Goran Žužić

ETH Zürich, Switzerland → Google Research

Education

Carnegie Mellon University — **School of Computer Science**
Ph.D. in Computer Science, Advised by Prof. Bernhard Haeupler — *2015–2020 (Degree conferred on 11 Aug 2020)*
Thesis: Towards Universal Optimality in Distributed Optimization

University of Zagreb — **Faculty of Electrical Engineering and Computing**
Master of Computer Science, Advised by Prof. Mile Šikić — *2012–2015*
GPA: 3.84 (out of 4.0)

University of Zagreb — **Faculty of Electrical Engineering and Computing**
Bachelor of Computer Science — *2009–2011*
GPA: 3.87 (out of 4.0)

Professional Experience

Google Research, research scientist — **Algorithms & Optimization group**
Mar 2023–present

ETH Zürich, postdoctoral scholar — **Research group of Prof. Mohsen Ghaffari**
continued my research in the area of principles of distributed computing
theory exercise designer for Algorithmen und Datenstrukturen, Fall 2022
co-instructor for Principles of Distributed Computing, Spring 2022
co-instructor for Advanced Algorithms, Fall 2021
teaching assistant for Principles of Distributed Computing, Spring 2021
teaching assistant for Algorithms, Probability, and Computing, Fall 2020
Sep 2020–Feb 2023

Google Research, research intern
using AI techniques to solve theoretical algorithmic questions — *May–Aug 2019*

VMware, research intern — **Research Team**
worked on theoretical algorithmic lower bounds — *May–Sep 2016*

Carnegie Mellon University, research and teaching assistant
led and participated in many research projects in the area of theoretical computer science
teaching assistant for 15-859 Z "Algorithmic Superpower Randomization" (incl. 1 guest lecture), Fall 2019
teaching assistant for 15-850 "Advanced Algorithms" (incl. 1 guest lecture), Fall 2018
teaching assistant for 15-750 "Graduate Algorithms", Spring 2016
2016–2020

Vibby (startup), software developer — **Founding Development Team**
developed a social video platform — *2013–2015*

Twitter, software engineering intern — **Advanced Analytics team**
developed a distributed system for online clustering large number of tweets based on NLP — *Jul–Oct 2013*

Facebook, software engineering Intern
developed parts of the new frontend ad console interface — *Summer of 2012*

Facebook, software engineering Intern
multiple projects — *Summer of 2011*

Facebook, software engineering Intern
developed core backend infrastructure — *Summer of 2010*

University of Zagreb, teaching assistant
TA for "Algorithms and Data Structures" and "Competitive programming" course (multiple guest lectures) — *2010–2012*

Awards

2021 ACM-EATCS Principles of Distributed Computing Doctoral Dissertation Award
for the best thesis in the area of principles of distributed computing (co-awarded with Leqi Zhu) — *2021*

DFINITY Scholarship for 2018 (individual)
a total of 3 individual and 1 team scholarships were awarded — *2018*

ACM International Collegiate Programming Competition (ACM ICPC), World Finals
silver medal (ranked $8/122$ invited three-member teams) — *2014*

Rector's Grand Award, University of Zagreb
for the paper titled "LISA - A tool for DNA alignment" (in Croatian, "LISA - Alat za poravnanje DNA očitanja") *2013*

The City of Zagreb Merit Scholarship
given to top students in Croatia's capital city *2009–2011*

International Olympiad in Informatics (IOI)
gold medal in 2007 (ranked $4/285$), gold medal in 2008 (ranked $5/283$) *2007–2009*

US Invitational Computing Olympiad (USACO)
first place out of 15 invited competitors; I was the only invited non-US competitor *June 2008*

TopCoder High School Tournament ($12,000)
first place out of 8 invited international three-member teams *June 2008*

Publications (ⓐ = authors sorted alphabetically; ⓒ = sorted by contribution; ⓡ = order randomized)

[1] Goran Zuzic. "A Simple Boosting Framework for Transshipment". In: *Annual European Symposium on Algorithms (ESA)* (2023).

[2] Goran Zuzic ⓡ Bernhard Haeupler ⓡ Antti Roeyskoe. "Sparse Semi-Oblivious Routing: Few Random Paths Suffice". In: *Proceedings of the 2023 ACM Symposium on Principles of Distributed Computing (PODC)*. 2023.

