Ioana Oriana Bercea

Electrical Engineering and Computer Science
KTH Royal Institute of Technology
Lindstedtsvägen 5, Office: 1541
S-10044 Stockholm, Sweden

Phone: +45-91-999-139
Email: bercea@kth.se
Website: https://ioanabercea.github.io/webpage/
ORCID: 0000-0001-8430-2441, **H-index:** 6

Positions

1/10/2023–present
Assistant Professor (tenure-track),
DIVISION OF THEORETICAL COMPUTER SCIENCE
Department of Computer Science, School of Electrical Engineering and Computer Science
KTH ROYAL INSTITUTE OF TECHNOLOGY, Stockholm, Sweden

1/05/2021–30/09/2023
Postdoc,
BASIC ALGORITHMS RESEARCH COPENHAGEN (BARC)
Department of Computer Science
IT UNIVERSITY OF COPENHAGEN, Copenhagen, Denmark
Host: Thore Husfeldt

1/09/2018–30/04/2021
Postdoc,
School of Electrical Engineering
TEL AVIV UNIVERSITY, Tel Aviv, Israel
Host: Guy Even

Education

03/09/2013–17/08/2018
Ph.D. in Computer Science,
UNIVERSITY OF MARYLAND, College Park, MD, USA
Thesis: *Approximation Algorithms for Geometric Clustering and Touring Problems*
Advisor: Samir Khuller

30/08/2010–19/05/2013
M.Sc. in Computer Science,
UNIVERSITY OF MARYLAND, College Park, MD, USA
Advisor: Aravind Srinivasan

25/09/2006–12/06/2010
B.Sc. in Mathematics (Honors) and B.Sc. in Computer Science,
UNIVERSITY OF CHICAGO, Chicago, IL, USA
Four-year scholarship

Research Interests

Data Structures, Computational Geometry, Randomized and Approximation Algorithms

Refereed Conference Articles (Author Order Alphabetical)

FOCS'23
Locally Uniform Hashing
Ioana O. Bercea, Lorenzo Beretta, Jonas Klausen, Jakob Bæk Tejs Houen, Mikkel Thorup
In: *64th IEEE Symposium on Foundations of Computer Science*, (**FOCS**)

SIGMOD'23
InfiniFilter: Expanding Filters to Infinity and Beyond
Niv Dayan, Ioana O. Bercea , Pedro Reviriego, Rasmus Pagh
(authors in order of contribution)
In: *International Conference on Management of Data*, (**SIGMOD**)

STOC'22
An Extendable Data Structure for Incremental Stable Perfect Hashing
Ioana O. Bercea, Guy Even
In: *54th Annual ACM Symposium on Theory of Computing*, (**STOC**)

WADS'21 **Dynamic Dictionaries for Multisets and Counting Filters with Constant Time Operations**
Ioana O. Bercea, Guy Even
In: *17th Algorithms and Data Structures Symposium*, (**WADS**)
Invited to the special issue of *Algorithmica*

CIAC'21 **Upper Tail Analysis of Bucket Sort and Random Tries**
Ioana O. Bercea, Guy Even
In: *12th International Conference on Algorithms and Complexity*, (**CIAC**)
Invited to the special issue of *Theoretical Computer Science*

SWAT'20 **A Dynamic Space-Efficient Filter with Constant Time Operations**
Ioana O. Bercea, Guy Even
In: *17th Scandinavian Symposium and Workshops on Algorithm Theory*, (**SWAT**) , pp. 11:1-11:17

APPROX'19 **On the cost of essentially fair clusterings**
Ioana O. Bercea, Martin Groß, Samir Khuller, Aounon Kumar, Clemens Rösner, Daniel R. Schmidt, Melanie Schmidt
In: *22nd International Workshop on Approximation Algorithms for Combinatorial Optimization Problems*, (**APPROX**), pp. 18:1-18:22

CCCG'18 **Improved Bounds for the Traveling Salesman Problem with Neighborhoods on Uniform Disks**
Ioana O. Bercea
In: *30th Canadian Conference on Computational Geometry*, (**CCCG**), pp.129-141

CCCG'16 **Minimizing Uncertainty through Sensor Placement with Angle Constraints**
Ioana O. Bercea, Volkan Isler, Samir Khuller
In: *28th Canadian Conference on Computational Geometry*, (**CCCG**), pp. 287-294

SPAA'14 **On Computing Maximal Independent Sets of Hypergraphs in Parallel**
Ioana O. Bercea, Navin Goyal, David G. Harris, Aravind Srinivasan
In: *26th ACM Symposium on Parallelism in Algorithms and Architectures*, (**SPAA**),pp. 42-50
Invited to the special issue of *TOPC*

