

EDUCATION

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- Ph.D. in Computer Science** Sep 2020 – Present  
University of Waterloo. Supervised by [Aukosh Jagannath](#) and [Kimon Fountoulakis](#).
- M.Math. in Computer Science (thesis option)** Sep 2018 – Apr 2020  
University of Waterloo. Supervised by [Jeffrey Shallit](#).
- B.Tech. in Computer Science** Jul 2012 – May 2016  
Indian Institute of Technology Jodhpur.













EXPERIENCE

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- **Research Intern, Microsoft Research** May 2023 – Aug 2023  
Working with the Cloud and Infrastructure Security Group on graph ML 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 & MANUSCRIPTS

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- **Optimality of Message-Passing Architectures for Sparse Graphs.** A. Baranwal, K. Fountoulakis, A. Jagannath. arXiv preprint arXiv:2305.10391, 2023. 
- **Effects of Graph Convolutions in Multi-layer Networks.** A. Baranwal, K. Fountoulakis, A. Jagannath. International Conference on Learning Representations (ICLR), 2023. (*Spotlight*)  
- **Graph Attention Retrospective.** K. Fountoulakis, A. Levi, S. Yang, A. Baranwal, A. Jagannath. Workshop on Anchoring Machine Learning in Classical Algorithmic Theory, 10th International Conference on Learning Representations (ICLR), 2022. (*Best paper award*)  
- **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. arXiv preprint arXiv:2209.09223, 2022. 
- **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

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- President's Graduate Scholarship, University of Waterloo 2023–2024
- Ontario Graduate Scholarship, Province of Ontario and University of Waterloo 2023–2024
- Top reviewer award, Learning on Graphs conference 2022
- Graduate Excellence Awards, University of Waterloo 2020–2022
- 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

## MISCELLANEOUS

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- Reviewed/reviewing for the following conferences: [NeurIPS](#), [ICLR](#), [LoG](#), [UAI](#).
- 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