[3] Václav Rozhoň ⓡ Bernhard Haeupler ⓡ Anders Martinsson ⓡ Christoph Grunau ⓡ Goran Zuzic. "Parallel Breadth-First Search and Exact Shortest Paths and Stronger Notions for Approximate Distances". In: *ACM Symposium on Theory of Computing (STOC)*. 2023.

[4] Ioannis Anagnostides ⓡ Christoph Lenzen ⓡ Bernhard Haeupler ⓡ Goran Zuzic ⓡ Themis Gouleakis. "Brief Announcement: Almost Universally Optimal Distributed Laplacian Solver". In: *Proceedings of the 2022 ACM Symposium on Principles of Distributed Computing (PODC)*. 2022.

[5] Mohsen Ghaffari ⓐ Goran Zuzic. "Universally-Optimal Distributed Exact Min-Cut". In: *Proceedings of the 2022 ACM Symposium on Principles of Distributed Computing (PODC)*. 2022.

[6] Bernhard Haeupler ⓐ D. Ellis Hershkowitz ⓐ Goran Zuzic. "Adaptive-Adversary-Robust Algorithms via Small Copy Tree Embeddings". In: *Annual European Symposium on Algorithms (ESA)*. 2022.

[7] Goran Zuzic and Di Wang ⓒ Aranyak Mehta ⓒ D. Sivakumar (first two authors made equal contributions). "Learning Robust Algorithms for Online Allocation Problems Using Adversarial Training". In: *ICLR 2022 Workshop on Gamification and Multiagent Solutions (ICLR GMS)* (2022).

[8] Václav Rozhoň ⓡ Christoph Grunau ⓡ Bernhard Haeupler ⓡ Goran Zuzic ⓡ Jason Li. "Undirected (1+epsilon)-Shortest Paths via Minor-Aggregates: Near-Optimal Deterministic Parallel & Distributed Algorithms". In: *ACM Symposium on Theory of Computing (STOC)*. 2022.

[9] Goran Zuzic ⓡ Goramoz Goranci ⓡ Mingquan Ye ⓡ Bernhard Haeupler ⓡ Xiaorui Sun. "Universally-Optimal Distributed Shortest Paths and Transshipment via Graph-Based L1-Oblivious Routing". In: *ACM-SIAM Symposium on Discrete Algorithms (SODA)* (2022).

[10] Bernhard Haeupler ⓐ David Wajc ⓐ Goran Zuzic. "Universally-Optimal Distributed Algorithms for Known Topologies". In: *ACM Symposium on Theory of Computing (STOC)* (2021).

[11] Mohsen Ghaffari ⓐ Bernhard Haeupler ⓐ Goran Zuzic. "Hop-Constrained Oblivious Routing". In: *ACM Symposium on Theory of Computing (STOC)* (2021).

[12] Bernhard Haeupler ⓐ D. Ellis Hershkowitz ⓐ Goran Zuzic. "Tree Embeddings for Hop-Constrained Network Design". In: *ACM Symposium on Theory of Computing (STOC)* (2021).

[13] Bernhard Haeupler ⓐ David Wajc ⓐ Goran Zuzic. "Network Coding Gaps for Completion Times of Multiple Unicasts". In: *IEEE Symposium on Foundations of Computer Science (FOCS)* (2020).

[14] Domagoj Bradac ⓐ Anupam Gupta ⓐ Sahil Singla ⓐ Goran Zuzic. "Robust Algorithms for the Secretary Problem". In: *Innovations in Theoretical Computer Science Conference (ITCS)* (2019).

[15] Domagoj Bradac ⓐ Sahil Singla ⓐ Goran Zuzic. "(Near) Optimal Adaptivity Gaps for Constrained Stochastic Probing". In: *International Conference on Randomization and Computation (RANDOM)* (2019).

[16] Keren Censor-Hillel ⓐ Bernhard Haeupler ⓐ D. Ellis Hershkowitz ⓐ Goran Zuzic. "Erasure Correction for Noisy Radio Networks". In: *33rd International Symposium on Distributed Computing (DISC)*. Vol. 146. Leibniz International Proceedings in Informatics (LIPIcs). 2019, 10:1–10:17. ISBN: 978-3-95977-126-9.

