Richard Hladík

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A final-semester student of the Computer Science MSc programme at ETH Zürich. Currently writing my Master's thesis at BARC, University of Copenhagen. I'm passionate about graph theory, algorithms, and data structures, but I've been exploring other areas as well (differential privacy most recently). I love tackling interesting problems and pushing the boundaries of human knowledge, especially in a group of similarly passionate people.

Education

Sept. 2021–Now — MSc in Computer Science, **ETH Zürich** *(expected graduation: July 2024)*
GPA of 5.59 (out of 6.00) after spring semester 2023

Sept. 2017–June 2021 — Bc. in Computer Science, **Charles University**, Prague
perfect GPA (1.00) throughout the studies and 224 ECTS credits (out of 180 required)

Work & Research Experience

Student Researcher (Nov. 2023–Now) – *BARC, University of Copenhagen*, supervisor: Rasmus Pagh

- Research on **differential privacy** in graph settings. At the moment exploring tighter upper and lower bounds for differentially private minimum spanning trees.

Research Project (Apr.–Oct. 2023) – *ETH Zürich*, supervisor: Bernhard Haeupler

- We **designed a novel heap** with a certain beyond-worst-case property and **proved that Dijkstra's algorithm** using any heap with this property **is universally optimal** (as fast as possible on every graph).

Software Engineering Intern (Sep. 2022–Feb. 2023) – *Daedalean, Zürich*

- **Designed** and **implemented algorithms** for matching model detections with air traffic data based on their movement patterns, thus **scaling up** model evaluation without human annotation.

Student Researcher (Mar. 2020–Jun. 2021) – *Charles University, Prague*, supervisor: Martin Koutecký

- **Designed** new combinatorial **algorithms** for the multicommodity flow problem (MCF), polynomial with respect to a certain parametrization.
- **Showed exponential lower bounds** on the circuits of the MCF linear program and on its fractionality.

Student Researcher (June 2018–Dec. 2020) – *Czech Technical University, Prague*, supervisor: Zdeněk Hanzálek

- **Proved NP-hardness** of a new periodic scheduling problem and **developed** several **heuristics** for it.

Teaching & Extracurricular Activities

2018–2022 *Czech Olympiad in Informatics* & *Czech IOI Selection Camp* – I prepared problems, graded solutions and generally helped with organization.

2017–2023 *KSP* – an algorithmic seminar for Czech highschoolers; **main organizer of the main category** in 2018–2019, managing 10–20 organizers. Co-organised educational camps and **gave lectures**.

2019–2020 TA of Programming for advanced students; *Charles University* (Spring & Fall 2019, Spring 2020).

Achievements & Awards

2021 **ETH-D scholarship** for excellent Master's students (≈ 90 out of 2500 students awarded each year)
2021 ACM-ICPC World Finals 2020 – advanced, but could not participate due to COVID
2018 **ACM-ICPC World Finals** – 56th place out of 140 teams
2017 International Olympiad in Informatics (**IOI**) – **Silver medal**, 69th place out of 304 participants
2016 International Olympiad in Informatics (IOI) – Bronze medal, 154th place out of 308 participants

Publications

[1] Bernhard Haeupler, Richard Hladík, Václav Rozhoň, Robert Tarjan, and Jakub Tětek. Universal optimality of Dijkstra via beyond-worst-case heaps. *ArXiv*, abs/2311.11793, 2023.

[2] Richard Hladík. Combinatorial algorithms for flow problems. Bachelor's thesis, 2021.

[3] Richard Hladík, Anna Minaeva, and Zdeněk Hanzálek. On the complexity of a periodic scheduling problem with precedence relations. In *International Conference on Combinatorial Optimization and Applications*, page 107–124. Springer, 2020.