Lianna Hambardzumyan – CV

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Website: https://www.cs.mcgill.ca/~lhamba/

Updated: December 26, 2024

Research interests	Computational Complexity; Communication complexity; Combinatorics; Analysis of Boolean functions; Discrete Mathematics	
Current position	**University of Victoria**	Victoria, Canada
	Postdoctoral fellow	Oct 2024 – Oct 2025
	Host: Sajin Koroth	
Past position	**The Hebrew University of Jerusalem**	Jerusalem, Israel
	Postdoctoral fellow	Sep 2022 – Sep 2024
	Hosts: Alex Samorodnitsky, Guy Kindler	
Education	**McGill University**	Montréal, Canada
	Ph.D. in Computer Science	2016 – 2021
	Advisor: Hamed Hatami	
	Co-Advisor: Prakash Panangaden	
	Thesis: *Dimension-free Bounds and Structural Results in Communication Complexity*	
	Yerevan State University	Yerevan, Armenia
	M.Sc. in Computer Science	2014 – 2016
	Advisor: Vahan Mkrtchyan	
	Thesis: *Graphs, Disjoint Matchings and some Inequalities*	
	Yerevan State University	Yerevan, Armenia
	B.Sc. in Informatics and Applied Mathematics	2010 – 2014
Visiting positions	**Bernoulli Center, EPFL**	Lausanne, Switzerland
	Long-term participant	Aug 19 - Sep 13, 2024
	Program: *Synergies of combinatorics and theoretical computer science*	
	Simons Institute, University of Berkeley	Berkeley, USA
	Visiting Graduate Student	Fall 2018
	Program: *Lower Bounds in Computational Complexity*	
Awards, scholarships	MathInGreaterParis 2-year postdoctoral fellowship (*declined*)	
	(The Fondation Sciences Mathématiques de Paris (FSMP))	2022-2024
	Women in Science Fellowship (McGill University)	2017-2019
	AGBU International Scholarship Award (AGBU)	2017-2019

Publications, **No Complete Problem for Constant-Cost Randomized Communication**
Preprints Yuting Fang, Lianna Hambardzumyan, Nathaniel Harms, Pooya Hatami.
STOC 2024, eccc:TR24-064

An improved protocol for ExactlyN with more than 3 players
Lianna Hambardzumyan, Toniann Pitassi, Suhail Sherif, Morgan Shirley, Adi Shraibman.
ITCS 2024, eccc:TR23-138

On depth-3 circuits and covering number: an explicit counter-example
Lianna Hambardzumyan, Hamed Hatami, Ndiamé Ndiaye.
arXiv:2210.08300

**A counter-example to the probabilistic universal graph conjecture
via randomized communication complexity**
Lianna Hambardzumyan, Hamed Hatami, Pooya Hatami.
Discrete Applied Mathematics Volume 322, 15 December 2022, Pages 117-122
doi:10.1016/j.dam.2022.07.023

Dimension-free Bounds and Structural Results in Communication Complexity
Lianna Hambardzumyan, Hamed Hatami, Pooya Hatami.
Israel Journal of Mathematics, 2022.
doi:10.1007/s11856-022-2365-8

**Biasing Boolean Functions and Collective Coin-Flipping Protocols over Arbitrary
Product Distributions**
Yuval Filmus, Lianna Hambardzumyan, Hamed Hatami, Pooya Hatami, David Zuckerman.
46th International Colloquium on Automata, Languages, and Programming (ICALP), 2019.
doi:10.4230/LIPIcs.ICALP.2019.58

Chang's lemma via Pinsker's inequality
Lianna Hambardzumyan, Yaqiao Li.
Discrete Mathematics, vol 343, iss 1, 2020.
doi:10.1016/j.disc.2019.04.015
*Nominated for "William T. Tutte Student Paper Award in Discrete Mathematics" at
CanaDAM 2019*, (out of 4)

Lower bounds for graph bootstrap percolation via properties of polynomials
Lianna Hambardzumyan, Hamed Hatami, and Yingjie Qian.
Journal of Combinatorial Theory, Series A 174 (2020): 105253, 2020.
doi:10.1016/j.jcta.2020.105253

Graphs, disjoint matchings and some inequalities
Lianna Hambardzumyan, Vahan Mkrtchyan, 2017.
arXiv:1512.02546

Teaching	**Course Instructor**, McGill University	
	COMP 202: *Foundations of Programming*	Winter 2022
	COMP 360: *Algorithm Design*	Fall 2021
	Teaching assistant, McGill University	
	COMP 531: *Advanced Theory of Computation*	Winter 2021
	COMP 531: *Advanced Theory of Computation*	Winter 2020
	COMP 252: *Honours Algorithms and Data Structures*	Winter 2019
	COMP 202: *Foundations of Programming*	Summer 2018
	COMP 360: *Algorithm Design*	Fall 2017
	COMP 202: *Foundations of Programming*	Summer 2017