[17] Bernhard Haeupler ⓐ Jason Li ⓐ Goran Zuzic. "Minor Excluded Network Families Admit Fast Distributed Algorithms". In: *Proceedings of the 2018 ACM Symposium on Principles of Distributed Computing (PODC)*. ACM. 2018, pp. 465–474.

[18] Filip Pavetić © Ivan Katanić © Gustav Matula © Goran Zuzic © Mile Šikić. "Fast and Simple Algorithms for Computing both LCS_k and LCS_{k+}". In: *Proceedings of the Prague Stringology Conference 2018*. Ed. by Jan Holub and Jan Žďárek. Czech Technical University in Prague, Czech Republic, 2018, pp. 50–62. ISBN: 978-80-01-06484-9.

[19] Keren Censor-Hillel ⓐ Bernhard Haeupler ⓐ D. Ellis Hershkowitz ⓐ Goran Zuzic. "Broadcasting in Noisy Radio Networks". In: *Proceedings of the ACM Symposium on Principles of Distributed Computing (PODC)*. ACM. 2017, pp. 33–42.

[20] Bernhard Haeupler ⓐ Taisuke Izumi ⓐ Goran Zuzic. "Near-Optimal Low-Congestion Shortcuts on Bounded Parameter Graphs". In: *International Symposium on Distributed Computing (DISC)*. Springer. 2016, pp. 158–172.

[21] Bernhard Haeupler ⓐ Taisuke Izumi ⓐ Goran Zuzic. "Low-Congestion Shortcuts Without Embedding". In: *Proceedings of the 2016 ACM Symposium on Principles of Distributed Computing (PODC)*. ACM. 2016, pp. 451–460.

[22] Tin Bariša © Mihovil Bartulović © Goran Žužić © Šandor Ileš © Jadranko Matuško © Fetah Kolonić. "Nonlinear Predictive Control of a Tower Crane Using Reference Shaping Approach". In: *Power Electronics and Motion Control Conference and Exposition (PEMC), 2014 16th International*. IEEE. 2014, pp. 872–876.

Service

Program committee
served on the program committee for ITCS'24, PODC'23

Paper review
reviewed papers for SODA'24, FOCS'23, ICALP'23, PODC'23, STOC'23, ITCS'23, SODA'23, DISC'23, SPAA'22, STOC'22, SODA'21, FOCS'21, STOC'21, FOCS'20, PODC'20, ITCS'20, SODA'19, FOCS'19, STOC'18, SODA'18, Algorithmica, DIST and TCS

Theory reading group
sole organizer; coordinated 13 weekly lectures at CMU — *Jan–May 2018*

ACM ICPC Central Europe Regional Contest (CERC), scientific committee
prepared tasks for an international programming competition — *Nov 2015, 2016, and 2017*

Penkala Association, organizing committee
organized retreats and activities to facilitate networking of young Croatian scientists — *2017, 2018*

X.FER Association, vice president
promoted competitive programming among computer science student population — *2012–2013*

Contest coaching and popularization
Learning to Code on the Cloud, Purdue University, May 2021 (guest lecture, online).
ACM World finals 2015 official coach of the Croatian team (silver medal), Marocco, Jul 2015.
Guest lectures at various Croatian venues (Krk informatics summer camp 2014, 2015, 2018; Krapina informatics winter camp 2016, 2020; Mutimir research retreat 2017, 2020).
Problemsetter for various Croatian contests (COCI 2009–2011; ACM ICPC national contest 2015–2017; etc.)