In Submission

2022 **Daisy Bloom Filters**
Ioana O. Bercea , Jakob Bæk Tejs Houen, Rasmus Pagh
url: https://arxiv.org/abs/2205.14894

Journal Articles

2022 **Dynamic Dictionaries for Multisets and Counting Filters with Constant Time Operations**
Ioana O. Bercea, Guy Even
In: *Algorithmica*, Special issue on WADS 2021

2021 **Upper Tail Analysis of Bucket Sort and Random Tries**
Ioana O. Bercea, Guy Even
In: *Theoretical Computer Science*, Special issue on CIAC 2021

2016 **On Computing Maximal Independent Sets of Hypergraphs in Parallel**
Ioana O. Bercea, Navin Goyal, David G. Harris, Aravind Srinivasan
In: *ACM Transactions on Parallel Computing*, Special issue on SPAA 2014

Invited Workshops

July 2024 *Algorithms and Data Structures Today: New Techniques, New Problems, New Challenges*
May 2023 DAGSTUHL SEMINAR: *Scalable Data Structures*
March 2023 NII SHONAN MEETING: *New Frontiers in Locality in Computation*
Feb. 2021 DAGSTUHL SEMINAR: *Scalable Data Structures*

Oct. 2019	IGAFIT: *Workshop for Postdoctoral Researchers in Algorithms*
Sept. 2019	GI-DAGSTUHL SEMINAR: *Algorithms for Big Data*
March 2019	DAGSTUHL SEMINAR: *Theoretical Foundations of Storage Systems*
Jan. 2019	DAGSTUHL SEMINAR: *Data Structures for the Cloud and External Memory Data*
Oct. 2018	*7th French-Israeli Workshop on Foundations of Computer Science*

Invited Talks

July 2023	ROMANIAN ALGORITHMS DAYS

Mentoring

2021-	**Jonas Østergaard Klausen** PhD, UNIVERSITY OF COPENHAGEN co-supervised with Mikkel Thorup, Jacob Holm
Spring 2023	**Jens Birk Andersen, Malthe Mathias Mølgaard Larsen** BSc Thesis, IT UNIVERSITY OF COPENHAGEN co-supervised with Martin Aumüller

Teaching

Fall 2023	**Course Responsible, Teacher for DD2440 Advanced Algorithms, MsC**, KTH ROYAL INSTITUTE OF TECHNOLOGY, Department of Computer Science
Summer 2022 & 2023	**Co-Intructor for Algorithms and Data Structures BSc, MSc**, IT UNIVERSITY OF COPENHAGEN, Department of Computer Science
Spring 2016	**Co-Intructor for CMSC 122: Intro to Computer Programming via the Web**, UNIVERSITY OF MARYLAND, Department of Computer Science
2010–2018	**Graduate Teaching Assistant**, UNIVERSITY OF MARYLAND, Department of Computer Science D = Leading discussion sections, presenting new material, reviewing, quizzes, grading, office hours; G = Grading and office hours **CMSC 250: Discrete Structures**, Fall 2011(D), Spring 2014(D), Spring 2015(D), Fall 2015(D), Fall 2016(D), Spring 2017(G) **CMSC 131/132: Object Oriented Programming I, II**, Fall 2010 (D), Fall 2013(D), Spring 2018(G) **CMSC 216:Introduction to Computer Systems**, Spring 2011(G), Summer 2011(D) **CMSC 351: Introduction to Algorithms**, Spring 2012(G) **CMSC 122: Intro to Computer Programming via the Web**, Fall 2017(G)
2009–2010	**Junior Tutor for Elementary Functions and Analysis 1,2,3**, UNIVERSITY OF CHICAGO, Mathematics Department

Honors and Awards

2023	**Future Digileader**, DIGITAL FUTURES
2014–2015	**Outstanding Graduate Assistant Award**, UNIVERSITY OF MARYLAND Top 2% of all UMD Graduate Assistants
2010–2012	**Dean's Fellowship**, UNIVERSITY OF MARYLAND
2006–2008, 2009–2010	**Dean's List**, UNIVERSITY OF CHICAGO

2006–2010	**Scholarship**, UNIVERSITY OF CHICAGO
	Tuition, housing and stipend (unconditioned on GPA)
2001–2006	**Romanian National Mathematics Olympiad**
	Bronze medals in the National Olympiad, Top 3 prizes in national and regional contests

Service

Program Committee co-chair, SOSA 2025

Program Committee, RANDOM 2024, ISAAC 2024, SOSA 2024, ICDCN 2020

Session Chair, HALG 2022

Journal Reviewer, *Transactions on Computers, European Journal of Operational Research, Theoretical Computer Science, Networks, ACM Transactions on Sensor Networks, The Visual Computer*

