

Ilan Doron-Arad

Curriculum Vitae

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Research Interests

I am a Ph.D. graduate interested in algorithms and theoretical computer science, particularly machine learning theory, combinatorial optimization, hardness of approximation, online algorithms, and parameterized algorithms.

Education

Ph.D. in Computer Science, Direct Track, Technion, 2019 - 2025.

Supervised by Hadas Shachnai and Ariel Kulik.

Awarded **M.A.** during PhD studies, Technion, 2022

B.Sc. in Computer Science, Technion, 2016 - 2019.

Graduated with honors

Experience

Algorithm Researcher, NextSilicon Company, February 2025 - November 2025

Research Internship at IBM Research in Cloud Computing, Haifa 2022.

Supervising a research project collaboration with GTIIT University, Summer 2023.

Head Teaching Assistant in the course 'Combinatorics for CS', Technion. Teaching the course for 7 semesters in 2019-2023. I was also a TA in 'Approximation Algorithms', 'Algorithms 1', and a TA in charge in a 'Seminar on Bioinformatics'.

Awards and Honors

Jacobs and Gutwirth Fellowship for Excellent PhD students, 2023-2024.

Excellence Award for Outstanding Scholars — Computer Science Department, Technion. Spring 2023, Winter 2023/2024, Spring 2024, and Winter 2024/2025.

Dean's Excellence Scholarship — A merit scholarship for Technion alumni, 2019/2020.

President's List of Excellence (highest honor, awarded four times), 2017-2019
Computer Science Department, Technion.

Bley Stein Travel Award 2025

Publications

1. *Tight Bounds for Maximum Weight Matroid Independent Set and Matching in the Zero Communication Model*, Ilan Doron-Arad. To appear in *NeurIPS* 2025.
2. *You (Almost) Can't beat Brute Force for 3-matroid Intersection*, Ilan Doron-Arad, Ariel Kulik, and Hadas Shachnai. To appear in *SODA* 2026
3. *On the Hardness of Training Deep Neural Networks Discretely*, Ilan Doron-Arad. *AAAI* 2025.
4. *An Algorithm-to-Contract Framework without Demand Queries*, Ilan Doron-Arad, Hadas Shachnai, Gilad Shmerler, Inbal Talgam-Cohen, arXiv: 2507.20038, 2025.
5. *Non-Linear Paging*, Ilan Doron-Arad, and Josef (Seffi) Naor. *ICALP* 2024.
6. *Lower Bounds for Matroid Optimization Problems with a Linear Constraint*, Ilan Doron-Arad, Ariel Kulik, and Hadas Shachnai. *ICALP* 2024.
7. *An EPTAS for Cardinality Constrained Multiple Knapsack via Iterative Randomized Rounding*, Ilan Doron-Arad, Ariel Kulik, Hadas Shachnai. *APPROX* 2024.
8. *Unsplittable Flow on a Short Path*, Ilan Doron-Arad, Ariel Kulik, and Fabrizio Grandoni. *IPEC* 2024.
9. *Approximations and Hardness of Packing Partially Ordered Items*, Ilan Doron-Arad, Guy Kortsarz, Josef (Seffi) Naor, Baruch Schieber, Hadas Shachnai. *WG* 2024.
10. *Fine-Grained Lower Bounds for Multidimensional Knapsack*, Ilan Doron-Arad, Ariel Kulik, and Pasin Manurangsi, arXiv:2407.10146, 2024.
11. *An FPTAS for Budgeted Laminar Matroid Independent Set*, Ilan Doron-Arad, Ariel Kulik, and Hadas Shachnai. *Operations Research Letters*, Vol. 51:6, pp. 632--637, 2023.
12. *An EPTAS for Budgeted Matching and Budgeted Matroid Intersection via Representative Sets*, Ilan Doron-Arad, Ariel Kulik and Hadas Shachnai. *ICALP* 2023.
13. *Budgeted Matroid Maximization: a Parametrized Viewpoint*, Ilan Doron-Arad, Ariel Kulik, and Hadas Shachnai. *IPEC* 2023.
14. *Approximating Bin Packing with Conflict Graphs via Maximization Techniques*, Ilan Doron-Arad and Hadas Shachnai. *WG* 2023.
15. *An AFPTAS for Bin Packing with Partition Matroid via a new method for LP rounding*, Ilan Doron-Arad, Ariel Kulik, and Hadas Shachnai. *APPROX* 2023.
16. *Tight Bounds for Budgeted Maximum Weight Independent Set in Bipartite and Perfect Graphs*, Ilan Doron-Arad and Hadas Shachnai. *Discrete Applied Mathematics journal*, 361, pp.453-464.
17. *An EPTAS for Budgeted Matroid Independent set*, Ilan Doron-Arad, Ariel Kulik, and Hadas Shachnai. *SOSA* 2023.
18. *An APTAS for Bin Packing with Clique-graph conflicts*, Ilan Doron-Arad, Ariel Kulik, and Hadas Shachnai. *WADS* 2021.

Invited Talks

Budgeted Matroid Maximization: a Parametrized Viewpoint, Parametrized Approximation Algorithms Workshop (PAAW), Tallinn, July 2024.

Approximating Bin Packing with Conflict Graphs via Maximization Techniques, Haifa Workshop on Graphs, May 2023.

An EPTAS for Budgeted Matroid Independent Set, Technion CS Theory Seminar, January 2023.