

EDUCATION













Ph.D. in Computer Science**in progress*University of Waterloo. Supervised by [Aukosh Jagannath](#) and [Kimon Fountoulakis](#).**M.Math. in Computer Science (thesis option)**University of Waterloo. Supervised by [Jeffrey Shallit](#).**B.Tech. in Computer Science**

Indian Institute of Technology Jodhpur.

EXPERIENCE

- **Research Intern, Microsoft Research, Redmond** Jun 2023 – Sep 2023
Worked with the Machine Learning and Cloud Security groups on GNNs for security.
- **Research Intern, Google Research** Oct 2022 – Dec 2022
Worked with the Graph mining group on scalable GNNs for sparse graphs.
- **Software Engineer, Microsoft Corporation** Jun 2016 – Jul 2018
Worked with the Azure compute group on distributed systems and anomaly detection.

PUBLICATIONS

- **Optimality of Message-passing Architectures for Sparse Graphs.** A. Baranwal, K. Fountoulakis, A. Jagannath. Neural Information Processing Systems (NeurIPS), 2023. 
- **Graph Attention Retrospective.** K. Fountoulakis, A. Levi, S. Yang, A. Baranwal, A. Jagannath. Journal of Machine Learning Research (JMLR) vol. 24:246 pp. 1–52, 2023.  
- **Effects of Graph Convolutions in Multi-layer Networks.** A. Baranwal, K. Fountoulakis, A. Jagannath. International Conference on Learning Representations (ICLR), 2023. (*Spotlight*)  
- **Graph Convolution for Semi-supervised Classification: Improved Linear Separability and Out-of-distribution Generalization.** A. Baranwal, K. Fountoulakis, A. Jagannath. International Conference on Machine Learning (ICML), 2021. (*Spotlight*)  
- **Antisquares and Critical Exponents.** A. Baranwal, J. Currie, L. Mol, P. Ochem, N. Rampersad, J. Shallit. Discrete Mathematics & Theoretical Computer Science vol. 25:2, 2023. 
- **Ostrowski-automatic Sequences: Theory and Applications.** A. Baranwal, L. Schaeffer, J. Shallit. Theoretical Computer Science 858, pp. 122–142, 2021. 
- **Decision Algorithms for Ostrowski-automatic Sequences.** A. Baranwal. MMath Thesis, University of Waterloo, School of Computer Science, 2020. 
- **Repetitions in Infinite Palindrome-rich Words.** A. Baranwal, J. Shallit. In Combinatorics on Words. WORDS 2019. LNCS vol. 11682, Springer, pp. 93–105, 2019. 
- **Critical Exponent of Balanced Words via the Pell Number System.** A. Baranwal, J. Shallit. In Combinatorics on Words. LNCS vol. 11682, Springer, pp. 80–92, 2019. 

AWARDS AND ACHIEVEMENTS

- President's Graduate Scholarship, University of Waterloo 2023–2024
- Ontario Graduate Scholarship, Province of Ontario and the University of Waterloo 2023–2024
- Top reviewer award, Learning on Graphs conference 2022
- Best paper award, GroundedML workshop at ICLR 2022
- Graduate Excellence Award, University of Waterloo 2020–2022
- Graduate Research Travel Grant, GSPA, University of Waterloo 2019
- Microsoft Engineering Star Award – Changing Status Quo 2017
- Ranked 29 at Google APAC (now Kick Start) 2016
- Team ranked 14 at ACM ICPC Asia regionals 2015

TALKS

- Polymorphic Malware Classification using Graph Neural Networks, Microsoft Research. Aug 2023
- Effects of Graph Convolutions in Multi-layer Networks, ICLR. Apr 2023
- Graph Convolutions for semi-supervised learning, ICML. Jul 2021
- Repetitions in infinite palindrome-rich words, Loughborough University, England. Sep 2019
- Anomaly detection and monitoring of metrics in Azure services, Microsoft Corporation. Jan 2017

TEACHING

- Instructional Apprentice, CS 341 - Algorithms 2019–2023
- Teaching Assistant, CS 135 - Designing Functional Programs 2018–2019

MISCELLANEOUS

- Serving/served as a reviewer for [NeurIPS](#), [ICLR](#), [LoG](#), [UAI](#) 2021–Now
- Helped underprivileged kids with education at [SOS Children's Villages of India](#) 2016–2018
- Associate member, National Cyber Safety and Security Standards India 2017–2018
- President, Programming Club IIT Jodhpur 2013–2014
- Problem setter for ACM ICPC preliminary contests in India 2015–2016