Conference Reviewer

2024, STOC, SODA, ICALP, ITCS, SWAT, SPAA

2023, FOCS, SODA, ICALP, ISAAC, FCT, SOSA, ALENEX

2022, FOCS, STOC, APPROX

2021-2020, WAOA'21, ESA'21, SPAA'21, WADS'21, SODA'20, STACS'20

< **2020**, ICALP '24, SWAT'24, SPAA'24, STOC'24, ITCS'24, SODA'24

2015–2016	**Graduate Student Representative**,
	UNIVERSITY OF MARYLAND, Computer Science Department Council
2012–2014	**Graduate Student Representative**,
	UNIVERSITY OF MARYLAND, Computer Science Department Education Committee

Talks

	Locally Uniform Hashing
July 2023	ROMANIAN ALGORITHMS DAYS
	Locality in Data Structures
May 2023	AARHUS UNIVERSITY, *Algorithms and Complexity Theory Seminar*
March 2023	NII SHONAN MEETING: *New Frontiers in Locality in Computation*
	Daisy Bloom Filters
Nov. 2022	ALGORITHMIC RESEARCH COOPERATION AROUND ØRESUND (ARCO)
	An Extendable Data Structure for Incremental Stable Perfect Hashing
May 2023	DAGSTUHL SEMINAR: *Scalable Data Structures*
July 2022	STOC
June 2022	HIGHLIGHTS OF ALGORITHMS (HALG) (short)
	Dictionaries et al.
Sept. 2021	DIGITAL RESEARCH CENTER DENMARK (DIREC)
May 2021	BARC, *Seminar*
March 2021	BAR-ILAN UNIVERSITY, *Computer Science Department Colloquium*
Feb. 2021	DAGSTUHL SEMINAR: *Scalable Data Structures*
	Upper Tail Analysis of Bucket Sort and Random Tries
June 2020	20TH HAIFA WORKSHOP ON GRAPH THEORY, COMBINATORICS AND ALGORITHMS
	Dynamic Dictionaries for Multisets and Counting Filters with Constant Time Operations
Aug. 2021	WADS

A Dynamic Space-Efficient Filter with Constant Time Operations

June 2020	SWAT
Dec. 2019	UTRECHT UNIVERSITY, Algorithms Seminar
Sept. 2019	GI-DAGSTUHL SEMINAR: Algorithms for Big Data
July 2019	WORKSHOP ON LOCAL ALGORITHMS (WOLA)

The Descent of Cuckoos, and Selection in Relation to Nests

June 2019	HIGHLIGHTS OF ALGORITHMS (HALG) (short)
June 2019	19TH HAIFA WORKSHOP ON GRAPH THEORY, COMBINATORICS AND ALGORITHMS
May 2019	ISRAELI NETWORKING DAY
March 2019	MAX PLANCK INSTITUTE FOR INFORMATICS, Theory Seminar
Jan. 2019	DAGSTUHL SEMINAR: *Data Structures for the Cloud and External Memory Data*

Improved Bounds for the Traveling Salesman Problem with Neighborhoods on Uniform Disks

Nov. 2018	TEL AVIV UNIVERSITY, Computational Geometry Seminar
Oct. 2018	*7th French-Israeli Workshop on Foundations of Computer Science*
Aug. 2018	CCCG
April 2018	CENTRA DE RECERCA MATEMATICA, IRP Program

Minimizing Uncertainty through Sensor Placement with Angle Constraints

Aug. 2016	CCCG

On Computing Maximal Independent Sets of Hypergraphs in Parallel

June 2014	SPAA

References

Prof. Samir Khuller
Northwestern University
Computer Science Department
2233 Tech Drive, Mudd Room 3017
Evanston, IL 60208-3109, USA
Phone: +1-847-491-2748
Email: samir.khuller@northwestern.edu

Prof. Guy Even
Tel Aviv University
Dept. of Electrical Engineering - Systems
Computer and Software Eng. Bldg., Room 208
Tel Aviv, IL, 68878
Phone: +972-3-6407769
Email: guy@eng.tau.ac.il

Prof. Rasmus Pagh
University of Copenhagen
Computer Science Department
Universitetsparken 1
2100 København Ø, Denmark
Phone:
Email: pagh@di.ku.dk

Prof. Thore Husfeldt
IT University of Copenhagen
Department of Computer Science
Rued Langgaards Vej 7, Building: 4B08
2300, København S, Denmark
Phone: (+45) 72185075
thore@itu.dk