Service	**Program Committee**	
	RANDOM 2025	

Reviewer
Journals: Computational Complexity, European Journal of Combinatorics, Journal of Computer and System Sciences
Conferences: STOC, ITCS, SODA, ICALP, IWOCA

Organizer
- Reading group on *Communication Complexity*   Winter 2020 - Fall 2021
  McGill University
- Helped in the organization of the conference STOC 2017 on the ground   June, 2017
  Montreal

Community
Computer Science Graduate Society, VP finance   2016-2017
McGill University

Talks, Conferences, Workshops attended	**Université de Montréal: Séminaires du LITQ**	Dec 5, 2024

Montreal, Canada
Visitor
Title: *The Power of Randomness in Communication Complexity: The Hyperefficient Setting*

Bernoulli Center, EPFL: Aug 19-23, 2024
Workshop on Synergies of combinatorics and theoretical computer science
Lausanne, Switzerland
Invited participant

Title: *On rank-like parameters of Boolean matrices*

Simons Institute, Analysis and TCS: New Frontiers Reunion   July 8-11, 2024
Berkeley, USA
Invited participant

Tel Aviv University: Combinatorics seminar   June 23, 2024
Tel Aviv, Israel
Invited speaker
Title: *Larger corner-free sets in high dimensions*

Tel Aviv University: Students seminar   June 2, 2024
Tel Aviv, Israel
Invited speaker
Title: *No Complete Problem for Constant-Cost Randomized Communication*

BIRS: Bootstrap Percolation and its applications   Apr 14 - 19, 2024
Banff, Canada
Invited participant

Hebrew University: Combinatorics seminar   Mar 11, 2024
Jerusalem, Israel
Invited speaker
Title: *Larger corner-free sets in high dimensions*

Technion: Combinatorics seminar   Feb 28, 2024
Haifa, Israel
Invited speaker
Title: *On a problem in Communicaton Complexity and Additive Combinatorics*

University of Victoria: Theory seminar   Jan 26, 2024
Victoria, Canada
Invited speaker
Title: *Structural results in Communication Complexity*

Simons Institute: Structural results   July 24, 2023
Program: *Analysis and TCS: New Frontiers*
Berkeley, USA
Invited speaker
Title: *Larger corner-free sets in high dimensions*

Tel Aviv University: Students seminar   July 5, 2023
Tel Aviv, Israel
Invited speaker

Title: *On a problem in Communicaton Complexity and Additive Combinatorics*

Hebrew University: KU-Jerusalem Seminar   June 27, 2023
Jerusalem, Israel
Invited speaker
Title: *On some rank-like measures and matrix rigidity*

University of Haifa: Theory seminar   May 23, 2022
Haifa, Israel
Invited Speaker
Title: *On a problem in Communicaton Complexity and Additive Combinatorics*

FILOFOCS 2023   May 9-11, 2023
Paris, France
Invited speaker
Title: *On a problem in Communicaton Complexity and Additive Combinatorics*

Hebrew University: Theory seminar   Nov 30, 2022
Jerusalem, Israel
Invited speaker
Title: *Structural results in Communication Complexity*

Technion: Theory seminar   Nov 16, 2022
Haifa, Israel
Invited speaker
Title: *Dimension-free relations in Communication Complexity*

BIRS: Communication Complexity and Applications, III   July 24 - 29, 2022
Banff, Canada
Speaker
Title: *Dimension-free relations in Communication Complexity*

Yerevan Math Colloquium   Oct 8, 22, 2021
Yerevan Center of Mathematical Sciences
Invited Speaker
Title: *Structural results in Communication Complexity (Part I , Part II)*

Lower Bounds in Computational Complexity Reunion   Dec 9–12, 2019
Simons Institute, Berkeley, USA
Participant

ICALP 2019   July 8-12, 2019
Patras, Greece
Speaker

Title: *Biasing Boolean Functions and Collective Coin-Flipping Protocols over Arbitrary Product Distributions*

Bootstrap Percolation Minisymposia, CanaDAM   May 28-31, 2019
Vancouver, Canada
Invited Speaker
Title: *Lower bounds for graph bootstrap percolation via properties of polynomials*

CanaDAM 2019   May 28-31, 2019
Vancouver, Canada
Invited Speaker
Title: *Chang's lemma via Pinsker's inequality*

BIRS Analytic Techniques in Theoretical Computer Science   Aug 12-17, 2018
Oaxaca, Mexico
Participant

Building Bridges II.   July 2-6, 2018
Conference to celebrate 70th birthday of László Lovász
Budapest, Hungary
Participant

STOC 2017   June 19-23, 2017
Montreal, Canada
Participant

Industry	**Synergy International Systems,** https://www.synisys.com/	Yerevan, Armenia
	Research and Development Engineer	Sep 2012 - Sep 2016
Other	**Languages**	
	Armenian (*native*)	
	English (*fluent*)	
	Russian (*fluent*)	
	French (*basic*)	
	Hebrew (*basic*)	