof of the Normal Graph Conjecture, Probability Seminar, Mathematical Institute, Toulouse, December 2015.
- Some problems of colorings in graph and digraphs, Combinatorics seminar, University of Birmingham, February 2014.
- On the dichromatic number of digraphs, LIRMM seminar, Université Montpellier, September 2013.
- Coloring digraphs, LIP seminar, ENS Lyon, September 2013.
- Independent dominating sets in graphs by the semi-random method, LIAFA Graph theory and distributed algorithms seminar, Université Paris 7, January 2013.
- On the chromatic number of digraphs, LRI Seminar, Université Paris-Sud, June 2012.
- On the chromatic number of digraphs, Mascotte Seminar, Nice-Sophia Antipolis, May 2012.
- Vertex-arboricity of planar graphs, SFU Discrete Mathematics Seminar, Simon Fraser University, March 2012.
- On the digraph chromatic number, SFU Discrete Mathematics Seminar, Simon Fraser University, May 2011.
- Shuffling cards: How many shuffles are enough?, *Proofs from the Book seminar series*, Simon Fraser University, February 2011.
- Digraph Coloring, Interdisciplinary Research in the Mathematical and Computational Sciences Researchers Poster Session, Simon Fraser University, Vancouver, April 2010.
- Independent Dominating Sets in Graphs of girth five, SFU Discrete Mathematics Seminar, Simon Fraser University, Vancouver, March 2010.
- Concentration Inequalities for Random Variables, Centre de Recherches Mathématiques (CRM) seminar in Analysis and Mathematical Physics, McGill University, Montreal, November 2007.
- An Introduction to the Probabilistic Method, Centre de Recherches Mathématiques (CRM) seminar in Analysis and Probability, McGill University, Montreal, May 2007.
- Highly Irregular Graphs, Concordia Computational Combinatorial Optimization Laboratory Seminar (ConCoCO), Montreal, April 2007.

Referee Service:

Reviewer for: Journal of Combinatorial Theory (Ser. B), SIAM Journal on Discrete Mathematics, Journal of Graph Theory, European Journal of Combinatorics, Electronic Journal of Combinatorics, Discrete Applied Mathematics, Discrete Mathematics, Discussiones Mathematicae Graph Theory, Information and Computation, Theoretical Computer Science, MFCS, Discrete Mathematics and Theoretical Computer Science, WG

Departmental Service:

2021 – 2019–	Member of the departmental <i>Master Admissions Committee</i> , Member of the departmental <i>Undergraduate Admissions Committee</i> , Computer Science Department, University Paris-Dauphine.
2019–	Member of the departmental <i>Scientific Council</i> , Computer Science Department, University Paris-Dauphine.
2016 – 2017	<i>Organiser</i> of the weekly <i>Probability Theory Seminar</i> (with Jonas Kahn and Laurent Miclo), Mathematical Institute, University of Toulouse.

Student supervision:

2019 –	Nikolaos Melissinos (PhD student; U. Paris-Dauphine) (supervised with Laurent Gourvès).
2020 – 2021	Narek Hovhannisyan (MSc student).
2020 – 2021	Aram Khanlari (BSc diploma thesis).
01/2015 – 06/2015	Khang Le (Master’s student, supervised with Julien Bensmail, ENS de Lyon); 2 joint papers
10/2012 – 10/2013	Sylvain Legay (informal co-supervision, Ph.D student of Yannis Manoussakis); 3 joint papers
10/2012 – 10/2013	Jean-Alexandre Anglès D’Auriac (informal co-supervision, Ph.D student of Yannis Manoussakis); 1 joint paper
10/2014 – 09/2015	Principal Examiner of two Master’s student defences at ENS de Lyon.

Teaching:

<i>Winter 2022</i>	Lecturer Randomized Algorithms (PhD course), University of Paris-Dauphine. (Class size: 15 students)
<i>Winter 2021, Winter 2022</i>	Lecturer for Graph Theory, University of Paris-Dauphine. (Class size: 25 students)
<i>Winter 2019</i>	Lecturer for Probabilistic Methods in Discrete Mathematics (PhD course), University Paris-Dauphine. (Class size: 10 students)
<i>Fall 2018</i>	Lecturer for Probabilité Discrète, University Paris-Dauphine. (Class size: 240 students)
<i>Winter 2018, Fall 2021</i>	Lecturer for Optimisation Combinatoire, University of Paris-Dauphine. (Class size: 25 students)
<i>Fall 2018, Fall 2019, Fall 2020, Fall 2021</i>	Lecturer for Analyse de Données (Data Analysis), University Paris-Dauphine. (Average Class size: 50 students)
<i>Fall 2017, Fall 2018, Fall 2019</i>	Lecturer for Graphes, algorithms et applications, University Paris-Dauphine. (Average Class size: 30 students)
<i>Winter 2015, and 2016:</i>	Lecturer for EISC102 Une promenade dans le jardin de la théorie des graphes (Selected topics in graph theory) (Average Class size: 25 students), ISAE/SUPAERO.
<i>Winter 2012</i>	Lecturer for MACM 201 Discrete Mathematics II (for Computer Science students) (Class size: 50 students), Simon Fraser University.
<i>Fall 2011</i>	Lecturer for MATH 150 Calculus I with Review (Class size: 40 students), Simon Fraser University.
<i>Fall 2010</i>	Teaching Assistant for MATH 308 Linear Optimization, Simon Fraser University.
<i>Winter 2010</i>	Teaching Assistant for MATH 343 Algebra: Groups, Simon Fraser University.
<i>Fall 2009</i>	Teaching Assistant for MATH 345 Introduction to Graph Theory, Simon Fraser University.
<i>Fall 2007</i>	Teaching Assistant for MATH 141 Calculus II, McGill University.

Miscellaneous:

Erdős number: 2 (via a paper with Pavol Hell and the following paper)
P. Hell, P. Erdős and P. Winkler, Bandwidth versus bandsize, *Annals of Discrete Math.* 41,
117–130, 1989.

References:

Prof. Pavol Hell
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Simon Fraser University
Email: pavol@sfu.ca

Prof. Colin McDiarmid
Department of Statistics
University of Oxford
E-mail: cmcd@stats.ox.ac.uk

Prof. Bojan Mohar
Department of Mathematics
Simon Fraser University
E-mail: mohar@sfu.ca

Prof. Stéphane Thomassé
Laboratoire de l'Informatique du Parallélisme
Ecole Normale Supérieure de Lyon
Email: stephan.thomasse@ens-lyon.fr