App Start Contest, organizing committee
helped organized three App Start Contests, a student competition in product development — *2011, 2012, 2013*

Talks

A Simple Boosting Framework for Transshipment
ESA 2023, invited conference talk — *Sep 2023*

Parallel breadth-first search and exact shortest paths and stronger notions for approximate distances
STOC 2023, invited conference talk — *June 2023*

Universal optimality in distributed computing and its connections to diverse areas of theoretical computer science
Aalto Theory Seminar — *Apr 2023*

Universal optimality in distributed computing and its connections to diverse areas of theoretical computer science
EPFL Theory Coffee — *Oct 2022*

Adaptive-Adversary-Robust Algorithms via Small Copy Tree Embeddings
ESA 2022, invited conference talk — *Sep 2022*

Universally-Optimal Distributed Exact Min-Cut
PODC 2022, invited conference talk — *July 2022*

Brief Announcement: Almost Universally Optimal Distributed Laplacian Solver
PODC 2022, invited conference talk — *July 2022*

Universal optimality in distributed computing and its connections to diverse areas of theoretical computer science
SIROCCO 2022, invited talk on a topic of choice — *June 2022*

Approximation Boosting: a Pervasive and Underexplored Feature of Modern Graph Algorithms
Workshop on Spectral and Convex Optimization Techniques in Graph Algorithms, Bocconi university, Milan *June 2022*

Universal optimality in distributed computing and its connections to diverse areas of theoretical computer science
Theoretical computer science seminar at the University of Zagreb, Faculty of science, Math Department *June 2022*

Universally-Optimal $(1+\varepsilon)$-Approximate Shortest Path and Transshipment in the Distributed Setting
HALG 2022, contributed talk *June 2022*

Universal optimality in distributed computing and its connections to diverse areas of theoretical computer science
Not-so-local local algorithms, an online talk series on sublinear algorithms, invited talk *May 2022*

Universal optimality in distributed computing and its connections to diverse areas of theoretical computer science
IRIF, Paris, invited seminar talk *Apr 2022*

A Simple Boosting Framework for Transshipment
"Mittagseminar": Seminar organized at ETH by the Institute of Theoretical Computer Science *Mar 2022*

Universally-Optimal Distributed Shortest Paths and Transshipment via Graph-Based ℓ_1-Oblivious Routing
SODA 2022, invited conference talk *Jan 2022*

Universal optimality in distributed computing and its connections to diverse areas of theoretical computer science
Google research talk *Nov 2021*

Universally-Optimal $(1+\varepsilon)$-Approximate Shortest Path and Transshipment in the Distributed Setting
"Mittagseminar": Seminar organized at ETH by the Institute of Theoretical Computer Science *Oct 2021*

An Overview of Universal Optimality in Distributed Computing
ADGA workshop 2021, invited speaker at a workshop colocated with DISC 2021 *Oct 2021*

Hop-Constrained Oblivious Routing
STOC 2021, invited conference talk *Jun 2021*

Universally-Optimal Distributed Algorithms for Known Topologies
STOC 2021, invited conference talk *Jun 2021*

Universally-Optimal Distributed Algorithms for Known Topologies
HALG 2021, contributed talk *May 2021*

Low-Congestion Shortcuts are Universally Optimal for Distributed Computing
"Mittagseminar": Seminar organized at ETH by the Institute of Theoretical Computer Science *Nov 2020*

Robust Algorithms for the Secretary Problem
HALG 2020, contributed talk *Sep 2020*

Towards Universal Optimality in Distributed Optimization
Max Planck Institute for Informatics *Jan 2020*

Erasure Correction for Noisy Radio Networks
DISC 2019, invited conference talk *Oct 2019*

(Near) Optimal Adaptivity Gaps for Constrained Stochastic Probing
RANDOM 2019, invited conference talk *Sep 2019*

Network Coding Gaps for Multiple-Unicast Completion Time
Google Algorithms Seminar *Aug 2019*

Byzantine Secretary Problem
CMU Theory Seminar *Feb 2019*

Minor Excluded Network Families Admit Fast Distributed Algorithms
PODC 2018, invited conference talk *Jul 2018*

Communication in Noisy Radio Networks
CMU Theory Seminar *May 2018*

Distributed Computing with Shortcuts—Near Optimal on Special Graphs
CMU Theory Seminar *Oct 2016*

Low-Congestion Shortcuts Without Embedding
PODC 2016, invited conference talk
"Exploring the Limits of Computation" project (ELC), Tokyo, invited seminar talk *2016*

Proficiencies

Programming: C++ (experienced), Python (experienced), JavaScript (1 year startup experience), Java (3 month internship experience)

Theoretical: Randomized algorithms; Distributed graph algorithms; Optimization

Machine Learning: Tensorflow (3 month internship experience)

Languages: English (fluent), Croatian (native)